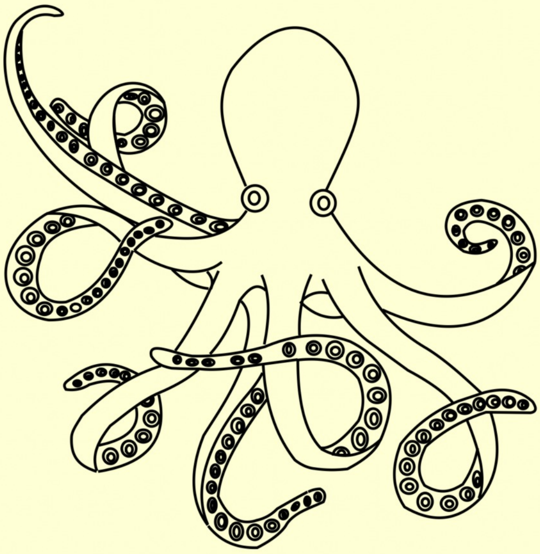

# Diving & ROV specialists

## Surface-Supplied Diving Handbook Series

## Book #8

## Implement the DCIEM tables

June 2025

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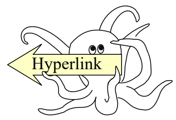
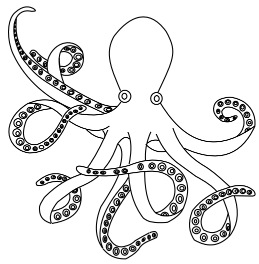
This document is the eighth of eight books in the "Surface-Supplied Diving Handbooks Series", described below.

| |
|---|
| **Book 1:** Overview of surface-supplied diving operations and scope of this series |
| **Book 2:** Description and prevention of accidents associated to diving operations |
| **Book 3:** Legal aspects of project preparation |
| **Book 4:** Description and maintenance of surface supplied diving systems |
| **Book 5:** Managing Weather, Communications, Surface Supports & Underwater Vehicles |
| **Book 6:** Prepare and manage the dives |
| **Book 7:** Implement the MT 92 tables |
| **Book 8:** Implement the DCIEM tables |

# Tables of contents







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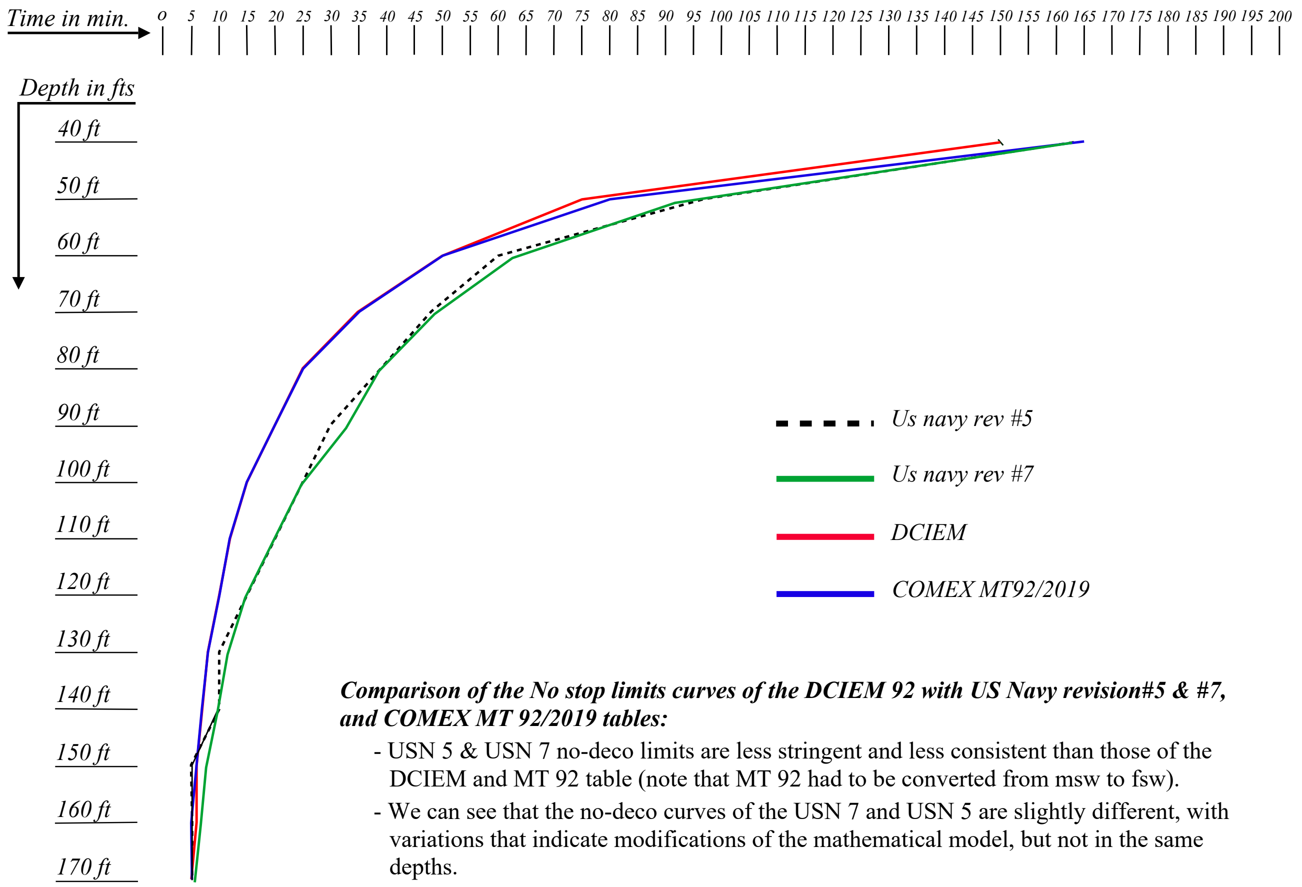
# 1 - Structure and enhancements of the the DCIEM diving tables

## 1.1 - What is DCIEM?

DCIEM is an abbreviation for "Defence and Civil Institute of Environmental Medicine". It is a Canadian research establishment whose mission is to enhance the safety and effectiveness of Canadian Forces personnel in the way in which they interact with their equipment and how they function in difficult environments. The establishment has been reorganized recently, and the name has been changed to "Defence Research and Development Canada" (DRDC). Diving research conducted at DRDC (previously DCIEM) had its origins in 1939.
Defence Research and Development Canada (DRDC) operates eight research centres across Canada, each with a specific combination of expertise and facilities to carry out science and technology research. The diving tables DCIEM have been studied in Toronto Research Centre, 1133 Sheppard Avenue West Toronto, Ontario

## 1.2 - The DCIEM decompression model

The DCIEM decompression theory is based on the Kid-Stubbs model, which was first published in 1962. This model is based on U.S. Navy tables that have been reinforced. The procedure of reinforcement used was organizing dives using the original model and changing the parameters of the model when symptoms of decompression illness occurred, making it more conservative. As a result of these experimentations, DCIEM scientists represented the human body by compartments in series, where one tissue is exposed to the ambient pressure and the gas transfers from tissue to tissue during the dive. These experimental dives started in 1967, and the Kidd-Stubbs model was approved as a safer alternative to the U.S. Navy tables in 1971. A reevaluation of the model was performed in 1979 using computers and specially-designed doppler ultrasonic bubble detectors that resulted in many improvements to the initial Kid-Stubbs model. These reinforcements are explained in the report # 84-R-44 issued by R.Y. Nishi and G.R. Lauckner in September 1984, which is available on the next page.
The last revision of these diving tables was released in 1992. It provides some improvements to the previous decompression model published in 1984. However, there is nothing fundamental regarding the Kidd-Stubbs model 1984 itself. This last revision is the one used in this handbook.
Although they are already 30 years old, DCIEM tables are still used by many companies in the industry. It must be noted that they have a similar no-decompression curve and stop times to the COMEX MT92 tables that were studied and published during the same period. Also, comparing these no-decompression curves with those of the US Navy tables revision #5, published in 2005, and US Navy revision 7, published in 2016, shows that these two decompression model tables are more severe regarding this matter. Some claim that this table is no longer developed by DRDC, which is indeed true. However, we need to note that the MT92 table is still part of the French labor diving regulations, reviewed in 2019, and remains unchanged since its first publication in 1992. Therefore, we can further compare the DCIEM with the MT 92 and USN Revision 7 to demonstrate that it remains suitable for commercial diving operations.




***Comparison of the No stop limits curves of the DCIEM 92 with US Navy revision#5 & #7, and COMEX MT 92/2019 tables:***

- USN 5 & USN 7 no-deco limits are less stringent and less consistent than those of the DCIEM and MT 92 table (note that MT 92 had to be converted from msw to fsw).
- We can see that the no-deco curves of the USN 7 and USN 5 are slightly different, with variations that indicate modifications of the mathematical model, but not in the same depths.

*Soft copy of the original report published in 1984*

September 1984 DCIEM No. 84-R-44

# DEVELOPMENT OF THE DCIEM 1983 DECOMPRESSION MODEL FOR COMPRESSED AIR DIVING

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**ABSTRACT**

The Kidd-Stubbs (KS) decompression computer model has been used at DCIEM for a considerable number of years to control experimental,operational, and training dives.

Although the KS model has been successful with a low incidence of decompression sickness, several problems exist. These include overly conservative no-decompression limits and conservative decompression times for short exposures. As the bottom times increase, the decompression times become less conservative and the decompression stress increases. A critical study of the model, using the Doppler ultrasonic bubble detector, showed that there was a range of bottom times in which the decompression stress was severe with a high risk of decompression sickness. Beyond this range of bottom times, the KS model once again became excessively conservative. In order to improve the safety of the KS model and to satisfy Canadian Forces requirements for compressed air diving, the Kidd-Stubbs model was modified to increase the no-decompression limit, decrease the decompression requirements for moderate exposures, increase the decompression times for severe exposures and remove the anomaly of the excessively long and unnecessary decompression times caused by the third and fourth compartments of the model.

The modified model, referred to as the DCIEM 1983 Air Decompression Model, has been used to generate standard air decompression tables, in-water oxygen decompression tables, and surface decompression using oxygen tables. Experiments have proven these tables safer than those derived from the Kidd-Stubbs model and they are recommended to become the Standard Canadian Forces Decompression Tables for compressed air diving.

# TABLE OF CONTENTS

# 1 INTRODUCTION

Decompression computers (1) have been used for many years at the Defence and Civil Institute of Environmental Medicine (DCIEM) to control compressed air dives. These dives have included experimental, training, and operational dives to depths as great as 100 metres of seawater (msw). Real-time dive control by computer is useful since the diver's actual depth is used to calculate the optimum ascent profile. For repetitive or non-standard dives (where the bottom depth and the descent or ascent rates do not remain constant), decompression computers produce far more efficient ascent profiles than those obtained from dive tables. The DCIEM decompression computer is based on the Kidd-Stubbs (KS) pneumatic analogue decompression computer (PADC) (2,3). The PADC was a pneumatic-mechanical analogue of the human body, in which the gas uptake and elimination were simulated by a series of cavities and flow resistances. The latest DCIEM developed decompression computer is the XDC-2 (1), a digital micro-computer which calculates numerically the gas uptake and elimination from the mathematical model of the PADC (4) which is known as the KS-1971 decompression model (5).

Although the KS-1971 model has been successfully used for many years with a low incidence of decompression sickness (DCS), it has several faults. One of these, the conservative nature of the no-decompression limits, is well known. Others, however, only became evident after a critical study of the model with the XDC-2 computer was undertaken (6,7) using the Doppler ultrasonic bubble detector to assess the severity of the decompression stress. This study revealed that there was a range of bottom times in which the decompression stress was severe enough to present a high risk of DCS. These limitations and other problems of the KS model will be discussed in more detail in the next section.

Because of the problems inherent in the KS-1971 model, it was felt that changes in the model were necessary to improve the safety of Canadian Forces compressed air diving. This report describes the modifications to the KS model and the development of the DCIEM 1983 model.

## BACKGROUND

### 1. History of the DCIEM Decompression Computer

The DCIEM decompression computer is the result of a program started in 1962 by D.J. Kidd and R.A. Stubbs (2-4,8). Their aim was to develop an instrument which would monitor the diver's depth-time history and provide instantaneous decompression information for oxygen-helium diving when complicated dive profiles and wide variations of gas mixtures would make the traditional tabular approach to decompression inadequate. Because excellent data were available for air dives, the concept of computer-controlled decompression was first applied to diving with compressed air.

Initial versions of the computer were pneumatic-mechanical analogue computers. Cavities or volumes into which gas could enter at a controlled rate were used to simulate the different types of tissues in the human body. Early prototypes of the PADC were based on the U.S. Navy Air Tables and consisted of four compartments in parallel. A series of modifications were made to half-times, supersaturation ratios and compartment configurations in order to increase the safety for a wide variety of single and multiple dives.

The diver portable Mark VS PADC, developed in 1965, and the surface-based Mark VIS PADC computers, developed in 1966, were the forerunners of the present day computer. These consisted of four compartments in a series arrangement with the same fixed supersaturation ratio on each compartment.

The operation of the PADC was described by the following set of four nonlinear differential equations (3):

$$dP_1/dt = A((B + P_o + 1^3{}_1)(Po - P_1) - (B + P1 \quad P2)(131 - P2)) \quad (1)$$

$$dP_2/dt = A((B + P_1 + P_2)(P_1 - P_2) - (B + P2 \quad P3)(P2 - P3)) \quad (2)$$

$$dP_3/dt = A((B + P_2 + P)(P_2 - P_3) - (B + P3 \quad P4)(P3 - P4)) \quad (3)$$

$$dP4/dt = A(B + P_3 + P_4)(P_3 - P_4) \quad (4)$$

where: $P_i$ = the pressure in compartment i,
$P_o$ = the ambient pressure,
A = 0.0002596, gas flow constant (air, P in msw), and
B = 83.67, gas flow constant (air, P in msw).

The safe ascent depth, SAD, was determined by:

$$SAD = Pt/1.8 - Ps1, \quad (5)$$

where $P_t$ is the largest of the four compartments pressures and $P_s1$ is the pressure at sea level (10.06 msw). This equation was the same for all four compartments. (All pressures in equations 1-5 are expressed as absolute gas pressures, not inert gas partial pressures).

Equations 1-4 describe the gas flow through pneumatic resistors (consisting of micropores) into and out of the four compartments which make up the PADC. (This gas flow is in the "slip-flow" regime). The flow constant "B" makes the uptake and elimination of gas nonlinear with pressure and introduces an asymmetry between uptake and elimination, with the uptake being more rapid than elimination. Thus, the equations describe the operation of a piece of hardware which is able to predict the safe decompression from a wide variety of dives rather than describing a physiological model for decompression.

However, there was some physiological basis for this nonlinear series model. Kidd and Stubbs (2) felt that, physiologically, the transfer of gas between the lungs and remote tissues could be visualized more as a series or series-parallel system of diffusion gradients rather than the traditional parallel configuration of diffusion compartments. They further argued that the transfer of gas throughout the body's tissues was a linear process only under special conditions (9). The series configuration is, in the limit, an approximation of a distributed system or continuous "slab" of tissue. Hennessy (10) has shown that the equations for the pneumatic computer are essentially an approximation of the bulk-diffusion equation into a slab of material where the diffusion co-efficient is a linear function of pressure. In addition, there was physiological evidence from animal experimentation to suggest that the uptake and elimination of inert gas were asymmetrical, with the rate of uptake being faster than elimination (11).

In 1970, it was discovered that hyperbaric chamber operators were not following the computed SAD but were staying deeper by as much as 3 msw because of an inherent distrust in the safety of the PADC for deep dives. This distrust appeared to be justified when dives done in the period June 1970 - February 1971 by following the SAD exactly resulted in a 20% incidence of DCS in the 60 to 91.5 msw depth range. The DCS incidence in the period December 1968 - May 1970 was only 3.6% for the same depth range. An analysis by Stubbs resulted in an equation for the SAD of the form:

$$SAD = P_t/R - OFF - Ps1 \qquad (6)$$

The two values, R = 1.385 and OFF = 3.018, gave a good fit to the SAD actually being used by the hyperbaric chamber operators.

The effect of the offset constant, OFF, was to make the supersat-uration ratio depth-dependent, with the ratio becoming more conserva-tive with increasing depth. The supersaturation ratio, "SR", can be obtained from Equation 6 as:

$$SR = P_t/(SAD + P_{s1}) = R/(1 - (R \times OFF)/P_t). \qquad (7)$$

The surfacing ratio, given by

$$SR_0 = P_t/P_{si} \text{ (i.e., for SAD = 0),} \qquad (8)$$

was still the same as the original ratio (i.e. 1.8), so that shallow or short dives were not affected greatly. For deeper and longer dives, the depth-dependent ratio had the effect of introducing deeper decompression stops.

Equations 1-4 and 6 define the KS-1971 decompression model. Appendix I gives sample standard air decompression tables calculated from these equations and Figure 1 provides a simple comparison of these tables to the USN Standard Air Tables (12) and RN Tables 11/12 (13).

During the 1970's, a large number of dives was performed using the PADC, primarily on compressed air. (Some dives were also conducted on a 20%-02/80%-He breathing mixture and, to a limited extent, on a 20%-02/80%-argon breathing mixture.) These dives included both single and repetitive dives. Both pneumatic-mechanical and pneumatic-electronic versions of the PADC were used. In most dives, the decompression was carried out on a continuous basis with the actual depth being kept the same as the computed SAD until the surface was reached. In practice, however, the actual depth tended to lag behind the SAD by a foot (of seawater) or more, making the actual profile somewhat more conservative than the calculated decompression profile.

In the late 1970's, the PADC was replaced by the microprocessor-controlled XDC-2 digital decompression monitor (1). The advantage of the digital computer was that the extensive calibration and maintenance procedures for each compartment of the PADC were no longer necessary. The only calibration required was for the depth transducer. In addition, the use of digital displays made it possible for the chamber operator to follow the displayed SAD exactly during decompression.

2. <u>Limitations of the KS-1971 Model</u>

Although thousands of dives based on the KS decompression model have been conducted successfully, two major problems were apparent. First, the no-decompression limits were extremely conservative. Figure 2 shows a comparison of the KS no-decompression limits with those from the U.S. Navy Standard Air Decompression Table (12) and the Royal Navy Table 11 Air Table (13). Also shown in Figure 2 is a set of three no-decompression isostress curves (curves of constant decompression stress) which define the no-decompression limits for low, moderate, and high decompression stress. These curves were determined using the Doppler ultrasonic bubble detector in a study carried out in 1980 on no-decompression limits (14). No-decompression isostress curve 2 (IS(NoD)-2) represents a good limiting line for hardworking well-acclimatized divers. Young, fit and well acclimatized divers could probably dive to IS(NoD)-3 for light, working dives, although there is some element of risk at the deeper depths. IS(NoD)-1 represents the limit for the "less than average" diver who may not be young or exceptionally fit or well-acclimatized. It can be seen that the KS no-decompression limits are less than IS(NoD)-1.

For some depths, it can be seen that the no-decompression limits are less than half of those specified by the other tables. As a result, there is a range of bottom times in the computer but not with the other Figure 1 which gives a comparison those of the Royal Navy and US Navy which decompression is required with tables. This can be clearly seen in of the KS decompression times with air tables for selected depths.

The second problem was an anomaly introduced by the third and fourth compartments of the KS model. When these became the controlling compartments for determining the safe ascent depth, the decompression times became excessively long. For example, it can be seen in Appendix I that the decompression time required for a 70 min exposure time at 36 msw is over twice that required for a 60 min bottom time at that depth. Figure 1 shows that in all cases, the decompression times become excessively long at long bottom times, and are considerably longer than those for the RN and USN tables.

In 1979, a critical study was undertaken to evaluate the XDC-2 for operational diving. The objectives were to determine if the SAD as displayed could be followed exactly for safe decompression, and to define the operational limits of the model for compressed air diving (6,7). In these dives, the decompression was carried out on a continuous basis by keeping the actual depth equal to the calculated SAD until 3 msw. The depth was held at 3 msw until the computer indicated that it was safe to surface. This procedure was used because it would be impossible to control the depth accurately at shallow depths when diving in the ocean. The Doppler ultrasonic bubble detector was used to assist in the assessment of the decompression stress.

This study resulted in the establishment of another set of three isostress curves (curves of constant decompression stress) (15) which defined regions of "mild to moderate" (isostress curve 1 (IS-1)), "moderate to severe" (IS-2), and "severe" decompression stress (IS-3) for "average" divers decompressed with the KS-1971 model. At IS-3, there was a definite risk of DCS. "Above average" or well-acclimatized divers could expect mild to moderate stress at curve 2 and moderate to severe stress at curve 3. These isostress limits are shown in parentheses in Appendix I besides the appropriate bottom times and in Figure 1.

Many of the dives in the past had been performed for bottom times less than the IS-3 limit where the incidence of bends was low. Some dives, mostly in the 60 to 91.5 msw range had been done for bottom times in which the fourth compartment was controlling and which resulted in long decompression times and generally safe decompressions. Very little diving had been done near the IS-3 limit. The importance of this study was that it identified a range of bottom times, previously unrecognized, in which there was a high risk of DCS and which imposed a limit on operational diving with the computer. Figure 1 shows that in this range of bottom times, the KS decompression times are close to or less than those of the RN or USN tables.

In 1982, decompression procedures for using oxygen in the water (In-water $O_2$) and surface decompression using oxygen (SurD $O_2$) in a recompression chamber (RCC), based on the KS-1971 model, were developed and evaluated (16). These experiments showed that both procedures were very effective in reducing the decompression times and the decompression

stress and that the XDC-2 could be used for "real-time" computer control of $O_2$ decompression.
However, the inherent problems of the KS-1971 model remained.

3. Objectives for Modifying the KS-1971 Model

To overcome the problems and anomalies in the KS-1971 model, a modification of the model was undertaken using the following criteria:

a. increase the no-decompression limit to approximate those of the Royal Navy Table 11 limits (13);

b. decrease the decompression requirements for moderate exposures (short bottom time dives) where the decompression times are known to be conservative;

c. increase the decompression times for severe exposures in the IS-3 region to reduce the decompression stress; and

d. remove the anomaly of the excessively long and unnecessary decompression times caused by the onset of the third and fourth compartments as controlling compartments.

An additional criterion was to make the modifications simple and not change the KS model too drastically so that the XDC-2 decompression computer could be easily reprogrammed to accommodate these changes. Also, a drastic change in the basic model would invalidate the large data base developed over the years at DCIEM and would require extensive testing which would be prohibitive in terms of time and manpower requirements.

**METHODS**

1. The Kidd-Stubbs Decompression Model

The KS-1971 model, as defined by equations 1-4 and 6, consists of only four constants which define the entire model - the two gas constants "A" and "B", and the two supersaturation constants "R" and "OFF" (Equation 1-4, 6). These four constants are identical for each compartment. Several approaches can be taken to modify the model in order to meet the five main criteria described previously.

One approach is to change all or some of the four constants. These four constants could also be made different for each compartment, thus giving 16 variable parameters. However, it is not necessary, or desirable, to go to this complexity. For example, Kidd, Stubbs and Weaver (9) have shown that it is possible to obtain a close match to the Workman M-value system (17) (which uses 27 parameters) with only 5 parameters.

The relationship between "A" and "B" can be seen from the halftime equation for a single compartment:

$$T(1/2) = (\ln ( 2 - A\ P/(B + P_i + P_f)))/(A(B + 2P_f)), \qquad (9)$$

where:

$P_i$ is the initial pressure, $P_f$ is the final pressure, and A P = Pf - $P_i$.

The constant "B" controls the nonlinearity of the gas uptake and elimination. The half-time is dependent on the pressure interval A P over which the measurement is made. Therefore, for gas uptake, $P_f > P_i$, the half-time is shorter than for gas elimination, $P_i > P_f$ (i.e. uptake is faster than elimination). Increasing "B" will reduce the nonlinear-ity and reduce the asymmetry between the uptake and elimination. To keep the half-time of the system similar to that of the KS model, "A" will then have to be made smaller. Note that if B>>Pi + $P_f$, the halftime equation becomes the same as that for linear uptake and elimination, i.e.:

$$T(1/2) = (\ln 2)/k, \qquad (10)$$

where k is a constant.

Any changes, however, even to only one compartment, affect the behaviour of all the compartments and will require changes to "R" and "OFF" to obtain the required behaviour. The problem with this approach is that it is difficult to make the required changes and still retain the desirable features of the KS model without a great deal of trial and error effort.

A simpler and more direct approach is to change only the two constants "R" and "OFF". For example, to increase the no-decompression limits and reduce the decompression times for short exposures, the first compartment supersaturation ratio needs to be made less conservative. To increase the decompression times for longer exposures, the ratios for the second to fourth compartments can be made more conservative. There is still a "downstream" effect with any first compartment changes affecting what happens to the second, third, and fourth compartments. However, the reverse is not true. Changes in the second or higher compartment will not affect the properties of the first compartment. Thus, the interaction problem between compartments is easier to deal with. This was the approach finally selected to meet the first three criteria for the new model.

To meet the fourth criterion for reducing the long decompression times when the third and fourth compartments become the controlling compartments, it is necessary to understand the reason for the long decompression times. The long decompression times for extended bottom times are a result of the model being limited to four compartments. Hennessy (10) has estimated that at least 8 compartments should be used to obtain an accurate fit to the bulk diffusion equation. For the long bottom time dives, the fourth compartment saturates faster than in a model in which there are more compartments. Hence, during decompression, more gas has to be eliminated, thus resulting in the "long tail" to the decompression. As a first step, it is therefore necessary to investigate the behaviour with more than four compartments.

## 2. Approach to Changing the KS-1971 Model

An analysis of the KS-1971 model showed that the first compartment controlled the decompression for all bottom times up to IS-2. Compartment 2 then controlled the decompression from IS-2 to bottom times about 20% greater than those at IS-3. The third compartment controlled for only a short time before the fourth compartment took over, thus resulting in the long "tail".

Between the no-decompression limits and IS-1, which defines the region of "mild to moderate" decompression stress, the decompression requirements had to be reduced by increasing the supersaturation ratio for the first compartment only. Between IS-1 and IS-2, the decompression stress increases from "mild to moderate" to "moderate to severe". In this region, the decompression requirements had to be increased slightly to keep the stress at IS-2 "moderate". Between IS-2 and IS-3, where the second compartment is dominant, the decompression stress becomes severe. Hence, the supersaturation ratio for the second compartment had to be reduced to give slightly longer decompression times. Reducing the supersaturation ratio for the second compartment would also shift where the second compartment is controlling towards IS-1, thus, increasing the decompression requirements below IS-2.

Based on the above considerations, the modifications to meet the criteria for the new decompression model could be achieved in three stages:

a. First Compartment

Increase no-decompression limits and reduce decompression requirements for short exposures (up to approximately IS-1);

b. Second Compartment

Increase the safety for moderate and long exposures (from between IS-1 and IS-2 to beyond IS-3); and

c. Third/Fourth Compartments

Eliminate the long "tail" in the decompression.

## RESULTS

1. The DCIEM 1983 Model

a. First Compartment

The no-decompression limits are determined by the surfacing ratio of the first compartment only. For the first compartment, the surfacing supersaturation ratio was increased from 1.8 in the KS model to 1.92. This value increased the no-decompression limits slightly. Figure 3 shows the no-decompression limits for the final surfacing ratio, with the US Navy and Royal Navy limits and the three no-decompression isostress (IS(NoD)) limits for comparison. The DCIEM 1983 no-decompression limits are not as great as the targeted Royal Navy limits for depths greater than 15 msw. At 12 msw, the DCIEM 1983 no-decompression limit exceeds that of the Royal Navy but is less than that of the US Navy. Deeper than 18 msw, the DCIEM 1983 no-decompression limits are still slightly less than the IS(NoD)-1 limits.

Although higher surfacing ratios give a better match to the Royal Navy limits, the limits at the shallower depths become too large because of the nonlinearity of the KS series model. In addition, the higher ratios tend to make the decompression times too short at 18 and 21 msw, compared to those from the RN Tables (13) or US Navy Standard Air Decompression Tables (12), for bottom times greater than IS(NoD)-1. To get a better fit to the RN no-decompression limits, the nonlinearity of the model would have to be altered by changing the "A" and "B" constants. This would have required a drastic change in the model.

The higher surfacing ratio decreases the decompression times for all bottom times controlled by the first compartment. For diver safety, however, it was felt necessary to retain the deep stops of the basic KS model. An analysis showed that the dives where additional decompression was required could be specified as all dives in which the first decompression stop was 15 msw or deeper. Therefore, the constants "R" and "OFF" were determined by the surfacing ratio of 1.92 (for SAD = 0) and by the supersaturation ratio from the KS model at SAD = 15 msw. The values of R = 1.3 and OFF = 4.8 were found to satisfy the constraints at SAD = 15 msw and at SAD = O.

The no-decompression limits resulting from the new model (shown in Figure 3) are rather conservative - especially between 15 and 24 msw. They are, however, considerably less restrictive than the KS-1971 limits shown in Figure 2. It is suggested that this extra margin of safety for short, shallow dives is beneficial since it is in this region that the majority of diving by "novice" and "infrequent" divers is done.

b. Second Compartment

For the second compartment, the surfacing ratio was made more conservative, from 1.8 in the KS model to 1.73. This resulted in about a 10 minute increase in decompression time at IS-3, and shifted the point where the second compartment became controlling down to approximately IS-1. To determine "R" and "OFF", the second constraint on the supersaturation ratio was the value on the surface (P = 10.06 msw) which determined the maximum safe altitude for flying. The target was to make this value as close to 2 as possible, thus, giving 0.5 atm (18000 ft altitude) which is normally accepted as being the threshold for altitude "bends" (18). The KS model gives a ratio of 2.37 (just over 22000 ft altitude) which was felt to be too high. The final values selected were R = 1.385 and OFF = 2.5. These gave a reasonable match to the constraints for surfacing and for altitude. The supersatura-tion ratio at the surface was found to be 2.11, which gave an altitude of just over 19000 ft, not too different from the normally accepted value of 18000 ft. A lower ratio was found to increase the decompression times too much.

c. Third/Fourth Compartments

The problem of removing the anomaly of the excessively long decompression times when the third and fourth compartments became the controlling compartments was solved by monitoring only the first two compartments (although all four compartments are used for calculating the compartment pressures). The decision to use this solution was based on an examination of the behaviour of the model when the number of compartments was made larger than four.

Figure 4 shows what happens when more than four compartments are used in the model. The figure shows the decompression times for the four compartment model with only two being monitored (indicated as DCIEM) with the decompression times for 4, 5, 6, and 8 compartments with all compartments being monitored. Also shown for comparison are the Royal Navy and US Navy decompression tables for air. The effect of adding more compartments is to reduce the decompression times for the longer bottom times since the "end" effect is reduced. For example, with 5 compartments, the pressure in the fourth compartment is reduced since the gas can escape into the fifth compartment. The "end" effect is still present but at a much greater bottom time. Similarily, by adding more compartments, the "end" effect can be pushed farther to the right (longer bottom times). However, the reduction in decompression time is serious since the decompression times become shorter than those of the Royal Navy and US Navy at extended bottom times and are considered insufficient.

On the other hand, monitoring only two compartments of a four-compartment model gives decompression times at extended bottom times which are more conservative than those of the other two tables and those generated for 5 or more compartments.

d. Summary

The final DCIEM 1983 model is thus derived from the KS-1971 four-compartment series model defined at the beginning of this paper with the following changes:

(1) First Compartment:R = 1.3, OFF = 4.8

(2) Second Compartment:R = 1.385, OFF = 2.5

(3) Third/Fourth Compartments: 1/R = 0.0, OFF = 0.0

Figure 5 graphically compares the KS-1971 and the DCIEM 1983 models. It is readily seen that the objectives of increasing the no-decompression limits, decreasing the decompression for moderate exposures, increasing the decompression in the KS IS-3 region and reducing the "tail" for extended bottom times has been achieved.

The DCIEM 1983 model has been programmed into the XDC-2 computers and real-time computer control (with printed tables for backup) has been used throughout the model validation process. Over 500 experimental man-dives with full ultrasonic Doppler monitoring have been done by this method to date.

For operational simplicity, "staged" decompression rather than "continuous ascent" is now used at DCIEM with the XDC-2. Decompression is carried out with stops at intervals of 3 msw (10 fsw). The diver stays at the 3 msw multiple (10 fsw multiple) deeper than the indicated "Safe Ascent Depth" (SAD) until the computer shows that he can ascend to the next stop.

2. Standard Air Decompression

Appendix II contains sample Standard Air decompression tables derived from the DCIEM 1983 model. Figure 6 compares total decompression times from these tables with those of the equivalent RN and USN tables. The DCIEM procedure is:

a. descend at 18 msw/min (60 fsw/min) or slower; and

b. ascend at 18 msw/min to the indicated stops and remain at each stop for the tabulated time. The stop time at each stop includes the ascent time to that stop.

The procedure for real-time computer control (with the XDC-2) is:

a. descend at 18 msw/min (60 fsw/min) or slower;

b. ascend at 18 msw/min to the indicated stops and remain at each stop for the tabulated time. The stop time at each stop includes the ascent time to that stop.

The procedure for real-time computer control(with the XDC-2)is:

a. descend at 18 msw/min (60 fsw/min) or slower;

b. ascend at 18 msw/min or slower to msw (10 fsw) which is deeper than the indicated Safe Ascent Depth (SAD);

c. remain at that stop until the SAD has decreased to the next shallower 3 msw multiple and then ascent to the next stop and so on; and

d. ascend to the surface when the SAD = "0".

The DCIEM tables are divided into two sections for each depth increment. The section above the line defines the "normal" air diving range and provides "Repetitive Dive Groups" for each profile. Profiles below the line are designated "exceptional exposures" and no repetitive diving is permitted following an "exceptional exposure" dive.

Although the DCIEM decompression times at extended bottom times are more conservative than those of the other published tables, experiments have shown that this conservatism is well justified. The US Navy Diving Manual (12) states that "if the diver was exceptionally cold during the dive, or if his work load was relatively strenuous, the next longer decompression schedule than the one he would normally follow should be selected". Canadian Forces experience has shown that the "next longer plus next deeper" is often required for adequate decompression after long hard dives in cold water. The DCIEM 1983 tables are designed for hard work in cold water and if the decompression times are compared to those of the US Navy for the next longer bottom times (USN +1), the results are quite similar. This can be seen in Figure 7.

3. In-Water Oxygen Decompression

Surface decompression with $0_2$ is well known and widely used. However, in military diving, it is not always possible to have a recompression chamber (RCC) on-site, yet it is possible to supply the diver with $0_2$. Therefore, it was decided to apply $0_2$ in the water - albeit at a conservative depth. Appendix III shows sample "In-Water $0_2$" decompression tables. The DCIEM "In-Water 02" procedure is:

a. do normal staged ascent as for Standard Air to 9 msw (30 fsw);

b. switch diver's gas to $0_2$. The diver remains on $0_2$ at 9 msw for the tabulated stop time; and

c. ascend to surface on $0_2$ in one minute.

For real-time computer control, the procedure is:

a. do a normal computer-controlled ascent to 9 msw at 18 msw/min or slower;

b. switch diver's gas and computer to 02. The diver remains on $0_2$ at 9 msw until the indicated SAD = "0"; and

c. ascend to surface on $0_2$ in one minute.

Figure 8 compares this method to RN Table 13. The total decompression times with this procedure are reduced by 35-40% over Standard Air decompression. Figure 9 presents a graphic comparison of in-water decompression times between DCIEM 1983 Standard Air, In-Water $0_2$ and USN Standard Air Decompression.

4. Surface Decompression with 07

Appendix IV shows sample "SurD 02" tables generated by the DCIEM 1983 model. Experimentation has shown that a diver could be safely surfaced for recompression in a chamber after he has completed the 9 msw (30 fsw) in-water stop, i.e., when the computer SAD reads 6 msw. The DCIEM "SurD $0_2$" procedure is:

a. do a normal staged ascent as for Standard Air to 9 msw (30 fsw) or surface (if no in-water stop is shown);

b. remain at the 9 msw stop for the tabulated stop time (stop time includes ascent time to 9 msw stop at 18 msw/min);

c. ascend to surface in 1 minute (9 msw/min) and recompress on $0_2$ to 12 msw (40 fsw) in the RCC. The "Surface Interval" (SI), which is the time from leaving the 9 msw water stop (or the bottom, if no in-water stop is required) to reaching the 12 msw RCC stop must not exceed 7 minutes (Note 1);

d. remain on $0_2$ at 12 msw for the tabulated stop time with 5 min air breaks after every 30 minutes on $0_2$ (Note 2); and

e. ascend to surface on $0_2$ in 2 min (6 msw/min). For real-

time computer control, the procedure is:

a. do a normal computer-controlled ascent to 9 msw. (If, on reaching 9 msw, the indicated SAD is 6 msw or shallower, ascend directly to the surface);

b. remain at 9 msw until the SAD indicates 6 msw, then ascend to surface at 9 msw/min and recompress on $0_2$ to 12 msw in the RCC. (The computer is switched to $0_2$ when the diver starts breathing $0_2$. The SI must not exceed 7 minutes.);

NOTE 1: A maximum SI of 7 minutes was chosen to enhance the "operability" of the procedure and to reduce the chances for "omitted decompression" during operations. Extensive experimentation using the full 7 minute SI has proven this approach safe.

2: The 5 minute air breaks after 30 minutes on $0_2$ were included in calculating the 12 msw $0_2$ stop times. The tabulated 12 msw stop times are "$0_2$ times" only, while the "Total Decompression Time" includes the air breaks.

c. remain on $O_2$ at 12 msw with 5 minute air breaks after every 30 minutes on $O_2$ (the computer is switched to "Air" during air breaks); and

d. ascend to surface on 02 in 2 minutes (6 msw/min) when the SAD = "-1 msw" ("-3 fsw"). (Note 3).

The SurD 02 method originally examined with the XDC-2 (16) was a combination of In-Water $O_2$ at 9 msw and $O_2$ in the RCC at 12 msw. Although this approach reduced the in-water decompression times somewhat, it was decided to adhere to the traditional method for general SurD $O_2$. If however, minimum water exposure and extended surface intervals are the prime criteria, (as may be the case in special military diving scenarios) the combination of In-Water $O_2$ with SurD $O_2$ provides an attractive alternate.

5. Repetitive Diving

The repetitive diving procedures developed for the DCIEM 1983 model are similar to those developed earlier for the KS-1971 model(5)but considerably simpler in operation. These procedures take into account the depths and bottom times of both the first and second dives and the surface interval between the dives. With a computer like the XDC-2, any combination of first dives, surface intervals, and subsequent dives is possible. With tables, however, compromises have to be made since it is impossible to take into account all possible repetitive dive combinations.

Each dive in the "normal" air diving range was classified into a repetitive dive group (Appendix II, III, IV) from A to O. For each repetitive dive group, a correction factor was calculated for a number of surface intervals following the first dive and the resulting table is shown in Appendix V. The actual bottom time of the second dive is multiplied by this correction factor to determine the Effective Bottom Time which would give the required decompression. The correction factors depend on the depth and bottom times of the second dive, particularly for short surface intervals - with the values being higher for shallow and short second dives. This dependency on the bottom time and the depth of the second dive becomes less as the surface interval becomes greater. For the values shown in Appendix V, the worst case situation has been taken, so that the correction to be made for the second dive may result in considerably more conservative decompression than actually required in some cases. (This is true of all procedures used for calculating repetitive dives.) In order to obtain the optimum decompression for the second dive, it is necessary to use a real-time on-line decompression computer such as the XDC-2.

NOTE 3: The diver remains at 12 msw in the RCC until the computer SAD = "-1 msw" to provide a "compensatory" decompression benefit for the time that he was in violation of the model during the surface interval. This benefit is therefore always proportional to the severity of the dive and is included in the tabulated RCC 02 stop times.

The repetitive dive group correction factors shown in Appendix V can also be used for in-water $0_2$ decompression and surface decompression with $0_2$. However, it should be noted that the repetitive dive groups may not be the same as those for standard air because the use of 02
changes the distribution of pressures in the four compartments. In fact, since the $0_2$ decompression procedures are more "efficient", the repetitive dive groups will normally be lower (never higher) than for straight air decompression.

The repetitive factors in Appendix V have been cut off arbitrarily at 2.0. It is felt that after a strenuous first dive, the minimum surface interval should be sufficient to reduce the residual nitrogen level of the diver to that degree. This approach brings the maximum "Effective Bottom Time" of a second dive within the range of the exceptional exposure tables. In effect, this defines the limits of the printed DCIEM 1983 tables.

6. Diving at Altitude

Appendix VI gives the depth corrections required for calculating the decompression times for dives done at different altitudes. The depth correction given in the table is added to the actual depth at altitude to obtain the decompression schedule from the sea level table. The reduced atmospheric pressure at altitude makes the actual dive equivalent to a much deeper dive at sea level. Corrections for the difference between sea water and fresh water have not been included since the difference is less than 3%.

The depth corrections were determined by comparing dives at different altitudes and selecting those depths which gave similar total decompression times to similar dives at sea level. The actual decompressions for these equivalent dives may have different stop depths and times even though the total decompression times are similar. In general, when differences exist, the equivalent sea level dive has either a deeper first stop depth or a longer first stop time which is compensated by slightly shorter stop times for the shallow decompression stops.

Appendix VI also gives the corrections which have to be made to the stop depths at altitude. Corrections for the rate of dive can also be made. However, the dive calculations at altitude were based on actual 18msw/min descent and ascent rates.

The corrections for altitude shown in Appendix VI only apply for divers who have been acclimatized at that altitude, i.e., for those who have spent at least 12 to 24 hrs at the altitude of the dive site. Corrections to the depth would have to be greater for those who have not been acclimatized. Although the depth corrections presented here have never been experimentally validated, they are similar to those derived from the Cross Method (19) which is widely used for sports diving.

## DISCUSSION

The approach taken in defining the DCIEM 1983 model has been purely empirical, starting from the existing KS-1971 model. This approach was taken since a considerable amount of data existed which defined the safety and limitations of the KS model. The final solution involved only changes to the surfacing ratios and the supersaturation ratios rather than changes to the actual gas uptake and elimination parameters. In effect, the solution was more a fine tuning of the KS model rather than a derivation of a new model.

The KS model, it must be realized, is a decompression calculation method rather than a decompression model, with the equations defining the model being derived from the operation of the pneumatic analogue decompression computer rather than from the physiology of decompression. Hills (20) makes the distinction clear between decompression calculation methods and decompression models. In a decompression calculation method, the equations and constants have been selected to fit the data. If the equations or constants prove inadequate, then other equations or constants are introduced until a good fit is achieved. Moreover, calculation methods are restricted to a limited range of conditions. It should be noted that most methods used for deriving decompression tables are calculation methods instead of mathematical models of decompression. These include the modified "Haldane" models which has been widely used for developing tables.

Hempleman (11) has indicated that a precise knowledge of the aetiology of decompression sickness is not a necessary prerequisite for successful decompression table calculations. Hence, it is not necessary to have a "physiological" model to calculate decompression tables. The important factor is that the model or method is based on actual diving data and predicts safe decompression. Selected profiles from DCIEM 1983 have been extensively tested for bottom times where the decompression requirements were reduced and for bottom times where the decompression requirements were extended in comparison to the KS-1971 model. The results showed that the DCIEM 1983 tables are as safe as the KS-1971 tables for short, moderate dives and much safer for dives in the KS IS 2/3 region. At extended bottom times where the 'tail' of the KS-1971 model has been reduced, the DCIEM 1983 model also gave excellent results.

As described previously, there is some physiological basis for the Kidd-Stubbs nonlinear series model. Hennessy, who has shown that the equations for the pneumatic computer are essentially an approximation of the bulk-diffusion equation into a slab of material where the diffusion coefficient is a linear function of pressure, found that the diffusion time scale is longer than that of straightforward diffusion models, and approaches current values only at the greater depth zones (10). He attributes the success of the computer to its inherent asymmetry. However, he does not believe that pneumatic flow through micro-pores or bulk diffusion with a diffusion coefficient which is a linear function of pressure are representative of the true physiological situation at low pressures. Ordinary linear diffusion with bubble growth during decompression is believed to be the main cause of the observed gas uptake-elimination asymmetry. However, as described above, it is not necessary for the model to be representative of the true physiological situation. Even if bubble growth during decompression is the cause of the asymmetry, the nonlinear series model can be used to predict this asymmetry.

The non-linearity of the KS model does pose some problems, probably due to the diffusion time scales not being exactly correct as found by Hennessy. This is manifested in the difficulty in obtaining a good match to other no-decompression limits such as those of the RN. The two constants, "A" and "B", in the KS model should ideally be changed, and perhaps, the values should be different for each compartment in order to retain the same behaviour for dives requiring decompression.

Although Hennessy (10) has estimated that at least 8 compartments should be used for a bulk diffusion model, analysis showed that the use of more than 4 compartments reduced the decompression times excessively for long bottom times. This reduction in decompression times could be eliminated by using different gas exchange parameters "A" and "B" and the supersaturation constants "R" and "OFF" for each compartment. However, introducing too many constants destroys the simplicity of the series model. The choice of monitoring only two compartments while still calculating gas uptake and elimination for four compartments retains some of the simplicity of the original KS model. An additional two parameters have been introduced in DCIEM 1983 since the supersaturation constants are different for the first and second compartments.

In a series model, all compartments are related and an unique half-time cannot be ascribed to each individual compartment. In addition, because of the nonlinear nature of the gas uptake and elimination, the half-times are time and pressure-dependent.

The main difference between the KS model and DCIEM 1983 is in the surfacing and supersaturation ratios. Hennessy and Hempleman (21) have shown that the critical pressure formula is not a simple pressure ratio but is of the form:

$$P_1 = aP_2 \quad 13,$$

where $P_1$ corresponds to $P_t$ in the SAD equation, $P_2$ corresponds to SAD + $P_s$i, and "a" and "b" are constants. The constant "a" depends on the solubility of the gas in the tissue. The formula which they derived for fatty tissue from experimental dive data,

$$P_1 = 1.361P_2 + 3.4 \quad \text{(msw)}$$

is remarkably similar to that originally derived empirically by Stubbs, which when converted to the same form, gives

$$P_1 = 1.385P_2 + 4.2.$$

The formula for DCIEM 1983 is even closer to that derived by Hennessy and Hempleman:

$$P1 = 1.385P_2 + 3.46.$$

This formula holds only for the second compartment which is the limiting compartment for this model.

It is also interesting to look at the direct or no-stop decompression from air saturation for DCIEM 1983. With the Royal Navy or US Navy tables, there is no limit for depths to 9 msw. The limit for the KS-1971 model was 8 msw. With the new model, based on the constants "R" and "OFF" for the second compartment, the no-stop limit is 7.3 msw. Although this value seems low, there is recent evidence to suggest that the actual no-stop limit is lower than previously thought. Tests at the US Navy Submarine Medical Research Laboratory, Groton, Connecticutt (22) suggest that the limit is close to 7.8 msw. Hennessy and Hempleman's estimate is even lower than the DCIEM value, at 7.0 msw.

The DCIEM 1983 decompression model has been evaluated for selected dive profiles - including repetitive dive combinations - with the Doppler ultrasonic bubble detector. The results show that the basic conservatism of the model is justified and necessary. The use of oxygen with this model was found to be effective in increasing the safety of the decompression and in reducing the in-water decompression times. The evaluations, which included Standard Air, In-Water 02 and SurD $0_2$ decompression will be reported separately.

## SUMMARY

The development of the DCIEM 1983 decompression model was undertaken to overcome the problems and limitations of the KS-1971 model. The objectives - to provide increased no-decompression limits, shorter decompression requirements for moderate dives, longer decompression times for more severe exposures, and to remove the anomaly of the excessively long decompression times for extended exposures - were achieved without significantly changing the basic philosophy of the Kidd-Stubbs approach. Thus, the definition of the DCIEM 1983 model is based on the large data base of dives performed on the Kidd-Stubbs model (over 5000 man-dives) as well as some 500 model validation dives using the Doppler ultrasonic bubble monitor. The results of these evaluation experiments have proven that the DCIEM 1983 model is safer than the Kidd-Stubbs model.

The new model has been used to produce "Standard Air", "In-Water $0_2$" and "Surface Decompression with 02" tables. Repetitive diving procedures have also been developed. The DCIEM 1983 tables are more conservative than the equivalent USN and RN tables and this conservatism increases at extended bottom times. If, however, the "one bottom time longer" rule is applied to the USN tables (USN+1) for hard working dives - as is often done by experienced divers - the resulting decompression times are remarkably similar (Figure 7). When the USN tables are modified by the "one deeper plus one longer" philosophy for extended bottom times, the results again coincide well with the DCIEM model.

The evaluation of the DCIEM 1983 model with the Doppler ultrasonic bubble detector has shown that the basic conservatism is indeed justified and necessary. The use of oxygen with this model enhances the safety and time-effectiveness of the decompression considerably.

In summary, it is submitted that the DCIEM 1983 model can satisfy all the decompression requirements for safe compressed air diving. The decompression tables and procedures based on this model will be recommended for adoption by the Canadian Armed Forces.

## ACKNOWLEDGEMENTS

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# LIST OF FIGURES

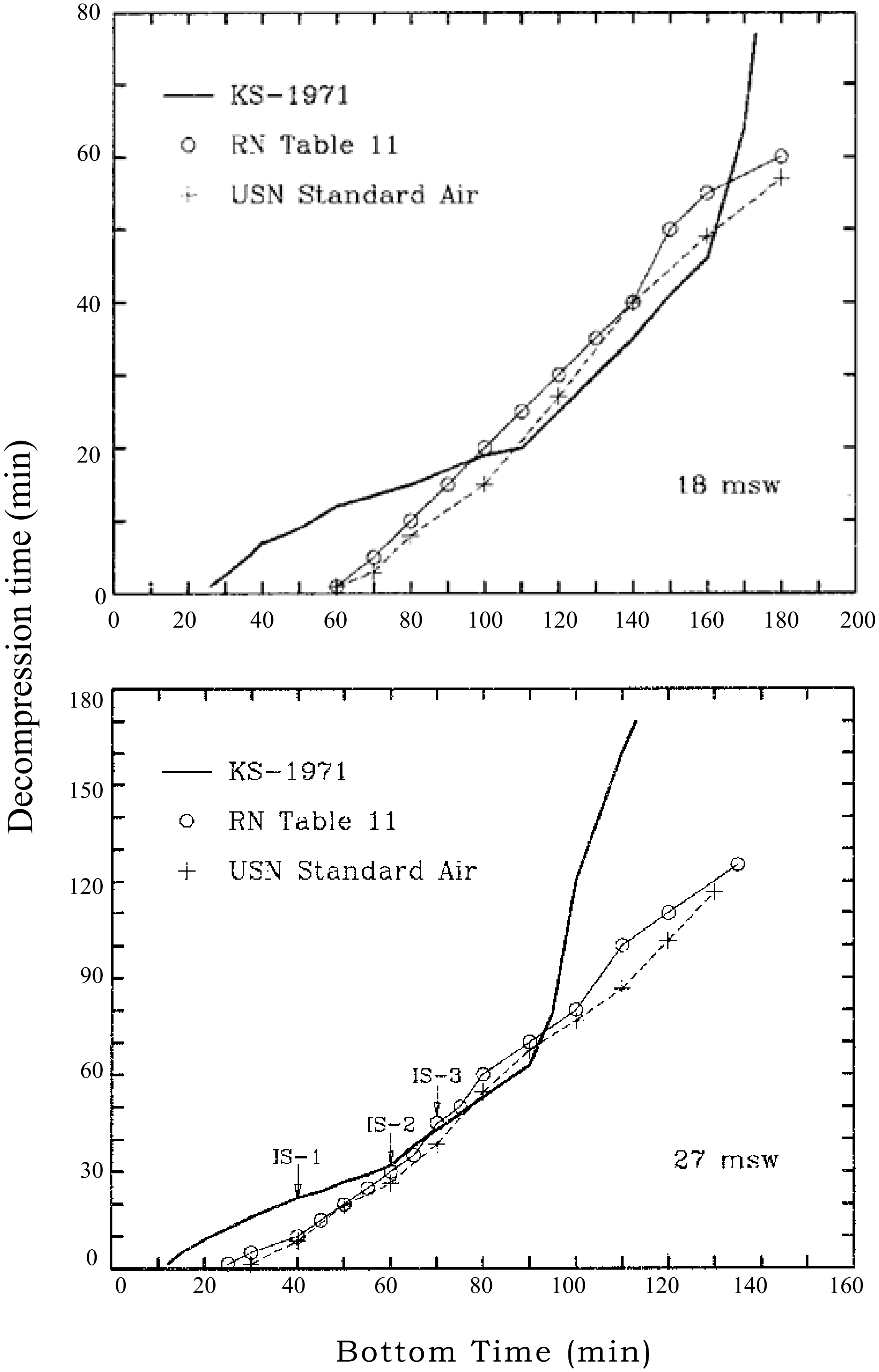



Fig. la. Comparison of the KS-1971 total decompression times for standard air dives (showing the Isostress Limits) for 18 and 27 msw with those of the Royal Navy and US Navy air tables.

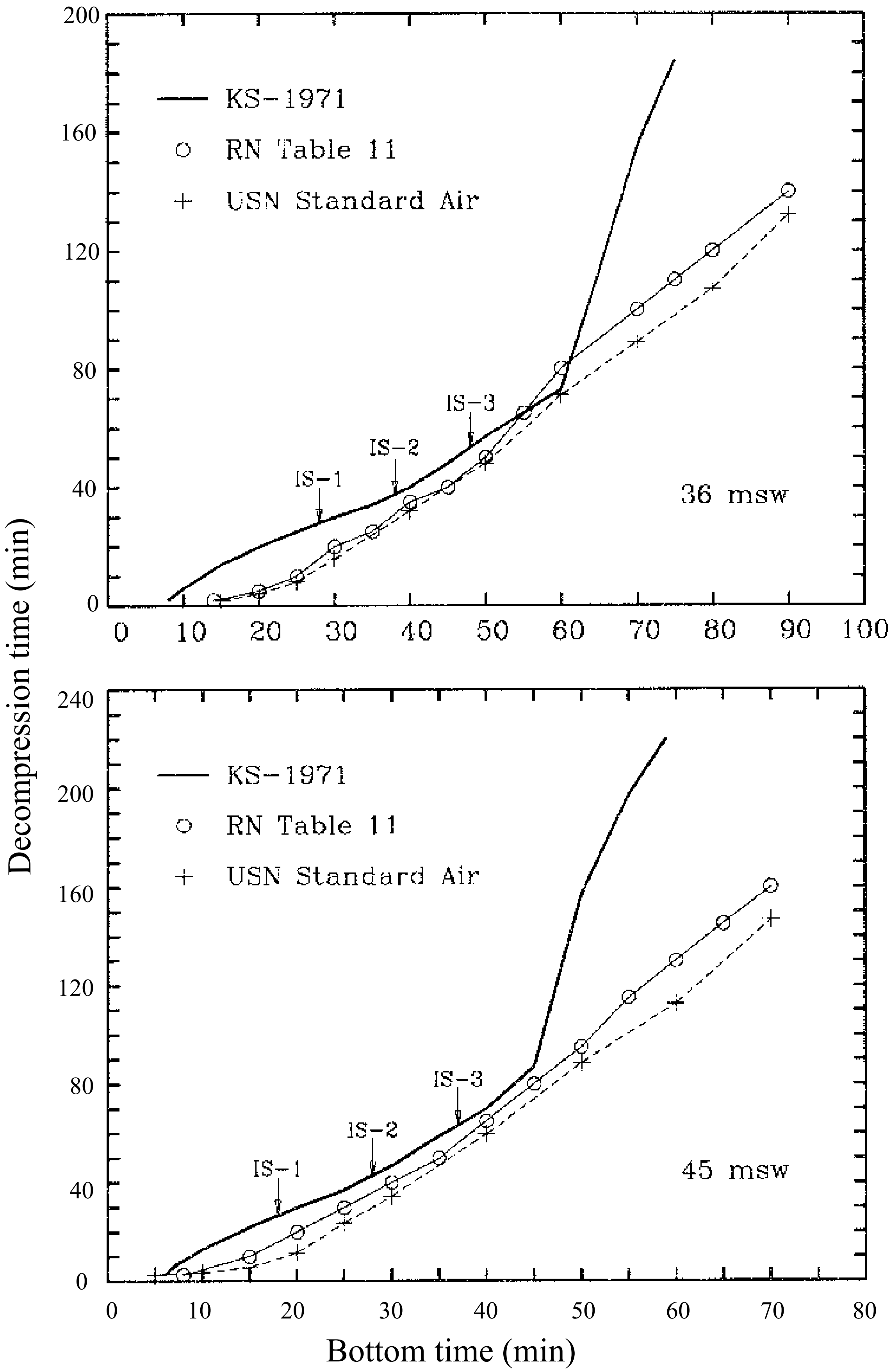



Fig. lb. Comparison of the KS-1971 total decompression times for standard air dives (showing the Isostress Limits) for 36 and 45 msw with those of the Royal Navy and US Navy air tables.

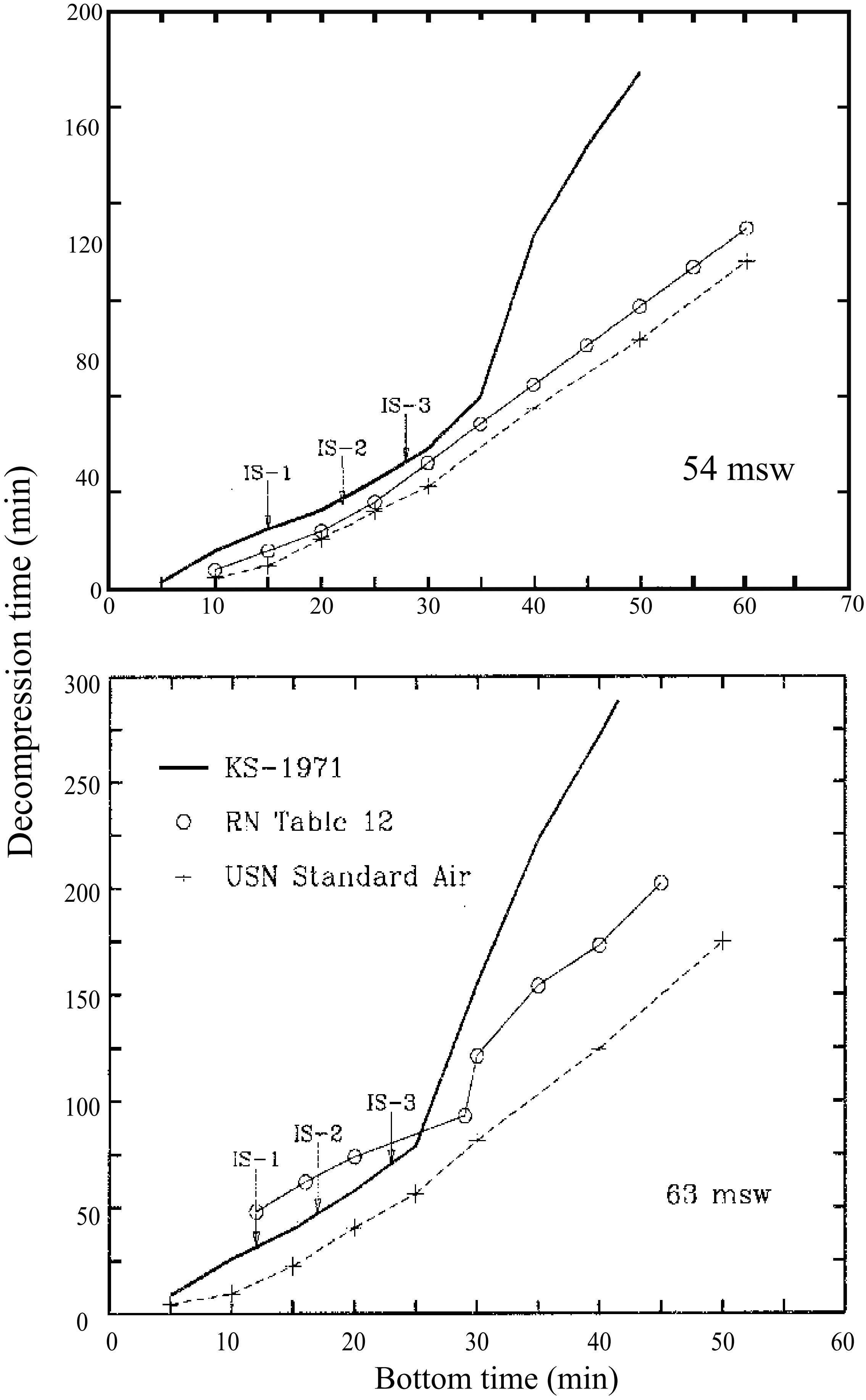



Fig. lc. Comparison of the KS-1971 total decompression times for standard air dives (showing the Isostress Limits) for 54 and 63 msw with those of the Royal Navy and US Navy air tables.

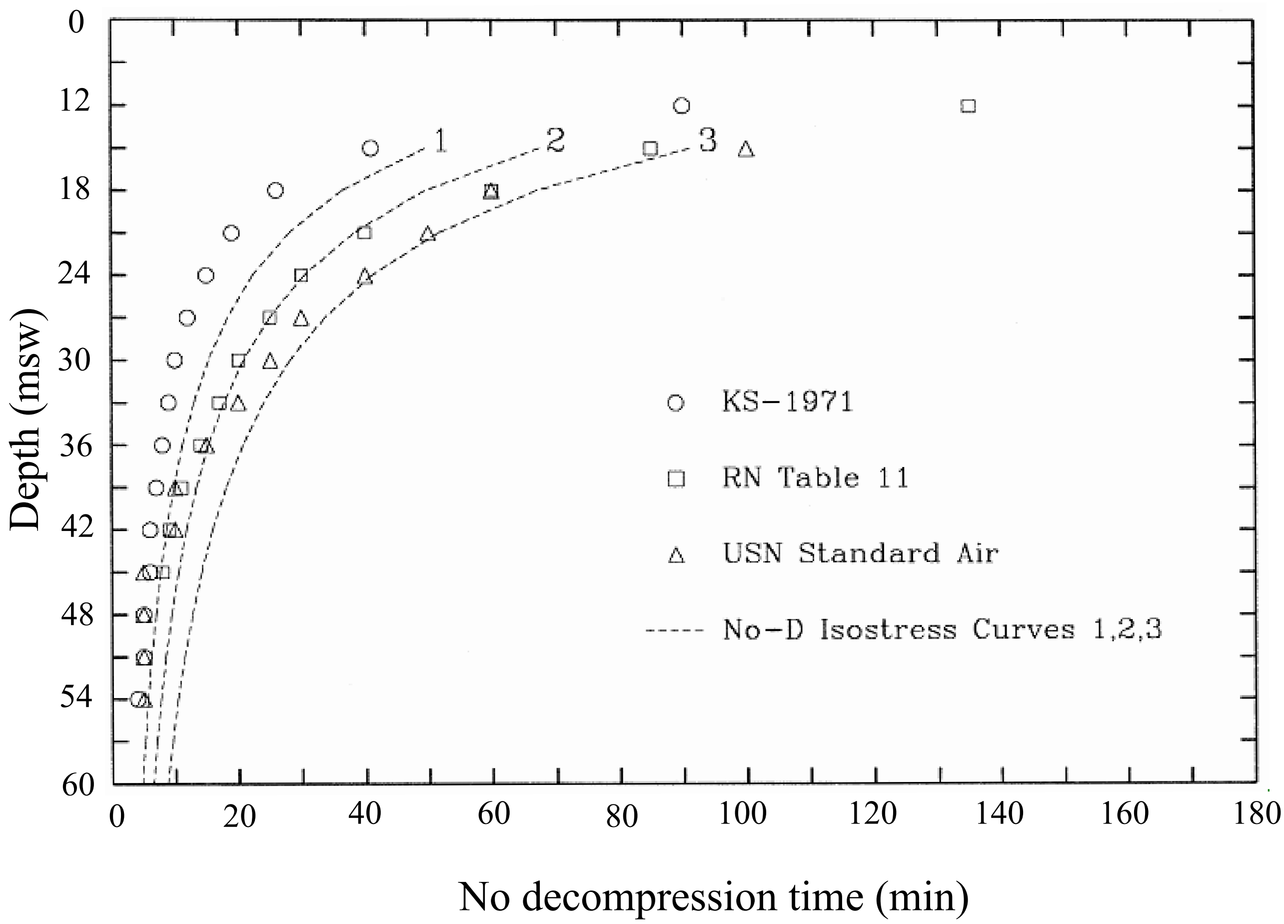



Fig. 2. Comparison of the KS-1971 no-decompression limits with those of the royal Navy, US Navy, and the DCIEM no decompression isostress curves

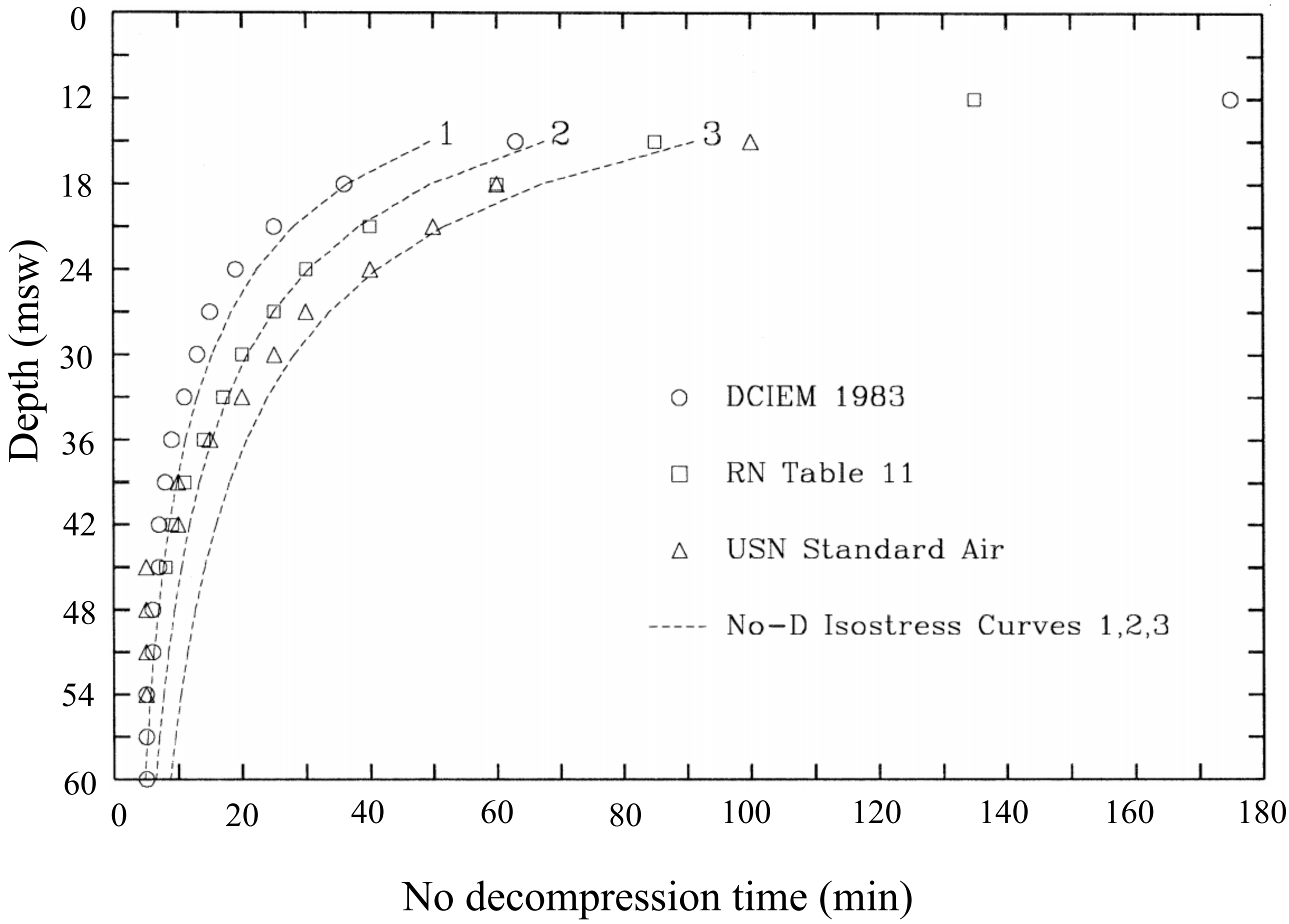



Fig. 3. Comparison of the DCIEM 1983 no-decompression limits with those of the royal Navy, US Navy, and the DCIEM no decompression isostress curves

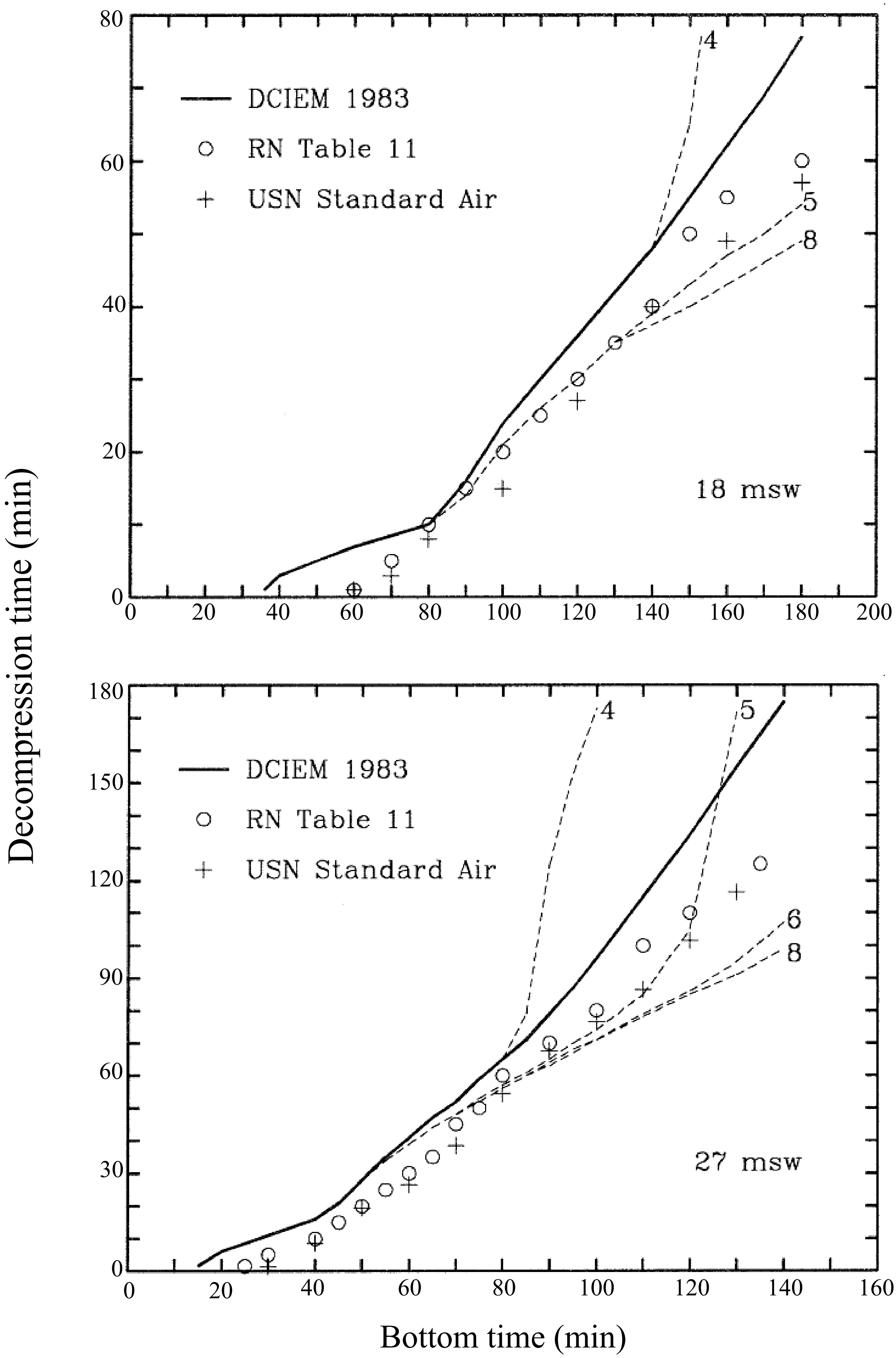



Fig. 4a. Total decompression times at 18 and 27 msw (standard air) for 4, 5, 6, and 8 compartments (indicated by the numbers to the right of the dashed lines) show—ing the effect of adding more compartments to the DCIEM 1983 nonlinear series model, with comparison to the final DCIEM 1983 model (4 compartments, first 2 monitored only), the Royal Navy and US Navy air tables.

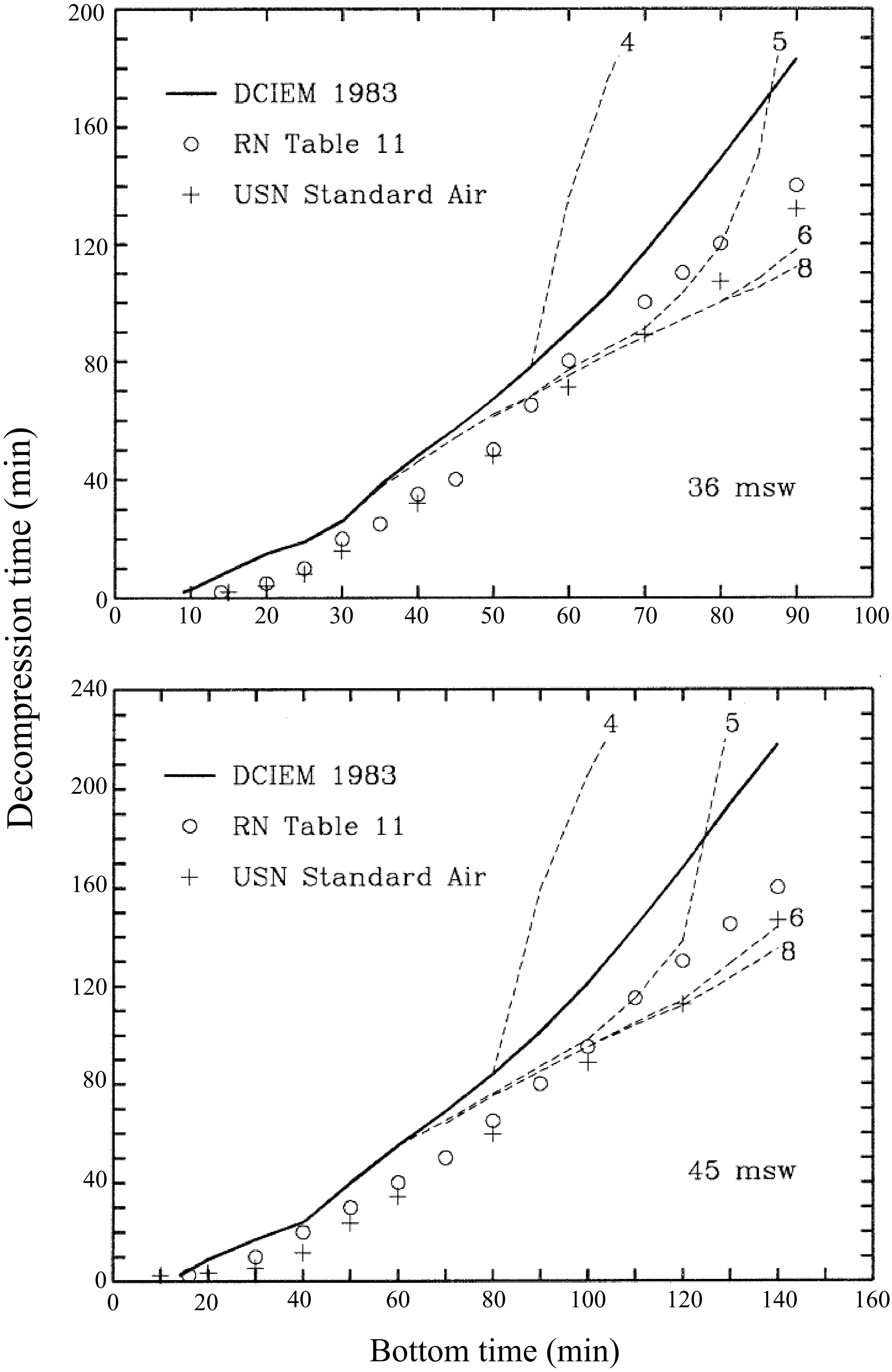



Fig. 4b. Total decompression times at 36 and 45 msw (standard air) for 4, 5, 6, and 8 compartments (indicated by the numbers to the right of the dashed lines) show—ing the effect of adding more compartments to the DCIEM 1983 nonlinear series model, with comparison to the final DCIEM 1983 model (4 compartments, first 2 monitored only), the Royal Navy and US Navy air tables.

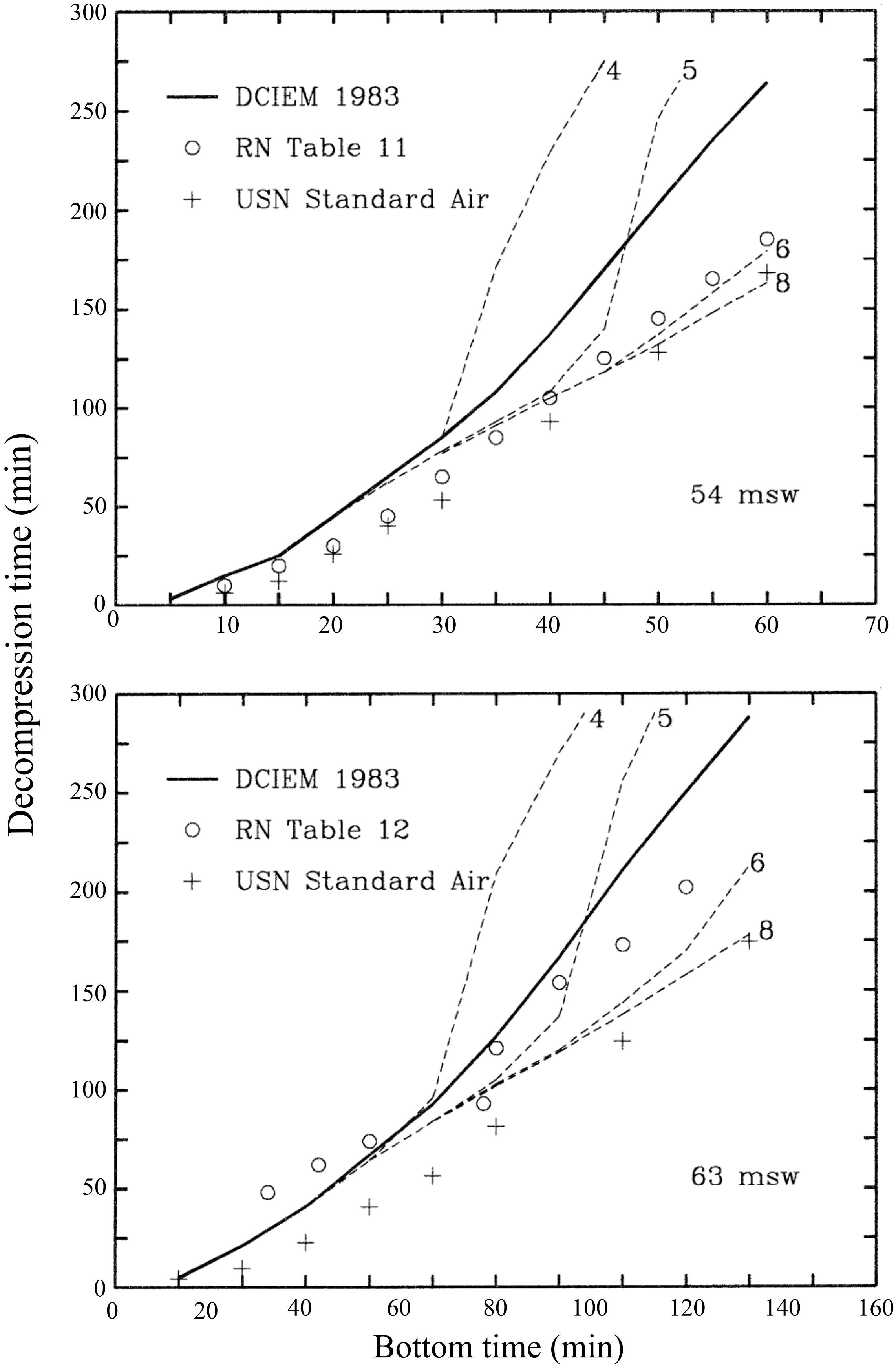



Fig. 4c. Total decompression times at 54 and 63 msw (standard air) for 4, 5, 6, and 8 compartments (indicated by the numbers to the right of the dashed lines) show—ing the effect of adding more compartments to the DCIEM 1983 nonlinear series model, with comparison to the final DCIEM 1983 model (4 compartments, first 2 monitored only), the Royal Navy and US Navy air tables.

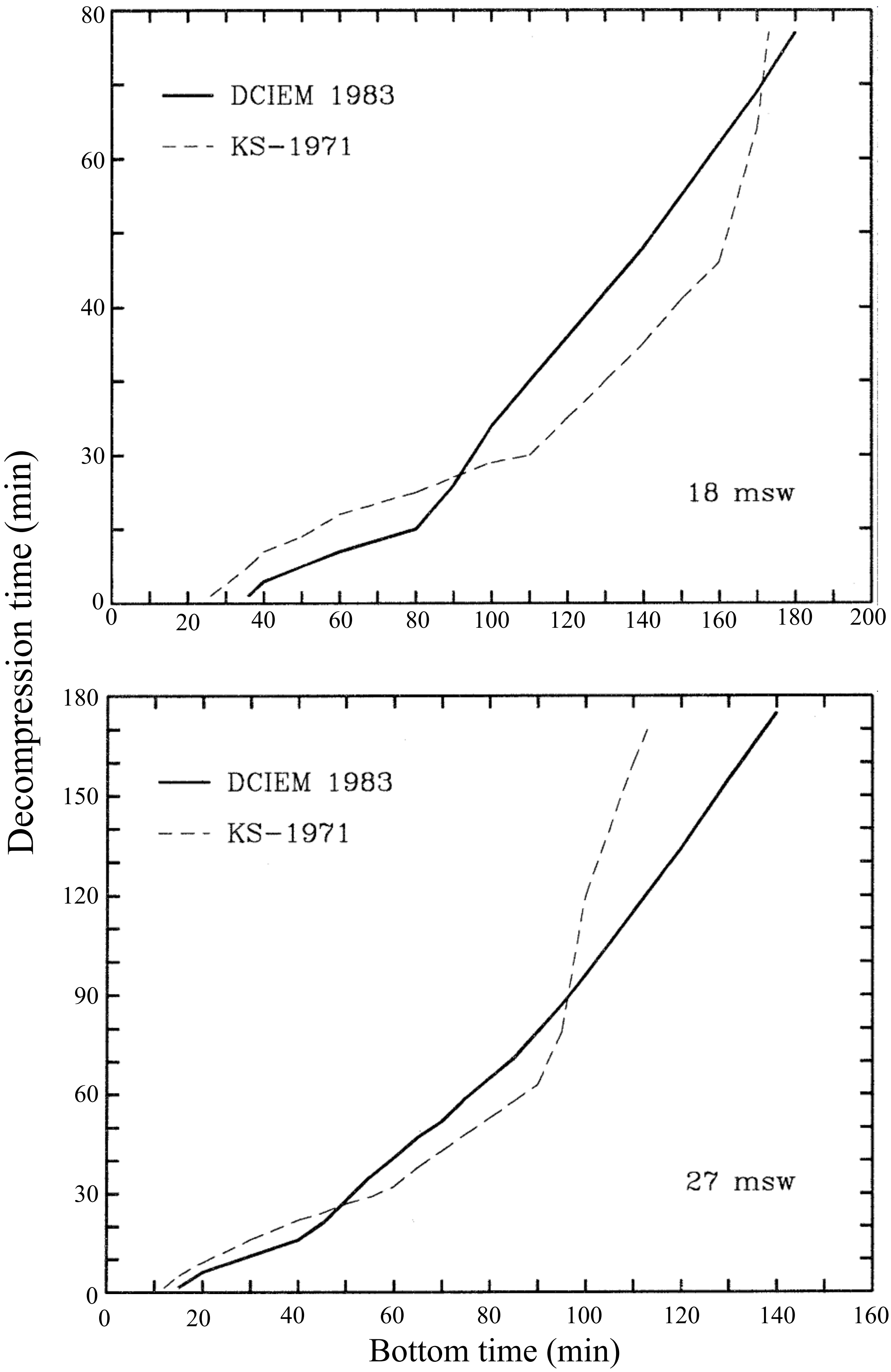



Fig. 5a. Comparison of DCIEM 1983 total decompression times for standard air dives with those of the Kidd-Stubbs (KS) 1971 model for 18 and 27 msw.

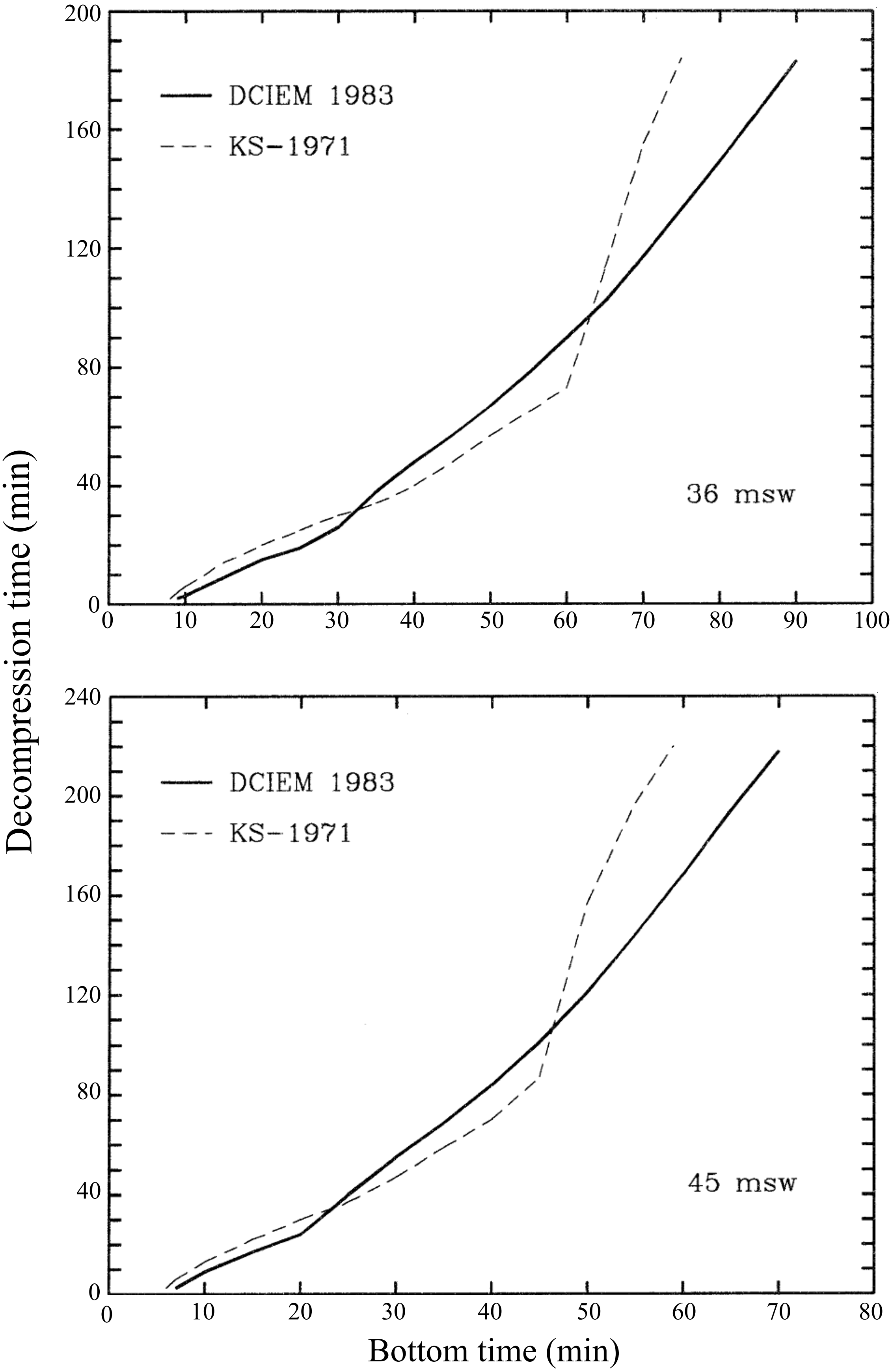



Fig. 5b. Comparison of DCIEM 1983 total decompression times for standard air dives with those of the Kidd-Stubbs (KS) 1971 model for 36 and 45 msw.

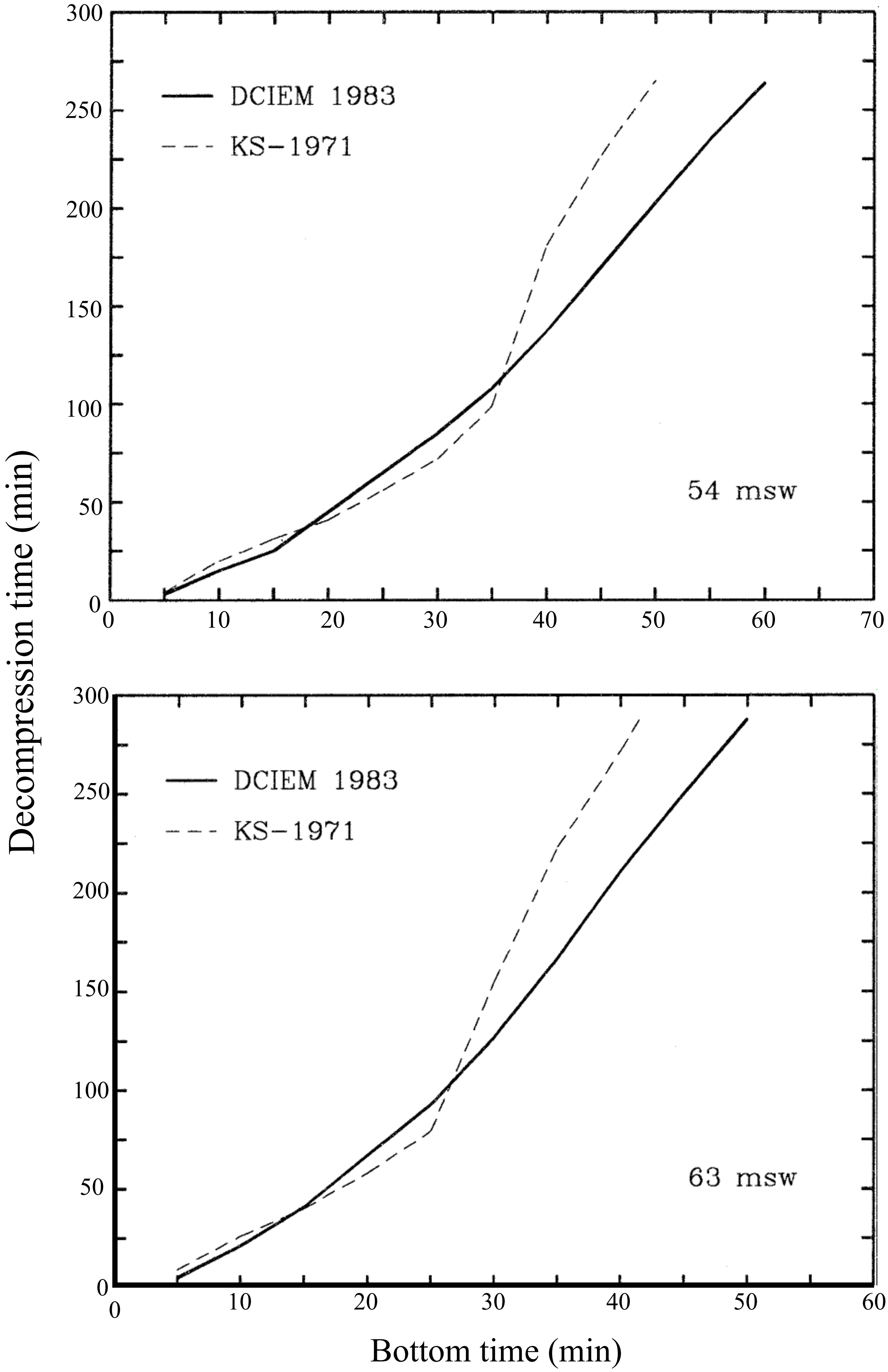



Fig. 5c. Comparison of DCIEM 1983 total decompression times for standard air dives with those of the Kidd-Stubbs (KS) 1971 model for 54 and 63 msw.

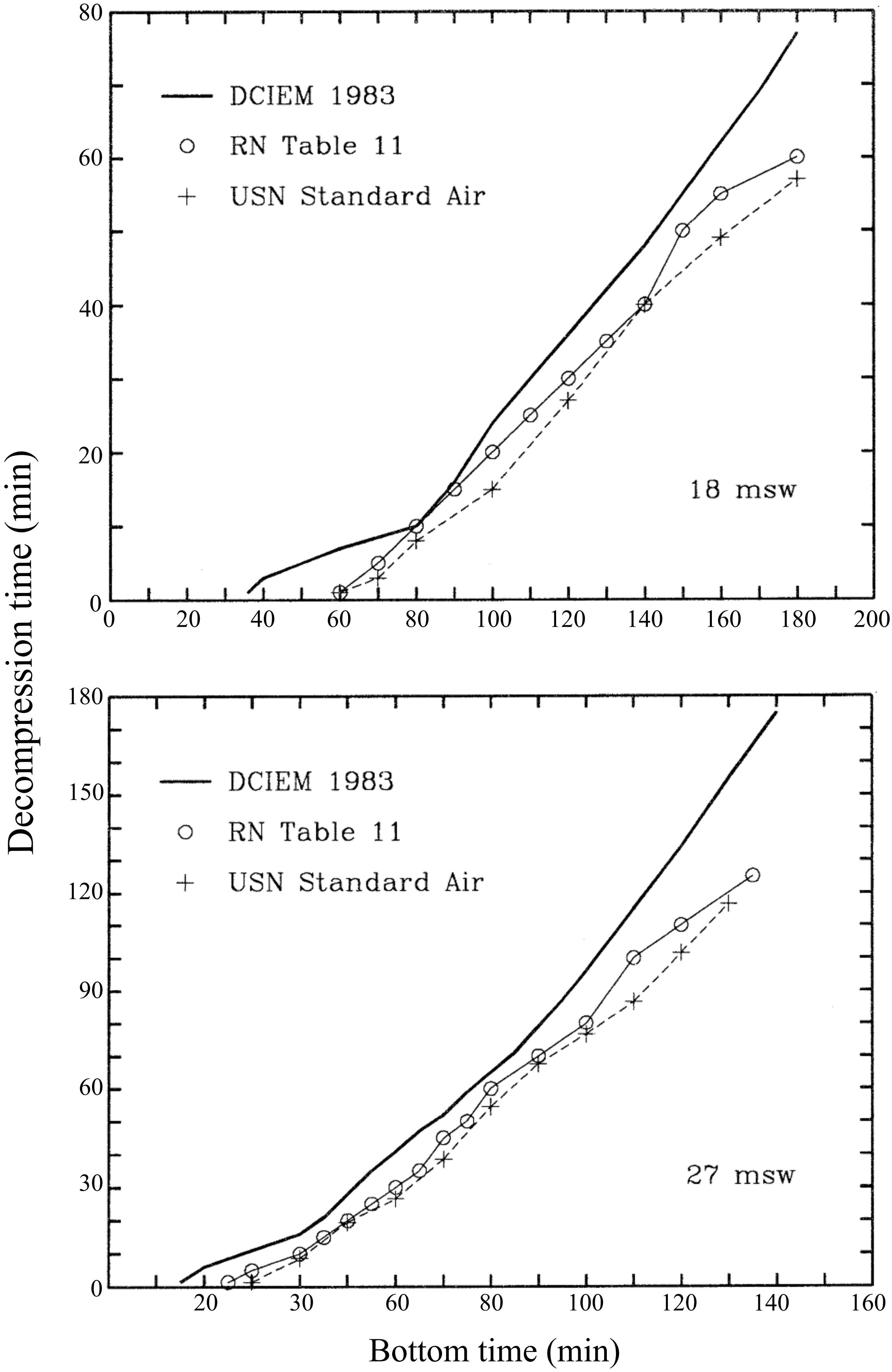



Fig. 6a. Comparison of DCIEM 1983 total decompression times for standard air dives with those of the Royal Navy and the US Navy air tables for 18 and 27 msw.

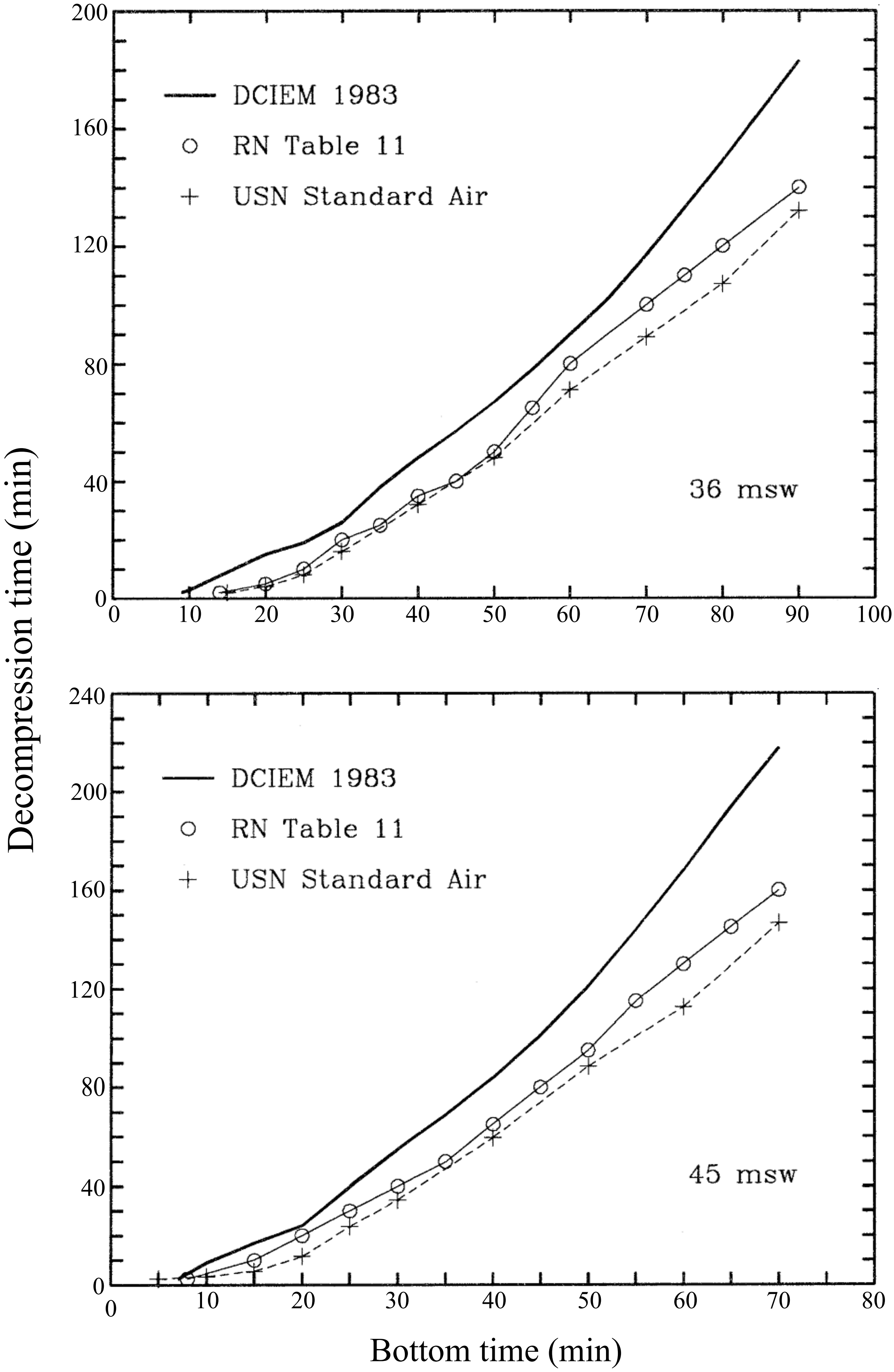



Fig. 6b. Comparison of DCIEM 1983 total decompression times for standard air dives with those of the Royal Navy and the US Navy air tables for 36 and 45 msw.

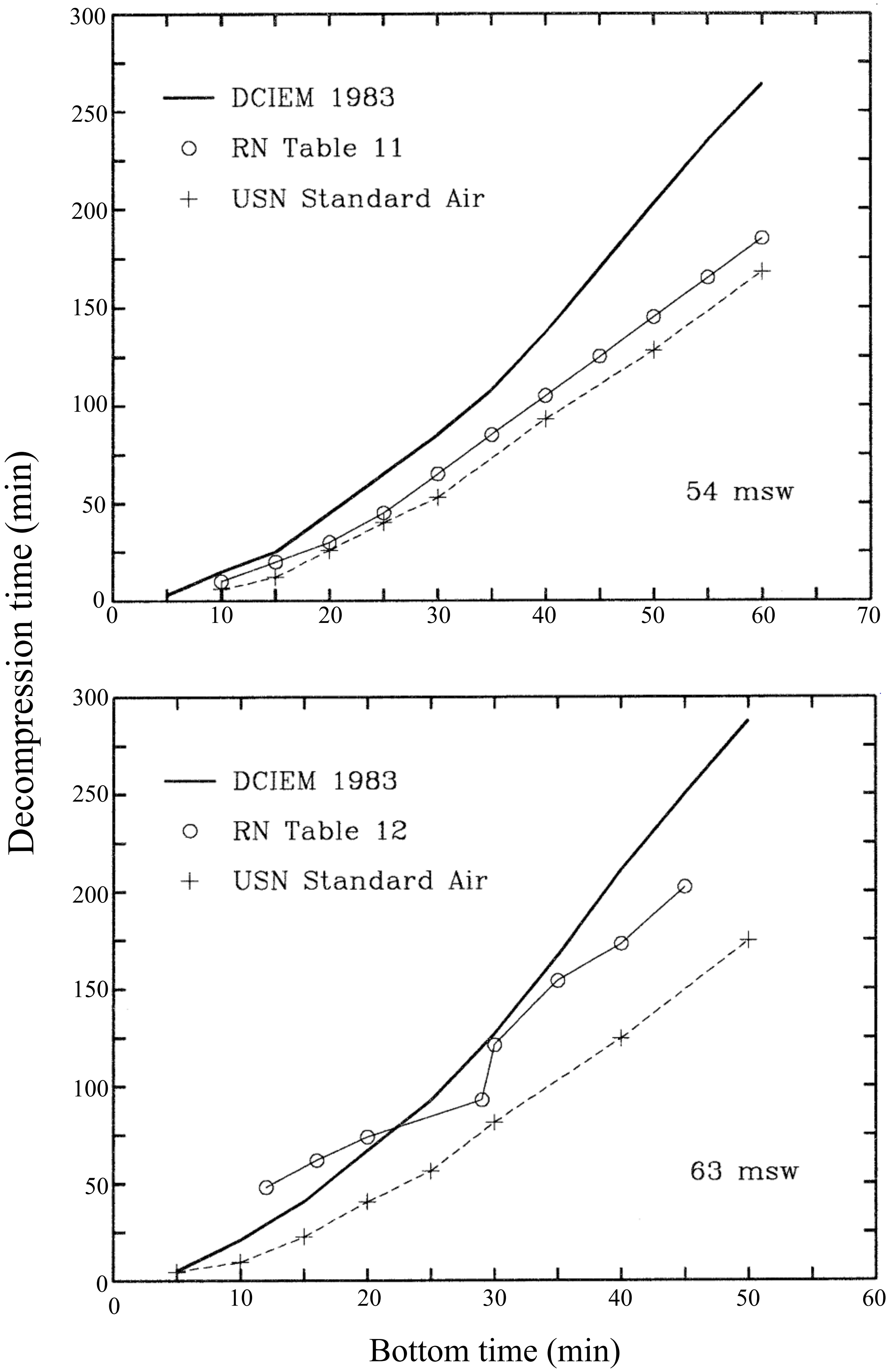



Fig. 6c. Comparison of DCIEM 1983 total decompression times for standard air dives with those of the Royal Navy and the US Navy air tables for 54 and 63 msw.

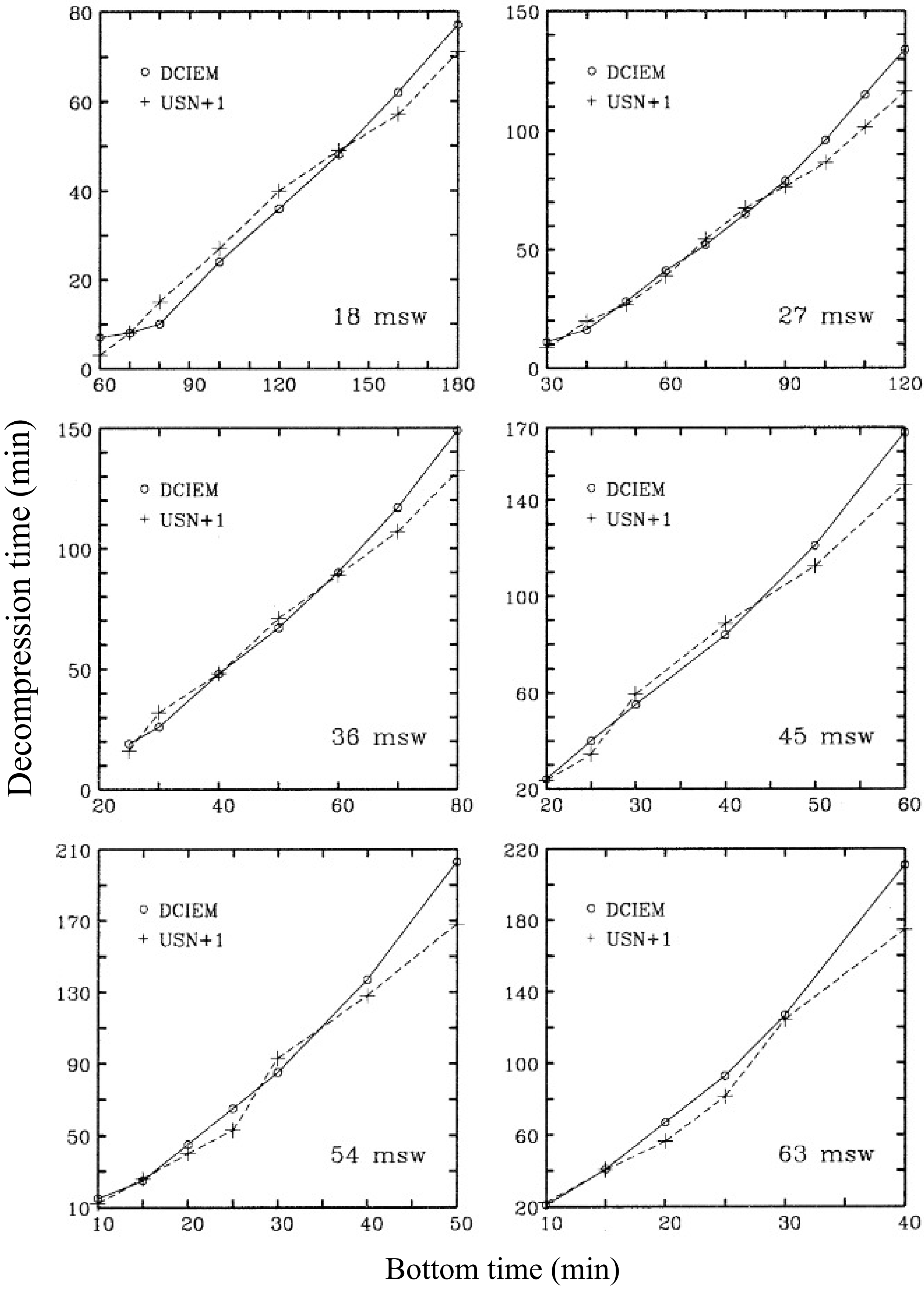



Fig. 7. Comparison of the DCIEM 1983 total decompression times for standard air with those for the next bottom time from US Navy Standard Air Table (USN+1).

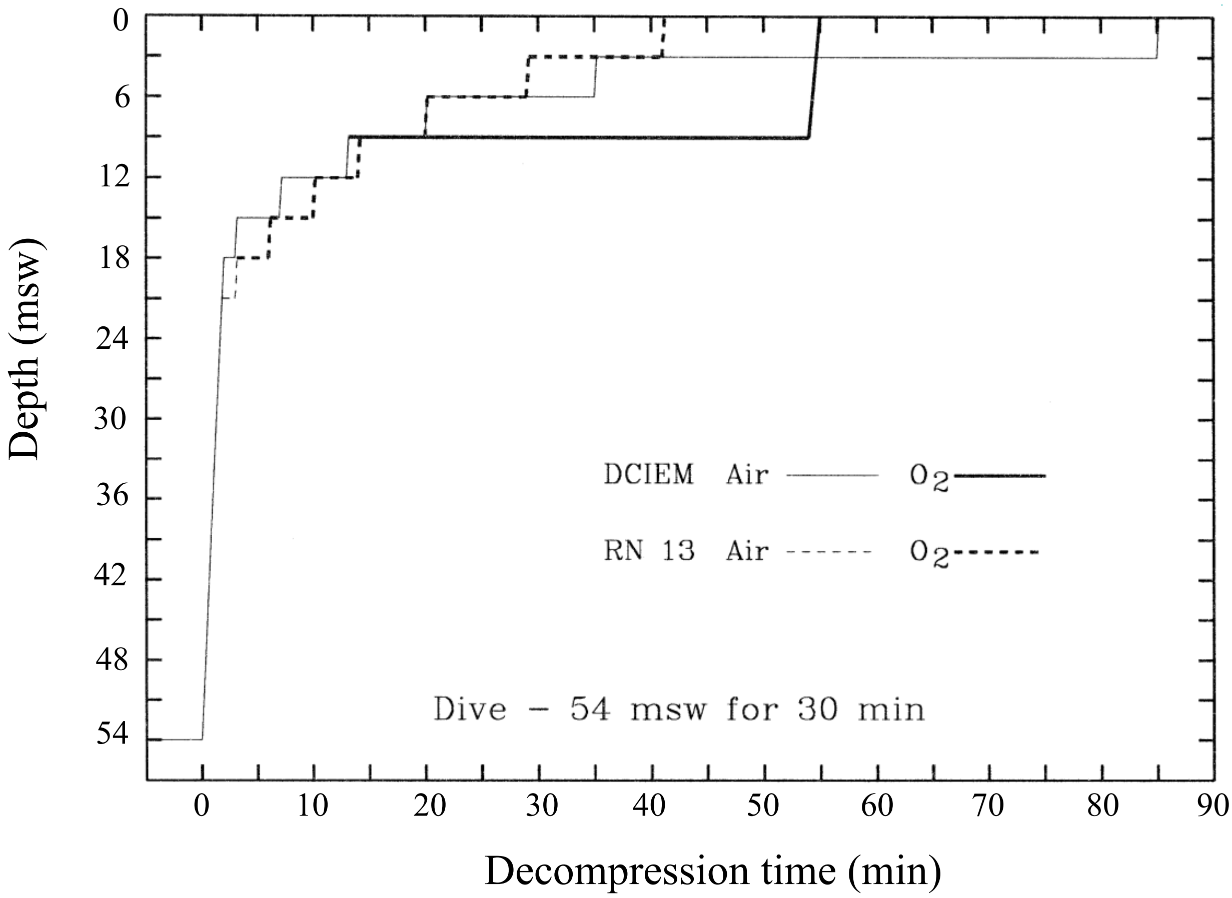



Fig. 8. Comparison of the decompression profiles for 54 msw for 30 min for DCIEM 1983 in-water oxygen decompression, DCIEM 1983 standard air, and royal Navy Table 13 deep Air-Oxygen Table

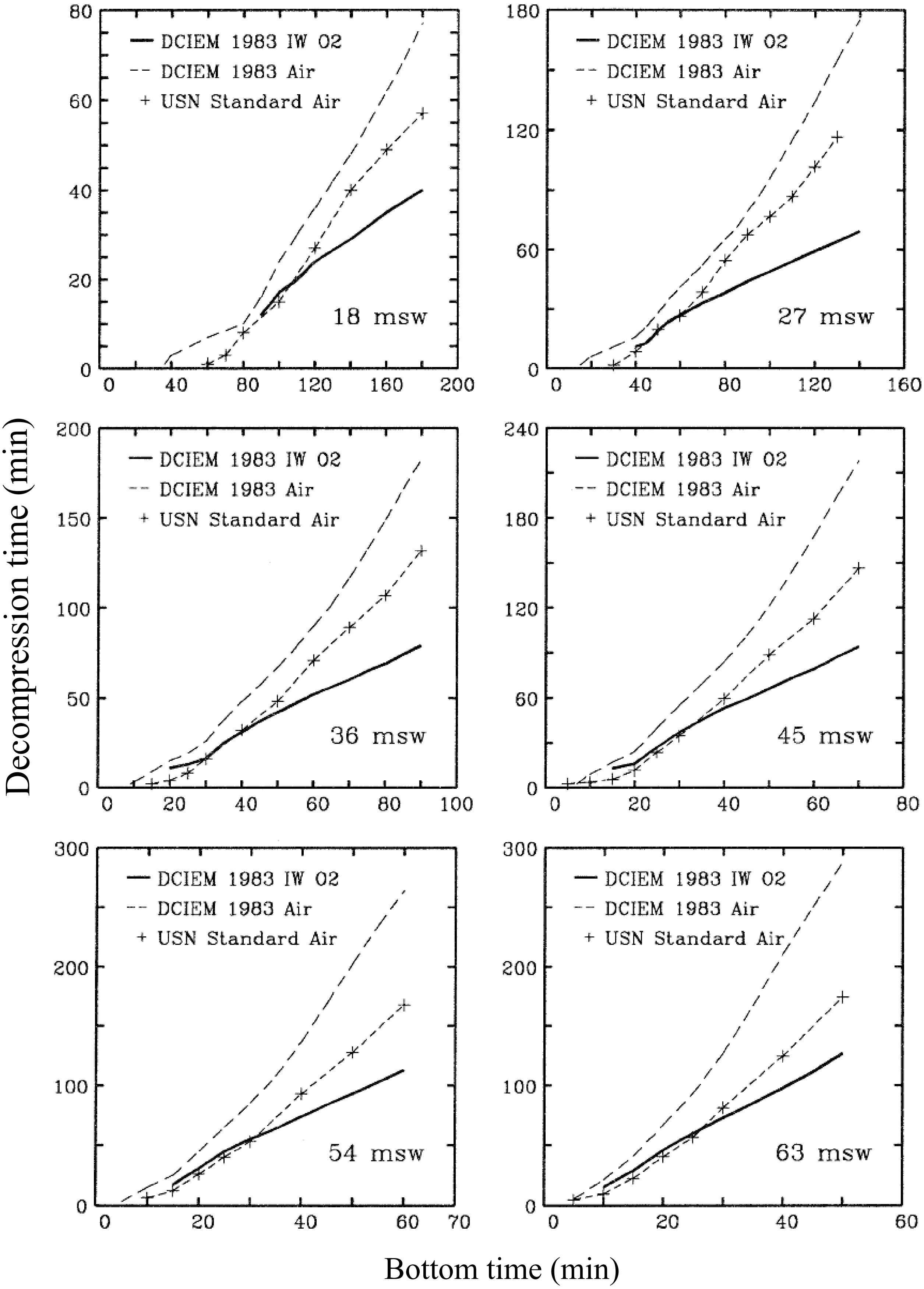



Fig. 9. Comparison of the DCIEM 1983 total decompression times for in-water oxygen decompression dives with those from the DCIEM 1983 and US Navy Standard Air Tables.

APPENDICES

SAMPLE DECOMPRESSION TABLES

I. Kidd-Stubbs 1971 Standard Air Table

II. DCIEM 1983 Standard Air Table

III. DCIEM 1983 In-Water Oxygen Table

IV. DCIEM 1983 Surface Decompression using Oxygen Table

V. DCIEM 1983 Repetitive Factors Table

VI. DCIEM Altitude Diving Corrections

# Appendix 1
# Kidd-Stubbs 1971 Air diving tables (metres)
# Standard Air

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|
| | | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| **18** | 26 | - | - | - | - | - | - | - | - |
| | 30 | - | - | - | - | - | - | 3 | 3 |
| | 40 | - | - | - | - | - | - | 7 | 7 |
| | 60 | - | - | - | - | - | | 12 | 12 |
| | 80(1) | - | - | - | - | - | - | 15 | 15 |
| | 100 | - | - | - | - | - | 3 | 16 | 19 |
| | 120 | - | - | - | | - | 4 | 21 | 25 |
| | 130 | - | - | - | - | - | 5 | 25 | 30 |
| | 140 | - | - | - | - | - | 5 | 30 | 35 |
| | 150 | - | - | - | - | - | 6 | 35 | 41 |
| | 160 | - | - | - | - | - | 7 | 39 | 46 |
| | 170 | - | - | - | - | - | 7 | 57 | 64 |
| | 180 | - | - | - | - | - | 8 | 98 | 106 |
| **27** | 12 | - | - | - | - | - | - | - | - |
| | 15 | - | - | - | | - | - | 5 | 5 |
| | 20 | - | - | - | - | - | - | 9 | 9 |
| | 30 | - | - | - | - | - | 4 | 12 | 16 |
| | 40(1) | - | - | - | - | - | 8 | 14 | 22 |
| | 50 | - | - | - | - | - | 11 | 16 | 27 |
| | 60(2) | - | - | - | - | 3 | 11 | 18 | 32 |
| | 70(3) | - | - | - | - | 5 | 11 | 27 | 43 |
| | 80 | - | - | - | - | 6 | 12 | 35 | 53 |
| | 90 | - | - | - | - | 7 | 13 | 43 | 63 |
| | 95 | - | - | - | - | 8 | 13 | 58 | 79 |
| | 100 | - | - | - | - | 8 | 14 | 98 | 120 |
| | 110 | - | - | - | - | 9 | 16 | 135 | 160 |
| | 120 | - | - | - | - | 10 | 21 | 159 | 190 |
| **36** | **8** | - | - | - | - | - | - | - | - |
| | 10 | - | - | - | - | - | - | 6 | 6 |
| | 15 | - | - | - | - | - | 3 | 11 | 14 |
| | 20 | - | - | - | - | - | 8 | 12 | 20 |
| | 25 | - | - | - | - | 3 | 8 | 14 | 25 |
| | 28(1) | - | - | - | - | 5 | 8 | 15 | 28 |
| | 30 | - | - | - | - | 5 | 9 | 16 | 30 |
| | 35 | - | - | - | - | 7 | 10 | 17 | 34 |
| | 38(2) | - | - | - | - | 9 | 10 | 17 | 36 |
| | 40 | - | - | - | 2 | 7 | 11 | 20 | 40 |
| | 45 | - | - | - | 4 | 7 | 11 | 26 | 48 |
| | 48(3) | - | - | - | 4 | 8 | 12 | 29 | 53 |
| | 50 | - | - | - | 5 | 8 | 12 | 32 | 57 |
| | 55 | - | - | - | 6 | 8 | 13 | 38 | 65 |
| | 60 | - | - | - | 6 | 9 | 14 | 44 | 73 |

# Appendix 1 (continued)
# Kidd-Stubbs 1971 Air diving tables (metres)
# Standard Air

| Depth (msw) | Bottom Time (min) | Stop Times (m'n) at Different Depths (msw) 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|
| **36** | 65 | - | - | | -- | 7 | 9 | 14 | 83 | 113 |
| | 70 | - | - | | -- | 8 | 9 | 18 | 120 | 155 |
| | 80 | - | | -- | 3 | 7 | 10 | 25 | 162 | 207 |
| | 90 | - | - | - | 3 | 8 | 11 | 33 | 191 | 246 |
| **45** | 6 | - | - | - | - | - | - | - | - | - |
| | 10 | - | - | - | - | - | - | - | 13 | 13 |
| | 15 | - | - | - | - | - | - | 10 | 12 | 22 |
| | 20(1) | - | - | - | | - | 7 | 9 | 14 | 30 |
| | 25 | - | - | - | - | 4 | 7 | 10 | 16 | 37 |
| | 28(2) | - | - | - | - | 6 | 7 | 10 | 18 | 41 |
| | 30 | - | - | - | - | 7 | 7 | 11 | 22 | 47 |
| | 35 | - | - | - | 3 | 6 | 8 | 12 | 30 | 59 |
| | 37(3) | - | | -- | 4 | 5 | 9 | 12 | 34 | 64 |
| | 40 | | -- | - | 4 | 6 | 9 | 13 | 38 | 70 |
| | 45 | | - | - | 6 | 6 | 9 | 14 | 52 | 87 |
| | 50 | - | - | - | 7 | 7 | 10 | 18 | 115 | 157 |
| | 55 | - | - | 3 | 5 | 7 | 11 | 23 | 148 | 197 |
| | 60 | - | - | 3 | 6 | 7 | 11 | 29 | 172 | 228 |
| **54** | 5 | - | - | - | - | - | - | - | 4 | 4 |
| | 10 | - | - | - | - | - | - | 8 | 12 | 20 |
| | 15(1) | - | - | - | - | - | 8 | 9 | 14 | 31 |
| | 20 | - | - | - | - | 7 | 7 | 10 | 17 | 41 |
| | 22(2) | - | - | - | 4 | 5 | 7 | 11 | 19 | 46 |
| | 25 | - | - | - | 5 | 6 | 7 | 12 | 26 | 56 |
| | 28(3) | - | - | - | 7 | 5 | 9 | 12 | 33 | 66 |
| | 30 | - | - | 3 | 5 | 6 | 8 | 13 | 37 | 72 |
| | 35 | - | - | 5 | 5 | 6 | 10 | 15 | 58 | 99 |
| | 40 | - | - | 6 | 5 | 7 | 11 | 21 | 131 | 181 |
| | 45 | - | 3 | 4 | 6 | 8 | 11 | 28 | 167 | 227 |
| | 50 | - | 4 | 5 | 6 | 8 | 12 | 36 | 194 | 265 |
| **63** | 5 | - | - | - | - | | -_ | - | 9 | 9 |
| | 10 | - | - | - | - | - | 6 | 8 | 12 | 26 |
| | 12(1) | - | - | - | - | 4 | 6 | 8 | 14 | 32 |
| | 15 | - | - | - | - | 8 | 6 | 10 | 16 | 40 |
| | 17(2) | - | - | - | 5 | 5 | 7 | 10 | 18 | 45 |
| | 20 | - | - | - | 7 | 6 | 7 | 12 | 26 | 58 |
| | 23(3) | - | - | 5 | 4 | 6 | 9 | 13 | 34 | 71 |
| | 25 | - | - | 6 | 5 | 6 | 9 | 13 | 40 | 79 |
| | 30 | - | 4 | 4 | 5 | 7 | 10 | 19 | 106 | 155 |
| | 35 | - | 6 | 4 | 6 | 8 | 11 | 27 | 161 | 223 |
| | 40 | 4 | 4 | 4 | 6 | 9 | 13 | 36 | 196 | 272 |

# Appendix 2
# DCIEM 1983 Air diving tables (metres)
# Standard Air

| Depth (rnsw) | Bottom Time (min) | Stop Times (min) at Different Depths (rnsw) | | | | | | | Deeom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| **18** | 10 | - | - | - | - | - | | - | - | A |
| | 20 | - | - | - | - | - | - | - | - | B |
| | 30 | - | - | - | - | - | - | - | - | D |
| | 36 | - | - | - | - | - | - | - | - | D |
| | 40 | - | - | - | - | - | - | 3 | 3 | E |
| | 50 | - | - | - | - | - | - | 5 | 5 | F |
| | 60 | - | - | - | - | - | - | 7 | 7 | G |
| | 80 | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | 16 | 16 | J |
| | 100 | - | - | - | | - | - | 24 | 24 | K |
| | 110 | - | - | - | - | - | - | 30 | 30 | L |
| | 120 | - | - | - | - | - | - | 36 | 36 | M |
| | 130 | - | - | - | - | | 2 | 40 | 42 | |
| | 140 | - | - | - | - | - | 2 | 46 | 48 | |
| | 150 | - | - | - | - | - | 3 | 52 | 55 | |
| | 160 | - | - | - | - | - | 3 | 59 | 62 | |
| | 170 | - | - | - | - | - | 4 | 65 | 69 | |
| | 180 | - | - | - | - | - | 4 | 73 | 77 | |
| | 190 | - | - | - | - | - | 5 | 80 | 85 | |
| | 200 | - | - | - | - | - | 7 | 87 | 94 | |
| | 210 | - | - | - | - | - | 13 | 91 | 104 | |
| | 220 | - | - | - | - | - | 17 | 97 | 114 | |
| | 230 | - | - | - | - | - | 21 | 103 | 124 | |
| | 240 | - | - | - | - | - | 24 | 109 | 133 | |
| **27** | 10 | - | - | - | - | - | - | - | - | A |
| | 15 | - | - | - | - | - | - | - | - | C |
| | 20 | - | - | - | - | - | - | 6 | 6 | D |
| | 30 | - | | - | - | - | 2 | 9 | 11 | F |
| | 40 | - | - | - | - | - | 6 | 10 | 16 | El |
| | 45 | - | - | - | - | - | 7 | 14 | 21 | I |
| | 50 | - | - | - | - | - | 8 | 20 | 28 | J |
| | 55 | - | - | - | - | - | 9 | 26 | 35 | K |
| | 60 | - | - | - | - | 2 | 8 | 31 | 41 | L |
| | 65 | - | - | - | - | 3 | 8 | 36 | 47 | |
| | 70 | - | - | - | - | 3 | 9 | 40 | 52 | |
| | 75 | - | | - | - | 4 | 9 | 46 | 59 | |
| | 80 | - | - | - | - | 4 | 10 | 51 | 65 | |
| | 85 | - | - | - | - | 5 | 10 | 56 | 71 | |
| | 90 | - | - | - | - | 5 | 14 | 60 | 79 | |
| | 95 | - | - | - | - | 6 | 17 | 64 | 87 | |
| | 100 | - | - | - | - | 6 | 20 | 70 | 96 | |
| | 110 | - | - | - | - | 7 | 26 | 82 | 115 | |
| | 120 | - | - | - | - | 8 | 31 | 95 | 134 | |

# Appendix 2 (continued)
## DCIEM 1983 Air diving tables (metres)
## Standard Air

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|
| 36 | 5 | - | - | - | - | - | - | - | - | A |
| | 9 | - | - | - | - | - | - | - | - | B |
| | 10 | - | | - | - | - | - | 3 | 3 | C |
| | 15 | - | - | - | - | - | - | 9 | 9 | D |
| | 20 | - | - | - | - | - | 6 | 9 | 15 | F |
| | 25 | - | - | - | - | - | 9 | 10 | 19 | G |
| | 30 | - | - | - | - | 4 | 8 | 14 | 26 | I |
| | 35 | - | - | - | - | 6 | 8 | 24 | 38 | J |
| | 40 | - | - | - | - | 8 | 8 | 32 | 48 | K |
| | 45 | | - | - | 3 | 6 | 10 | 38 | 57 | M |
| | 50 | - | - | - | 4 | 7 | 10 | 46 | 67 | N |
| | 55 | - | - | - | 5 | 7 | 13 | 53 | 78 | |
| | 60 | - | - | - | 6 | 7 | 18 | 59 | 90 | |
| | 65 | - | - | - | 6 | 8 | 22 | 66 | 102 | |
| | 70 | - | - | - | 7 | 8 | 27 | 75 | 117 | |
| | 75 | - | - | - | 8 | 8 | 31 | 86 | 133 | |
| | 80 | - | - | 2 | 6 | 9 | 35 | 97 | 149 | |
| | 85 | - | - | 3 | 6 | 10 | 40 | 107 | 166 | |
| | 90 | - | - | 3 | 7 | 13 | 42 | 118 | 183 | |
| | 95 | - | - | 4 | 6 | 16 | 46 | 128 | 200 | |
| | 100 | - | - | 4 | 7 | 19 | 50 | 136 | 216 | |
| 45 | 7 | - | - | - | - | - | - | - | - | U |
| | 10 | - | - | - | - | - | - | 9 | 9 | D |
| | 15 | - | - | - | - | - | 8 | 9 | 17 | F |
| | 20 | - | - | - | - | 6 | 7 | 11 | 24 | H |
| | 25 | - | - | - | 4 | 5 | 8 | 23 | 40 | J |
| | 30 | - | - | - | 6 | 6 | 9 | 34 | 55 | K |
| | 35 | - | - | 3 | 5 | 7 | 10 | 44 | 69 | M |
| | 40 | - | - | 4 | 6 | 7 | 15 | 52 | 84 | 0 |
| | 45 | - | - | 5 | 6 | 8 | 21 | 61 | 101 | |
| | 50 | - | - | 6 | 7 | 8 | 27 | 73 | 121 | |
| | 55 | - | 3 | 5 | 6 | 9 | 33 | 88 | 144 | |
| | 60 | - | 3 | 5 | 7 | 12 | 38 | 103 | 168 | |
| | 65 | - | 4 | 5 | 8 | 16 | 42 | 119 | 194 | |
| | 70 | - | 5 | 5 | 8 | 20 | 48 | 132 | 218 | |
| | 75 | - | 5 | 6 | 8 | 24 | 55 | 142 | 240 | |
| | 80 | - | 6 | 6 | 8 | 28 | 63 | 150 | 261 | |

# Appendix 2 (continued)
# DCIEM 1983 Air diving tables (metres)
# Standard Air

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| **54** | 5 | - | - | | -- | - | - | - | - | - | - | B |
| | 10 | - | | -- | - | - | - | - | 6 | 9 | 15 | E |
| | 15 | - | | | -- | - | - | 7 | 7 | 11 | 25 | H |
| | 20 | | -- | - | - | - | 6 | 6 | 8 | 25 | 45 | J |
| | 25 | - | - | - | - | 5 | 5 | 7 | 9 | 39 | 65 | M |
| | 30 | - | - | - | 3 | 4 | 6 | 7 | 15 | 50 | 85 | 0 |
| | 35 | - | - | - | 5 | 4 | 6 | 8 | 23 | 62 | 108 | |
| | 40 | - | | -- | 6 | 5 | 7 | 9 | 30 | 80 | 137 | |
| | 45 | - | - | 4 | 4 | 5 | 7 | 13 | 36 | 101 | 170 | |
| | 50 | - | - | 4 | 5 | 5 | 8 | 18 | 42 | 121 | 203 | |
| | 55 | - | - | 5 | 5 | 6 | 8 | 23 | 51 | 137 | 235 | |
| | 60 | - | - | 6 | 5 | 6 | 9 | 28 | 61 | 149 | 264 | |
| **63** | 5 | - | - | - | - | - | | -- | - | 5 | 5 | |
| | 10 | - | - | - | - | - | - | 5 | 6 | 10 | 21 | |
| | 15 | - | - | - | - | - | 7 | 6 | 8 | 20 | 41 | |
| | 20 | - | - | - | - | 7 | 5 | 7 | 9 | 39 | 67 | |
| | 25 | - | - | - | 6 | 4 | 6 | 8 | 17 | 52 | 93 | |
| | 30 | - | - | 5 | 4 | 4 | 7 | 8 | 28 | 71 | 127 | |
| | 35 | - | 3 | 3 | 4 | 6 | 7 | 12 | 35 | 97 | 167 | |
| | 40 | - | 4 | 4 | 4 | 6 | 8 | 19 | 43 | 123 | 211 | |
| | 45 | - | 5 | 4 | 5 | 6 | 9 | 25 | 54 | 142 | 250 | |
| | 50 | 3 | 3 | 4 | 6 | 6 | 13 | 29 | 70 | 154 | 288 | |

# Appendix 3
# DCIEM 1983 Air diving tables 2 (metres)
# In water oxygen

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) Air 24 | 21 | 18 | 15 | 12 | 0₂ 9 | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|
| **18** | 90 | - | - | - | - | - | 11 | 12 | J |
| | 100 | - | - | .. | .. | - | 16 | 17 | J |
| | 110 | - | - | - | - | - | 19 | 20 | K |
| | 120 | - | - | - | - | - | 23 | 24 | K |
| | 140 | - | - | - | - | - | 28 | 29 | |
| | 160 | - | - | - | - | - | 34 | 35 | |
| | 180 | - | - | - | - | - | 39 | 40 | |
| | 200 | - | - | - | - | - | 44 | 45 | |
| | 220 | - | - | - | - | - | 49 | 50 | |
| | 240 | - | - | - | - | - | 53 | 54 | |
| **27** | 40 | - | - | - | - | - | 10 | 11 | G |
| | 45 | - | - | - | - | - | 12 | 13 | H |
| | 50 | | - | - | - | - | 18 | 19 | H |
| | 55 | - | - | - | - | - | 23 | 24 | I |
| | 60 | - | - | - | | - | 26 | 27 | J |
| | 70 | - | - | - | - | - | 32 | 33 | |
| | 80 | - | - | - | | - | 37 | 38 | |
| | 90 | | - | - | - | | 43 | 44 | |
| | 100 | - | - | - | - | - | 48 | 49 | |
| | 110 | - | - | - | - | - | 53 | 54 | |
| | 120 | - | - | - | - | - | 58 | 59 | |
| **36** | 20 | - | - | - | - | - | 10 | 11 | F |
| | 25 | - | - | - | - | - | 12 | 13 | G |
| | 30 | - | - | - | - | - | 15 | 16 | H |
| | 35 | - | - | - | - | - | 24 | 25 | H |
| | 40 | - | - | - | - | - | 30 | 31 | I |
| | 45 | - | - | - | - | 3 | 33 | 37 | J |
| | 50 | - | - | - | - | 4 | 37 | 42 | K |
| | 55 | - | - | - | - | 5 | 41 | 47 | |
| | 60 | - | - | - | - | 6 | 45 | 52 | |
| | 65 | - | - | - | - | 6 | 49 | 56 | |
| | 70 | - | - | - | - | 7 | 52 | 60 | |
| | 75 | - | - | - | - | 8 | 56 | 65 | |
| | 80 | - | - | - | 2 | 6 | 60 | 69 | |
| | 85 | - | - | - | 3 | 6 | 64 | 74 | |
| | 90 | - | - | - | 3 | 7 | 68 | 79 | |
| | 95 | - | - | - | 4 | 6 | 72 | 83 | |
| | 100 | - | - | - | 4 | 7 | 76 | 88 | |

# Appendix 3 (continued)
# DCIEM 1983 Air diving tables 2 (metres)
# In water oxygen

| Depth (msw) | Bottom (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Time0 Air | | | | | | 2 | | |
| | | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | |
| **45** | 15 | - | - | - | - | | - | 12 | 13 | F |
| | 20 | - | - | - | - | - | - | 15 | 16 | G |
| | 25 | - | - | - | - | - | 4 | 22 | 27 | H |
| | 30 | - | - | - | - | - | 6 | 30 | 37 | I |
| | 35 | - | - | - | - | 3 | 5 | 36 | 45 | K |
| | 40 | - | - | - | - | 4 | 6 | 42 | 53 | M |
| | 45 | - | - | - | - | 5 | 6 | 47 | 59 | |
| | 50 | | - | - | - | 6 | 7 | 52 | 66 | |
| | 55 | - | - | - | 3 | 5 | 6 | 58 | 73 | |
| | 60 | - | - | - | 3 | 5 | 7 | 63 | 79 | |
| | 65 | - | - | - | 4 | 5 | 8 | 69 | 87 | |
| | 70 | - | - | - | 5 | 5 | 8 | 75 | 94 | |
| | 75 | - | - | - | 5 | 6 | 8 | 81 | 101 | |
| | 80 | - | - | - | 6 | 6 | 8 | 87 | 108 | |
| **54** | 15 | - | - | - | - | - | - | 16 | 17 | G |
| | 20 | - | - | - | - | - | 6 | 24 | 31 | H |
| | 25 | - | - | - | - | 5 | 5 | 34 | 45 | J |
| | 30 | - | - | - | 3 | 4 | 6 | 41 | 55 | M |
| | 35 | - | - | - | 5 | 4 | 6 | 48 | 64 | |
| | 40 | - | - | - | 6 | 5 | 7 | 55 | 74 | |
| | 45 | - | - | 4 | 4 | 5 | 7 | 63 | 84 | |
| | 50 | - | - | 4 | 5 | 5 | 8 | 70 | 93 | |
| | 55 | - | - | 5 | 5 | 6 | 8 | 78 | 103 | |
| | 60 | - | - | 6 | 5 | 6 | 9 | 86 | 113 | |
| **63** | 10 | - | - | - | - | - | - | 14 | 15 | |
| | 15 | - | - | - | - | - | 7 | 21 | 29 | |
| | 20 | - | - | - | - | 7 | 5 | 33 | 46 | |
| | 25 | - | - | - | 6 | 4 | 6 | 43 | 60 | |
| | 30 | - | - | 5 | 4 | 4 | 7 | 52 | 73 | |
| | 35 | - | 3 | 3 | 4 | 6 | 7 | 61 | 85 | |
| | 40 | - | 4 | 4 | 4 | 6 | 8 | 71 | 98 | |
| | 45 | - | 5 | 4 | 5 | 6 | 9 | 81 | 111 | |
| | 50 | 3 | 3 | 4 | 6 | 6 | 13 | 91 | 127 | |

# Appendix 4
# DCIEM 1983 Air diving tables 3 (metres)
# Surface decompression with oxygen

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface | Chamber | | |
| | | Air | | | | | | Interval | $0_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| **18** | 80 | - | - | - | - | - | - | Time from leaving the 9 msw stop (or the bottom, if no in-water stop is required) To reaching the 12 msw Chamber stop must not exceed 7 minutes | 16 | 25 | H |
| | 90 | - | - | - | - | - | - | | 20 | 29 | I |
| | 100 | - | - | - | - | - | - | | 24 | 33 | J |
| | 110 | - | - | - | - | - | - | | 28 | 37 | K |
| | 120 | - | - | - | - | - | - | | 30 | 39 | K |
| | 130 | | - | - | - | - | - | | 32* | 46 | |
| | 140 | - | - | - | - | - | - | | 38* | 52 | |
| | 150 | - | - | - | - | - | - | | 42* | 56 | |
| | 160 | - | - | - | - | - | - | | 46* | 60 | |
| | 170 | - | - | - | - | - | - | | 50* | 64 | |
| | 180 | - | - | - | - | - | - | | 54* | 68 | |
| | 190 | - | - | - | - | - | - | | 57* | 71 | |
| | 200 | - | - | - | - | - | | | 60* | 74 | |
| | 210 | - | - | - | - | - | - | | 63** | 82 | |
| | 220 | - | - | - | - | - | - | | 69** | 88 | |
| | 230 | - | - | - | - | - | - | | 73** | 92 | |
| | 240 | - | | - | - | - | - | | 77** | 96 | |
| **27** | 40 | - | - | - | - | - | | | 16 | 25 | G |
| | 45 | - | - | - | - | - | - | | 21 | 30 | H |
| | 50 | - | - | - | - | - | - | | 25 | 34 | H |
| | 55 | - | - | - | - | - | 1 | | 28 | 38 | I |
| | 60 | - | | | | | | | 30* | 46 | J |
| | 70 | - | | | | | | | 37* | 54 | |
| | 80 | | | | | | | | 45* | 63 | |
| | PO | | - | | - | - | 5 | | 52* | 71 | |
| | 100 | - | - | - | - | | 6 | | 58* | 78 | |
| | 110 | - | | | | | | | 65** | 91 | |
| | 120 | - | - | - | - | - | 8 | | 74** | 101 | |
| **38** | 25 | - | | | | | | | 13 | 24 | G |
| | 30 | - | | | | | | | 21 | 34 | G |
| | 35 | - | - | - | - | - | 6 | | 27 | 42 | H |
| | 40 | - | - | | - | - | 8 | | 30* | 52 | I |
| | 45 | - | - | - | - | 3 | 6 | | 36* | 59 | J |
| | 50 | - | - | - | - | 4 | 7 | | 42* | 67 | K |
| | 55 | - | - | - | - | 5 | 7 | | 48* | 74 | |
| | 60 | - | - | - | - | 6 | 7 | | 53* | 80 | |
| | 85 | - | - | - | - | 6 | 8 | | 58* | 86 | |

# Appendix 4 (continued)
## DCIEM 1983 Air diving tables 3 (metres)
## Surface decompression with oxygen

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | Surface Interval | Chamber | | |
| | | | | | | | | Air()2 | | | | |
| | | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| **36** | 70 | - | - | - | - | - | 7 | 8 | Time from leaving the 9 msw stop (or the bottom, if no in-water stop is required) To reaching the 12 msw Chamber stop must not exceed 7 minutes | 60** | 94 | |
| | 75 | - | - | - | - | - | 8 | 8 | | 70** | 105 | |
| | 80 | - | - | - | - | 2 | 6 | 9 | | 76** | 112 | |
| | 85 | - | - | - | - | 3 | 6 | 10 | | 82** | 120 | |
| | 90 | - | - | - | - | 3 | 7 | 13 | | 87** | 129 | |
| | 95 | - | - | - | | 4 | 6 | 16 | | 90** | 135 | |
| | 100 | - | - | - | | 4 | 7 | 19 | | 100*** | 154 | |
| **45** | 20 | - | - | - | - | - | - | 6 | | 17 | 32 | G |
| | 25 | - | - | - | - | - | 4 | 5 | | 27 | 45 | H |
| | 30 | - | - | | | | 6 | 6 | | 30* | 56 | I |
| | 35 | - | - | - | - | 3 | 5 | 7 | | 40* | 69 | K |
| | 40 | - | - | - | - | 4 | 6 | 7 | | 48* | 79 | M |
| | 45 | - | - | - | | 5 | 6 | 8 | | 55* | 88 | |
| | 50 | - | - | - | - | 6 | 7 | 8 | | 60** | 100 | |
| | 55 | - | | - | 3 | 5 | 6 | 9 | | 72** | 114 | |
| | 60 | - | - | | 3 | 5 | 7 | 12 | | 80** | 126 | |
| | 65 | - | - | - | 4 | 5 | 8 | 16 | | 87** | 139 | |
| | 75 | - | | | 5 | 6 | 8 | 24 | | 105*** | 172 | |
| | 80 | - | | | 6 | 6 | 8 | 28 | | 111*** | 183 | |
| **54** | 15 | - | - | - | - | - | - | 7 | | 15 | 31 | G |
| | 20 | - | - | | | - | 6 | 6 | | 28 | 49 | H |
| | 25 | - | - | - | - | 5 | 5 | 7 | | 36* | 67 | J |
| | 30 | - | | - | 3 | 4 | 6 | 7 | | 47* | 81 | M |
| | 35 | | | - | 5 | 4 | 6 | 8 | | 56* | 93 | |
| | 40 | - | - | - | 6 | 5 | 7 | 9 | | 66** | 112 | |
| | 45 | - | - | 4 | 4 | 5 | 7 | 13 | | 78** | 130 | |
| | 50 | - | - | 4 | 5 | 5 | 8 | 18 | | 88** | 147 | |
| | 55 | - | - | 5 | 5 | 6 | 8 | 23 | | 101*** | 172 | |
| | 60 | - | - | 6 | 5 | 6 | 9 | 28 | | 110*** | 188 | |
| **63** | 15 | - | - | - | - | - | 7 | 6 | | 25 | 47 | |
| | 20 | - | - | | - | 7 | 5 | 7 | | 36* | 69 | |
| | 25 | - | | | 6 | 4 | 6 | 8 | | 49* | 87 | |
| | 30 | | - | 5 | 4 | 4 | 7 | 8 | | 60* | 102 | |
| | 35 | - | 3 | 3 | 4 | 6 | 7 | 12 | | 76** | 130 | |
| | 40 | - | 4 | 4 | 4 | 6 | 8 | 19 | | 88** | 152 | |
| | 45 | - | 5 | 4 | 5 | 6 | 9 | 25 | | 105*** | 183 | |
| | 50 | 3 | 3 | 4 | 6 | 6 | 13 | 29 | | 116*** | 204 | |

# Appendix 5
# DCIEM 1983 Air diving tables 4
# Repetitive dive factor

| Repetitive Dive Group First Dive | Surface Intervals (hr:min) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 0:30 --*0:59 | 1:00 ---).1:29 | 1:30 - q:59 | 2:00 -*2:59 | 3:00 --*3:59 | 4:00 ---5:59 | 6:00 - q3:59 | 9:00 - q1:59 | 12:00 -*18:00 |
| **A** | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| **B** | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 |
| C | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 |
| **D** | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| **E** | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 |
| **F** | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 |
| **G** | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 |
| **H** | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 |
| **I** | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 |
| **J** | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 |
| **K** | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 |
| **L** | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 |
| **M** | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 |
| **N** | - | | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 |
| **0** | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 |

**INSTRUCTIONS**

1. Determine the **First Dive** Group from the table used.
2. Find the **Repetitive Factor (RF)** from this table under the appropriate **Surface Interval.**
3. Multiply the **Bottom Time** of the **Second Dive** by this **RF** to obtain the **Effective Bottom Time (EBT).**
4. Decompress for the **Depth** and **EBT** of the **Second Dive.**

# Appendix 6
# DCIEM 1983 Air diving tables 5 (metres)
# Depth correction for diving at altitude

| Actual Depth (msw) | Depth Correction (msw) at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 -4300 | 300 -4600 | 600 -+900 | 900 -+1200 | 1200 -41500 | 1500 -+1800 | 1800 --42100 | 2100 -*2400 | 2400 -*3000 |
| 9 | +0 | +3 | +3 | +3 | +3 | +3 | +3 | +6 | +6 |
| 12 | +0 | +3 | +3 | +3 | +3 | +3 | +6 | +6 | +6 |
| 15 | +0 | +3 | 4 3 | +3 | +3 | +6 | +6 | +6 | +6 |
| 18 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +6 | +9 |
| 21 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +9 | +9 |
| 24 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 27 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 30 | +0 | +3 | +3 | +6 | +6 | +9 | +9 | +9 | +12 |
| 33 | +0 | -I- 3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 36 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 39 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 |
| 42 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +18 |
| 45 | +3 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +18 |
| 48 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 | +18 |
| 51 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | +21 |
| 54 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | |
| 57 | +3 | +6 | +6 | +9 | +12 | +12 | +15 | | |
| 60 | +3 | +6 | +6 | +9 | +12 | +12 | | | |
| 63 | +3 | +6 | +6 | +9 | | | | | |
| 66 | +3 | +6 | | | | | | | |
| 69 | +3 | | | | | | | | |

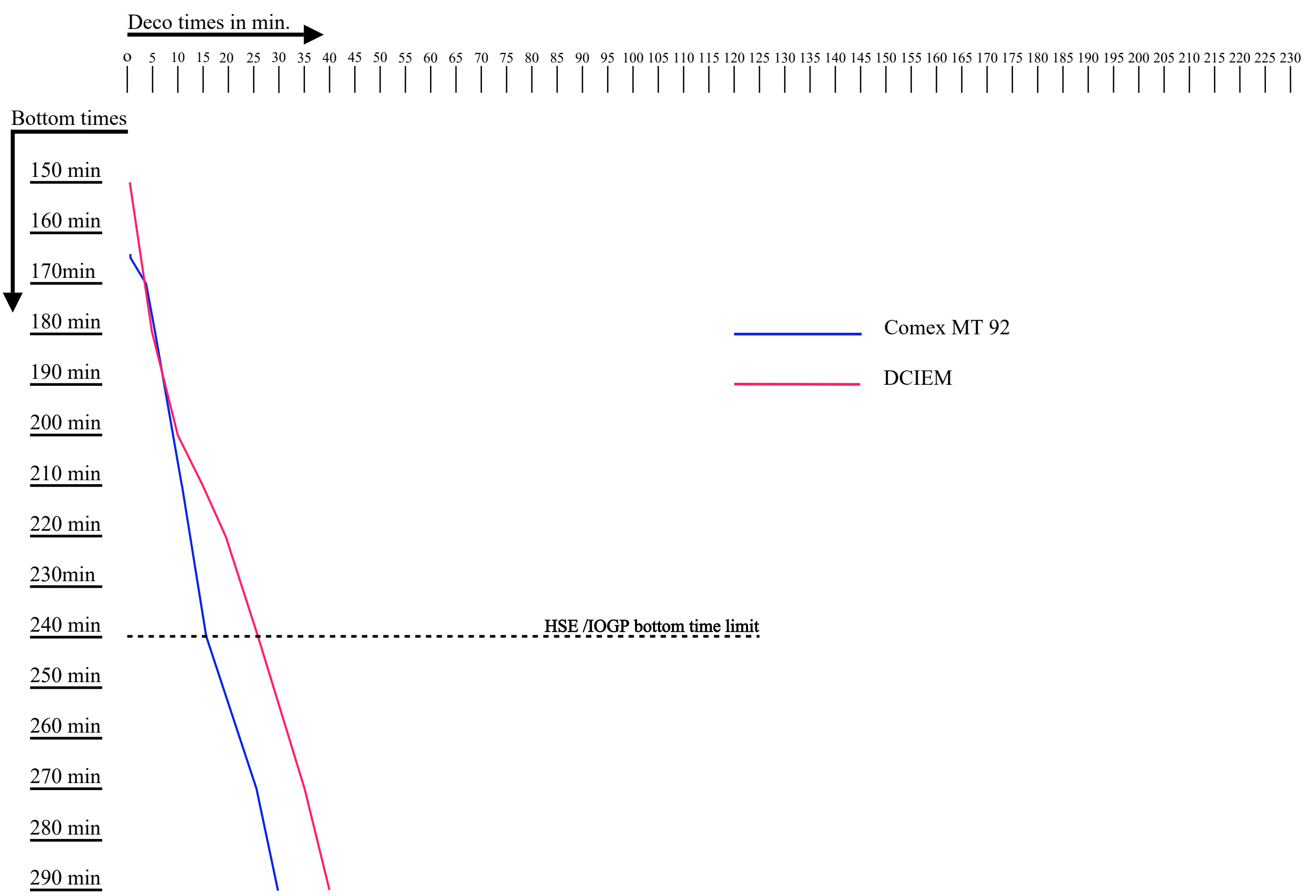
| Sea Level Stop Depth (msw) | Actual Stop Depth (msw) at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 300 | 300 4600 | 600 900 | 900 1200 | 1200 1500 | 1500 1800 | 1800 2100 | 2100 2400 | 2400 3000 |
| 3 | 3M | 3.0 | 3.0 | 3.0 | 3.0 | 2.5 | 2.5 | 2.5 | 2.5 |
| 6 | 6.0 | 6.0 | 6.0 | 5.5 | 5.5 | 5.0 | 5.0 | 5.0 | 4.5 |
| 9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.0 | 7.5 | 7.5 | 7.0 | 7.0 |
| 12 | 12.0 | 12.0 | 11.5 | 11.0 | 10.5 | 10.0 | 10.0 | 9.5 | 9.0 |
| 15 | 15.0 | 14.5 | 14.0 | 13.5 | 13.0 | 12.5 | 12.0 | 12.0 | 11.5 |
| 18 | 18.0 | 17.5 | 17.0 | 16.5 | 16.0 | 15.0 | 14.5 | 14.0 | 13.5 |
| 21 | 21.0 | 20.5 | 20.0 | 19.0 | 18.5 | 17.5 | 17.0 | 16.5 | 16.0 |

## 1.3. - Comparison of the air in-water decompression stops with those of MT 92.

In the presentation, we said that even though DCIEM tables are no longer developed, they have similar decompression curves to the Comex MT 92 tables that have been in force within French regulations since 1992 and have been kept untouched in the revisions in 2012 and 2019, which is an indicator that these tables give good results. The comparison below illustrates the points made above and is already displayed alongside the no-decompression limit curves, showing that DCIEM is often slightly more stringent. However, it is worth noting that longer decompression does not necessarily mean the model is safer, as other factors, such as the ascent rate and the depth of the first stop, are also part of the decompression strategy.

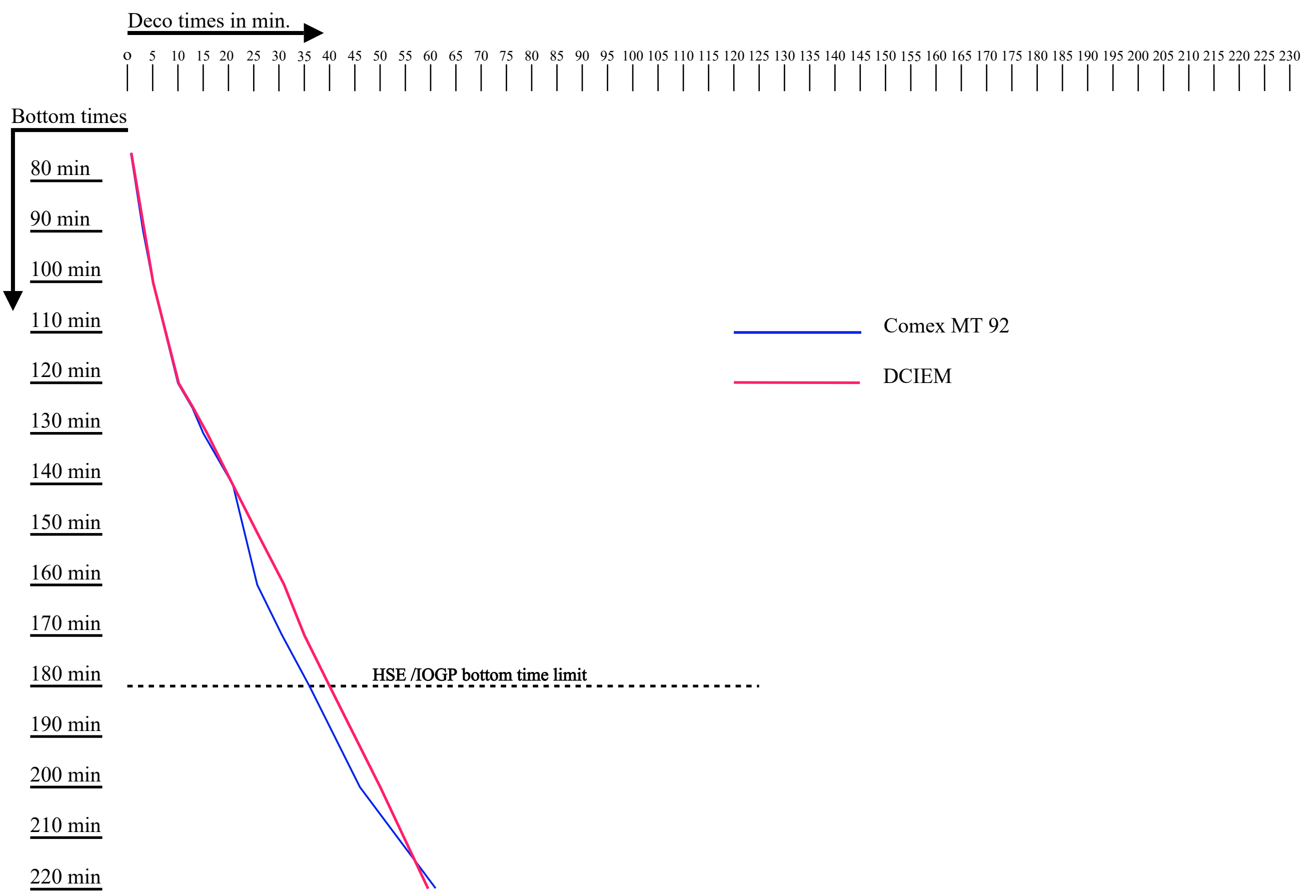
Comparison ascent times MT92/2019, and DCIEM for a dive at 12 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference with MT 92* |
|---|---|---|---|
| ***150*** | 1:00 | 1:00 | 0 |
| ***165*** | 1:00 | (Stop not indicated) | — |
| ***170*** | 3:45 | (Stop not indicated) | — |
| ***180*** | 5:45 | 5:00 | - 0:45 |
| ***200*** | (Stop not indicated) | 10:00 | — |
| ***210*** | 10:45 | 15:00 | + 4:15 |
| ***220*** | (Stop not indicated) | 19:00 | — |
| ***240*** | 15:45 | 26:00 | +10:15 |
| ***Operational limits UK-HSE*** | | | |
| ***270*** | 25:45 | 35:00 | + 10:15 |
| ***300*** | 30:45 | 44:00 | + 13:15 |
| ***330*** | 35:45 | 53:00 | + 17:15 |



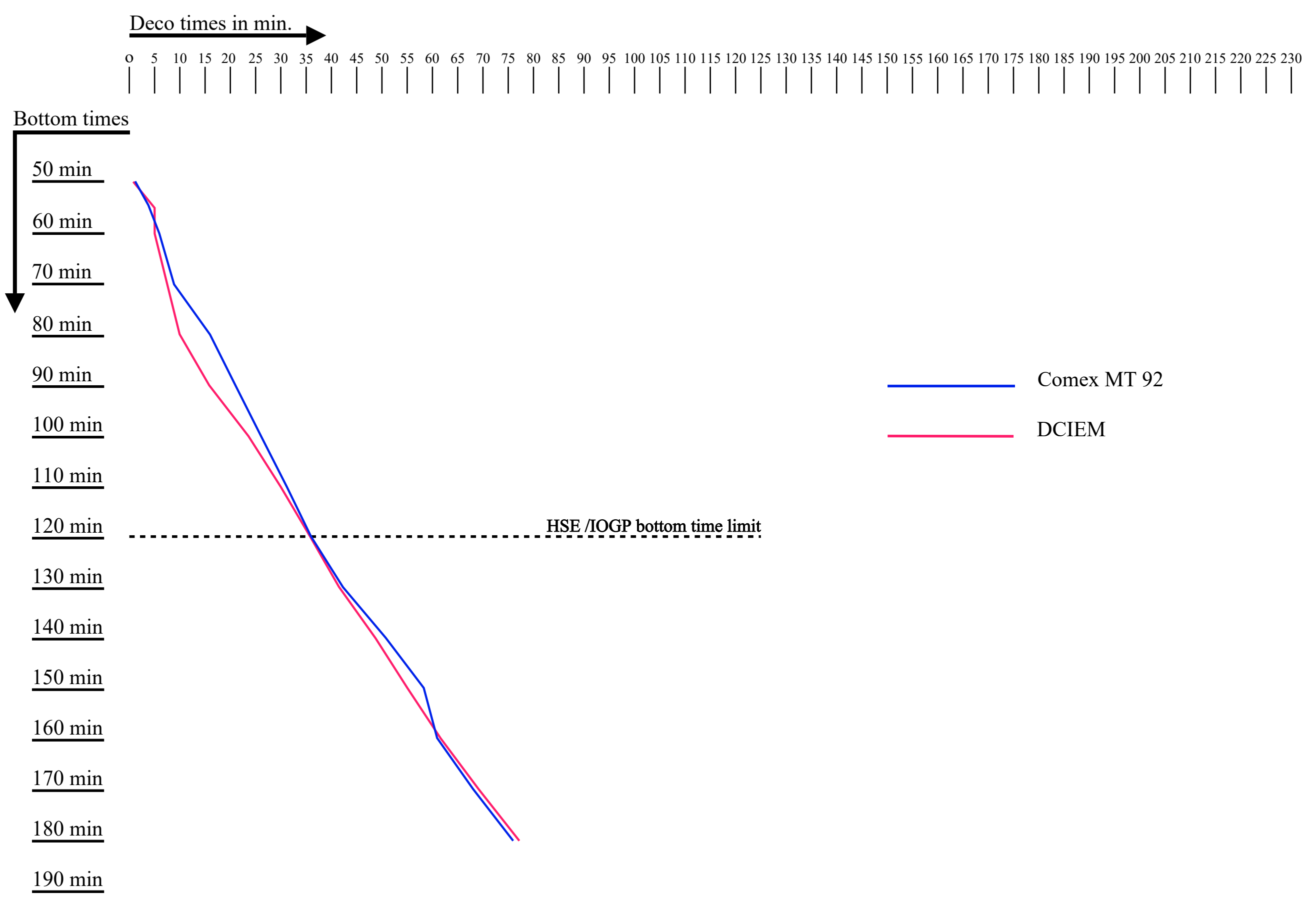
Comparison ascent times MT92/2019, and DCIEM for a dive at 15 m

| Bottom time | Ascent time MT92 | Ascent time DCIEM | Difference DCIEM with MT 92 |
|---|---|---|---|
| ***60*** | 1:00 | 1:00 | 0 |
| ***75*** | 1:00 | 1:00 | 0 |
| ***90*** | 3:00 | (Stop not indicated) | — |
| ***100*** | 5:00 | 5:00 | 0 |
| ***120*** | 10:00 | 10:00 | 0 |
| ***125*** | 13:00 | 13:00 | 0 |
| ***130*** | 15:00 | 16:00 | + 1:00 |
| ***140*** | 21:00 | 21:00 | 0 |
| ***150*** | (Stop not indicated) | 26:00 | — |
| ***160*** | 26:00 | 31:00 | + 5:00 |
| ***170*** | 31:00 | 35:00 | + 4:00 |
| ***180*** | 36:00 | 40:00 | + 4:00 |
| ***Operational limits UK-HSE*** | | | |
| ***200*** | 46:00 | 50:00 | + 4:00 |
| ***220*** | 61:00 | 59:00 | + 2:00 |
| ***240*** | 71:00 | 70:00 | + 1:00 |



Comparison ascent times MT92/2019, and DCIEM for a dive at 18 m

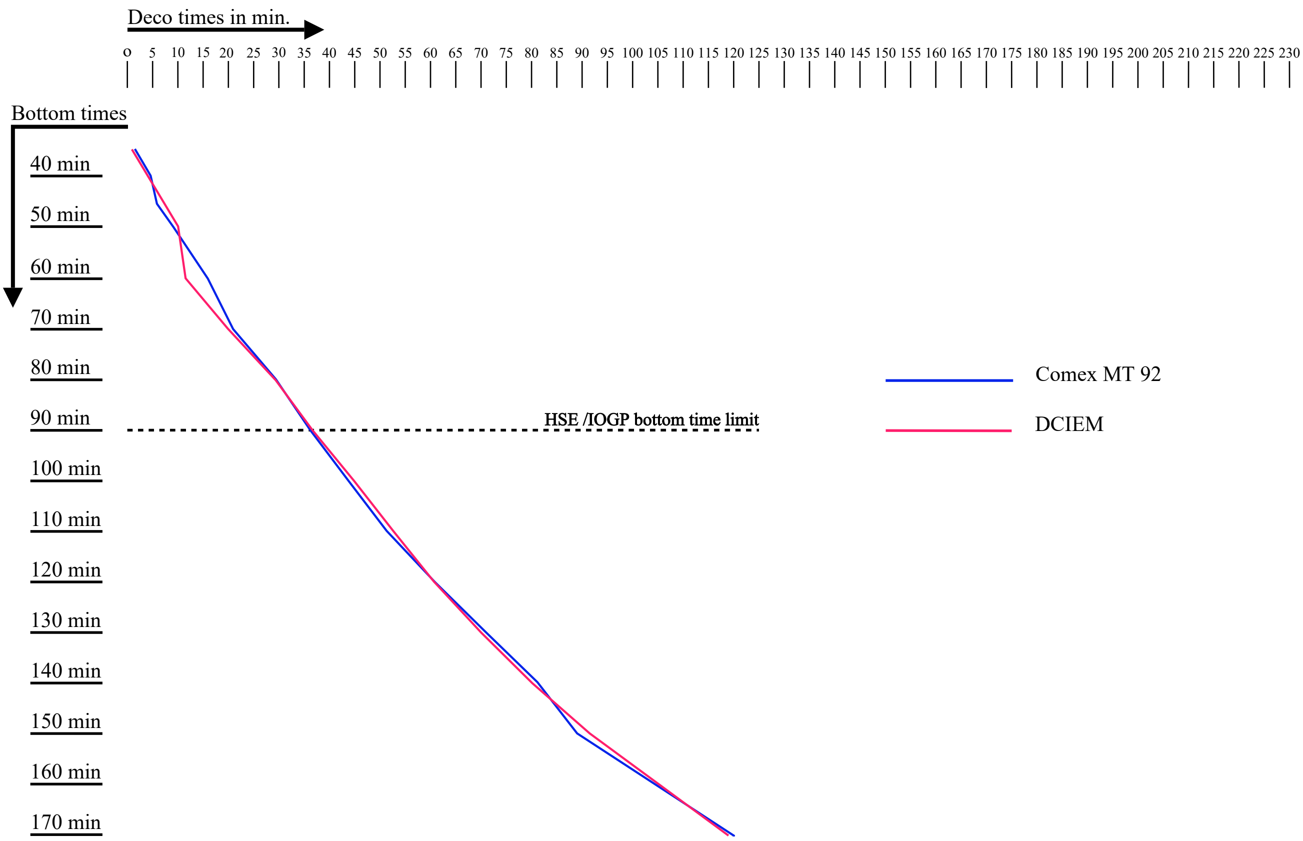
| Bottom time | Ascent time MT92 | Ascent time DCIEM | Difference DCIEM with MT 92 |
|---|---|---|---|
| ***50*** | 1:30 | 1:00 | - 0:30 |
| ***55*** | 4:15 | 5:00 | + 0:45 |
| ***60*** | 6:15 | 5:00 | - 1:15 |
| ***70*** | 8:15 | (Stop not indicated) | — |
| ***80*** | 16:15 | 10:00 | - 6:15 |
| ***90*** | 21:15 | 16:00 | - 5:45 |
| ***100*** | 26:15 | 24:00 | - 2:15 |
| ***110*** | 31:15 | 30:00 | - 1:15 |
| ***120*** | 36:15 | 36:00 | - 0:15 |
| ***Operational limits UK-HSE*** | | | |
| ***130*** | 44:00 | 42:00 | - 2:00 |
| ***140*** | 51:00 | 48:00 | - 3:00 |
| ***150*** | 58:00 | 55:00 | - 3:00 |
| ***160*** | 61:00 | 62:00 | + 1:00 |
| ***170*** | 68:00 | 69:00 | + 1:00 |
| ***180*** | 76:00 | 77:00 | + 1:00 |



Hyperlink Table of contents

Comparison ascent times MT92/2019, and DCIEM for a dive at 21 m

| Bottom time | Ascent time MT92 | Ascent time DCIEM | Difference DCIEM with MT 92 |
|---|---|---|---|
| 35 | 1:45 | 1:00 | - 0:45 |
| 40 | 4:30 | 5:00 | + 0:30 |
| 45 | 6:30 | (Stop not indicated) | — |
| 50 | 8:30 | 10:00 | + 1:30 |
| 60 | 16:30 | 12:00 | - 4:30 |
| 70 | 21:30 | 20:00 | - 1:30 |
| 80 | 29:15 | 29:00 | - 0:15 |
| 90 | 36:15 | 37:00 | + 0:45 |
| Operational limits UK-HSE | | | |
| 100 | 43:15 | 45:00 | + 1:45 |
| 110 | 51:15 | 53:00 | + 2:45 |
| 120 | 61:15 | 61:00 | - 0:15 |
| 130 | 71:15 | 70:00 | - 1:15 |
| 140 | 81:15 | 80:00 | - 1:15 |
| 150 | 89:00 | 92:00 | + 3:00 |
| 160 | (Stop not indicated) | 105:00 | — |
| 170 | 121:00 | 118:00 | - 3:00 |



Comparison ascent times MT92/2019, and DCIEM for a dive at 24 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***25*** | 2:00 | 2:00 | 0 |
| ***30*** | 4:45 | 5:00 | + 0:15 |
| ***35*** | 6:45 | 11:00 | + 4:15 |
| ***40*** | 8:45 | 11:00 | + 2:15 |
| ***45*** | 11:45 | (Stop not indicated) | — |
| ***50*** | 16:45 | 15:00 | - 1:45 |
| ***55*** | (Stop not indicated) | 20:00 | — |
| ***60*** | 24:30 | 27:00 | + 2:30 |
| ***65*** | 36:30 | 32:00 | - 4:30 |
| ***70*** | 36:30 | 37:00 | + 0:30 |
| ***Operational limits UK-HSE*** | | | |
| ***75*** | (Stop not indicated) | 42:00 | — |
| ***80*** | 46:30 | 46:00 | + 0:30 |
| ***85*** | (Stop not indicated) | 51:00 | — |
| ***90*** | 56:30 | 56:00 | + 0:30 |
| ***95*** | (Stop not indicated) | 61:00 | — |
| ***100*** | 69:15 | 66:00 | - 2:45 |
| ***110*** | 79:15 | 78:00 | - 1:15 |
| ***120*** | 94:15 | 93:00 | - 1:15 |

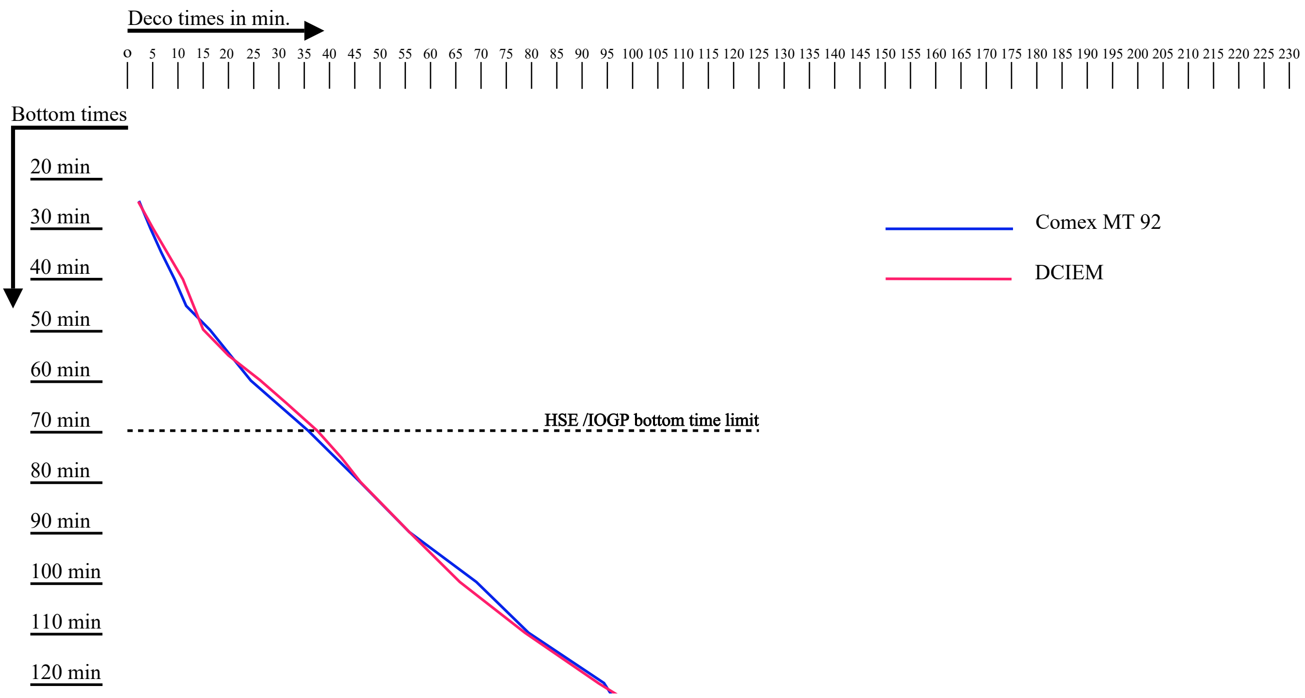
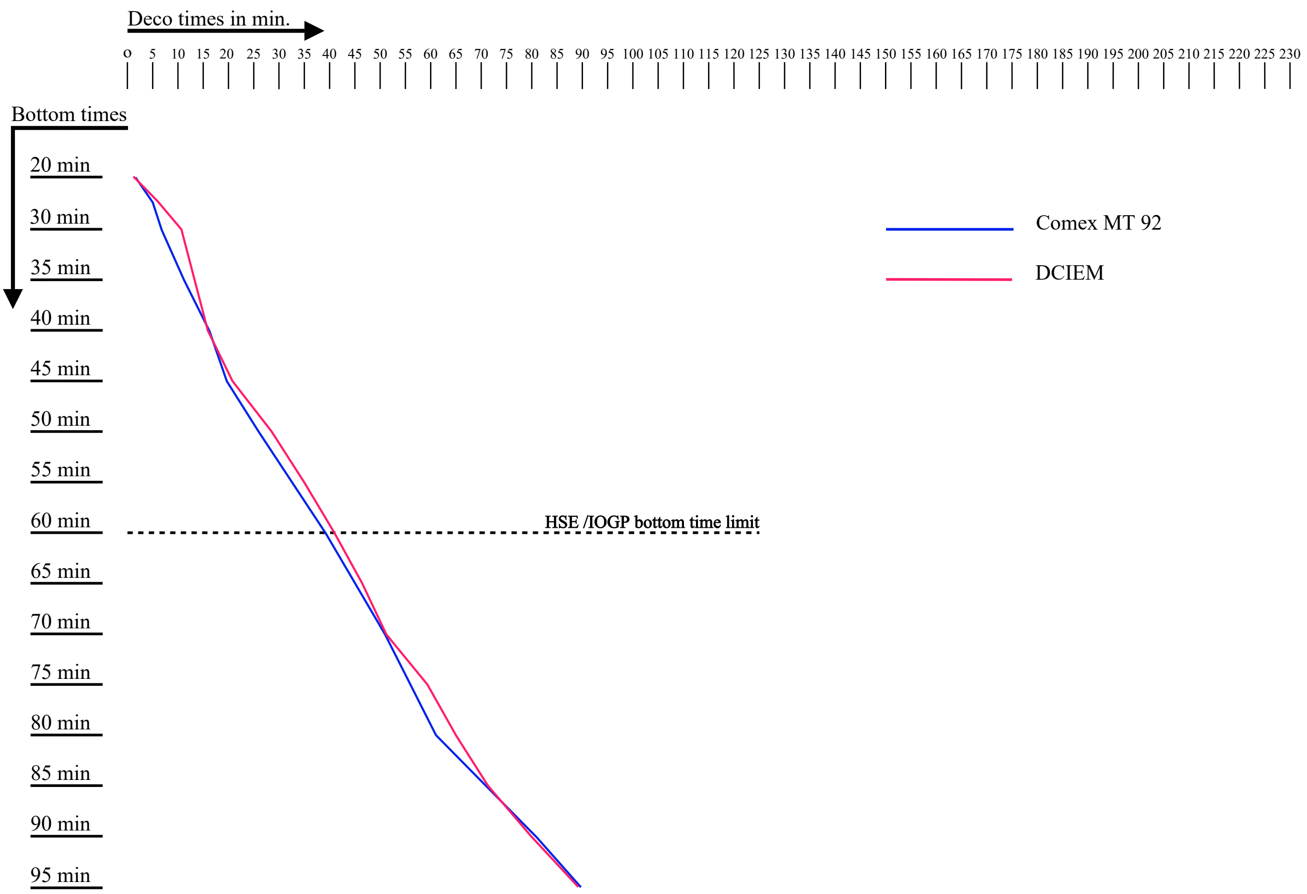


Table of contents

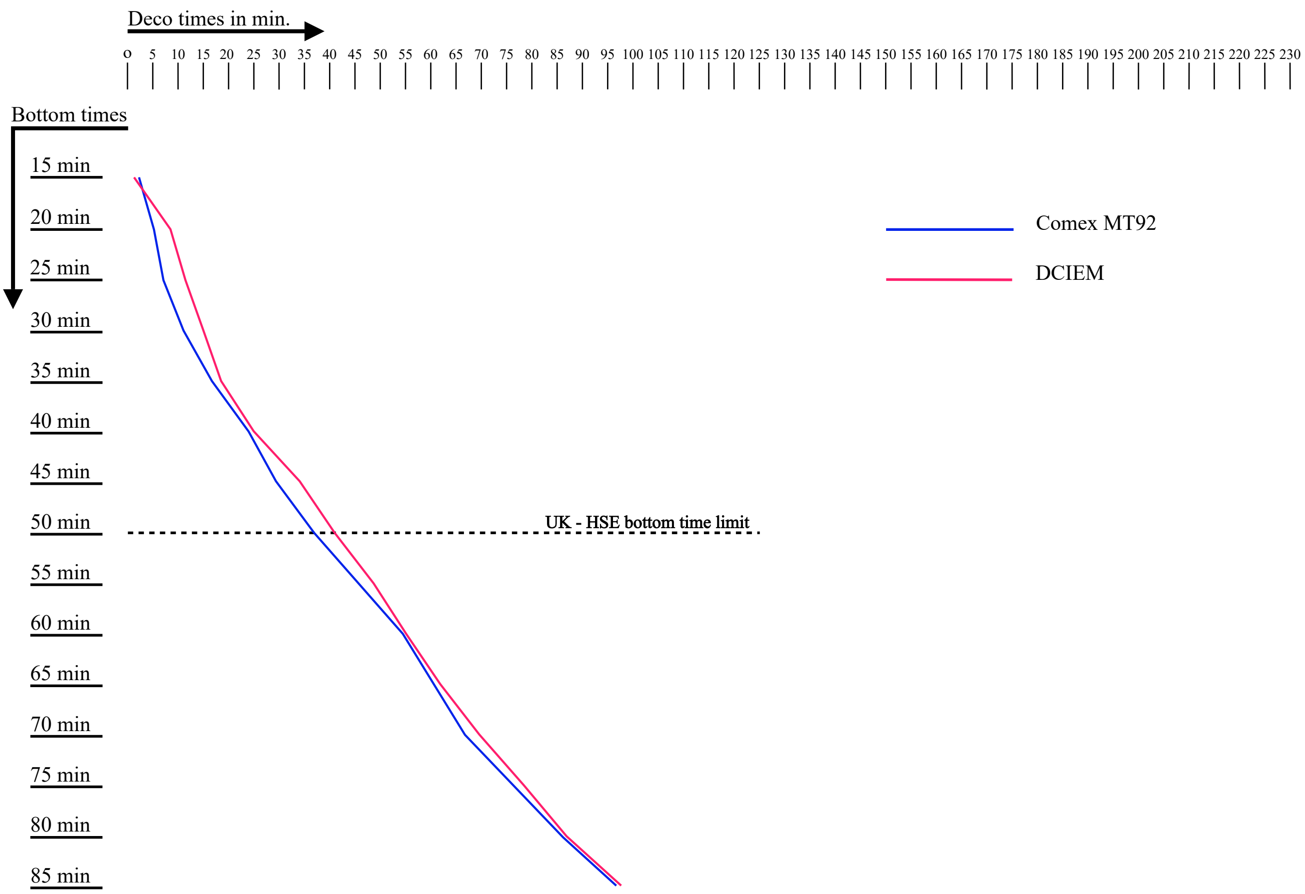
Comparison ascent times MT92/2019, and DCIEM for a dive at 27 m

| ***Bottom time*** | ***Ascent time MT92*** | ***Ascent time DCIEM*** | ***Difference DCIEM with MT 92*** |
|---|---|---|---|
| ***20*** | 2:15 | 2:00 | 0 |
| ***25*** | 5:00 | 7:00 | + 2:00 |
| ***30*** | 7:00 | 11:00 | + 3:00 |
| ***35*** | 12:00 | (Stop not indicated) | — |
| ***40*** | 16:45 | 16:00 | - 0:15 |
| ***45*** | 19:45 | 21:00 | - 1:15 |
| ***50*** | 26:45 | 28:00 | - 1:15 |
| ***55*** | (Stop not indicated) | 35:00 | — |
| ***60*** | 38:45 | 41:00 | - 2:15 |
| ***Operational limits UK-HSE*** | | | |
| ***65*** | (Stop not indicated) | 47:00 | — |
| ***70*** | 51:45 | 52:00 | + 0:15 |
| ***75*** | (Stop not indicated) | 59:00 | — |
| ***80*** | 61:30 | 65:00 | - 3:30 |
| ***85*** | (Stop not indicated) | 71:00 | — |
| ***90*** | 81:30 | 79:00 | - 2:30 |
| ***95*** | (Stop not indicated)) | 87:00 | — |



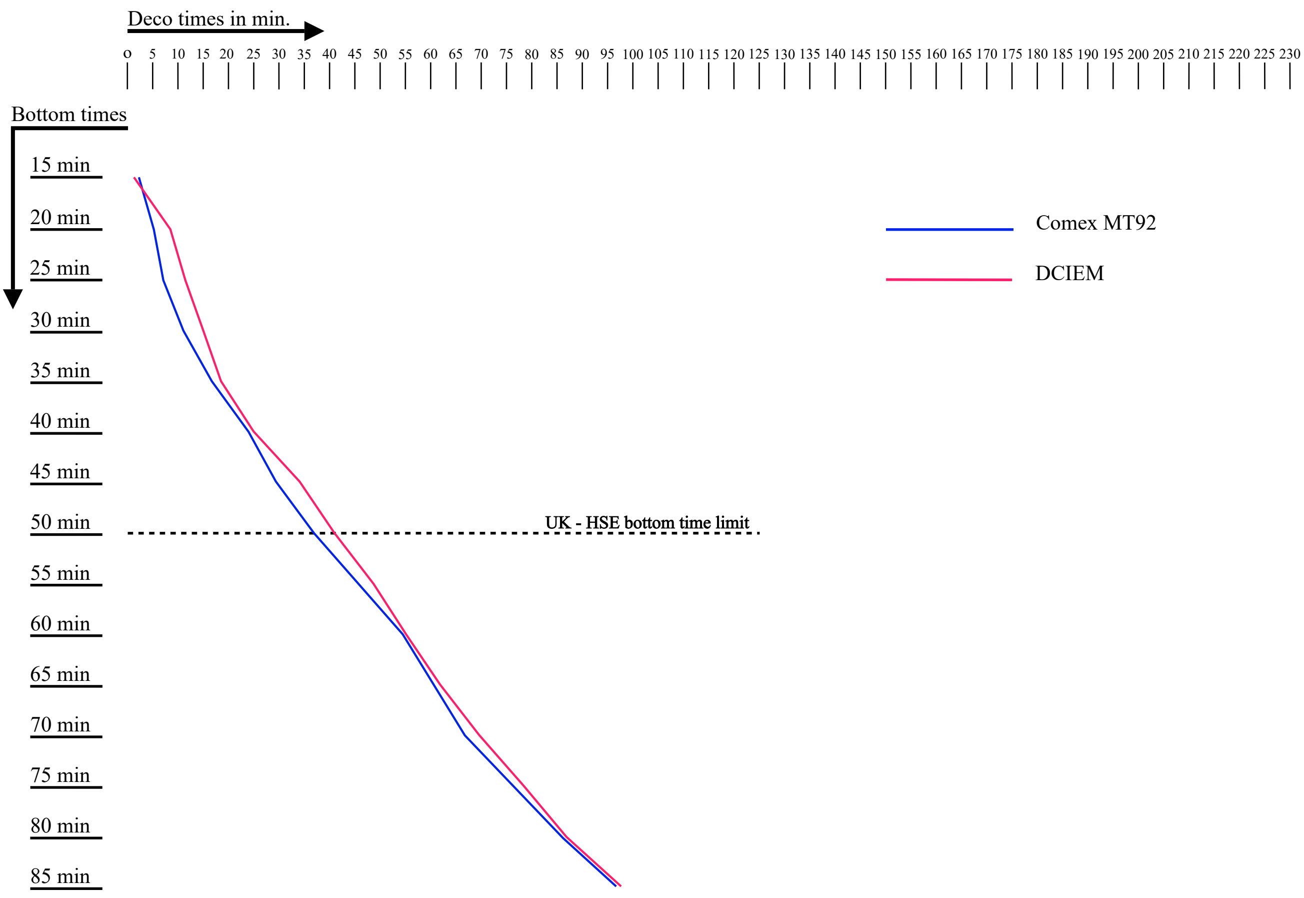
Comparison ascent times MT92/2019, and DCIEM for a dive at 30 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***15*** | 2:30 | 2:00 | - 0:30 |
| ***20*** | 5:15 | 8:00 | + 2:45 |
| ***25*** | 7:15 | 12:00 | + 4:45 |
| ***30*** | 12:15 | 15:00 | + 2:45 |
| ***35*** | 17:00 | 18:00 | + 1:00 |
| ***40*** | 24:00 | 25:00 | + 1:00 |
| ***45*** | 29:00 | 34:00 | + 5:00 |
| ***50*** | 37:00 | 41:00 | + 4:00 |
| ***Operational limits UK-HSE*** | | | |
| ***55*** | (Stop not indicated) | 48:00 | — |
| ***60*** | 54:45 | 55:00 | + 0:15 |
| ***65*** | (Stop not indicated) | 62:00 | — |
| ***70*** | 66:45 | 69:00 | + 2:15 |
| ***75*** | (Stop not indicated) | 78:00 | — |
| ***80*** | 86:45 | 87:00 | +0:15 |
| ***85*** | (Stop not indicated) | 97:00 | — |



Comparison ascent times MT92/2019, and DCIEM for a dive at 30 m

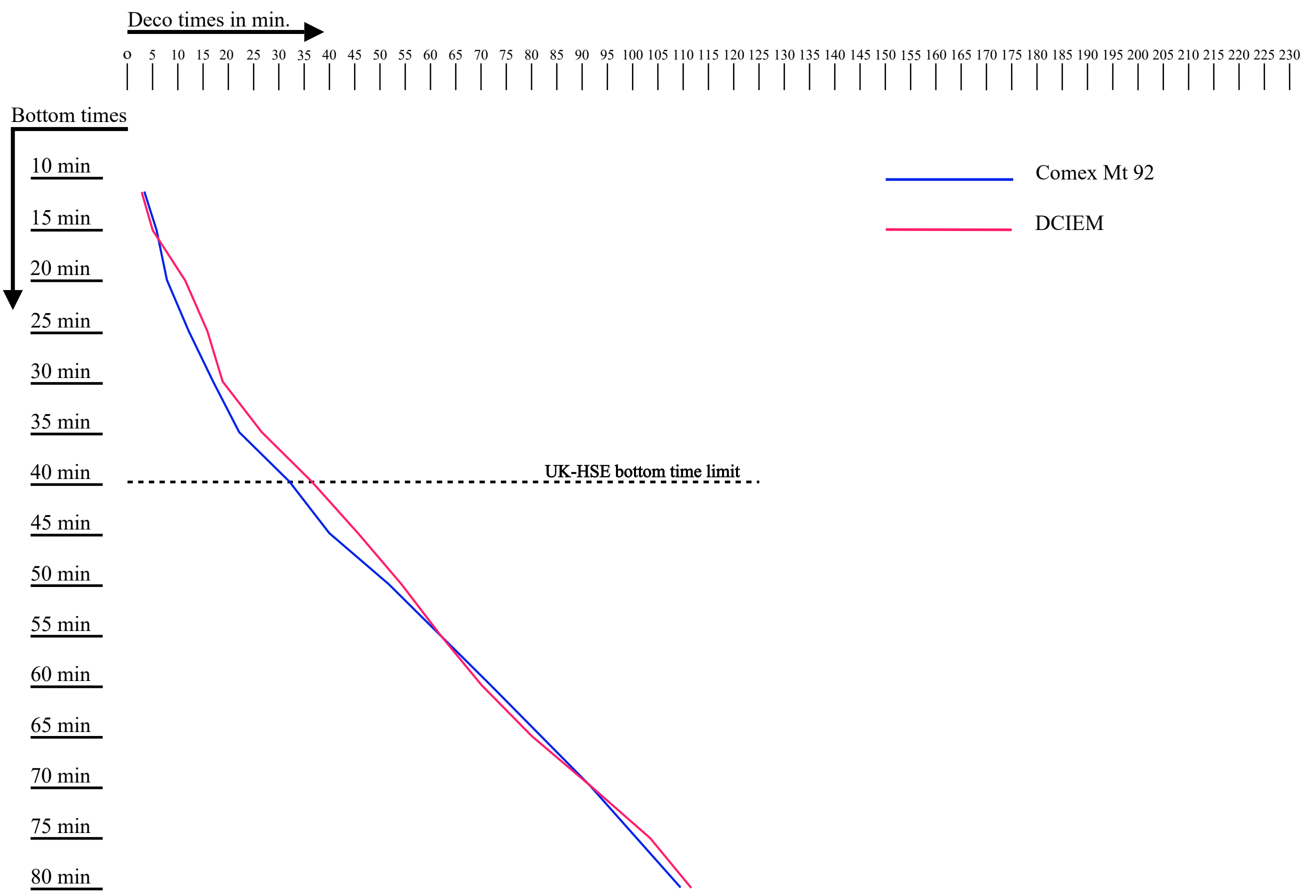
| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***15*** | 2:30 | 2:00 | - 0:30 |
| ***20*** | 5:15 | 8:00 | + 2:45 |
| ***25*** | 7:15 | 12:00 | + 4:45 |
| ***30*** | 12:15 | 15:00 | + 2:45 |
| ***35*** | 17:00 | 18:00 | + 1:00 |
| ***40*** | 24:00 | 25:00 | + 1:00 |
| ***45*** | 29:00 | 34:00 | + 5:00 |
| ***50*** | 37:00 | 41:00 | + 4:00 |
| ***Operational limits UK-HSE*** | | | |
| ***55*** | (Stop not indicated) | 48:00 | — |
| ***60*** | 54:45 | 55:00 | + 0:15 |
| ***65*** | (Stop not indicated) | 62:00 | — |
| ***70*** | 66:45 | 69:00 | + 2:15 |
| ***75*** | (Stop not indicated) | 78:00 | — |
| ***80*** | 86:45 | 87:00 | +0:15 |
| ***85*** | (Stop not indicated) | 97:00 | — |



Hyperlink Table of contents

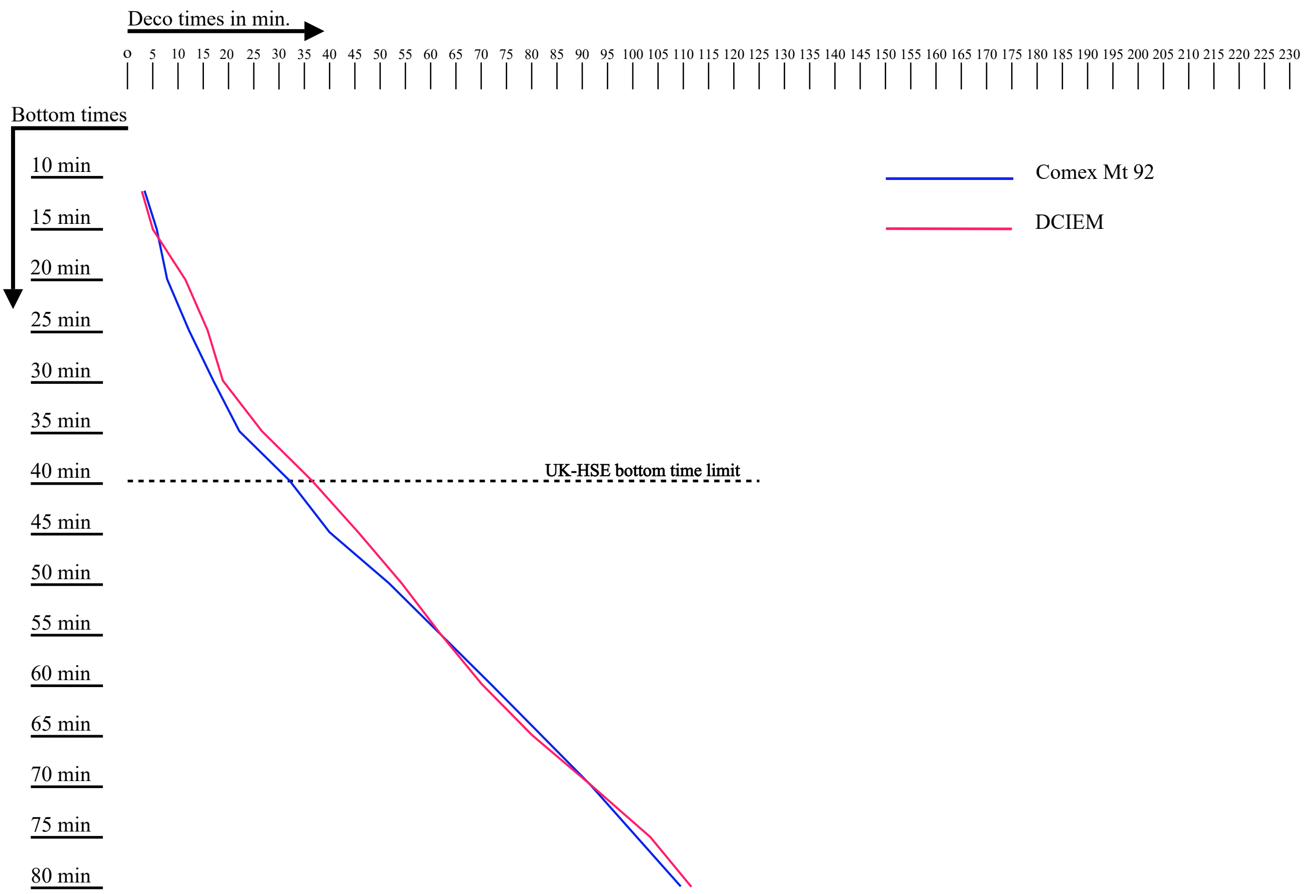
Comparison ascent times MT92/2019, and DCIEM for a dive at 33 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***12*** | 2:45 | 2:00 | - 0:45 |
| ***15*** | 5:30 | 5 | - 0:30 |
| ***20*** | 7:30 | 12 | + 4:30 |
| ***25*** | 12:15 | 16 | + 3:45 |
| ***30*** | 17:15 | 19 | + 1:45 |
| ***35*** | 22:15 | 27 | + 4:45 |
| ***40*** | 32:00 | 37 | + 5:00 |
| ***Operational limits UK-HSE*** | | | |
| ***45*** | 40 | 46 | +6:00 |
| ***50*** | 52:00 | 54 | + 2:00 |
| ***55*** | (Stop not indicated) | 62 | — |
| ***60*** | 72:00 | 70 | - 2:00 |
| ***65*** | (Stop not indicated) | 80 | — |
| ***70*** | 91:45 | 92 | + 0:15 |
| ***75*** | (Stop not indicated) | 103 | — |
| ***80*** | 109:45 | 116 | + 6:15 |



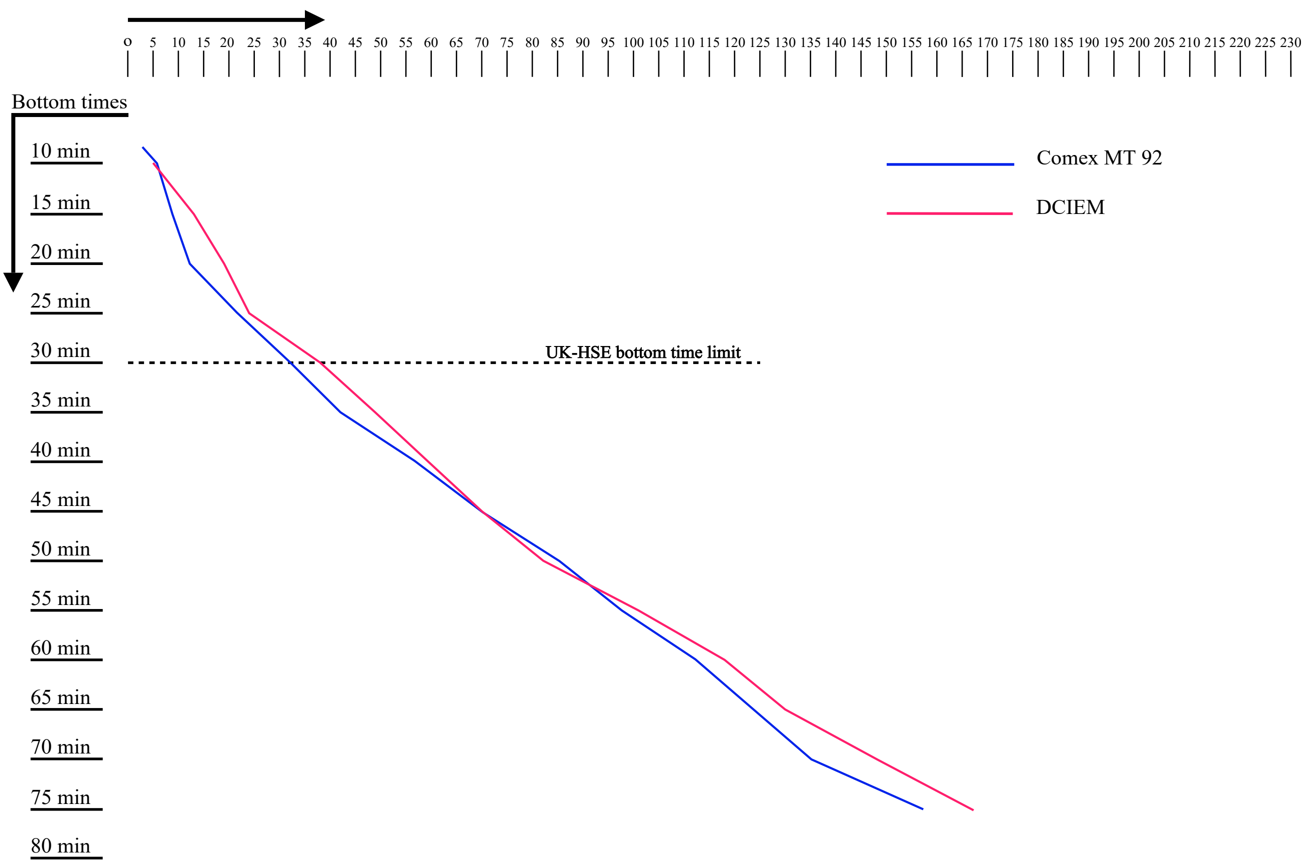
Comparison ascent times MT92/2019, and DCIEM for a dive at 36 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***10*** | 3:00 | 2:00 | - 1:00 |
| ***15*** | 5:45 | 10:00 | + 4:15 |
| ***20*** | 9:45 | 15:00 | + 5:15 |
| ***25*** | 17:30 | 19:00 | + 1:30 |
| ***30*** | 24:30 | 26:00 | + 1:30 |
| ***35*** | 35:15 | 38:00 | + 2:45 |
| ***Operational limits UK-HSE*** | | | |
| ***40*** | 42:15 | 48:00 | + 5:45 |
| ***45*** | 52:15 | 57:00 | + 4:45 |
| ***50*** | 67:00 | 67:00 | 0 |
| ***55*** | (Stop not indicated) | 78:00 | — |
| ***60*** | 87:00 | 90:00 | + 3:00 |
| ***65*** | (Stop not indicated) | 102:00 | — |
| ***70*** | 107:00 | 117:00 | + 10:00 |
| ***75*** | (Stop not indicated) | 133:00 | — |
| ***80*** | 129:00 | 149:00 | + 20:00 |



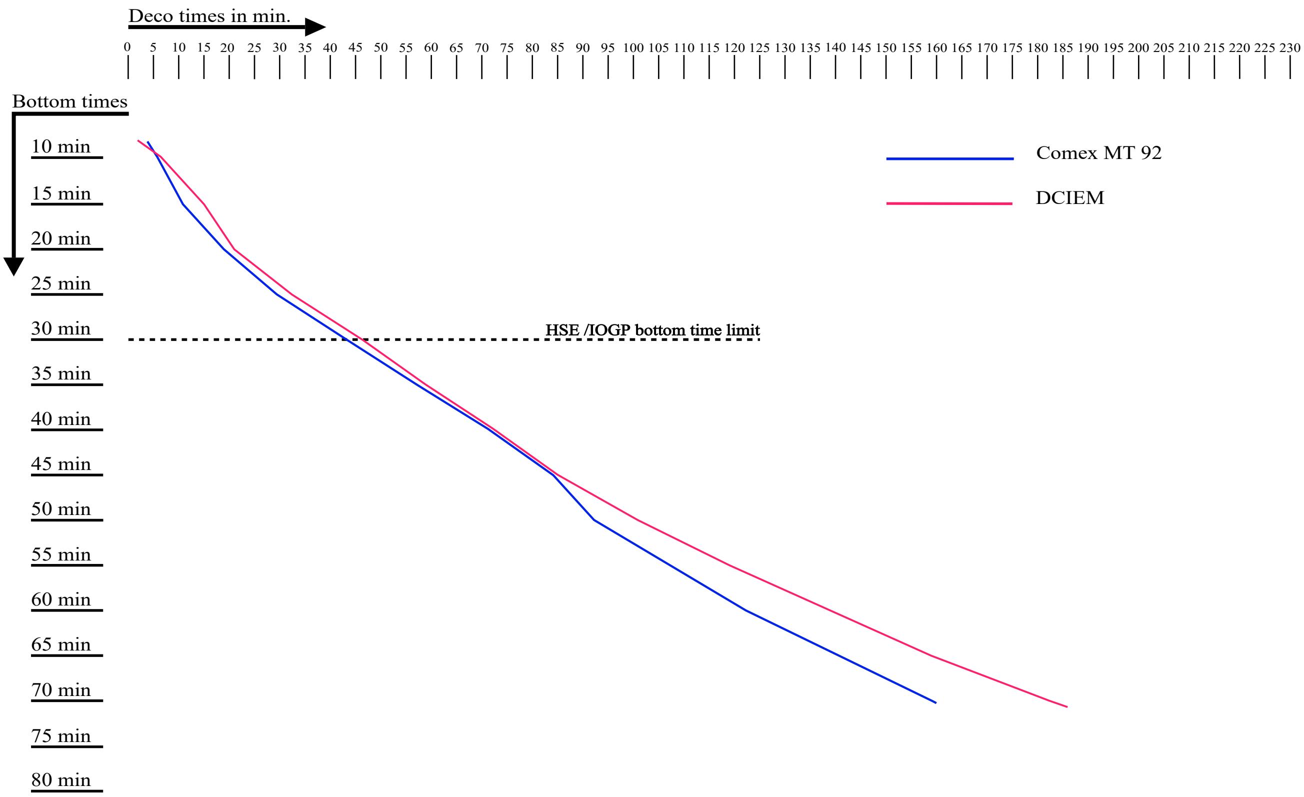
Comparison ascent times MT92/2019, and DCIEM for a dive at 39 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***8*** | 3:15 | 2:00 | - 1:15 |
| ***10*** | 6:00 | 5:00 | - 1:00 |
| ***15*** | 8:00 | 12:00 | + 4:00 |
| ***20*** | 12:45 | 18:00 | + 5:15 |
| ***25*** | 22:45 | 23:00 | + 0:15 |
| ***30*** | 32:30 | 37:00 | + 4:30 |
| ***Operational limits UK-HSE*** | | | |
| ***35*** | 42:30 | 48:00 | + 5:30 |
| ***40*** | 57:15 | 59:00 | + 2:45 |
| ***45*** | 70:15 | 70:00 | - 0:15 |
| ***50*** | 85:15 | 82:00 | - 3:15 |
| ***55*** | (Stop not indicated) | 97:00 | — |
| ***60*** | 107:15 | 112:00 | + 4:45 |
| ***65*** | (Stop not indicated) | 130:00 | — |
| ***70*** | 135:00 | 148:00 | + 13:00 |
| ***75*** | 157:00 | 167:00 | + 10:00 |



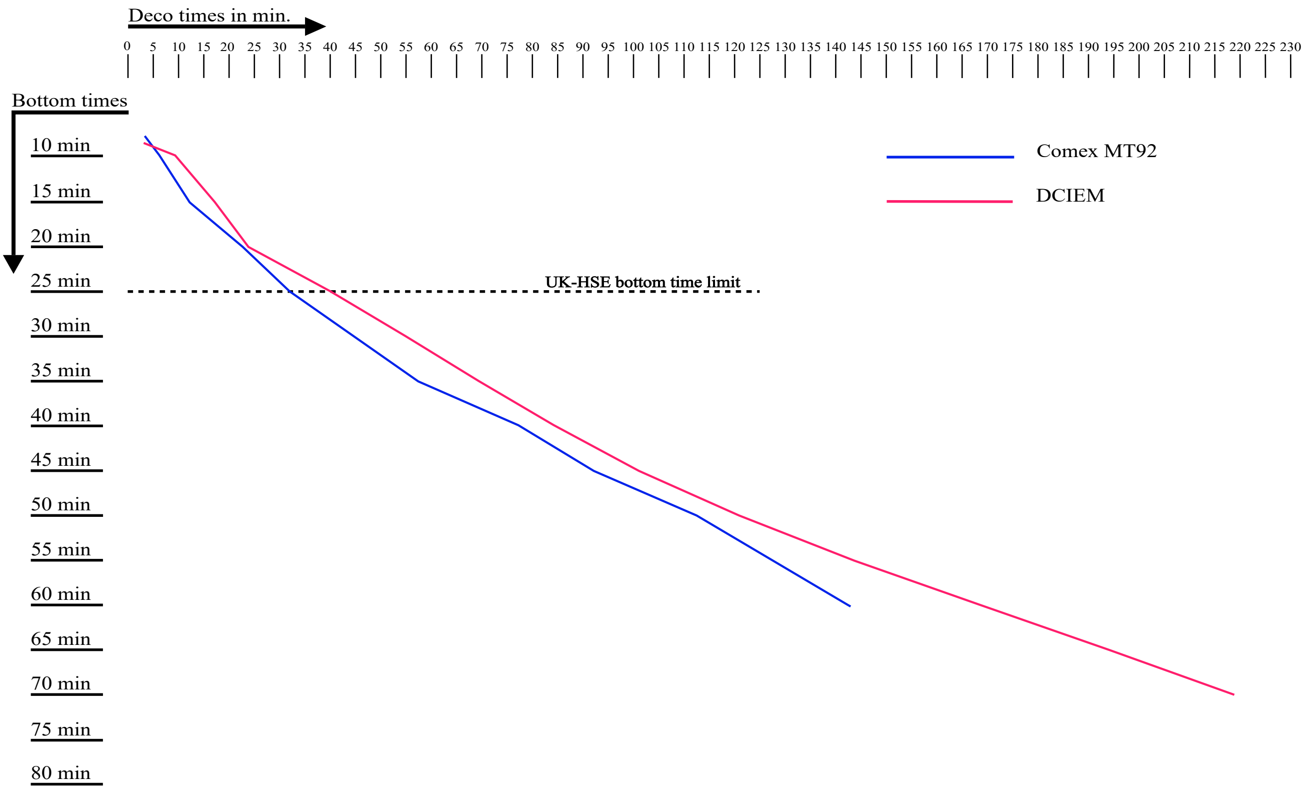
Comparison ascent times MT92/2019, and DCIEM for a dive at 42 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***7*** | 3:30 | 2:00 | - 1:30 |
| ***10*** | 6:15 | 7:00 | + 0:45 |
| ***15*** | 11:00 | 15:00 | + 4:00 |
| ***20*** | 18:00 | 21:00 | + 3:00 |
| ***25*** | 29:45 | 32:00 | + 2:15 |
| ***30*** | 42:45 | 46:00 | + 3:15 |
| ***Operational limits UK-HSE*** | | | |
| ***35*** | 57:30 | 58:00 | + 0:30 |
| ***40*** | 70:30 | 70:00 | - 0:30 |
| ***45*** | 84:30 | 85:00 | + 0:30 |
| ***50*** | 92:30 | 101:00 | + 7:30 |
| ***55*** | (Stop not indicated) | 119:00 | — |
| ***60*** | 122:15 | 139:00 | + 16:45 |
| ***65*** | (Stop not indicated) | 159:00 | — |
| ***70*** | 159:15 | 182:00 | +22:45 |



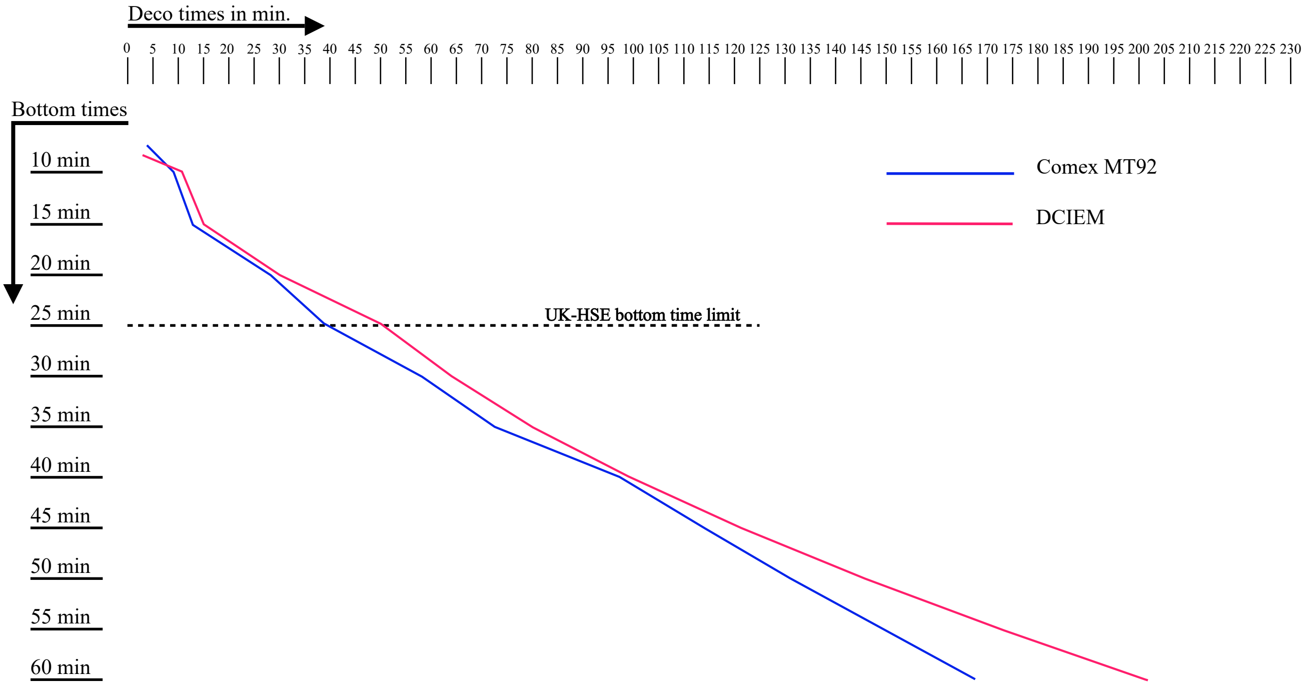
Comparison ascent times MT92/2019, and DCIEM for a dive at 45 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***6*** | 3:45 | 3:00 | - 0:45 |
| ***7*** | (Stop not indicated) | 3:00 | — |
| ***10*** | 6:30 | 9:00 | + 2:30 |
| ***15*** | 13:15 | 17:00 | + 3:45 |
| ***20*** | 23:00 | 24:00 | + 1:00 |
| ***25*** | 33:00 | 40:00 | + 7:00 |
| ***Operational limits UK-HSE*** | | | |
| ***30*** | (Stop not indicated) | 55:00 | — |
| ***35*** | 57:45 | 69:00 | + 11:15 |
| ***40*** | 77:45 | 84:00 | + 6:15 |
| ***45*** | 92:30 | 101:00 | + 8:30 |
| ***50*** | 112:30 | 121:00 | + 8:30 |
| ***55*** | (Stop not indicated) | 144:00 | — |
| ***60*** | 142:15 | 168:00 | +25:45 |



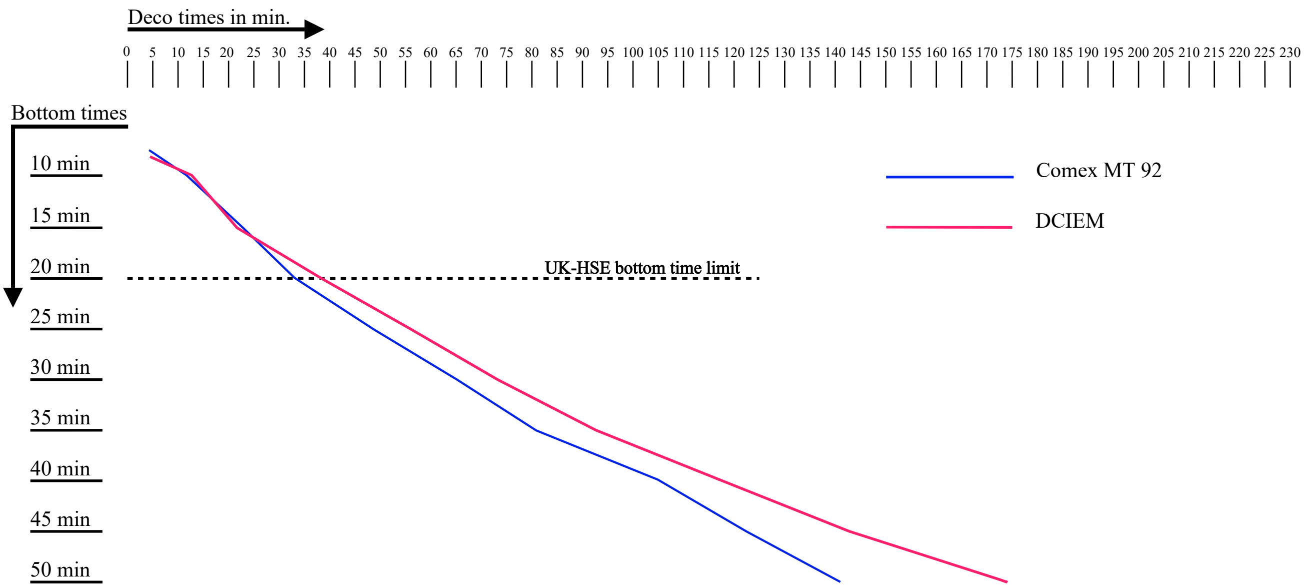
Comparison ascent times MT92/2019, and DCIEM for a dive at 48 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***5*** | 4:00 | 3:00 | - 1:00 |
| ***6*** | (Stop not indicated) | 3:00 | — |
| ***10*** | 8:45 | 11:00 | + 2:15 |
| ***15*** | 13:30 | 20:00 | + 6:30 |
| ***20*** | 28:15 | 30:00 | + 1:45 |
| ***25*** | 38:15 | 49:00 | + 10:45 |
| ***Operational limits UK-HSE*** | | | |
| ***30*** | 58:00 | 64:00 | + 6:00 |
| ***35*** | 73:00 | 80:00 | + 7:00 |
| ***40*** | 97:45 | 99:00 | + 1:15 |
| ***45*** | 114:45 | 121:00 | + 6:15 |
| ***50*** | 130:30 | 146:00 | + 16:00 |
| ***55*** | (Stop not indicated) | 173:00 | — |
| ***60*** | 167:30 | 201:00 | + 33:30 |



Comparison ascent times MT92/2019, and DCIEM for a dive at 51 m

| *Bottom time* | *Ascent time MT92* | *Ascent time DCIEM* | *Difference DCIEM with MT 92* |
|---|---|---|---|
| ***5*** | 4:15 | 3:00 | - 1:15 |
| ***6*** | (Stop not indicated) | 3:00 | — |
| ***10*** | 11:45 | 13:00 | - 1:15 |
| ***15*** | 23:30 | 22:00 | - 1:30 |
| ***20*** | 32:30 | 38:00 | +5:30 |
| ***Operational limits UK-HSE*** | | | |
| ***25*** | 48:15 | 56:00 | + 7:45 |
| ***30*** | 65:15 | 73:00 | + 7:45 |
| ***35*** | 81:00 | 94:00 | + 13:00 |
| ***40*** | 105:00 | 117:00 | + 12:00 |
| ***45*** | 122:45 | 143:00 | + 20:15 |
| ***50*** | 144:45 | 174:00 | + 29:15 |



## 1.4 - Quick comparison with the USN tables

The US Navy tables remain the most employed procedures, and for this reason, it is interesting to compare them with the DCIEM tables. Note that DCIEM procedures allow organizing similar surface-supplied diving operations as with the US Navy tables. They consist of diving methods with gasses such as Air, Nitrox, and heliox. The tables listed below are provided in imperial and metric systems.

- Table 1. Standard Air Decompression.
- Table 1S. Short Standard Air Decompression.
- Table 2. ln-Water Oxygen Decompression.
- Table 2S. Short In-Water Oxygen Decompression.
- Table 3. Surface Decompression with Oxygen.
- Table 4. Repetitive Diving.
- Table 5. Depth Corrections for Diving at Altitude.
- Table 1(N): Equivalent Air Depth (EAD) and Partial Pressure of Oxygen (PO2) for Open-Circuit Nitrogen-Oxygen Diving.
- Table 2(N): Recommended Bottom Time Limits for Various PO2 Exposures.
- Table 2M: Modified In-Water Oxygen Decompression (feet).

### 1.4.1 - Presentation

The presentation of the US Navy tables revisions 3, 4 & 5 were similar to DCIEM. Thus, each table was published on a separate sheet. However, since revision 6 in 2008, the US Navy has changed the presentation of its air tables to a display where the in-water stops air and oxygen, and also surface decompression stops are grouped on a single page:

- The columns are not separated by lines as in the other tables.
- Opposite to DCIEM, the oxygen chamber periods for surface decompression are indicated in periods instead of minutes. They are visible on the right side of the in-water table.
- The in-water oxygen decompression procedure is indicated the line below air decompression in the same sheet. Oxygen stops are highlighted by bold characters. They are not indicated in specific columns as in the DCIEM table (Note that in-water O2 decompression procedure was not part of revisions 4 & 5).

USN rev. 5 - standard air

***Table 9-8.*** *U.S. Navy Standard Air Decompression Table.*

| Depth feet/meters | Bottom time (min) | Time first stop (min:sec) | Decompression stops (feet/meters) 50 / 15.2 | 40 / 12.1 | 30 / 9.1 | 20 / 6.0 | 10 / 3.0 | Total decompression time (min:sec) | Repetitive group |
|---|---|---|---|---|---|---|---|---|---|
| 40 / 12.1 | 200 | | | | | | 0 | 1:20 | * |
| | 210 | 1:00 | | | | | 2 | 3:20 | N |
| | 230 | 1:00 | | | | | 7 | 8:20 | N |
| | 250 | 1:00 | | | | | 11 | 12:20 | O |
| | 270 | 1:00 | | | | | 15 | 16:20 | O |
| | 300 | 1:00 | | | | | 19 | 20:20 | Z |
| | Exceptional Exposure | | | | | | | | |
| | 360 | 1:00 | | | | | 23 | 24:20 | ** |
| | 480 | 1:00 | | | | | 41 | 42:20 | ** |
| | 720 | 1:00 | | | | | 69 | 70:20 | ** |

USN revisions 6 & 7

***Table 9-9.*** *Air Decompression Table.*
(DESCENT RATE 75 FPM—ASCENT RATE 30 FPM)

| Bottom Time (min) | Time to First Stop (M:S) | Gas Mix | DECOMPRESSION STOPS (FSW) Stop times (min) include travel time, except first air and first $O_2$ stop 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | Total Ascent Time (M:S) | Chamber $O_2$ Periods | Repet Group |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **30 FSW** | | | | | | | | | | | | | | |
| 371 | 1:00 | AIR | | | | | | | | | 0 | 1:00 | 0 | Z |
| | | AIR/$O_2$ | | | | | | | | | **0** | 1:00 | | |
| 380 | 0:20 | AIR | | | | | | | | | 5 | 6:00 | 0.5 | Z |
| | | AIR/$O_2$ | | | | | | | | | **1** | 2:00 | | |
| In-Water Air/$O_2$ Decompression or SurD$O_2$ Recommended | | | | | | | | | | | | | | |
| 420 | 0:20 | AIR | | | | | | | | | 22 | 23:00 | 0.5 | Z |
| | | AIR/$O_2$ | | | | | | | | | **5** | 6:00 | | |
| 480 | 0:20 | AIR | | | | | | | | | 42 | 43:00 | 0.5 | |
| | | AIR/$O_2$ | | | | | | | | | **9** | 10:00 | | |
| 540 | 0:20 | AIR | | | | | | | | | 71 | 72:00 | 1 | |
| | | AIR/$O_2$ | | | | | | | | | **14** | 15:00 | | |
| Exceptional Exposure: In-Water Air Decompression ------------ In-Water Air/$O_2$ Decompression or SurD$O_2$ Required ---------- | | | | | | | | | | | | | | |

This “three in one” presentation is not as straightforward as the more classical presentation of DCIEM, and I think it can be the source of reading errors. I am not alone in this opinion as many companies decided to keep revision 5 when this presentation was published with revision 6 in 2008.
Also, there is no real advantage with this new “three in one” presentation proposed by the US Navy because the DCIEM user can prepare the alternative methods of decompression of the one selected when planning for the operation. Thus, for me, DCIEM tables are easier to read and manage (see on the next page), and for these reasons, I definitively prefer the DCIEM tables regarding this point.

The limits of this handbook regarding the oxygen stops are already discussed in points 2.1.5 & 2.3. A lot of regulations have forbidden in-water oxygen decompression at depths below 20 ft (6 m), because it is considered that acute oxygen poisoning is more likely to happen below this depth. For this reason, DCIEM, which initially published these tables with in-water oxygen stops at 30 feet (9 m), emitted the table “2M” with in-water oxygen decompression at 20 ft (6 m) in addition to the previous tables with O2 stops at 30 ft (9 m). Thus, because the table USN includes only decompression stops at 30 ft, a wet bell must be used instead of in-water stops according to the procedures promoted in this document.

DCIEM (standard air)

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 20 | 30 | - | - | - | - | - | - | - | - | 1 | A |
| | 60 | - | - | - | - | - | - | - | - | 1 | B |
| | 90 | - | - | - | - | - | - | - | - | 1 | C |
| | 120 | - | - | - | - | - | - | - | - | 1 | D |
| | 150 | - | - | - | - | - | - | - | - | 1 | E |
| | 180 | - | - | - | - | - | - | - | - | 1 | F |
| | 240 | - | - | - | - | - | - | - | - | 1 | G |
| | 300 | - | - | - | - | - | - | - | - | 1 | H |
| | 360 | - | - | - | - | - | - | - | - | 1 | I |
| | 420 | - | - | - | - | - | - | - | - | 1 | J |
| | 480 | - | - | - | - | - | - | - | - | 1 | K |
| | 600 | - | - | - | - | - | - | - | - | 1 | L |
| | 720 | - | - | - | - | - | - | - | - | 1 | M |

DCIEM in-water O2

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) Air 80 | 70 | 60 | 50 | 40 | 30 | $O_2$ 20 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 75 | - | - | - | - | - | - | - | 1 | G |
| | 115 | - | - | - | - | - | - | **5** | 6 | J |
| | 130 | - | - | - | - | - | - | **12** | 13 | J |
| | 140 | - | - | - | - | - | - | **15** | 16 | K |
| | 160 | - | - | - | - | - | - | **20** | 21 | |
| | 180 | - | - | - | - | - | - | **24** | 25 | |
| | 200 | - | - | - | - | - | - | **28** | 29 | |
| | 220 | - | - | - | - | - | - | **32** | 33 | |
| | 240 | - | - | - | - | - | - | **36** | 37 | |
| | 260 | - | - | - | - | - | - | **39** | 40 | |
| | 280 | - | - | - | - | - | - | **43** | 44 | |

DCIEM surface O2 deco

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) In-Water Stops Air 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 50 | - | - | - | - | - | - | Time from leaving the 30 fsw stop (or the bottom, if no in-water stop is required) to reaching the 40 fsw Chamber stop must not exceed 7 minutes. | - | 1 | F |
| | 70 | - | - | - | - | - | - | | **10** | 18 | H |
| | 80 | - | - | - | - | - | - | | **16** | 24 | H |
| | 90 | - | - | - | - | - | - | | **20** | 28 | I |
| | 100 | - | - | - | - | - | - | | **24** | 32 | J |
| | 110 | - | - | - | - | - | - | | **28** | 36 | K |
| | 120 | - | - | - | - | - | - | | **30** | 38 | K |
| | 130 | - | - | - | - | - | - | | **33*** | 46 | |
| | 140 | - | - | - | - | - | - | | **38*** | 51 | |
| | 150 | - | - | - | - | - | - | | **43*** | 56 | |
| | 160 | - | - | - | - | - | - | | **47*** | 60 | |
| | 170 | - | - | - | - | - | - | | **50*** | 63 | |
| | 180 | - | - | - | - | - | - | | **54*** | 67 | |
| | 190 | - | - | - | - | - | - | | **57*** | 70 | |
| | 200 | - | - | - | - | - | - | | **60**** | 78 | |
| | 210 | - | - | - | - | - | - | | **64**** | 82 | |
| | 220 | - | - | - | - | - | - | | **70**** | 88 | |
| | 230 | - | - | - | - | - | - | | **74**** | 92 | |
| | 240 | - | - | - | - | - | - | | **77**** | 95 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

### 1.4.2 - Comparison of the no-decompression limits

No-decompression limits curves indicate whether the mathematical model has been modified, as zig-zags in the curve indicate a modification of the initial calculation. This method had long been used to visualize and compare decompression procedures. However, although it provides valuable information, this visualization is insufficient to understand a table, as many decompression procedures have been strengthened whithout changing the no-decomression curve Therefore, it must be completed by comparing the decompression times for each depth, taking into account that the ascent rates and depth of the first stop are part of the decompression startegy, so that longer decompression does not automaticaly means safer decompression. On this matter, operational results are the judge!

The table below compares the maximum no-decompression bottom times of the US Navy tables revisions 4, 5, 6, 7, and DCIEM. Note that US Navy tables rev. 4 and 5 have the same values and are grouped for this reason.

| *Depth* | *Bottom times USN-4 & 5* | *Bottom times USN-6* | *Difference USN 5 & 6* | *Bottom times USN-7* | *Difference USN 6 & 7* | *Bottom time DCIEM* | *Difference USN 7 & DCIEM* |
|---|---|---|---|---|---|---|---|
| ***30 ft*** | 405 | 371 | - 34 (USN 6) | 371 | 0 | 330 | DCIEM (- 41) |
| ***40 ft*** | 200 | 163 | - 37 (USN 6) | 163 | 0 | 150 | DCIEM (- 13) |
| ***50 ft*** | 100 | 92 | - 8 (USN 6) | 92 | 0 | 75 | DCIEM (- 17) |
| ***60 ft*** | 60 | 60 | 0 | 63 | - 3 (USN 6) | 50 | DCIEM (- 10) |
| ***70 ft*** | 50 | 48 | - 2 (USN 6) | 48 | 0 | 35 | DCIEM (-13) |
| ***80 ft*** | 40 | 39 | -1 (USN 6) | 39 | 0 | 25 | DCIEM (-14) |
| ***90 ft*** | 30 | 30 | 0 | 33 | - 3 (USN 6) | 20 | DCIEM (-13) |
| ***100 ft*** | 25 | 25 | 0 | 25 | 0 | 15 | DCIEM (-10) |
| ***110 ft*** | 20 | 20 | 0 | 20 | 0 | 12 | DCIEM (-8) |
| ***120 ft*** | 15 | 15 | 0 | 15 | 0 | 10 | DCIEM (-5) |
| ***130 ft*** | 10 | 10 | 0 | 12 | - 2 (USN 6) | 8 | DCIEM (-4) |
| ***140 ft*** | 10 | 10 | 0 | 10 | 0 | 7 | DCIEM (-3) |
| ***150 ft*** | 5 | 5 | 0 | 8 | - 3 (USN 6) | 6 | DCIEM (-2) |
| ***160 ft*** | 5 | 5 | 0 | 7 | - 2 (USN 6) | 6 | DCIEM (-1) |
| ***170 ft*** | 5 | 5 | 0 | 6 | - 1 (USN 6) | 5 | DCIEM (-1) |
| ***180 ft*** | 5 | 5 | 0 | 6 | - 1 (USN 6) | 5 | DCIEM (-1) |

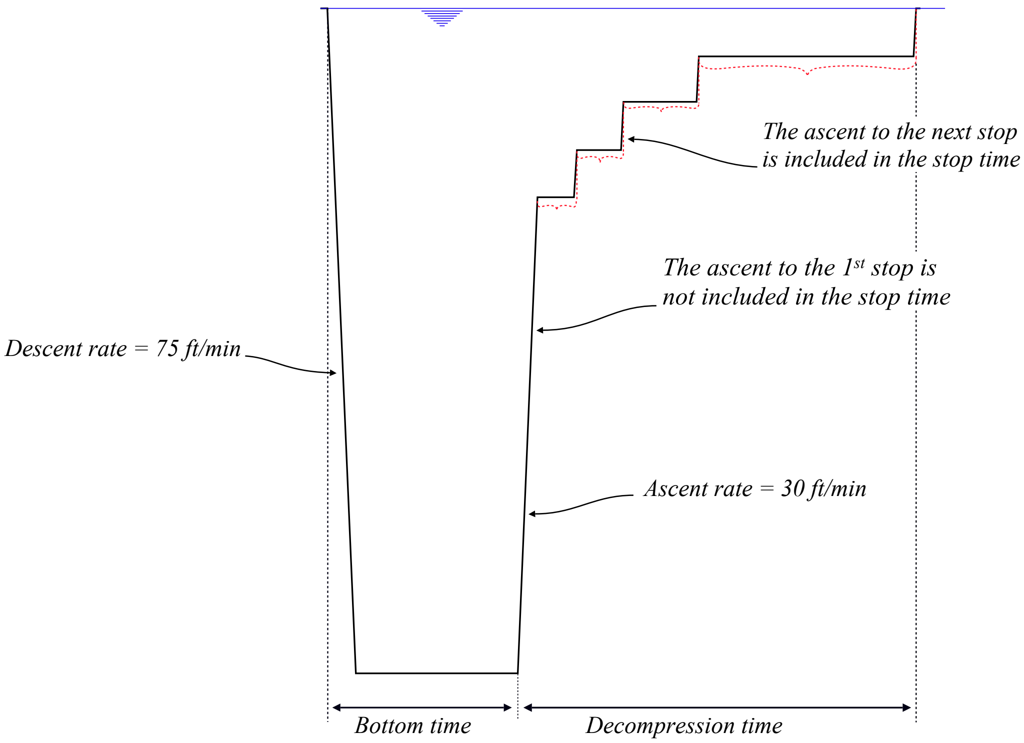
### 1.4.3 - Comparison of the air in-water decompression times

No-deco limits curve allows visualizing a decompression model. However, the decompression model may have been modified or deeply reviewed following incident reports or other studies, and the reinforcements of the decompression times may not be visible on the no-decompression curve. It is the case of the US Navy tables that have been reviewed and provide today a better level of safety than the previous versions with a no-decompression curve that is not profoundly modified. As a reminder, the US Navy revision 6 (published in 2008) was a significant reinforcement of revisions 4 & 5, and revision 7 (published in 2016) is logically an improvement of revision 6. The aim of the US Navy scientists was obviously to obtain a level of safety equal or above those of DCIEM and COMEX MT92 and some other more recent tables. These revisions 6 and 7 have resulted in a significant increase in the duration of the stops.

For this reason, it is interesting to visualize and compare the decompression times of the DCIEM tables with those of this more recent set of US Navy tables. Note that the ascent speed and the way the stops are organized influence the decompression times. It is also the case with the gas used during the decompression, such as air replacing heliox during the ascent to the shallow stops performed under oxygen. However, the purpose of these comparisons between the DCIEM procedures and the US Navy revision 7 is not to decide the validity of both concepts but only to visualize which table can be the more advantageous for a company regarding the decompression times. Also, we are not comparing the frequency of decompression accidents between the DCIEM tables and the new US Navy revision 7 in this study, so which model is the safest because we have insufficient data for such a complex task. In addition, we can say that DCIEM tables are reputed to be among the safest decompression procedures, which is the reason they are selected for this handbook. Note that the profiles of US Navy revisions 4, 5, and 6 are added in the tables for a better comparison.

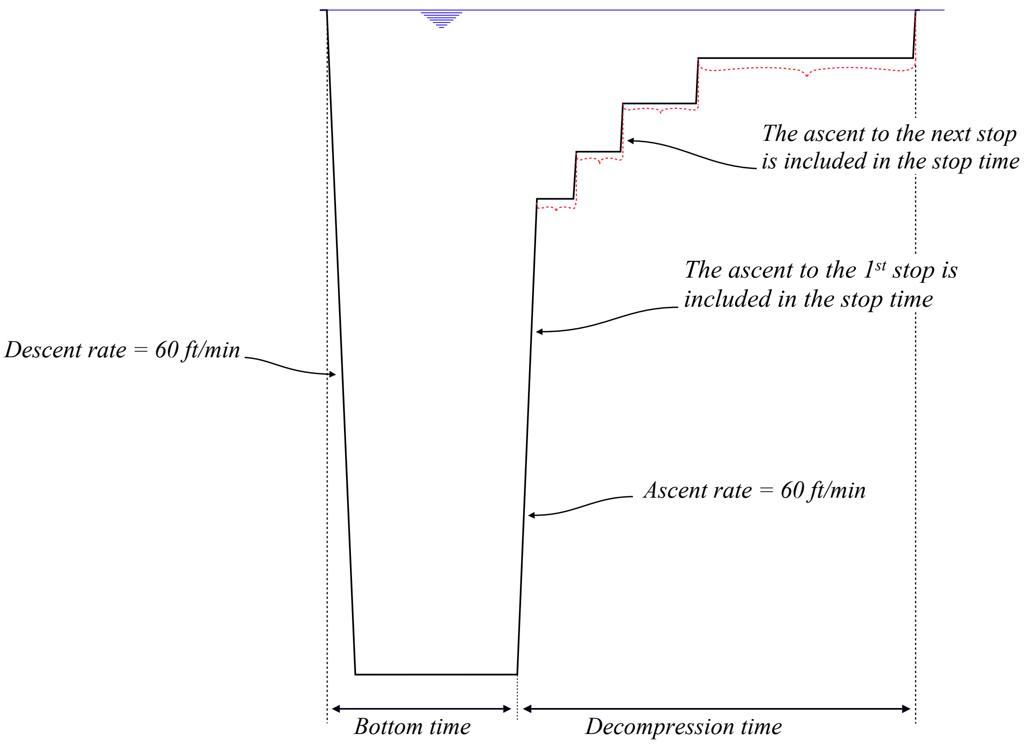
- US Navy revision 7:

- The depth to select is exactly equal to or next greater than the one read on the depth gauge.
- The bottom time to select is exactly equal to or greater than the one indicated on the watch.
- The descent rate is limited to 75 ft/min
- The ascent rate is 30 ft/min
- The ascent rate to the 1st stop remains at 30 ft/min and is not part of the stop.
- The time at the first decompression stop begins when the diver arrives at the stop and ends when he leaves the stop. For all subsequent stops, the stop time begins when the diver leaves the previous stop and ends when he leaves the stop. In other words, ascent time between stops is included in the subsequent stop time.



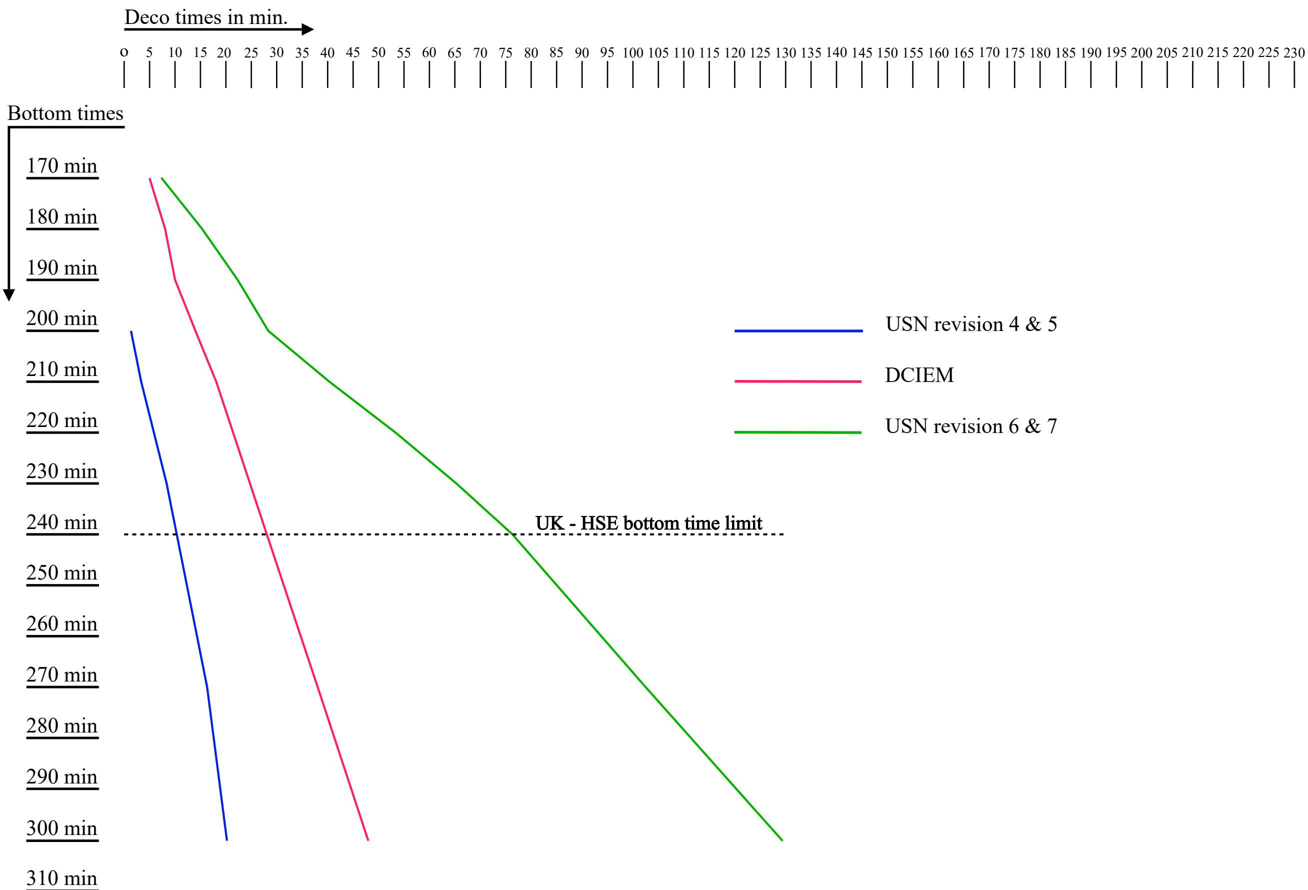

- DCIEM:

- The depth to select is exactly equal to or next greater than the one read on the depth gauge.
- The bottom time to select is exactly equal to or greater than the one indicated on the watch.
- The descent has to be performed at 60 ft/min maximum.
- The ascent rate is 60 ft/min.
- The ascent from the bottom to the 1st stop and to the subsequent stops are integrated into the stop times.



- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 40 fsw

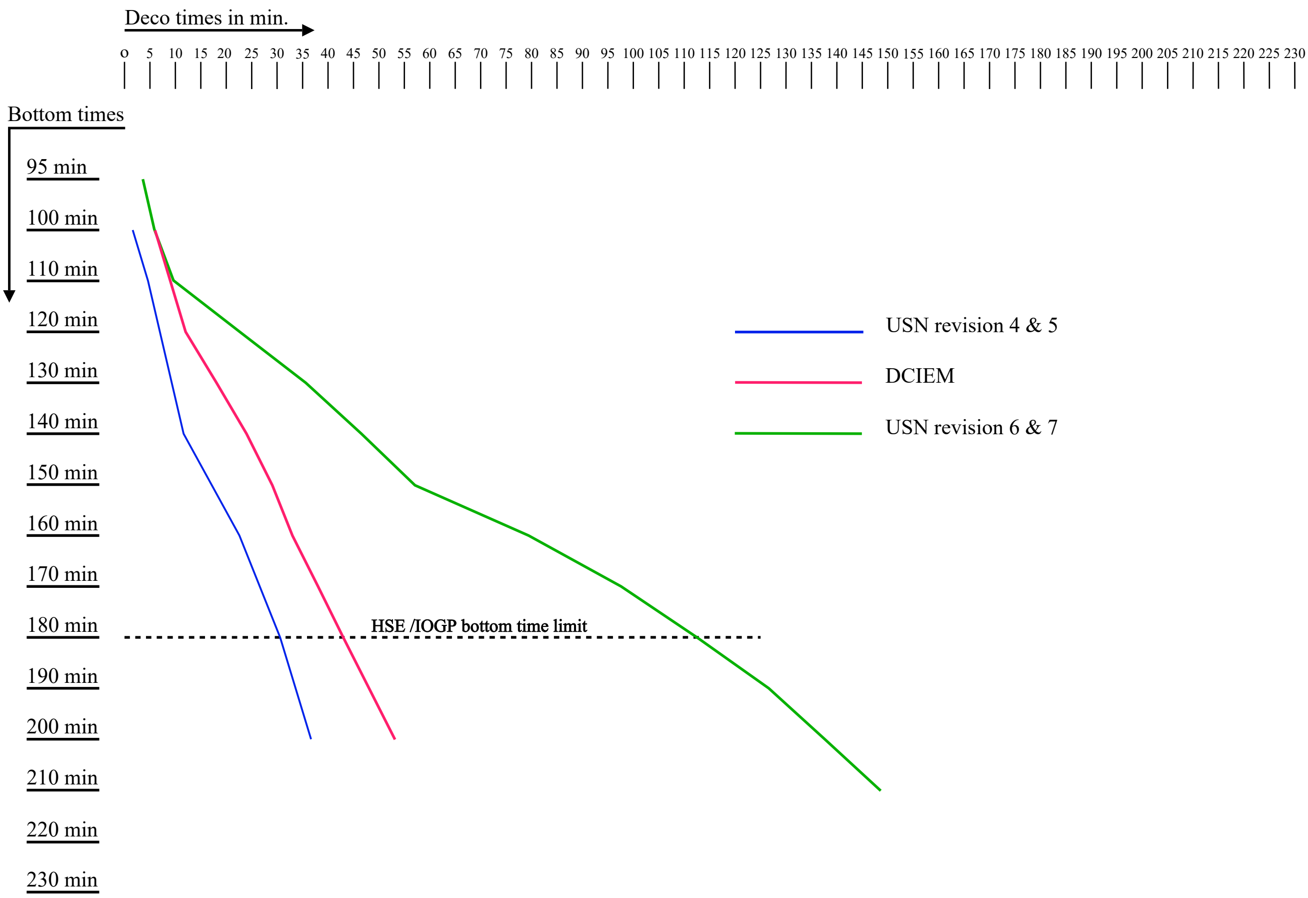
| ***Bottom time*** | ***Ascent time USN-4 & USN-5*** | ***Ascent time USN-6*** | ***Difference USN 5 & USN 6*** | ***Ascent time USN-7*** | ***Difference USN 6 & USN 7*** | ***Ascent time DCIEM*** | ***Difference USN & DCIEM*** |
|---|---|---|---|---|---|---|---|
| ***163*** | | 1:20 | | 1:20 | 0 | | |
| ***170*** | | 7:20 | | 7:20 | 0 | 5 | USN +2:20 |
| ***180*** | | 15:20 | | 15:20 | 0 | 8 | USN +7:20 |
| ***190*** | | 22:20 | | 22:20 | 0 | 10 | USN +12:2 |
| ***200*** | 1:20 | 28:20 | +27 (R. 6) | 28:20 | 0 | 14 | USN +14:2 |
| ***210*** | 3:20 | 40:20 | +37 (R. 6) | 40:20 | 0 | 18 | USN +22:2 |
| ***220*** | | 53:20 | | 53:20 | 0 | | |
| ***230*** | 8:20 | 65:20 | +57 (R. 6) | 65:20 | 0 | | |
| ***240*** | | 76:20 | | 76:20 | 0 | 28 | USN +69:2 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***270*** | 16:20 | 102:20 | +86 (R. 6) | 102:20 | 0 | 38 | USN +64:2 |
| ***300*** | 20:20 | 129:20 | +89 (R. 6) | 129:20 | 0 | 48 | USN +81 |
| ***330*** | | 161:20 | | 161:20 | 0 | 57 | USN +104:2 |
| ***360*** | | 185:20 | | 185:20 | 0 | 66 | USN +119:2 |




Note:
The deco times of the DCIEM table are more conservative than those of USN 4 & 5 but nearly parallel, which can be expected as the table was studied using the previous version of US Navy tables as a starting point. However, the curve of the US Navy revision 7 seems exaggeratedly stringent, with a difference of 69 minutes for 240 minutes bottom time.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 50 fsw

| *Bottom time* | *Ascent time USN-4* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| ***92*** | | 1:40 | | 1:40 | 0 | | |
| ***95*** | | 3:40 | | 3:40 | 0 | | |
| ***100*** | 1:40 | 5:40 | +4 (Rev 6) | 5:40 | 0 | 6 | Dciem +1:20 |
| ***110*** | 4:40 | 9:40 | +5 (Rev 6) | 9:40 | 0 | | |
| ***120*** | 6:40 | 22:40 | +16 (Rev 6) | 22:40 | 0 | 12 | USN +10:40 |
| ***130*** | | 35:40 | | 35:40 | 0 | 18 | USN +17:40 |
| ***140*** | 11:40 | 46:40 | +51 (Rev 6) | 46:40 | 0 | 24 | USN +22:40 |
| ***150*** | | 57:40 | | 57:40 | 0 | 29 | USN +28:40 |
| ***160*** | 22:40 | 79:40 | +57 (Rev 6) | 79:40 | 0 | 33 | USN + 46:40 |
| ***170*** | | 97:40 | | 97:40 | 0 | 38 | USN +59:40 |
| ***180*** | 30:40 | 112:40 | +82 (Rev 6) | 112:40 | 0 | 43 | USN +69:40 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***190*** | | 126:40 | | 126:40 | 0 | | |
| ***200*** | 36:40 | 137:40 | 101 (Rev 6) | 137:40 | 0 | 53 | USN +84:40 |
| ***210*** | | 148:40 | | 148:40 | 0 | | |

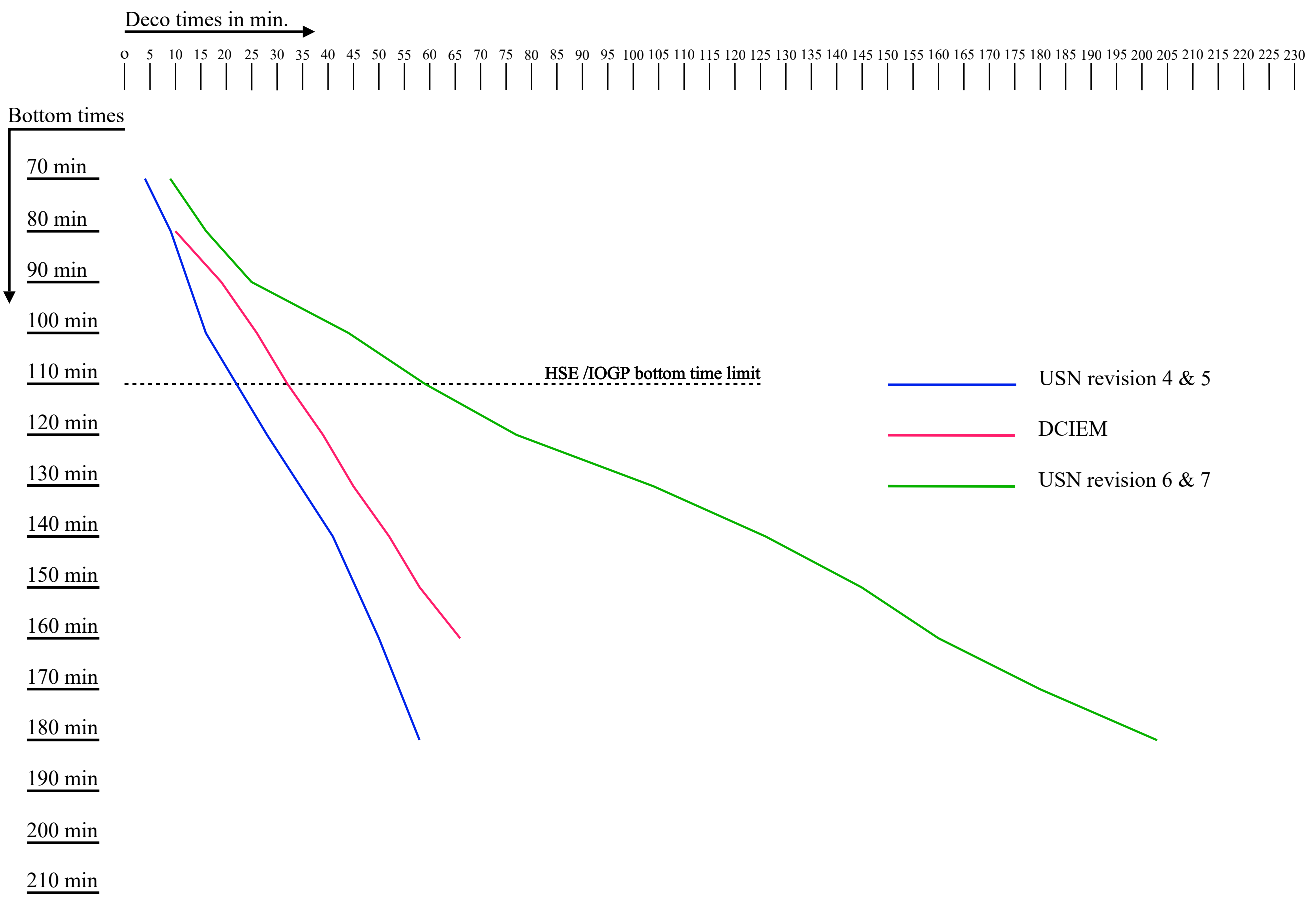



The remarks regarding the decompression times at this depth are similar to those at 40 fsw.

Table of contents

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 60 ft

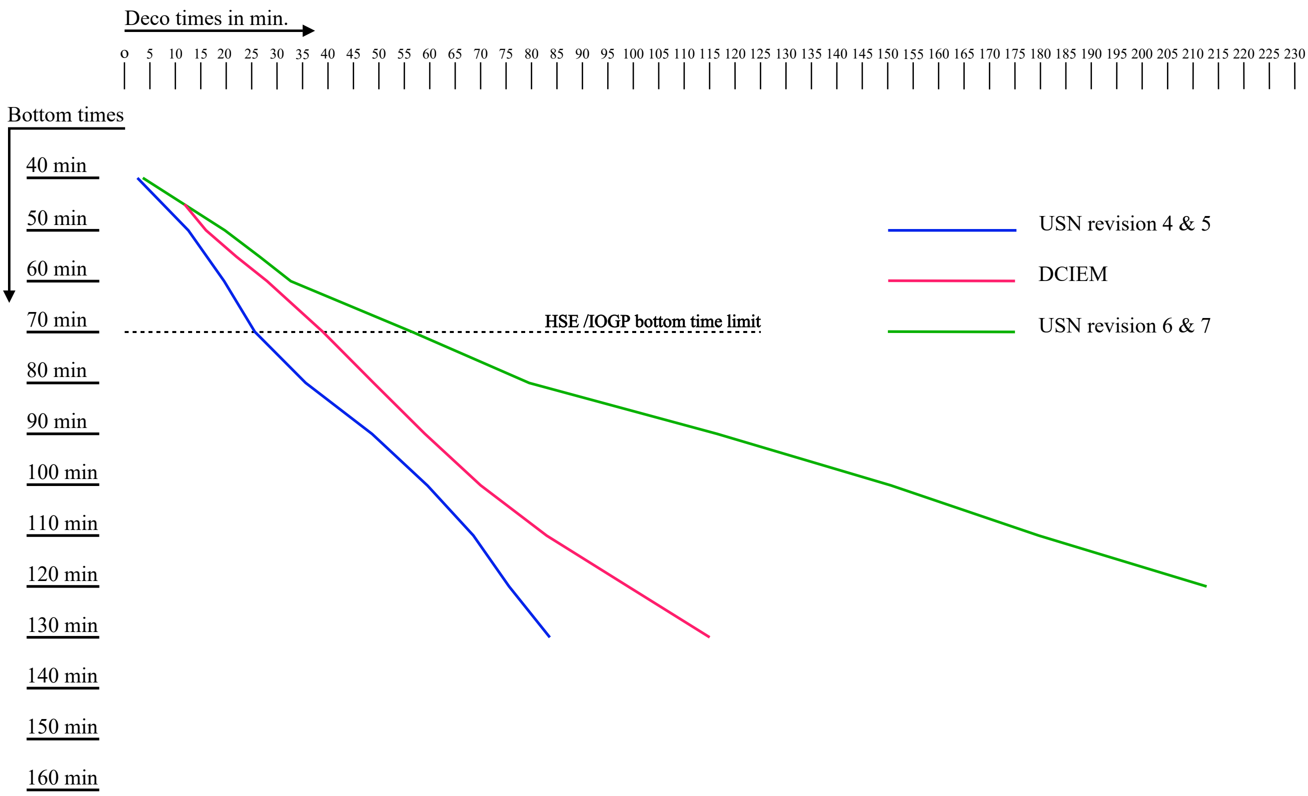
| *Bottom time* | *Ascent time USN-4 & USN-5* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| ***70*** | 4:00 | 9:00 | +5 (Rev 6) | 9:00 | 0 | | |
| ***80*** | 9:00 | 16:00 | +7 (Rev 6) | 16:00 | 0 | 10 | USN +6 |
| ***90*** | | 25:00 | | 25:00 | 0 | 19 | USN +6 |
| ***100*** | 16:00 | 44:00 | +28 (Rev 6) | 44:00 | 0 | 26 | USN +18 |
| ***110*** | | 59:00 | | 59:00 | 0 | 32 | USN +27 |
| ***120*** | 28:00 | 77:00 | +49 (Rev 6) | 77:00 | 0 | 39 | USN +38 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***130*** | | 104 | | 104 | 0 | 45 | USN +59 |
| ***140*** | 41:00 | 126 | +85 (Rev 6) | 126 | 0 | 52 | USN +74 |
| ***150*** | | 145 | | 145 | 0 | 58 | USN +87 |
| ***160*** | 50:00 | 160 | +110 (rev 6) | 160 | 0 | 66 | USN +94 |
| ***170*** | | 180 | | 180 | 0 | | |
| ***180*** | 58:00 | 203 | +145 (Rev 6) | 203 | 0 | 82 | USN +121 |




The remarks regarding the decompression times at this depth are similar to those at 40 fsw.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 80 ft

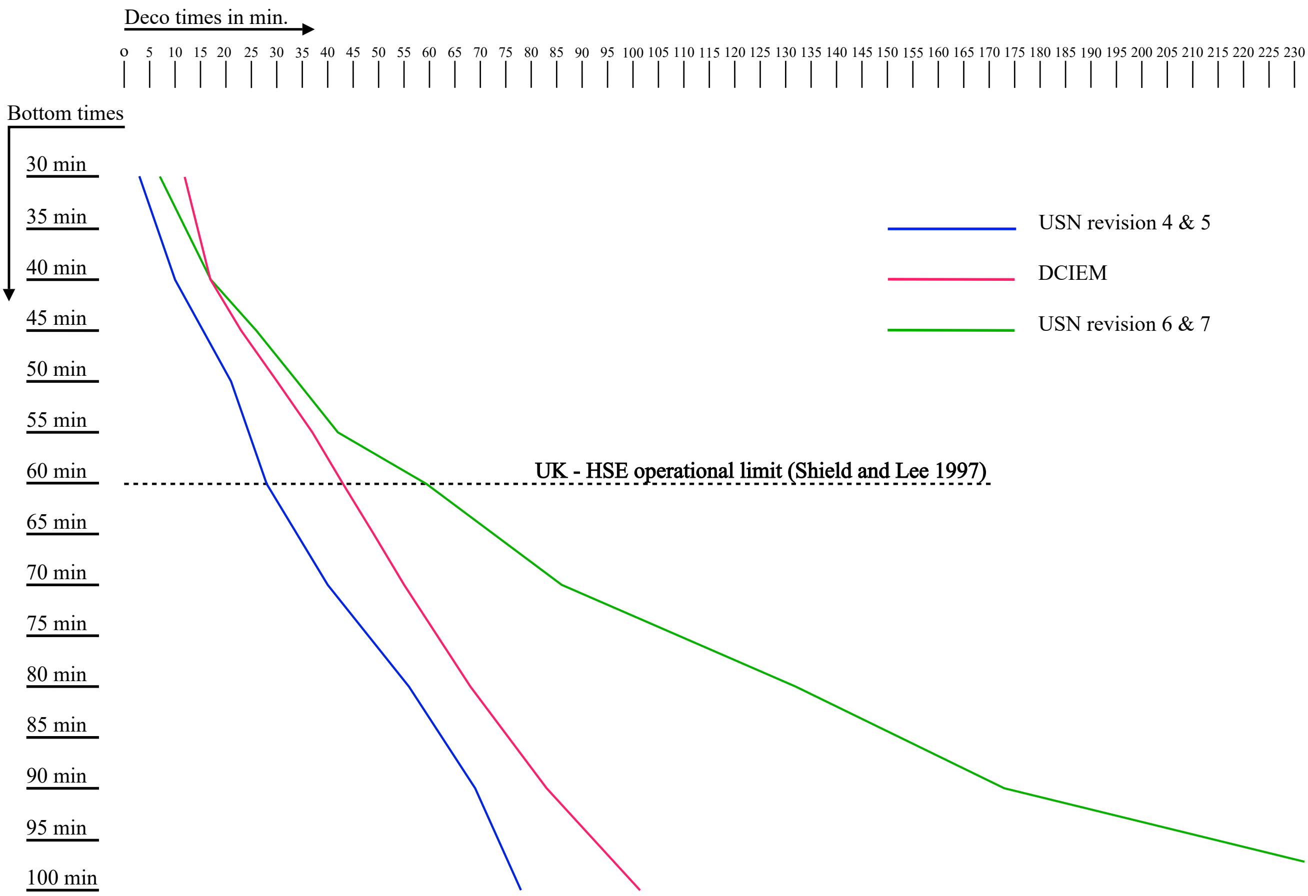
| *Bottom time* | *Ascent time USN-4 & USN-5* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| ***39*** | | 2:40 | | 2:40 | 0 | | |
| ***40*** | 2:40 | 3:40 | +1 (Rev 6) | 3:40 | 0 | | |
| ***45*** | | 12:40 | | 12:40 | 0 | 12 | USN +0:40 |
| ***50*** | 12:40 | 19:40 | +7 (Rev 6) | 19:40 | 0 | 16 | USN +3:40 |
| ***55*** | | 26:40 | | 26:40 | 0 | 22 | USN +4:40 |
| ***60*** | 19:40 | 32:40 | +13 (R 6) | 32:40 | 0 | 28 | USN +4:40 |
| ***70*** | 25:40 | 56:40 | +31 (R 6) | 56:40 | 0 | 39 | USN +17:40 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***80*** | 35:40 | 79:40 | +44 (R 6) | 79:40 | 0 | 49 | USN +30:40 |
| ***90*** | 48:40 | 116:40 | +68 (R 6) | 116:40 | 0 | 59 | USN +57:40 |
| ***100*** | 59:40 | 150:20 | +91 (R 6) | 150:40 | 0 | 70 | USN +80:40 |
| ***110*** | 68:40 | 179:20 | +111 (R 6) | 179:40 | 0 | 83 | USN +96:40 |
| ***120*** | 75:40 | 212:20 | +137 (R 6) | 212:40 | 0 | 99 | USN +113:4 |
| ***130*** | 83:40 | 248:20 | +165 (R 6) | 248:40 | 0 | 115 | USN +133:4 |




Note:
The curves of the DCIEM and USN 4 & 5 are also nearly parallel with an approximate angle of 49º from the horizontal for the USN revision 4 & 5, and 41º for the DCIEM that is more conservative for the reasons indicated previously. Again the US Navy revision 7 is the most stringent with an angle of 28º from the horizontal. The difference in stop times with DCIEM for 70 minutes of bottom time is more than 17 minutes, which is 44% of the DCIEM stop time.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 90 ft

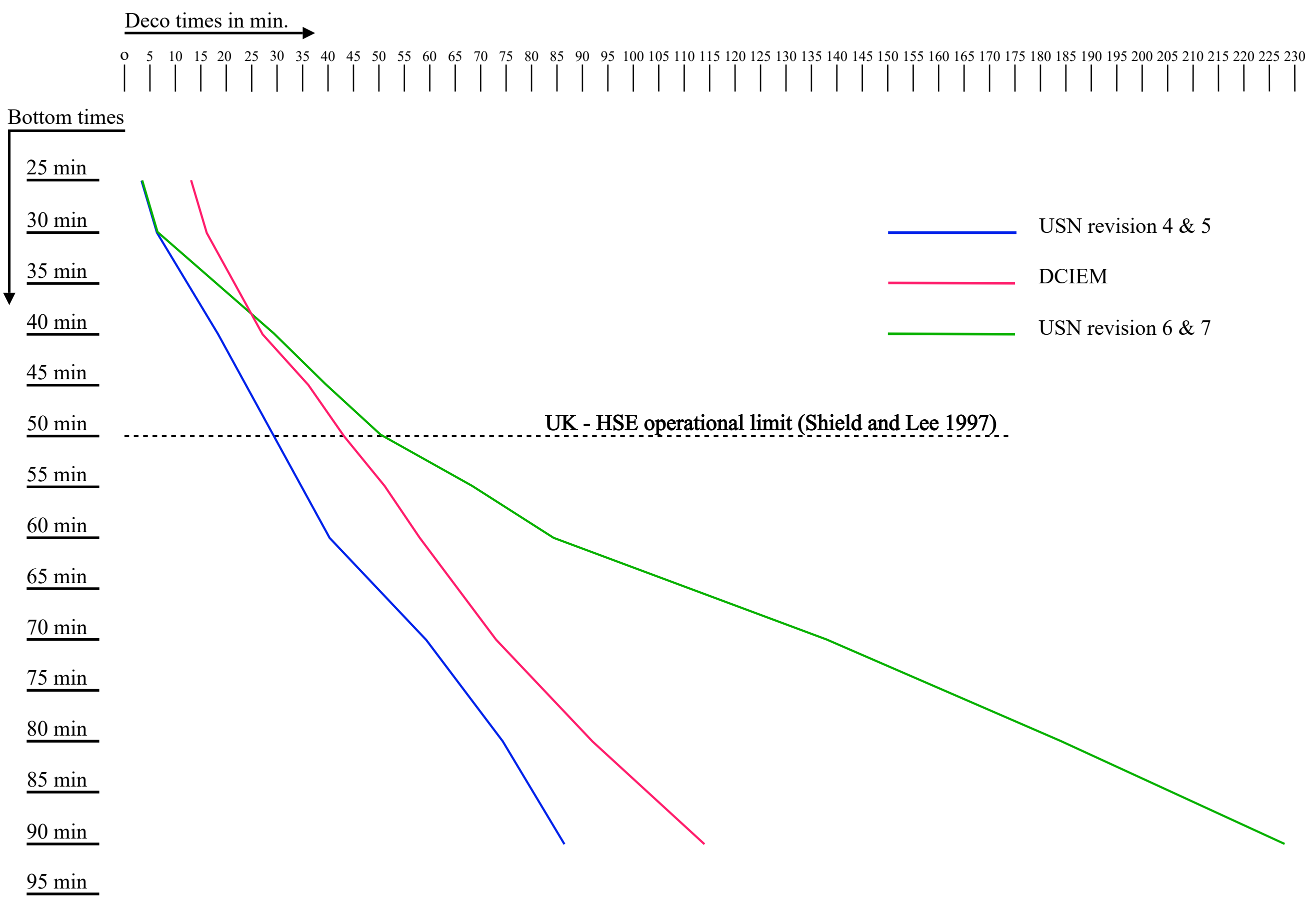
| *Bottom time* | *Ascent time USN-4 & USN-5* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| *25* | | | | | | 8 | |
| *30* | 3:00 | 7:00 | +4 (R 6) | 7:00 | 0 | 12 | DCIEM +5 |
| *40* | 10:00 | 17:00 | +7 (R 6) | 17:00 | 0 | 17 | 0 |
| *45* | | 26:00 | | 26:00 | 0 | 23 | USN +3 |
| *50* | 21:00 | 34:00 | +13 (R 6) | 34:00 | 0 | 30 | USN +34 |
| *55* | | 42:00 | | 42:00 | 0 | 37 | USN +5 |
| *60* | 28:00 | 59:00 | + 31 (R 6) | 59:00 | 0 | 43 | USN +16 |
| *UK - HSE operational limit (Shield and Lee 1997)* | | | | | | | |
| *65* | | | | | | 49 | |
| *70* | 40:00 | 86:00 | + 46 (R 6) | 86:00 | 0 | 55 | USN +31 |
| *80* | 56:00 | 132:40 | +76 (R 6) | 132:40 | 0 | 68 | USN +64:4 |
| *90* | 69:00 | 173:40 | +104 (R 6) | 173:40 | 0 | 83 | USN +90:4 |
| *100* | 78:00 | 206:40 | +128 (R 6) | 206:40 | 0 | 101 | USN +105:4 |
| *110* | 88:00 | 251:40 | +163 (R 6) | 251:40 | 0 | 121 | USN +130:4 |
| *120* | 103:00 | 288:40 | +185 (R 6) | 288:40 | 0 | 142 | USN +43:4 |




The curve of the DCIEM table has an approximate angle of 59º from the horizontal, while the one of US Navy revision 7 has an angle of 54º from 30 min to 55 min, and then an angle of 30º. US Navy revision 7 is less stringent than DCIEM for 30 min bottom time, equal to it for 40 minutes bottom time, and becomes more conservative after this bottom time.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 100 ft

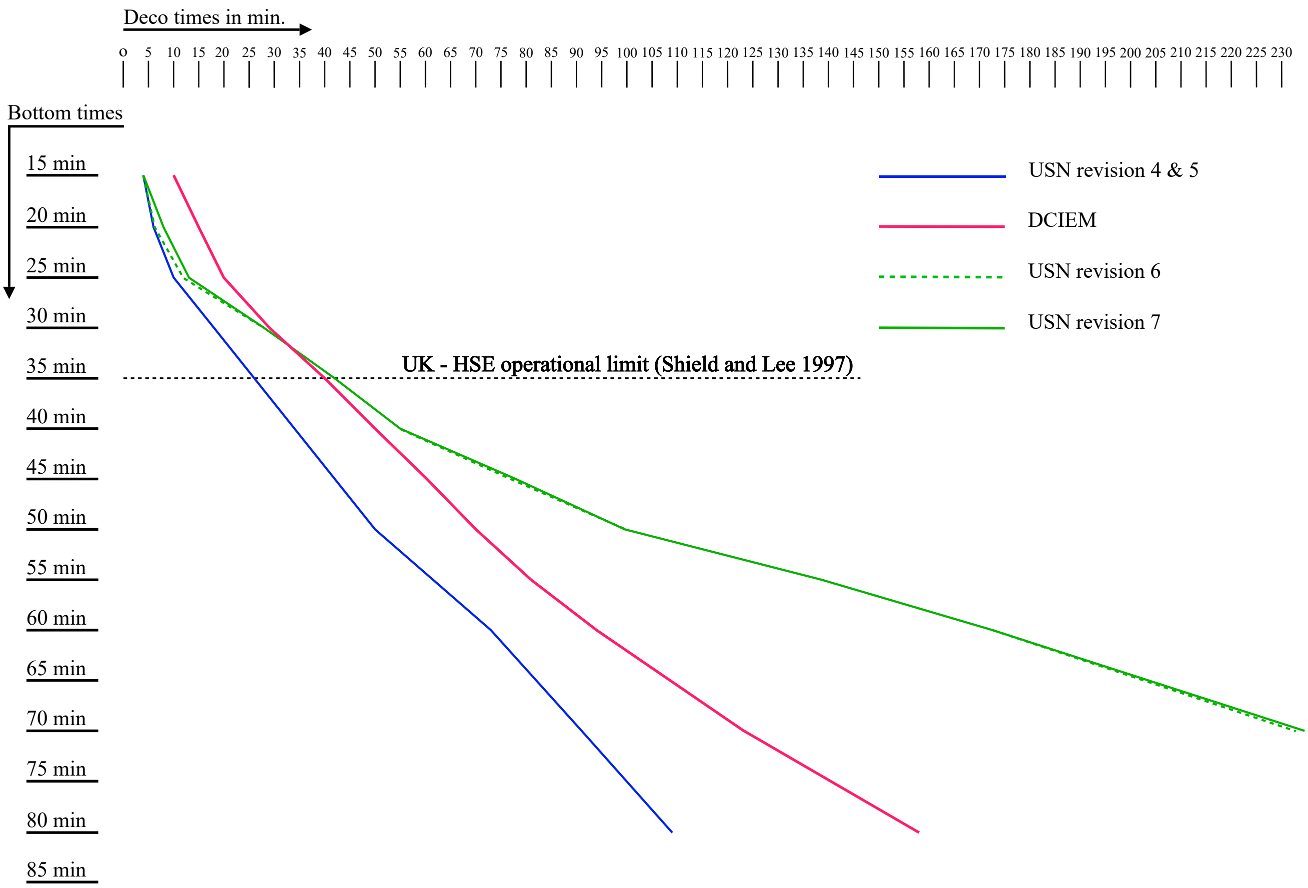
| ***Bottom time*** | ***Ascent time USN-4 & USN-5*** | ***Ascent time USN-6*** | ***Difference USN 5 & USN 6*** | ***Ascent time USN-7*** | ***Difference USN 6 & USN 7*** | ***Ascent time DCIEM*** | ***Difference USN & DCIEM*** |
|---|---|---|---|---|---|---|---|
| ***20*** | | | | | | 8 | |
| ***25*** | 3:20 | 3:20 | 0 | 3:20 | 0 | 13 | DCIEM +9:40 |
| ***30*** | 6:20 | 6:20 | 0 | 6:20 | 0 | 16 | DCIEM +9:40 |
| ***40*** | 18:20 | 29:20 | +11 (R 6) | 29:20 | 0 | 27 | USN +2:20 |
| ***45*** | | 39:20 | | 39:20 | 0 | 36 | USN +2:20 |
| ***50*** | 29:20 | 50:20 | +21 (R 6) | 50:20 | 0 | 43 | USN +7:20 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***55*** | | 68:20 | | 68:20 | 0 | 51 | USN 17:20 |
| ***60*** | 40:20 | 84:20 | +44 (R 6) | 84:20 | 0 | 58 | USN 26:20 |
| ***70*** | 59:20 | 138:00 | 79:20 (R 6) | 138:00 | 0 | 73 | USN 65 |
| ***80*** | 74:20 | 184:00 | 110:2 (R 6) | 184:00 | 0 | 92 | USN 92 |
| ***90*** | 86:20 | 228:00 | 64:20 (R 6) | 228:00 | 0 | 114 | USN 114 |
| ***100*** | 99:20 | 280:4 | 181:2 (R 6) | 280:4 | 0 | 139 | USN 141:4 |
| ***110*** | 119:20 | 322:4 | 203:2 (R 6) | 322:4 | 0 | 164 | USN 158:4 |




The curve of the DCIEM table has an approximate angle of 56º from the horizontal and is roughly parallel to the one of US Navy revisions 4 & 5. The curve of the US Navy revision 7 is similar to the Rev. 4 & 5 at 25 & 30 minutes bottom times and then crosses the DCIEM's curve with an angle of 40º. The difference for 50 min bottom time is 7:2 minutes. However, the difference with DCIEM for 90 minutes is nearly the equivalent of the total decompression with DCIEM.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 110 ft

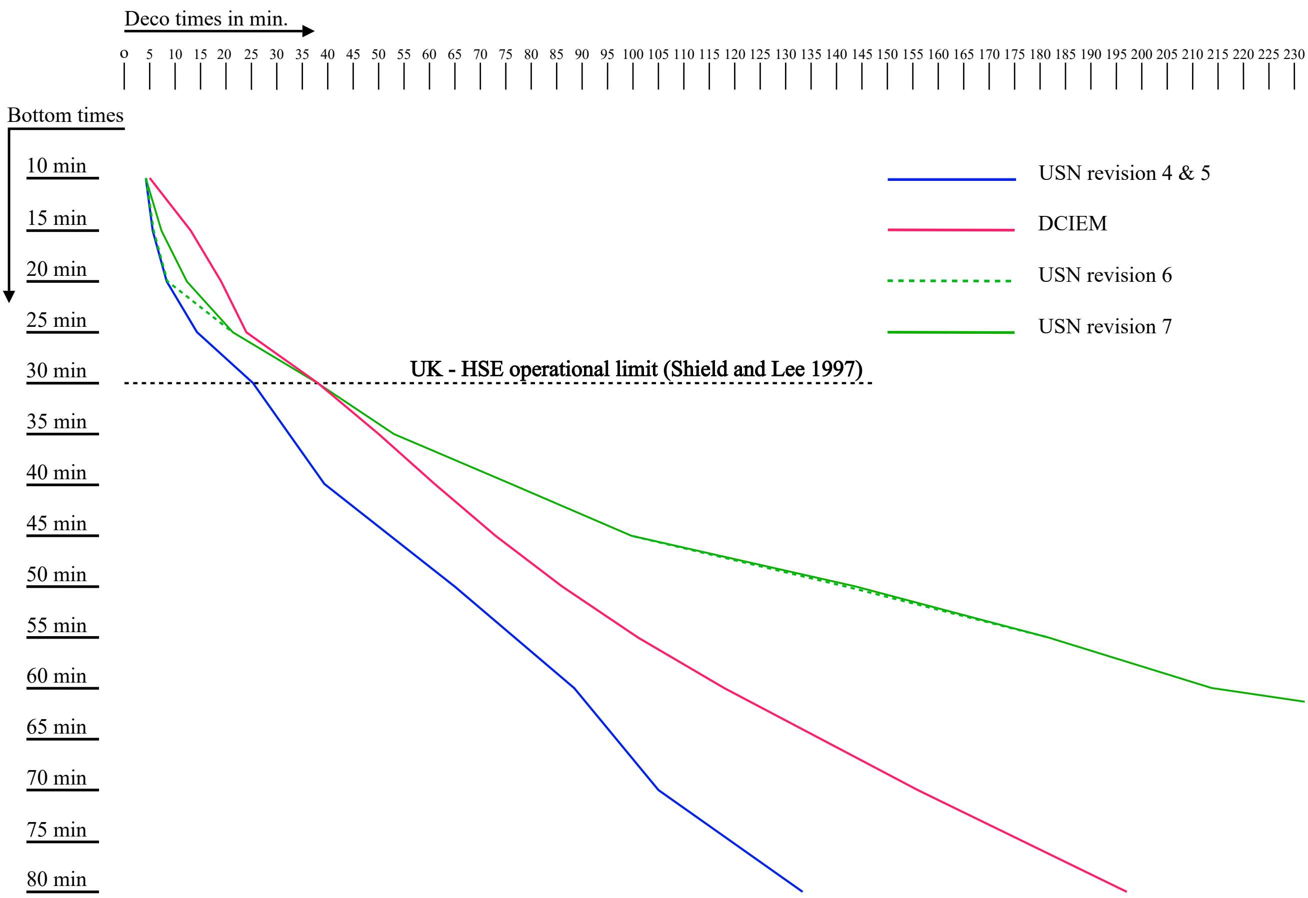
| Bottom time | Ascent time USN-4 & USN-5 | Ascent time USN-6 | Difference USN 5 & USN 6 | Ascent time USN-7 | Difference USN 6 & USN 7 | Ascent time DCIEM | Difference USN & DCIEM |
|---|---|---|---|---|---|---|---|
| *15* | 4 | 4 | 0 | 4 | 0 | 10 | DCIEM +6 |
| *20* | 6 | 6 | 0 | 8 | +2 (R 7) | 15 | DCIEM +7 |
| *25* | 10 | 12 | +2 (R 6) | 13 | +1 (R 7) | 20 | DCIEM + 7 |
| *30* | 18 | 28 | + 10 (R 6) | 28 | 0 | 29 | DCIEM +1 |
| *35* | | 42 | | 42 | 0 | 40 | USN +2 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| *40* | 34 | 55 | +21 (R 6) | 54:40 | +0:2 (R 6) | 50 | USN +4:4 |
| *45* | | 76 | | 77:40 | +1:4 (R 7) | 60 | USN +17:4 |
| *50* | 50 | 98:40 | +48:4 (R 6) | 98:40 | 0 | 70 | USN +28:4 |
| *55* | | 138:40 | | 138:40 | 0 | 81 | USN + 57:4 |
| *60* | 73 | 172:40 | +99:4 (R 6) | 172:40 | 0 | 94 | USN +78:4 |
| *70* | 91 | 233:20 | 142:2 (R 6) | 234:20 | +1 (R 7) | 123 | USN +111:2 |
| *80* | 109 | 301:20 | 192:2 (R 6) | 301:20 | 0 | 158 | USN +143:2 |
| *90* | 134 | 367 | 233 (R 6) | 367 | 0 | 192 | USN +175 |
| *100* | 152 | 443 | 291 (R 6) | 443 | 0 | 226 | USN +217 |




The angles of the curves are nearly similar to the previous depth, with the US navy revision 7 curve crossing the DCIEM one at 32 minutes bottom time, and becoming more stringent. Again, the difference for 100 minutes bottom time is enormous.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 130 ft

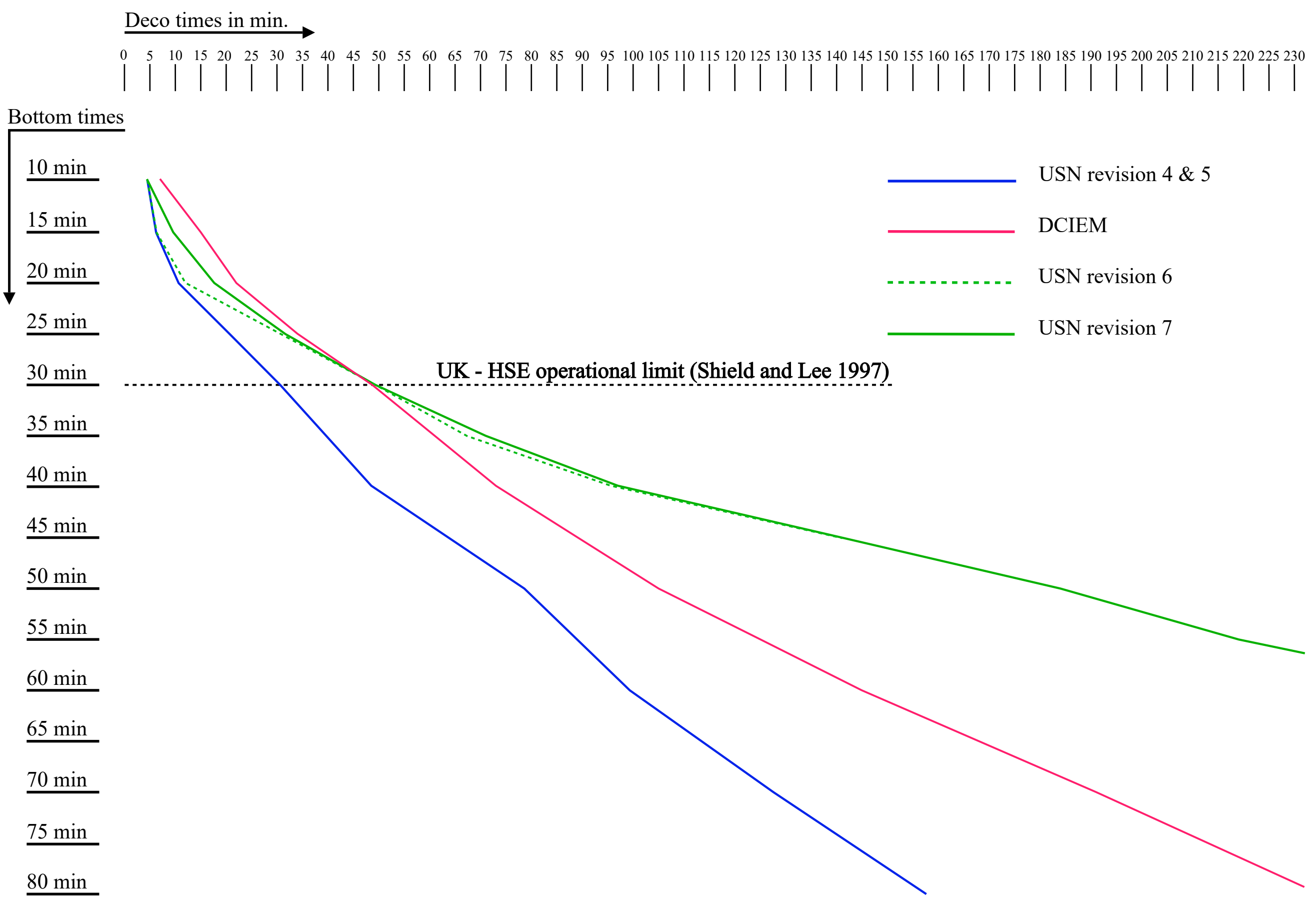
| *Bottom time* | *Ascent time USN-4 & USN-5* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| *10* | 4:20 | 4:20 | 0 | 4:20 | 0 | 5 | DCIEM +0:40 |
| *15* | 5:20 | 5:20 | 0 | 7:20 | +2 (R 7) | 13 | DCIEM +5:40 |
| *20* | 8:20 | 8:20 | 0 | 12:20 | +4 (R 7) | 18 | DCIEM +4 |
| *25* | 14:20 | 21:20 | +7 (R 6) | 21:20 | 0 | 24 | DCIEM +2:40 |
| *30* | 25:20 | 38:20 | +13 (R 6) | 38:00 | +0:2 (R 6) | 38 | USN +0:20 |
| *UK - HSE operational limit (Shield and Lee 1997)* | | | | | | | |
| *35* | | 53:20 | | 53 | +0:2 (R 6) | 50 | USN +3:20 |
| *40* | 39:20 | 74 | +34:4 (R 6) | 76 | +2 (R 7) | 61 | USN +15 |
| *45* | | 100 | | 99:40 | +0:2 (R 6) | 73 | USN +26:40 |
| *50* | 65:20 | 142 | +76:4 (R 6) | 143:40 | +1:4 (R 7) | 86 | USN +57:40 |
| *55* | | 180:40 | | 181:40 | 0 | 101 | USN +80:40 |
| *60* | 88:20 | 213:40 | +125:2 (R 6) | 213:40 | 0 | 118 | USN +95:40 |
| *70* | 105:20 | 293:2 | +188 (R 6) | 293:2 | 0 | 156 | USN +137:20 |
| *80* | 133:20 | 366:2 | +233 (R 6) | 366:2 | 0 | 197 | USN +169:20 |
| *90* | 156:20 | 452:2 | +296 (R 6) | 453:20 | +1 (R 7) | 234 | USN +219:20 |




The remarks regarding the decompression times at this depth are similar to those of the previous depth. Note that the curve of the US Navy revision 7 crosses the DCIEM one at 30 minutes bottom time.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 140 ft

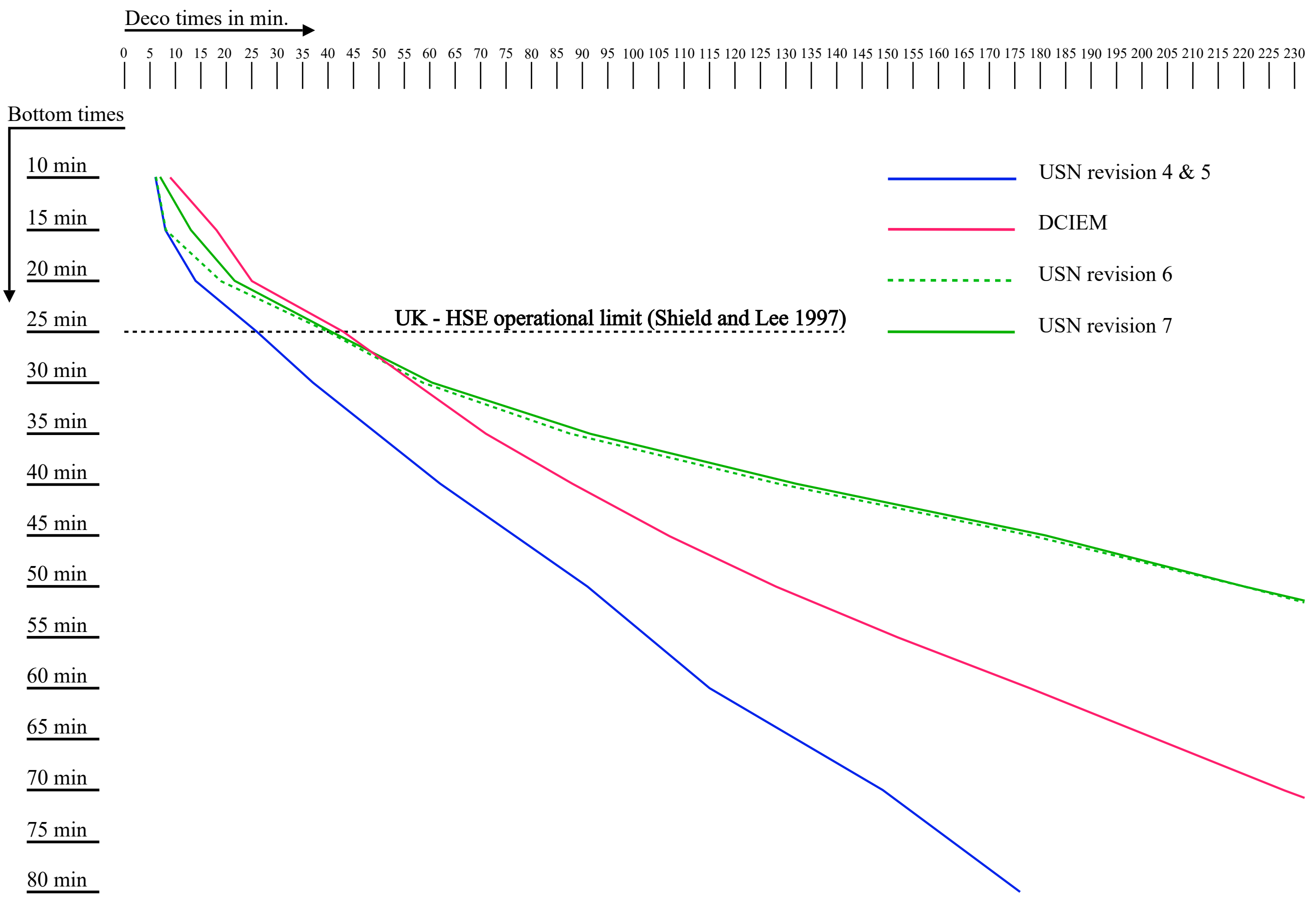
| ***Bottom time*** | ***Ascent time USN-4 & USN-5*** | ***Ascent time USN-6*** | ***Difference USN 5 & USN 6*** | ***Ascent time USN-7*** | ***Difference USN 6 & USN 7*** | ***Ascent time DCIEM*** | ***Difference USN & DCIEM*** |
|---|---|---|---|---|---|---|---|
| ***10*** | 4:40 | 4:40 | 0 | 4:40 | 0 | 7 | DCIEM +7 |
| ***15*** | 6:40 | 6:40 | 0 | 9:40 | +2 (R 7) | 15 | DCIEM +5:20 |
| ***20*** | 10:40 | 11:40 | +1 (R 6) | 17:40 | +6 (R 7) | 22 | DCIEM +4:20 |
| ***25*** | 20:40 | 30:20 | +9:40 (R 6) | 31:20 | +1 (R 7) | 34 | DCIEM +2:40 |
| ***30*** | 30:40 | 48:20 | +17:4 (R 6) | 48:20 | 0 | 48 | USN +0:20 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***35*** | | 67:20 | | 71 | +3:40 (R 7) | 61 | USN +10 |
| ***40*** | 48:40 | 95:20 | +46:4 (R 6) | 97 | +1:40 (R 6) | 73 | USN +24 |
| ***45*** | | 141 | | 141 | 0 | 89 | USN +52 |
| ***50*** | 78:40 | 184 | +105:2 (R 6) | 184 | 0 | 105 | USN +79 |
| ***55*** | | 219 | | 219 | 0 | 125 | USN+94 |
| ***60*** | 99:40 | 265:40 | +166 (R 6) | 265 | 0:40 (R 6) | 145 | USN +120 |
| ***70*** | 127:40 | 346 | +218:20 (R 6) | 347 | +1 (R 7) | 191 | USN +156 |
| ***80*** | 157:40 | 445 | +287:20 (R 6) | 445 | 0 | 235 | USN +210 |
| ***90*** | | 545:20 | | 545 | 0:20 (R 6) | 273 | USN +272 |




The remarks regarding the decompression times at this depth are similar to those of the previous depth. Again, the curve of the US Navy revision 7 crosses the DCIEM one at 30 minutes bottom time.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM  for a dive at 150 ft

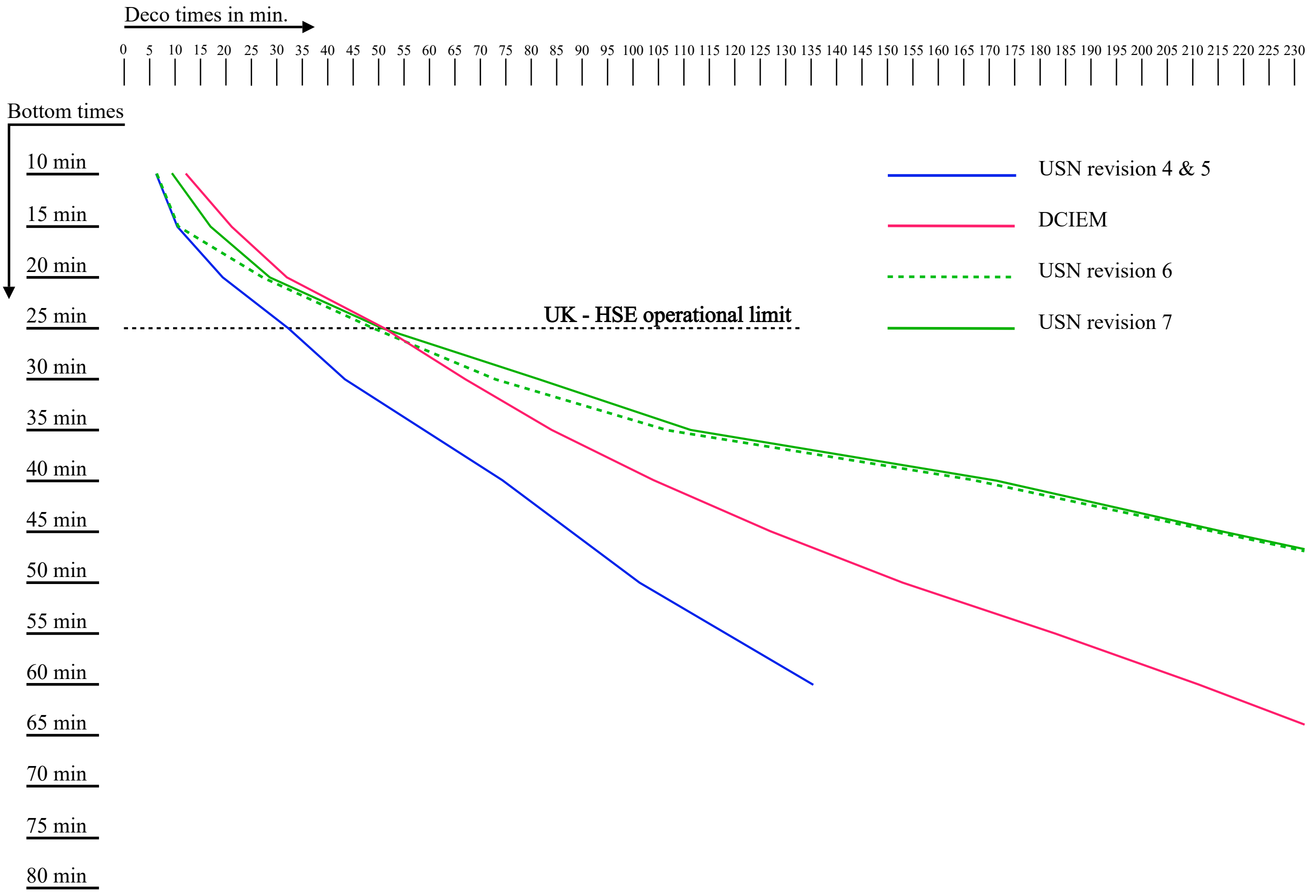
| *Bottom time* | *Ascent time USN-4 & USN-5* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| *10* | 6 | 6 | 0 | 7 | +1 (R 7) | 9 | DCIEM +2 |
| *15* | 8 | 8 | 0 | 13 | +5 (R 7) | 18 | DCIEM +5 |
| *20* | 14 | 19 | +5 (R 6) | 21:40 | 2:4 (R 7) | 25 | DCIEM +3:20 |
| *25* | 26 | 40 | +14 (R 6) | 40:40 | 0:40 (R 7) | 43 | DCIEM +1:20 |
| *UK - HSE operational limit (Shield and Lee 1997)* | | | | | | | |
| *30* | 37 | 58:40 | +21:4 (R 6) | 60:20 | 1:40 (R 7) | 57 | USN +3:20 |
| *35* | | 87:40 | | 91:20 | 3:40 (R 7) | 71 | USN +20:20 |
| *40* | 62 | 128:20 | +66:2 (R 6) | 132 | 3:40 (R 7) | 88 | USN +44 |
| *45* | | 179:20 | | 181 | 1:40 (R 7) | 107 | USN +74 |
| *50* | 91 | 220 | +129 (R 6) | 220 | 0 | 128 | USN +92 |
| *55* | | 271 | | 272 | +1 (R 7) | 152 | USN +120 |
| *60* | 115 | 317 | +331 (R 6) | 317 | 0 | 178 | USN +139 |
| *70* | 149 | 413 | +264 (R 6) | 413 | 0 | 228 | USN +185 |
| *80* | 176 | 532:40 | +356:40 (r 6) | 532 | 0:40 (R 6) | 271 | USN +261 |




The remarks regarding the decompression times at this depth are similar to those of the previous depth. Again, the curve of the US Navy revision 7 crosses the DCIEM one at approximately 30 minutes bottom time.

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 160 ft

| *Bottom time* | *Ascent time USN-4 & USN-5* | *Ascent time USN-6* | *Difference USN 5 & USN 6* | *Ascent time USN-7* | *Difference USN 6 & USN 7* | *Ascent time DCIEM* | *Difference USN & DCIEM* |
|---|---|---|---|---|---|---|---|
| *10* | 6:20 | 6:20 | 0 | 9:20 | +2 ( R 7) | 12 | DCIEM +2:67 |
| *15* | 10:20 | 10:20 | 0 | 17 | +6:40 (R 7) | 21 | DCIEM +4 |
| *20* | 19:20 | 27:20 | +8 (R 6) | 28:40 | +1 (R 7) | 32 | DCIEM +3:20 |
| *25* | 32:20 | 49 | +16:4 (R 6) | 50:40 | +1:40 (R 7) | 51 | DCIEM +0:20 |
| *UK - HSE operational limit (Shield and Lee 1997)* | | | | | | | |
| *30* | 43:20 | 73:40 | +30:33 (R 6) | 81:20 | +7:40 (R 7) | 67 | USN +14.20 |
| *35* | | 106:40 | | 111:20 | +4:40 (R 7) | 84 | USN +27:20 |
| *40* | 74:20 | 166:40 | +92:20 (R 6) | 171:20 | +4:40 (R 7) | 104 | USN +67:20 |
| *45* | | 214:20 | | 216 | +1:40 (R 7) | 127 | USN +89 |
| *50* | 101:20 | 268:20 | +167 (R 6) | 268 | + 0:20 (R 7) | 153 | USN + 115 |
| *55* | | 320 | | 320 | 0 | 183 | USN +137 |
| *60* | 135:20 | 371 | 235:40 (R 6) | 372 | +1 (R 7) | 211 | USN +161 |
| *70* | | 496 | | 496 | 0 | 263 | USN +233 |

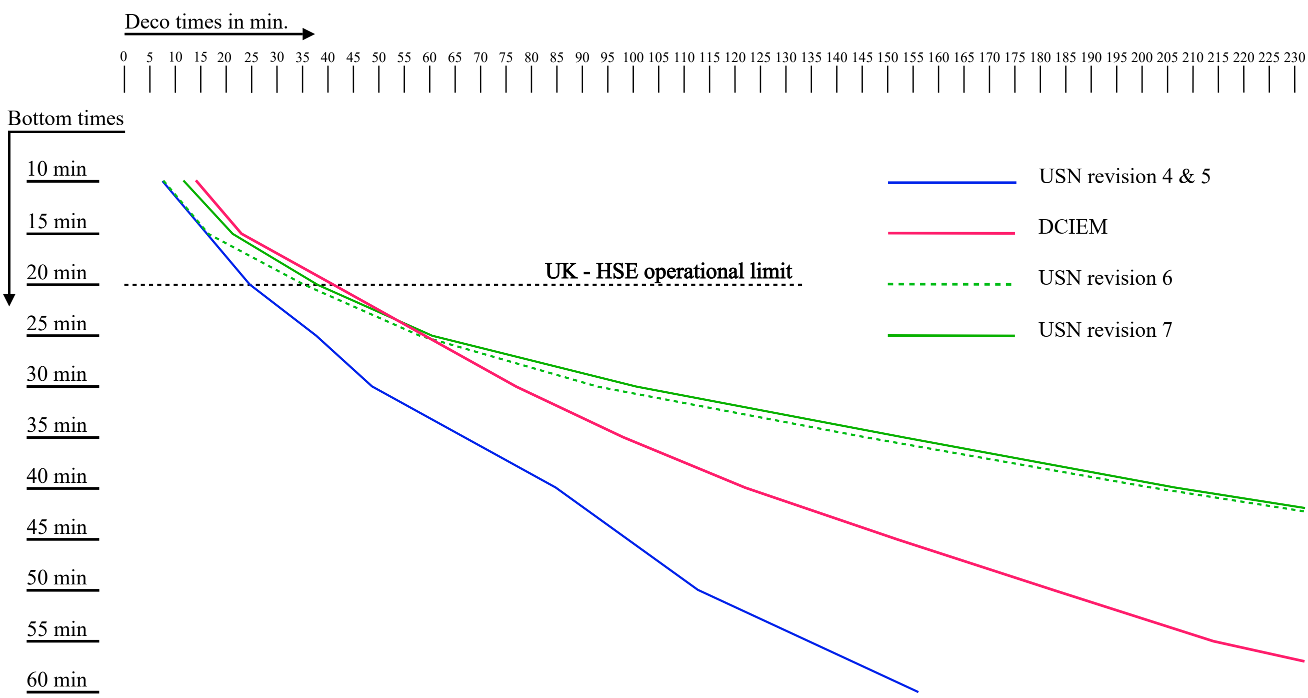



The remarks regarding the decompression times at this depth are similar to those of the previous depth. Note that the curve of the US Navy revision 7 crosses the DCIEM one at approximately 25 minutes bottom time.

Table of contents

- Comparison ascent times USN 4, USN 5, USN 6, USN 7, and DCIEM for a dive at 170 ft

| ***Bottom time*** | ***Ascent time USN-4 & USN-5*** | ***Ascent time USN-6*** | ***Difference USN 5 & USN 6*** | ***Ascent time USN-7*** | ***Difference USN 6 & USN 7*** | ***Ascent time DCIEM*** | ***Difference USN & DCIEM*** |
|---|---|---|---|---|---|---|---|
| ***10*** | 7:40 | 7:40 | 0 | 11:40 | +4 (R 7) | 14 | DCIEM +2:20 |
| ***15*** | 12:40 | 12:40 | 0 | 21:20 | +8:40 (R 7) | 23 | DCIEM +1:40 |
| ***20*** | 24:40 | 35:20 | +1040 (R 6) | 38 | 2:40 (R 7) | 41 | DCIEM +3 |
| ***UK - HSE operational limit (Shield and Lee 1997)*** | | | | | | | |
| ***25*** | 37:40 | 58 | +20:20 (R 6) | 60:40 | 2:40 (R 7) | 59 | USN +1:40 |
| ***30*** | 48.40 | 93 | +44:20 (R 6) | 100:40 | 7:40 (R 7) | 77 | USN +23:40 |
| ***35*** | | 145:40 | | 153:20 | 7:40 (R 7) | 98 | USN +55:20 |
| ***40*** | 84.40 | 201:40 | +117 (R 6) | 206:20 | 4:40 (R 7) | 122 | USN +84:20 |
| ***45*** | | 254:40 | | 257.20 | 2:40 (R 7) | 152 | USN +105:20 |
| ***50*** | 112.40 | 315:20 | +202:40 (R 6) | 316 | 0:40 (R 7) | 183 | USN +133 |
| ***55*** | | 369:20 | | 372 | 2:40 (R 7) | 214 | USN +158 |
| ***60*** | 155.40 | 436 | +280:2 (R 6) | 436 | 0 | 244 | USN +192 |
| ***70*** | | 572 | | 572 | 0 | 296 | USN +276 |




The remarks regarding the decompression times at this depth are similar to those of the previous depth. Note that the curve of the US Navy revision 7 crosses the DCIEM one at approximately 23 minutes bottom time.

### 1.4.4 - Conclusion regarding the durations of stops

The US Navy procedures revisions 3, 4, and 5 were often selected by companies to the detriment of other decompression tables such as DCIEM and COMEX MT92 because of their more reduced decompression times. However, their main inconvenience was that they were initially designed for military operations and that many decompression accidents were reported during the early times of the offshore industry. As a result, reinforcement procedures such as the "Jesus factors" indicated in the UK-HSE report *"The incidence of decompression sickness arising from commercial offshore air diving operations in the UK sector of the North sea during 1982/83"*, written by doctors TG Shield & WB Lee, were implemented by most companies in addition to the bottom times limitations also recommended in this report and adopted by the UK - HSE, and later on by the organizations representing the clients.
Revision 7 of the US Navy tables has increased the level of safety of these tables. However, this has resulted in longer decompression times for the air table than for the DCIEM tables. Thus, this "advantage" is now lost as DCIEM calls for fewer stops in most depths, along with a very favorable reputation for preventing decompression sickness accidents.
As already said in the introduction, considering that the DCIEM tables have similar decompression curves to the MT92 tables that are still in force in France and have been unchanged since their first publication in 1992, we can assume that these tables are still suitable for commercial diving and thus can be used even though "Defence Research and Development Canada (DRDC)" has ceased to develop them. Of course, that could be questioned if the French government decides that the MT92 tables are no longer suitable and must be reinforced.

## 1.5 - Reinforcement of the original procedures

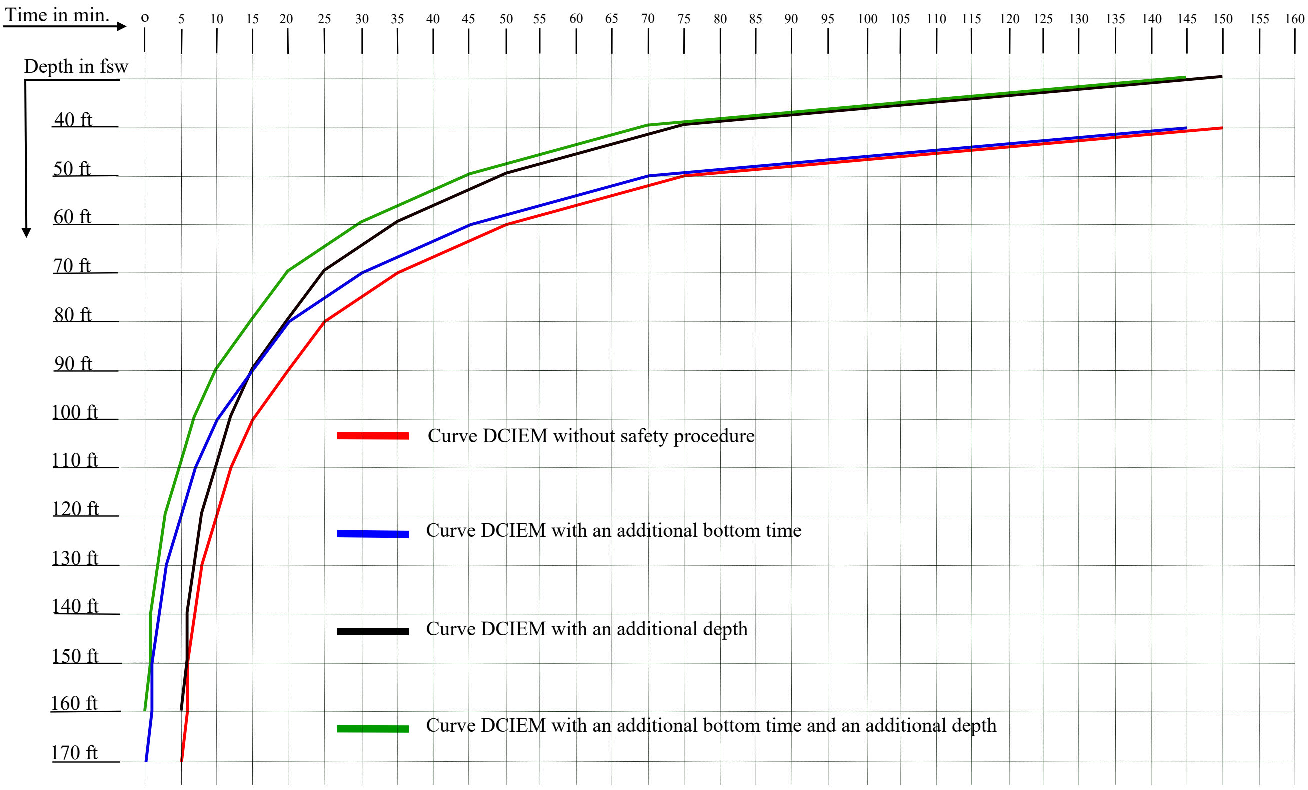
### 1.5.1 - Implement the "Jesus factor"

The “Jesus factor”, is an old concept based on the fact that a table is developed for a determined population of divers, which does not always correspond to the divers operating on the job site. This procedure was initially implemented because most tables used during the 60s and 70s were initially designed for military divers which resulted in numerous decompression accidents. This “Jesus factor” is described in detail in the document *“The incidence of decompression sickness arising from commercial offshore air-diving operations in the UK sector of the North sea during 1982/83”* issued in December 1997 by doctors Shields and Lee.

Even though the tables currently used, such as MT 92 or DCIEM, have provided considerable improvements, this procedure that consists in adding bottom time or switching to the next deeper depth continues to be applied by numerous supervisors and is mandatory with some companies because databases have demonstrated that the tables need to be sometimes reinforced according to the tasks performed, the environmental conditions, and the age of the diver.
In addition to preserving the divers' health, many companies ensure that no decompression sickness happens because such an undesirable event results in incident reports that may damage their reputation. This point is not the most glorious, but it must be taken into account.

Safety procedures are officially introduced in some tables. It is the case of the COMEX /MT 92, where it indicated the following: *“When diving or working conditions are difficult, the risk of a decompression accident is higher. It is an established fact that poor physical condition, nervous tension, poor visibility, cold and accumulated fatigue after weeks of intensive diving, predispose a diver to decompression sickness. Similarly, a current, uncertain depth control and poor sea conditions make decompression procedures difficult to follow and thus increase the risk of a decompression accident. All these factors must be taken into consideration when a decompression table is chosen. In the case where diving conditions are such that they may adversely affect decompression safety, the next longest time on the bottom in the table should be used in order to give the divers an additional margin of safety”*.
It is also the case of the Norwegian tables where it is said in chapter “prevention for decompression illness”: *”If there are circumstances increasing the risk for decompression illness, the decompression should be more conservative than prescribed by the tables. Especially this is true if multiple risk increasing factors are present and for dives with bottom times bordering the maximum allowed bottom time. In such cases the standard air decompression tables should be used more conservatively by decompressing according to a table time one or two steps longer than otherwise”*.

This concept has also been adopted by manufacturers of diving computers designed for scuba diving that provide the possibility to reinforce the basic decompression profile. These reinforcements usually consist of shifting the deco curve and do not modify the mathematic model.
This handbook recommends applying, at a minimum, an additional bottom time or depth, except for light work dives with perfect weather and underwater conditions.




### 1.4.2 - Predive conditioning procedures

Current diving tables control the risks linked to Decompression Sickness (DCS) by managing factors such as the dive duration, the depth, the ascent rate, and the duration of the stops. However, in the paper *“Preconditioning Methods and Mechanisms for Preventing the Risk of Decompression Sickness in Scuba Divers: A Review”*, doctors Emmanuel Gemp

& Jean-Eric Blatteau say that clinical data supporting the importance and the role of each factor on Decompression Sickness (DCS) development are lacking due in part to the great inter/intra-variability between individuals regarding susceptibility to DCS. They also say that based on their clinical experience and Divers Alert Network (DAN) statistics, most injured divers presenting neurological DCS (75%–90%) followed their dive profile and did not performed inadequate decompression schedules, which puts forward the notion that conservative dive profiles are no guarantor of protection against DCS and that novel means are required for DCS prevention.

The fact that diving time and nitrogen pressure are not the only determinants of Vascular Gas Embolisms (VGE) formation and that factors such as the variation between individuals and other not fully clarified phenomenons is taken into account by many other scientists. For example, doctors Peter Germonpré & Costantino Balestra confirm these points in their study *"Preconditioning to reduce decompression stress in scuba divers"*. For these reasons, new concepts still under evaluation have been developed to explain the production of Vascular Gas Embolisms (VGE), such as the generally admitted assumption that bubbles form from already present gaseous nuclei, and that these initially unstable nuclei may be trapped in intercellular hydrophobic crevices on the endothelial surface or be coated by surface-active molecules like surfactant, platelets, or proteins and thus stabilized by these processes before being released into the bloodstream. These mechanisms of nuclei formation are still debated by scientists with also the role of body substances such as Nitric Oxide (NO), an omnipresent intercellular messenger, modulating blood flow and neural activity, which is thus responsible for vasodilatation. That opens to studies on chemical reactions and drugs that may be used to interfere in these phenomenon and be used to control the production of Vascular Gas Embolisms (VGE).

In the paper called *"Static Metabolic Bubbles as Precursors of Vascular Gas Emboli During Divers' Decompression: A Hypothesis Explaining Bubbling Variability"* Jean-Pierre Imbert, Salih Murat Egi, Peter Germonpré, and Costantino Balestra make a status of the research ongoing and propose solutions that will probably result in new decompression tables in the near future.

As there is, for the moment, no table integrating these new concepts in a public release for commercial diving, we continue to use tables such as DCIEM or COMEX MT 92 that, although they are not integrating these new concepts, have proved to be and continue to be efficient means of control. However, some elements from the studies mentioned above can be implemented to improve these procedures. Among the solutions investigated to improve decompression, the authors of this document insist on the benefits of "pre-dive conditioning", which refers to experimental studies made to demonstrate that exercises, oxygen, or substances uptake before the immersion have beneficial effects on decompression. These beneficial effects are assumed to result from eliminating nuclei by physical processes or/and chemical reactions.

To highlight the advantage of the pre-dive conditioning, we can refer to a paragraph of this study where the authors remember experiments made by doctors Gennser and Al that concluded that five weeks of bed-rest significantly increased bubble grades after decompression. The reasons given to explain these results are the following:

- Bedrest conditions are associated to minimal activity and therefore to a minimal metabolism. The consequence is that the initial Static Metabolic Bubbles (SMB) volume in the divers prior to the dive was maximal.
- The lack of exercise reduces vibrations and it is likely that most of the available Active Hydrophobic Spots (AHS) were populated by SMB.
- After a bedrest, the divers started the dive with a high density of SMB with a maximal volume that favored higher grades of detected VGE.

Scientists have successfully tested the pre-dive conditioning solutions listed below on humans.

- Endurance exercise:
  This process consists of exercises requiring 70 to 90% of maximum heart rate performed before the dive. Note that the maximum heart rate is often calculated with the formula "220 minus the age of the person tested".
- Hydration:
  This concept is based on the fact that it has long been suggested that dehydration may increase the risk of Decompression Sickness (DCS) and that experiments have been made on animals that correlate it.
- Heat exposure:
  This concept leans on papers that demonstrated that moderate dehydration resulting in stroke volume reduction induced by a predive exercise could decrease venous circulating bubbles in divers.
- Oxygenation:
  These procedures are based on the assumption that oxygen breathing before diving eliminates pre-existing gas micronuclei before they can grow into bubbles. The proposed mechanism is based on the ability of oxygen to replace nitrogen in the nucleus by diffusion. The reduction of oxygen pressure after switching from oxygen to air could enhance the consumption of oxygen from the nucleus, thus eliminating it completely.
- Vibration:
  This procedure consists of submitting the diver to sessions on vibrating mattresses sold to all public. The effects expected are similar to those obtained with predive exercise except that more efficiency is looked for.
- Jumping:
  This technique aims to provoke blood displacement and muscular contractions to dislodge VGE nuclei. The method selected to obtain the expected result consists of jumping on a mini trampoline.
- Specific substances uptake:
  This terminology refers to drugs or food that can be used to control chemical reactions linked to decompression, such as nitric oxide (NO) production.

The processes of these experiments are described in papers available on the "Diving and ROV Specialists.com" website and through recognized scientific article publishers.

We, nevertheless, need to take into account the fact that these reinforcement processes are experimental and that, despite the positive results obtained, they may not apply to commercial diving operations due to implementation issues and the fact that the procedures described have been tested with military and sportive SCUBA divers, so initially thought in the function of the concept to be tested and according to methods practiced for this type of diving instead of the intensive operations we commonly organize in commercial diving. For these reasons, it is reasonable to be conservative regarding these new procedures, so only to apply what has been tested and not go outside these limits, even though we may feel that some variations of the solutions described may work.

- Regarding endurance exercise and hydration, doctors Gempp & Blatteau conclude their article *"Preconditioning Methods and Mechanisms for Preventing the Risk of Decompression Sickness in Scuba Divers: A Review"* by saying *"Evidence suggests that, for a population of trained and military divers, endurance exercise (even in a warm environment) associated with oral hydration prior to the dive is beneficial in vascular bubble reduction"*.
- Normobaric pre-dive oxygen breathing is a procedure that is easy to implement with standard air diving, and is described in a paper called *"Pre-dive normobaric oxygen reduces bubble formation in scuba divers"*, published by doctors Olivier Castagna, Emmanuel Gempp, and Jean-Eric Blatteau. Because no tests have been made with nitrox and oxygen decompression stops, we must abstain from merging this concept with these procedures, even though there is no apparent conflict, and we feel that the two concepts used together may give excellent results. This is, of course, based on the idea of the conservative approach discussed previously.
- Whole body vibration results better than normobaric oxygen breathing and endurance exercise, and this concept can also be implemented for standard air diving.
  However, in an article called "Pre-dive Whole-Body Vibration Better Reduces Decompression-Induced Vascular Gas Emboli than Oxygenation or a Combination of Both", doctors Costantino Balestra, Sigrid Theunissen, Virginie Papadopoulou, Cedric Le Mener, Peter Germonpré, François Guerrero, & Pierre Lafère say that pre-dive conditioning with only whole body vibration was more efficient during experiments than predive-conditioning with normobaric oxygen and body vibration performed together. They say that this absence of synergy could be explained by the fact that the two modes of preconditioning, mechanical or diffusion, could act on the same nuclei and thus be in direct competition. That demonstrates that procedures that have not been tested must not be implemented, so the idea of the conservative approach must always prevail.

### 1.5.3 - Operational limits UK-HSE

Similarly to the US Navy tables, the safe operational limits recommended by DCIEM are mainly based on the repeat groups and indicated by a double bar on the tables. These operational limits do not correspond to those recommended by the UK-HSE, adopted by many other countries, and some clients' diving departments. These recommended limits are those of the UK-HSE report *"The incidence of decompression sickness arising from commercial offshore air-diving operations in the UK sector of the North sea during 1982/83"* issued in December 1997 by doctors Shields and Lee. This report is available on our website, from which it can be downloaded through the link provided. It can also be found on the UK Health and Safety Executive (HSE) website.

| ***Depth*** | | ***Bottom times limits*** |
|---|---|---|
| ***Metres*** | ***Feet*** | ***SD & In water*** |
| *0 - 12* | *0 - 40* | *240* |
| *15* | *50* | *180* |
| *18* | *60* | *120* |
| *21* | *70* | *90* |
| *24* | *80* | *70* |
| *27* | *90* | *60* |
| *30* | *100* | *50* |
| *33* | *110* | *40* |
| *36* | *120* | *35* |
| *39* | *130* | *30* |
| *42* | *140* | *30* |
| *45* | *150* | *25* |
| *48* | *160* | *25* |
| *50* | *164* | *20* |

### 1.5.4 - Procedure in case of blow up from the bottom

The procedure for omitted decompression DCIEM consists to return the diver to the next deeper stop where the omission occurred repeat this stop and continue the decompression normally. However, there is no real procedure for uncontrolled ascent (blow-up), and the chamber is not at direct proximity.
To close this point, the classical procedure used with the US Navy, COMEX MT/92, and the French Navy MN 90 has been added. This procedure can also be used as a substitute of the procedure DCIEM for omitted decompression as it is more stringent: If the diver's condition allows it, this procedure consists of returning to half depth in less than 3 minutes, carrying out 5 minutes stop. Then perform the decompression based on the total diving time, including re-descent and the five-minute stop at half depth.

### 1.5.5 - About the ascent rate of 18 m (60 ft) per minute

Numerous teams using DCIEM tables have reduced the initial ascent speed from 60 ft/minute (18 m/min) to 30 ft/minute (9 m/min). Because not based on calculation, this change is an empirical procedure similar to the efficient decompression tables developed by the Okinawan and Australian pearl divers during the 50's and 60's and reported by Hills and Le Messurier. The origin of this speed reduction is based on the fact that the US Navy tables and a lot of tables are calculated with slower ascent speeds (US Navy is 9 m/minute). Also, a lot of publications from recognized physiologists are promoting the theory of slow ascent. The following elements can be used to explain it:

- On page 13/point b of the DCIEM report 84-R-44 published in September 1984, R.Y. Nishi and G.R Lauckner indicate *"an ascend speed at 18 msw/min or slower"*, which is not exactly the procedure indicated in the manual issued in 1992 where the ascent rate is *"18 m/min + or - 3m/min"*. A comparison with the tables of this report shows a model slightly more conservative in 1984, with stops starting earlier than the current model, but with the rest of the stops strictly identical, as demonstrated in the example below:

*Edition 1984*

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Dive Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 18 | 10 | - | - | - | - | - | - | - | - | A |
| | 20 | - | - | - | - | - | - | - | - | B |
| | 30 | - | - | - | - | - | - | - | - | D |
| | 36 | - | - | - | - | - | - | - | - | D |
| | 40 | - | - | - | - | - | - | 3 | 3 | E |
| | 50 | - | - | - | - | - | - | 5 | 5 | F |
| | 60 | - | - | - | - | - | - | 7 | 7 | G |
| | 80 | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | 16 | 16 | J |
| | 100 | - | - | - | - | - | - | 24 | 24 | K |
| | 110 | - | - | - | - | - | - | 30 | 30 | L |
| | 120 | - | - | - | - | - | - | 36 | 36 | M |
| | 130 | - | - | - | - | - | 2 | 40 | 42 | |
| | 140 | - | - | - | - | - | 2 | 46 | 48 | |
| | 150 | - | - | - | - | - | 3 | 52 | 55 | |
| | 160 | - | - | - | - | - | 3 | 59 | 62 | |
| | 170 | - | - | - | - | - | 4 | 65 | 69 | |
| | 180 | - | - | - | - | - | 4 | 73 | 77 | |
| | 190 | - | - | - | - | - | 5 | 80 | 85 | |
| | 200 | - | - | - | - | - | 7 | 87 | 94 | |
| | 210 | - | - | - | - | - | 13 | 91 | 104 | |
| | 220 | - | - | - | - | - | 17 | 97 | 114 | |
| | 230 | - | - | - | - | - | 21 | 103 | 124 | |
| | 240 | - | - | - | - | - | 24 | 109 | 133 | |

*Edition 1992*

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 18 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | - | - | 1 | F |
| | 60 | - | - | - | - | - | - | - | 5 | 5 | G |
| | 80 | - | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | - | 16 | 16 | J |
| | 100 | - | - | - | - | - | - | - | 24 | 24 | K |
| | 110 | - | - | - | - | - | - | - | 30 | 30 | L |
| | 120 | - | - | - | - | - | - | - | 36 | 36 | M |
| | Maximum operational limit OGP/ HSE | | | | | | | | | | |
| | 130 | - | - | - | - | - | - | 2 | 40 | 42 | |
| | 140 | - | - | - | - | - | - | 2 | 46 | 48 | |
| | 150 | - | - | - | - | - | - | 3 | 52 | 55 | |
| | 160 | - | - | - | - | - | - | 3 | 59 | 62 | |
| | 170 | - | - | - | - | - | - | 4 | 65 | 69 | |
| | 180 | - | - | - | - | - | - | 4 | 73 | 77 | |
| | 190 | - | - | - | - | - | - | 5 | 80 | 85 | |
| | 200 | - | - | - | - | - | - | 7 | 87 | 94 | |
| | 210 | - | - | - | - | - | - | 13 | 91 | 104 | |
| | 220 | - | - | - | - | - | - | 17 | 97 | 114 | |
| | 230 | - | - | - | - | - | - | 21 | 103 | 124 | |
| | 240 | - | - | - | - | - | - | 24 | 109 | 133 | |

  Based on this observation we can consider the tables published in 1984 a little bit more stringent, and the ascent speed slower than 18 m/min (60 ft/min) conform to this philosophy.

- In his report to explain the decompression table MN90 (French Navy tables). "Proces verbal CEPISMER no 03/90 lettre no 105/EMM/MAT/ST/NP" published the 4th of January 1990", doctor Meliet explained that the database has proved that decompression accidents are often the fact of faster ascent speeds than those calculated for the tables. He designed a table with a maximum ascent speed of 17 m/min because he considered it a suitable solution for the population of divers and the dive profiles selected (Military divers of 32 years old average age, not doing hard jobs similar to those of the civil and the offshore industry). But he also said that he did not retain a speed of 20 m/min despite the advantage of reducing the stop at 3 m given by this solution because this speed was frequently involved in decompression accidents using the previous model (GERS 65).
- In the well known book "Diving and subaquatic medicine", doctor Robyn Walker said:

  *"Significant changes have also taken place since the Haldane experiments, clarifying the "safe rate of* ascent"

  *for compressed air scuba diving. Haldane used a 9 metres per minute ascent rate, slow enough to avoid bubble development in the fastest tissues and logistically to permit ascent in standard gear (hard hat). With the freedom of ascent with scuba, these rates were increased. With experience, they have now been decreased.*

  - *1956- US Navy = 18 m/min*
  - *1957- Workman = 18 m/min*
  - *1968 - RNPL = 15 m/min (Hempleman proposed 3m/min between the stops)*
  - *1966-76 - Hills = 12 m/min*
  - *1975 - Buhlmann = 10 m/min*
  - *1992 US navy rev 4= 9 m/min (today 9 m/min)*

  *Apart from the greater opportunity to off-load nitrogen during the ascent, other advantages of slow ascents probably include: Reduced rate of Venous Gas Emboli production; less pulmonary filter obstruction; and less*

*chance of pulmonary damage (barotrauma or seeding of bubbles).*
*Not only is the total volume of gas very relevant, but so is the time over which it is released. Bolus doses of gas, such as produced during rapid ascents from short deep dives, are more likely to overload the pulmonary filtration system and thus cause early development of cerebral DCS than the same volume of gas from a shallow long dive, which may be in the slower deep tissues and cause a late joint bend.*
*The shallow safety stop, usually 5-10 minutes between 3 and 5 metres, is of value as it not only increases the total decompression time, but also reduces by up to 50 per cent the bolus volume of gas that the pulmonary filter has to cope with during that period. Moreover, it also reduces the nitrogen gradients between different tissues".*

- Other well-known specialists have published similar recommendations. In his book *"Hyperbaric physics with bubble mechanics and decompression theory in depth"*, Bruce R Wienke indicated the following on page 255*" ... Neuman, Hall, and Linaweaver found that slower ascent rates with nominal shallow stops reduced doppler scores by an order of magnitude on air dives. Smith and Stayton noted marked reductions in precordial* (The region of the anterior surface of the body covering the heart and lower thorax.) *bubbles when ascent rates were cut from 60 ft/min to 30 ft/min…".*

  On the other hand, some specialists highlight the fact that if there is a too slow ascent rate, the diver remains at depth a longer time with an effect of gas uptake into the slower tissues compartments simultaneously to the decompression of the faster tissues. That is why a minimum ascent speed, and procedures to solve the problems due to a too slow ascent, must be calculated.

According to these observations and the explanation from doctors Walker and Wienke, it seems evident that a slower ascent speed than 18 m/min (60 ft/min) could increase this table's safety.
However, we are not a recognized competent body on this matter, and we do not have the resources to modify this table officially. Thus the descent and ascent procedures selected by the designers of these tables must be followed.

# 2 - Implement the DCIEM air standard and nitrox procedures

This chapter discusses the implementation of the Air standards and Nitrox DCIEM procedures using ladders and baskets as means of deployment. The procedures for the use of Heliox with the various means of deployment are explained in other books. It is also the case for implementing Air and Nitrox with "scuba replacement".
Note that conception and reinforcements are presented in chapter #3 of Book #2 of this manual, "Elements for preparation". Thus, the reasons these tables are selected and the reinforcements proposed are already explained in Book #2 and are not repeated here.
Remember that DCIEM proposes 1 set of tables in imperial and one set of tables in metric, which presentation is similar whatever the gas used.

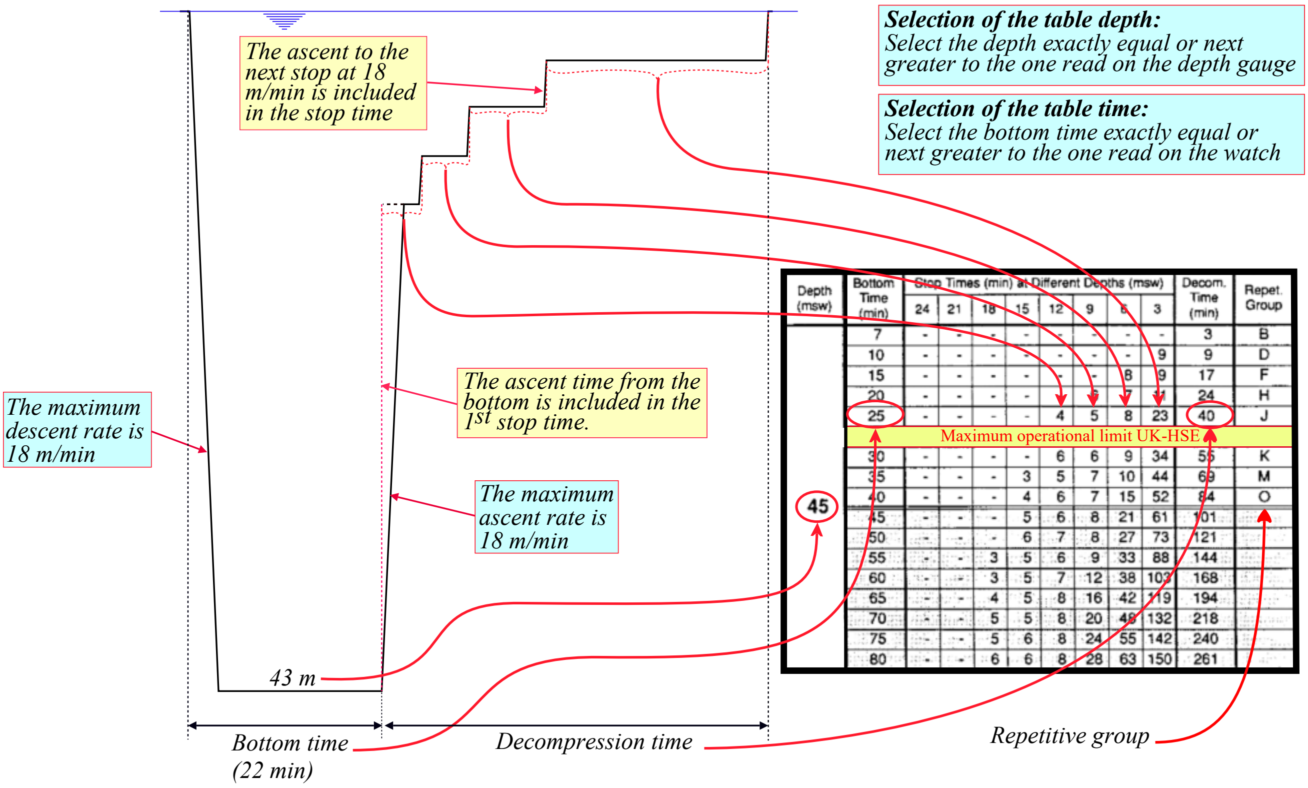
## 2.1 - Tables standard air with in-water stops

### 2.1.1 - Presentation of tables #1 and #1S

Tables #1 and #1S are used to manage standard air diving. Table #1S is a simplified one-page version of the main table limited to 150 fsw /45 msw. It is described on the next page. Table #1 is the main table, and is the one that should be used by the diving supervisor to manage the dives undertaken. It displays the following information:

- Depth of the table selected in feet or meters
- Bottom times in minutes
- Stops depth in feet or meters & time to be performed at the indicated depth
- Total deco time
- Repetitive group
- The operational limits UK-HSE , established by doctors Shield and Lee have been integrated into the tables (see the explanations in book #2)

The elements considered to calculate the decompression are the following:
- The depth to select is exactly equal to or next greater than the one read on the depth gauge.
- The bottom time to select is exactly equal to or greater than the one indicated on the watch.
- The decompression depths are indicated in the ribbon between the column "bottom time" and "Deco m time" . The duration of the stops are in the columns below.
- The "deco m time" is the addition of the ascent and the stops.
- The decent has to be performed at 18 m/min (60 ft/min) maximum.
- The ascent speed proposed by DCIEM is 18 m/min + or - 3 m (60 ft/min + or - 10 ft) . Slower ascent can be selected by the supervisor, but in this case the procedure for too slow ascent rate (see next) must be applied.
- The ascent from the bottom to the 1st stop at 18 m/min (60 ft/min) is integrated in the stop time.
- The accent to the next stop at 18 m/min (60 ft/min) is integrated in the stop time.




| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 9 | 9 | D |
| | 15 | - | - | - | - | - | - | 8 | 9 | 17 | F |
| | 20 | - | - | - | - | [illegible] | 6 | 7 | 11 | 24 | H |
| | 25 | - | - | - | - | 4 | 5 | 8 | 23 | 40 | J |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | 9 | 34 | 55 | K |
| | 35 | - | - | - | 3 | 5 | 7 | 10 | 44 | 69 | M |
| 45 | 40 | - | - | - | 4 | 6 | 7 | 15 | 52 | 84 | O |
| | 45 | - | - | - | 5 | 6 | 8 | 21 | 61 | 101 | |
| | 50 | - | - | - | 6 | 7 | 8 | 27 | 73 | 121 | |
| | 55 | - | - | 3 | 5 | 6 | 9 | 33 | 88 | 144 | |
| | 60 | - | - | 3 | 5 | 7 | 12 | 38 | 103 | 168 | |
| | 65 | - | - | 4 | 5 | 8 | 16 | 42 | 119 | 194 | |
| | 70 | - | - | 5 | 5 | 8 | 20 | 48 | 132 | 218 | |
| | 75 | - | - | 5 | 6 | 8 | 24 | 55 | 142 | 240 | |
| | 80 | - | - | 6 | 6 | 8 | 28 | 63 | 150 | 261 | |

Companies working in United Kingdom waters or for IOGP members will have to comply with the UK-HSE maximum operational limits. For this reason, and to help the diving supervisor, these maximum operational limits have been introduced in the original tables 1.
Under normal diving conditions, the supervisor must take care to never pass this threshold because <u>any dive below this limit will be considered as an incident by the IOGP client representatives.</u> The tables below the limit can be used as recovery tables in the case of an incident

| Depth (fsw) | Bottom Time (min) | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 7 | - | - | - | - | - | - | - | - | 2 | B |
| | 10 | - | - | - | - | - | - | - | 7 | 7 | D |
| | 15 | - | - | - | - | - | - | 6 | 9 | 15 | F |
| | 20 | - | - | - | - | - | 4 | 7 | 11 | 22 | G |
| | 25 | - | - | - | - | - | 7 | 8 | 19 | 34 | I |
| | 30 | - | - | - | - | 4 | 6 | 9 | 29 | 48 | K |
| | **Maximum operational limit UK- HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 6 | 6 | 10 | 39 | 61 | L |
| | 40 | - | - | - | - | 7 | 7 | 10 | 49 | 73 | N |
| | 45 | - | - | - | 3 | 6 | 7 | 17 | 56 | 89 | O |
| | 50 | - | - | - | 4 | 6 | 8 | 22 | 65 | 105 | |
| | 55 | - | - | - | 5 | 6 | 9 | 27 | 78 | 125 | |
| | 60 | - | - | - | 6 | 6 | 9 | 33 | 91 | 145 | |
| | 65 | - | - | - | 7 | 6 | 11 | 38 | 106 | 168 | |
| | 70 | - | - | 2 | 5 | 7 | 15 | 42 | 120 | 191 | |
| | 75 | - | - | 3 | 5 | 8 | 18 | 47 | 133 | 214 | |
| | 80 | - | - | 3 | 6 | 8 | 21 | 54 | 143 | 235 | |
| | 85 | - | - | 4 | 6 | 8 | 25 | 61 | 151 | 255 | |
| | 90 | - | - | 4 | 6 | 8 | 30 | 68 | 157 | 273 | |

Normal diving conditions

Recovery tables to be used in case of incident only

As indicated before, Table #1S, is not to be used to manage the dives. However it is an indicator of the main bottom times, decompression times, and repetitive groups for depths from 20 to 150 feet (6 to 45 m) that can be used to quickly predict dive profiles and repetitive groups. Also DCIEM suggests using it for the calculations multilevel dives.

It is divided into two vertical sections:

- A no-decompression section on the left of the broad vertical line (see #1).
- A decompression-required section to the right of the line *(see #2)*.

Each entry in the table gives The depth *(see #3)*, the bottom time *(see #4)* and, where applicable, the repetitive group *(see #5)*.
Where bottom times appear without a Repetitive Group, repetitive diving is not recommended *(see #6)*.

In the no-decompression (no stop) section, bottom times are given for each Repetitive Group at each depth. These are for the purposes of calculating repetitive dives. The largest number to the left of the broad vertical line is the no-decompression limit at the given depth for first dives only.

For bottom times in the “decompression-required" section the decompression stop times and stop depths are specified after the 60 fsw (18 msw) row and at the bottom of the table after the 150 fsw (45 msw) row. Stop times are given in increments of 5 min and include the ascent time to the stop at 60/10 fsw/min (18/3 msw/min).

- For depths to 60 fsw (18 msw), decompression stops are taken at 10 fsw (3 msw) only *(see #7)*.
- For deeper depths, decompression stops are at 20 and 10 fsw (6 and 3 msw) *(see #8)*.

As this table is to be used for information only and to calculate multilevel dives, the UK-HSE operational limits have not been inserted

| Depth (fsw) | 1 No-Decompression Bottom Times (min) | | | | 2 Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|---|
| 20 3 | 30 A<br>60 B<br>90 C<br>120 D | 150 E<br>180 F<br>240 G<br>300 H | 360 I<br>420 J<br>480 K<br>600 L | 720 M<br>∞ 4 | | | | |
| 30 | 30 A<br>45 B<br>60 C<br>90 D | 100 E<br>120 F<br>150 G<br>180 H | 190 I<br>210 J<br>240 K<br>270 L | 300 M | 5 330 N<br>360 O | 400 | 420 | 6 450 |
| 40 | 22 A<br>30 B<br>40 C | 60 D<br>70 E<br>80 F | 90 G<br>120 H<br>130 I | 150 J | 160 K<br>170 L | 180 M<br>190 | 200 | 215 |
| 50 | 18 A<br>25 B | 30 C<br>40 D | 50 E<br>60 F | 75 G | 85 H<br>95 I | 105 J<br>115 K | 124 L | 132 M |
| 60 | 14 A<br>20 B | 25 C<br>30 D | 40 E | 50 F | 60 G | 70 H<br>80 I | 85 J | 92 K |
| Decompression Time in minutes at 7 | | 10 fsw | | | 5 | 10 | 15 | 20 |
| 70 | 12 A<br>15 B | 20 C | 25 D | 35 E | 40 F | 50 G | 63 I | 66 J |
| 80 | 10 A<br>13 B | 15 C | 20 D | 25 E | 29 F | 35 G | 48 H | 52 I |
| 90 | 9 A | 12 B | 15 C | 20 D | 23 E | 27 F | 35 G | 43 I |
| 100 | 7 A | 10 B | 12 C | 15 D | 18 D | 21 E | 29 G | 36 H |
| 110 | | 6 A | 10 B | 12 C | 15 D | 18 E | 22 F | 30 H |
| 120 | | 6 A | 8 B | 10 C | 12 D | 15 E | 19 F | 25 G |
| 130 | | | 5 A | 8 B | 10 C | 13 D | 16 F | 21 G |
| 140 | | | 5 A | 7 B | 9 C | 11 D | 14 F | 18 G |
| 150 | | | 4 A | 6 B | 8 C | 10 D | 12 E | 15 F |
| Decompression Time in minutes at 8 | | 20 fsw | | | - | - | 5 | 10 |
| | | 10 fsw | | | 5 | 10 | 10 | 10 |

**2.1.2 - Repetitive dives** (Also called successive dives)

DCIEM considers that the residual nitrogen gradually reduces to a normal level over approximately 18 hours, so a diver planning to make a second dive within this period must calculate this residual nitrogen.
The procedures described below allow for calculating this residual nitrogen using table #4A, *"Repetitive factors surface intervals table"*, and #4B, *"No-decompression repetitive table"*.
Please note that the IMCA organization, which previously prohibited repetitive dives for normal operations, has removed this rule from its recent guidelines. However, it should be pointed out that some clients reject this new guidance and have maintained this rule. Even though the client's policy prohibits these practices for normal operations, it must be kept in mind that these procedures should be available to schedule an emergency dive at all times.

***2.1.2.1 - Description of the repetitive dive tables #4A & #4B***

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 → 11:59 | 12:00 → 14:59 | 15:00 → 18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

The RF decreases until it becomes 1.0

Repetitive factors (RF) are given for each repetitive group at selected surface intervals from 15 minutes to 18 hrs

When the repetitive factor is equal to 1.0, the decompression procedure can be performed without repetitive dive procedure

The column repetitive group is corresponding to the column of the dive (table 1)

Key elements to calculate the repetitive dive (effective bottom time):
- Repetitive Factor (RF)
- Next depth
- Next bottom time
- No deco limit

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

The allowable no deco limit for repetitive dives are shown for different depths as a function of the Repetitive Factor

The depths indicated are those planned for the repetitive dives

The Repetitive Factors (RF) is used to calculate the Effective Bottom Time by multiplying the bottom planned for the next time . (BT x RF)

If the actual bottom time of the second dive is less than or equal to the "allowable no deco limit" in table B , the 2nd dive is a no deco dive

If the actual bottom time of the 2nd dive is greater than the "allowable no Deco limit" , the repetitive dive request decompression.
- Multiply the the actual bottom time of the repetitive dive by the Repetitive factor to obtain the "effective Bottom Time" .
- Then use the table 1 (dive table) to determine the decompression schedule for the depth and effective Bottom Time of the repetitive dive

Various scenarios are explained in the following pages.

Hyperlink Table of contents

### *2.1.2.2 - Scenario #1: No decompression repetitive dive*

- 1st dive: 60 ft / 30 min
- Surface interval: 1 hr
- 2nd dive depth: 50 ft
- Bottom time planned: 30 min

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |
| | 50 | | | | | | | | | 1 | F |
| | 60 | | | | | | | | | 5 | G |
| | 80 | - | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | - | 19 | 19 | J |
| | 100 | - | - | - | - | - | - | - | 26 | 26 | K |
| | 110 | - | - | - | - | - | - | - | 32 | 32 | L |
| | 120 | - | - | - | - | - | - | 2 | 37 | 39 | M |
| | 130 | - | - | - | - | - | - | 2 | 43 | 45 | |
| | 140 | - | - | - | - | - | - | 3 | 49 | 52 | |
| | 150 | - | - | - | - | - | - | 3 | 55 | 58 | |
| | 160 | - | - | - | - | - | - | 4 | 62 | 66 | |
| | 170 | - | - | - | - | - | - | 4 | 70 | 74 | |
| | 180 | - | - | - | - | - | - | 5 | 77 | 82 | |
| | 190 | - | - | - | - | - | - | 5 | 85 | 90 | |
| | 200 | - | - | - | - | - | - | 11 | 90 | 101 | |
| | 210 | - | - | - | - | - | - | 15 | 96 | 111 | |
| | 220 | - | - | - | - | - | - | 19 | 102 | 121 | |
| | 230 | - | - | - | - | - | - | 23 | 108 | 131 | |
| | 240 | - | - | - | - | - | - | 27 | 114 | 141 | |

1) Check the repetitive group ( D )

2) Report the group to panel A

3) select the internal surface (1 hr)

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 → 11:59 | 12:00 → 14:59 | 15:00 → 18:00 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | [illegible] | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | | | | | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

4) Report the repetitive factor to panel B

5) Select the depth of the 2nd dive

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

6) Calculation of the Effective Bottom Time:
(Bottom time planned x Repeat factor ) 30 min x 1.4 = 42 min

7) Compare the "Effective Bottom Time" with the allowable "No-D limits":
No D limit (45 min) > effective bottom time (42 min) =
NO Decompression requested

### *2.1.2.3 - Scenario #2: Repetitive dive requesting decompression*

- 1st dive: 110 ft / 15 min
- Surface interval: 40 min
- 2nd dive depth: 110 ft
- Bottom time planned: 10 min

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 110 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 12 | - | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | - | 5 | 5 | D |
| | 20 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 12 | F |
| | 25 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 16 | G |
| | 30 | - | - | - | - | - | - | 9 | 11 | 20 | H |
| | 35 | - | - | - | - | - | 4 | 7 | 19 | 30 | I |
| | 40 | - | - | - | - | - | 5 | 8 | 26 | 39 | J |
| | 45 | - | - | - | - | - | 6 | 9 | 33 | 48 | K |
| | 50 | - | - | - | - | - | 8 | 9 | 39 | 56 | M |
| | 55 | - | - | - | - | - | 9 | 9 | 46 | 64 | N |
| | 60 | - | - | - | - | 3 | 7 | 11 | 53 | 74 | |
| | 65 | - | - | - | - | 3 | 8 | 16 | 58 | 85 | |
| | 70 | - | - | - | - | 4 | 8 | 20 | 64 | 96 | |
| | 75 | - | - | - | - | 5 | 8 | 23 | 73 | 109 | |
| | 80 | - | - | - | - | 5 | 8 | 28 | 81 | 122 | |
| | 85 | - | - | - | - | 6 | 8 | 32 | 91 | 137 | |
| | 90 | - | - | - | - | 6 | 9 | 35 | 101 | 151 | |
| | 95 | - | - | - | - | 7 | 9 | 40 | 111 | 167 | |
| | 100 | - | - | - | - | 7 | 10 | 44 | 120 | 181 | |
| | 105 | - | - | - | - | 8 | 13 | 46 | 129 | 196 | |
| | 110 | - | - | - | - | 8 | 16 | 50 | 136 | 210 | |

1) Check the repetitive group ( D )

2) Report the group to panel A

3) select the internal surface (40 min)

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 → 11:59 | 12:00 → 14:59 | 15:00 → 18:00 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | [illegible] | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| [illegible] | [illegible] | [illegible] | [illegible] | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

4) Report the repetitive factor to panel B

5) Select the depth of the 2nd dive

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | [illegible] | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

6) Calculation of the Effective Bottom Time:
(Bottom time planned x Repeat factor ) 10 min x 1.5 = 15 min

7) Compare the "Effective Bottom Time" with the allowable "No-D limits":
No D limit (7 min) < effective bottom time (15 min) = Decompression requested

If decompression is requested, apply the calculation for effective bottom time: Apply deco. for 15 min at 110 ft

### *2.1.2.4 - Scenario #3: Repetitive dive requesting decompression with repetitive bottom time less than the no decompression limit in the dive table (table 1)*

- 1st dive: 60 ft / 50 min
- Surface interval: 1.45 hr
- 2nd dive depth: 60 ft
- Bottom time planned: 30 min

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 60 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | - | - | 1 | F |
| | 60 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | G |
| | 80 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | 10 | I |
| | 90 | - | - | - | - | - | - | - | 19 | 19 | J |
| | 100 | - | - | - | - | - | - | - | 26 | 26 | K |
| | 110 | - | - | - | - | - | - | - | 32 | 32 | L |
| | 120 | - | - | - | - | - | - | 2 | 37 | 39 | M |
| | 130 | - | - | - | - | - | - | 2 | 43 | 45 | |
| | 140 | - | - | - | - | - | - | 3 | 49 | 52 | |
| | 150 | - | - | - | - | - | - | 3 | 55 | 58 | |
| | 160 | - | - | - | - | - | - | 4 | 62 | 66 | |
| | 170 | - | - | - | - | - | - | 4 | 70 | 74 | |
| | 180 | - | - | - | - | - | - | 5 | 77 | 82 | |
| | 190 | - | - | - | - | - | - | 5 | 85 | 90 | |
| | 200 | - | - | - | - | - | - | 11 | 90 | 101 | |
| | 210 | - | - | - | - | - | - | 15 | 96 | 111 | |
| | 220 | - | - | - | - | - | - | 19 | 102 | 121 | |
| | 230 | - | - | - | - | - | - | 23 | 108 | 131 | |
| | 240 | - | - | - | - | - | - | 27 | 114 | 141 | |

1) Check the repetitive group ( D )

2) Report the group to panel A

3) select the internal surface (1.45 hr)

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 → 11:59 | 12:00 → 14:59 | 15:00 → 18:00 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | [illegible] | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

4) Report the repetitive factor to the panel B

5) Select the depth of the 2nd dive

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
|---|---|---|---|---|---|---|---|---|---|---|
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

6) Calculation of the Effective Bottom Time:
(Bottom time planned x Repeat factor )
30 min x 1.5 = 45

7) Compare the "Effective Bottom Time" with the allowable "No-D limits":
No D limit (27 min) < effective bottom time (45 min) = Decompression requested

8) Check the decompression on the dive table (table 1)

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |

9) If no decompression stop is indicated in the dive table (table 1) a 5 minutes stop at 10 ft is mandatory.
Apply 5 min decompression at 10 ft

### *2.1.2.5 - Scenario #4: Surface interval less than 15 minutes with 2nd dive at the same depth.*

- 1st dive: 60 ft / 30 min
- Surface interval: 10 min
- 2nd dive depth: 60 ft
- Bottom time planned: 25 min

Apply:
1st dive + 2nd dive = Bottom time to calculate the new decompression
30 minutes + 25 minutes = 55 minutes
Apply decompression for 55 minutes at 60 ft

### *2.1.2.6 - Scenario #5: Surface interval less than 15 minutes with 2nd dive not at the same depth.*

- 1st dive: 120 ft / 10 min
- Surface interval: 12 min
- 2nd dive depth: 70 ft
- Bottom time planned: 20 min

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 60 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 110 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | | | | | | | | | 2 | C |
| | 15 | - | - | - | - | - | - | - | 10 | 10 | E |
| | 20 | - | - | - | - | - | - | 5 | 10 | 15 | F |
| | 25 | - | - | - | - | - | - | 9 | 11 | 20 | G |
| | 30 | - | - | - | - | - | 5 | 7 | 17 | 29 | I |

1) Find the repetitive group from the 1st dive

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 70 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | | | | | | | | | 1 | C |
| | 25 | - | - | | | | | | | 1 | D |
| | 35 | - | - | | | | | | | 1 | E |
| | 40 | - | - | - | - | - | - | - | 5 | 5 | F |
| | 50 | - | - | - | - | - | - | - | 10 | 10 | G |
| | 60 | - | - | - | - | - | - | 2 | 11 | 13 | H |

2) Find the bottom time corresponding

Apply:
1st dive + new bottom time of the 2nd dive = Bottom time to calculate the new decompression
20 minutes + 20 minutes = 40 minutes
Apply decompression for 40 minutes at 70 ft

### *2.1.2.7 - Scenario #5: Find the minimum surface interval for a no decompression dive*

- 1st dive: 80 ft / 25 min
- repetitive group 1st dive: E
- 2nd dive depth: 50 ft
- Bottom time planned: 50 min
- Surface interval: ?

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:15 →0:29 | 0:30 →0:59 | 1:00 →1:29 | 1:30 →1:59 | 2:00 →2:59 | 3:00 →3:59 | 4:00 →5:59 | 6:00 →8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | | | | | | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | | | | | | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | | | | | | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| | | | | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| | | | | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| | | | | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| | | | | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

4) Find the corresponding surface interval

3) Find the repetitive factor corresponding to the repetitive group of the 1st dive

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 30 | 272 | 250 | 220 | | | | | | 157 | 150 |
| 40 | 136 | 125 | 115 | | | | | | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

2) Proceed upward to find the Repetitive factor

1) Enter in table B at the depth of the repetitive dive

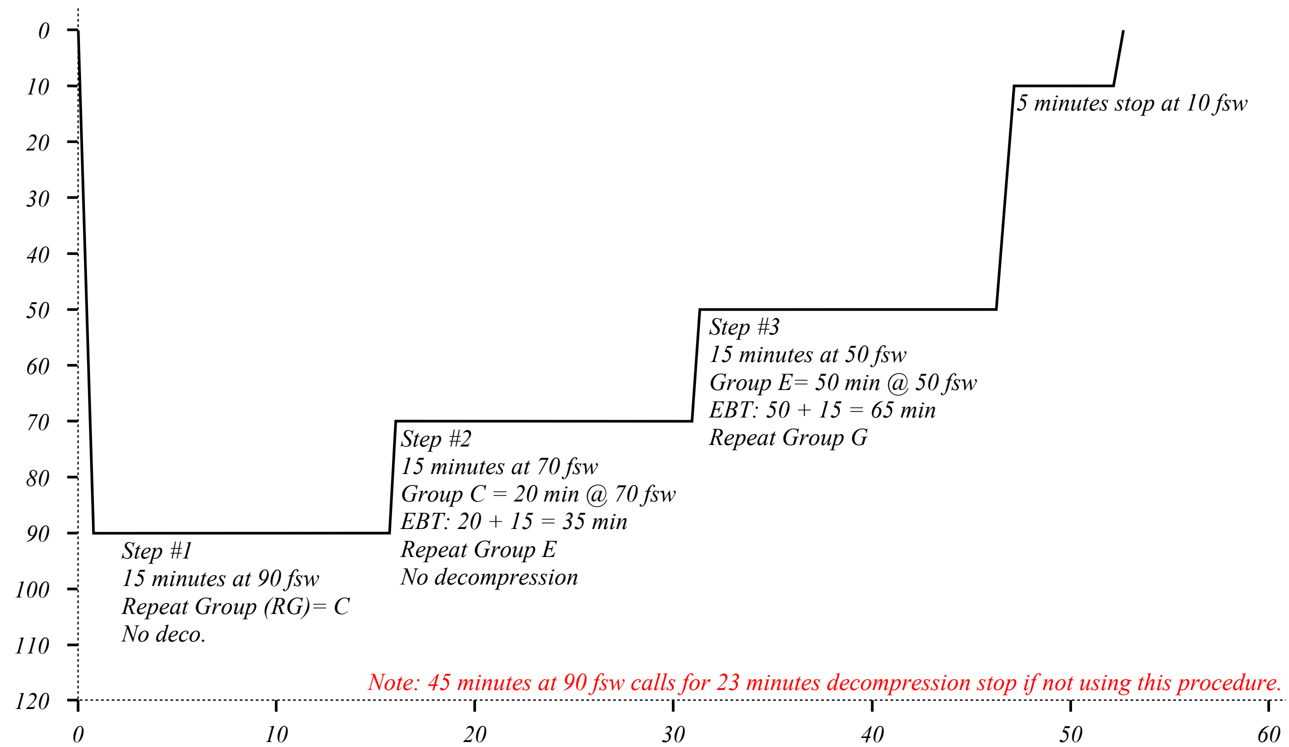
**2.1.3 - Multilevel diving** (Also called "riser dives")

A multi-level dive is a dive during which the bottom time is spent at two or more depths given in the tables.
These procedures are based solely on Table #1S (Short Standard Air Decompression) and should not be extended outside the limits of this table. They are based on repetitive diving procedures for less than 15 min surface intervals.
DCIEM recommends limiting the dive to 4 steps or less and plans to conduct the deepest part of the dive first and ascend to progressively shallower depths. However, many companies have banished the use of this procedure as a result of accidents due to miscalculations. For this reason, if it is decided to employ it, we recommend limiting it to only two steps.
The procedure of calculation is explained as follows by DCIEM:

A. Find the repetitive group (RG) for the depth and bottom time of Step 1. Example, for 15 min at 90 ft the RG is C *(see #1)*.
*B.* Proceed to the depth of Step 2 and find the bottom time for that RG. Example for a 2nd depth at 70 ft, the bottom time corresponding to group C is 20 minutes *(see #2)*
C. Add this bottom time to the planned time at Step 2. For example 15 minutes *(see #3)* The RG for this total time is the RG at the end of Step 2. In the example 15 min + 20 min @ 70 feet = 35 min / group E *(see #4)*.
*D.* Proceed to the depth of Step 3 and find the bottom time for the RG at the end of Step 2. In our example, at a depth of 50 feet, the bottom time group E is 50 minutes *(see #5)*.
E. Add this bottom time to the planned time at Step 3 to determine the RG at the end of Step 3. With our example, 15 minutes at 50 feet + 50 minutes = 65 min /group G
F. For each successive step shallower than the one before, ascend at least 20 fsw (6 msw) to and between stops in the dive (for depths greater than 100 fsw (30 msw), ascend at least 30 fsw (9 msw)).
G. for dives not requiring decompression after any level, finish the dive in shallow water in a depth range between 10 and 20 fsw (3 and 6 msw) for at least 5 minutes.

| Depth (fsw) | No-Decompression Bottom Times (min) | | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|---|
| 20 | 30 A 60 B 90 C 120 D | 150 E 180 F 240 G 300 H | 360 I 420 J 480 K 600 L | 720 M ∞ | | | | |
| 30 | 30 A 45 B 60 C 90 D | 100 E 120 F 150 G 180 H | 190 I 210 J 240 K 270 L | 300 M | 330 N 360 O | 400 | 420 | 450 |
| 40 | 22 A 30 B 40 C | 60 D 70 E 80 F | 90 G 120 H 130 I | 150 J | 160 K 170 L | 180 M 190 | 200 | 215 |
| 50 | 18 A 25 B | 30 C 40 D | 50 E 60 F | 75 G | 85 H 95 I | 105 J 115 K | 124 L | 132 M |
| 60 | 14 A 20 B | 25 C 30 D | 40 E | 50 F | 60 G | 70 H 80 I | 85 J | 92 K |
| Decompression Time in minutes at | | 10 fsw | | | 5 | 10 | 15 | 20 |
| 70 | 12 A 15 B | 20 C | 25 D | 35 E | 40 F | 50 G | 63 I | 66 J |
| 80 | 10 A 13 B | 15 C | 20 D | 25 E | 29 F | 35 G | 48 H | 52 I |
| 90 | 9 A | 12 B | 15 C | 20 D | 23 E | 27 F | 35 G | 43 I |
| 100 | 7 A | 10 B | 12 C | 15 D | 18 D | 21 E | 29 G | 36 H |
| 110 | | 6 A | 10 B | 12 C | 15 D | 18 E | 22 F | 30 H |
| 120 | | 6 A | 8 B | 10 C | 12 D | 15 E | 19 F | 25 G |
| 130 | | | 5 A | 8 B | 10 C | 13 D | 16 F | 21 G |
| 140 | | | 5 A | 7 B | 9 C | 11 D | 14 F | 18 G |
| 150 | | | 4 A | 6 B | 8 C | 10 D | 12 E | 15 F |
| Decompression Time in minutes at | | 20 fsw | | | - | - | 5 | 10 |
| | | 10 fsw | | | 5 | 10 | 10 | 10 |

The scheme below shows the steps described above. Again, the recommendation is to limit this procedure to only two steps.



If it is necessary to conduct a dive requiring decompression after any level, decompress for the maximum decompression attained (furthest right column attained in Table 1S).
Example:

*A.* Step #1: 120 fsw/15 min = group E (decompression required) *(see #7)*
*B.* Step #2: 50 fsw/15 min = Group E (previous depth) at 50 fsw + 15 min = 50 min + 15 min = 65 min / group G *(see #6).*
C. Decompression: 10 min at 10 fsw (for step #1)

DCIEM recommends allowing for a minimum surface interval of 1 hour after multilevel dive before diving again.

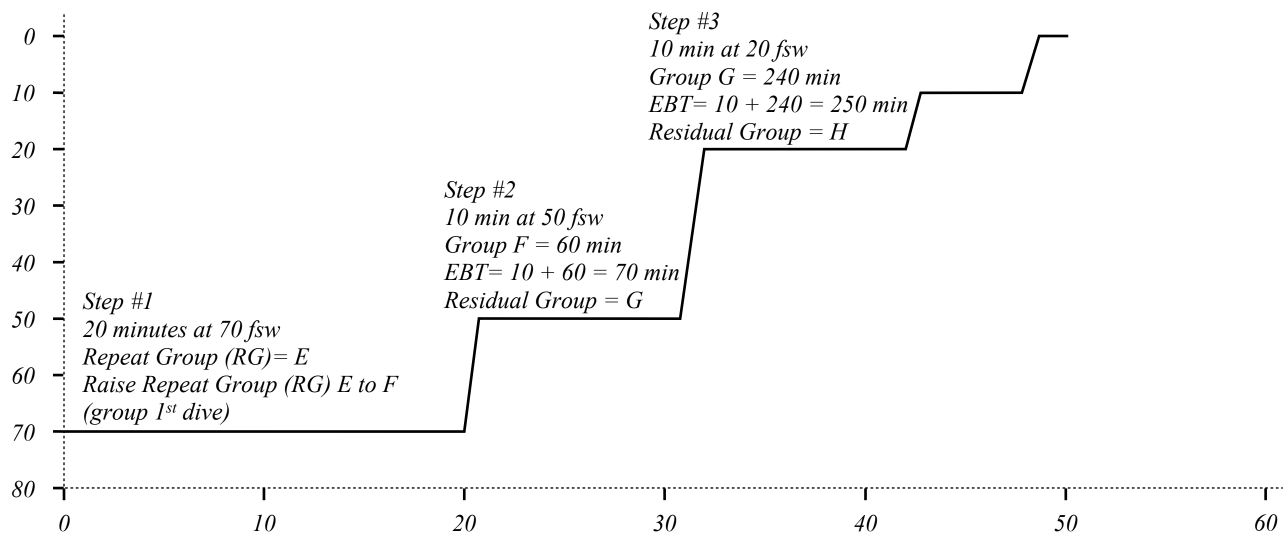
For a repetitive multi-level dive, it is recommended to multiply the actual bottom time of Step 1 by the repetitive factor (RF) to determine the effective bottom time and Group (RG) of the first step and use the procedure given above.
The RG for Step 1 must be greater than or equal to the RG from the preceding dive.
Before surfacing, DCIEM recommends spend at least 5 minutes at a depth between 10 and 20 fsw (3 and 6 msw) either as a final step in the dive or as a safety stop.
These instructions apply only for each successive step shallower than the one before with the EBT (Equivalent Bottom Time) at each step within the no-decompression limit. Example:

- 1st dive: Group (RG) = F, Surface Interval (SI), Repetitive Factor (RF) = 1.3
- 2nd dive
  - Step #1: 70 fsw/20 min, Equivalent Bottom Time (EBT) = 26 min, Group (RG) = E
    Raise RG=E to RG=F
  - Step #2: 50 fsw/10 min, group F (step #1) = 60 min at this depth
    Equivalent Bottom Time (EBT) = 60 min + 10 min = 70 min / Group (RG) G
  - Step #3: 20 fsw/10 min, group G (step #2) = 240 min at this depth
    Equivalent Bottom Time (EBT) = 10 min + 240 min = 250 min / Group H

*Dive #1:*
*Repeat Group (RG)= F*

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |



### 2.1.4 - Depth correction for diving at altitude

Diving at altitude requires the adaptation of decompression tables due to the variation of surface atmospheric pressure. A commonly used procedure to calculate the necessary correction consists of calculating the "Equivalent depth" using the equation below, based on the ratio between the absolute ambient pressure at depth and the surface atmospheric pressure. Note that the equivalent depth is always more profound than the actual depth, and the decompression time is therefore always longer than at sea level.

$$\text{Equivalent depth} = \frac{\text{Actual depth at dive site x Atmospheric pressure at sea level}}{\text{Atmospheric pressure at dive site}}$$

Another problem due to the difference between the local and sea level atmospheric pressures is the variation of the reference pressure of bourdon tube depth gauges that results in degraded readings. As a result, the depth read at the gauge is shallower than the actual depth. This variation can be calculated in metres using the formula below:

*10 x (atmospheric pressure sea level (bar) - atmospheric pressure worksite (bar)).*

With the imperial system, this variation can also be calculated using the formula below:

*33 x (atmospheric pressure sea level (atm) - atmospheric pressure worksite (atm)).*

Add the calculated variation to the reading provided by the bourdon tube gauge to obtain the actual depth.
Note that electronic diving depth gauges display the real (actual) depths.

DCIEM has developed table 5 to provide depth corrections for selected altitudes from 300 feet (100 metres) to 10,000 feet (3000 metres). These depth corrections are added to the actual depth to determine the dive profile to be used for decompression purposes. In addition, Table 5 gives the actual stop depths to be used in place of the standard decompression stops. The procedure for using this table is as follows:

*A.* Establish the altitude of the dive site and determine the actual maximum water depth of the dive *(see #1).*

B. Find the correction for the actual depth according to the altitude and add this correction to the actual depth to obtain the Effective Depth (ED).

C. Determine the decompression schedule from the appropriate decompression table by applying the Effective Depth and the actual planned bottom time.

*D.* Replace the stop depths from the normal decompression table with the actual stop depths shown at the bottom of Table 5 (the stop times are not changed) *(see #2).*

E. Decompress on this altitude schedule in accordance with normal procedures using the regular travel rates. (Above 5000 feet (1500 metres), reduce the ascent rate to 50 ft/min (15 m/min).)

Example:
For a dive 23 minutes at 100 fsw at 7200 ft altitude, the depth correction is +30 fsw *(see #3)*.
Thus, the effective depth is 100 + 30 = 130 fsw.
The decompression stops for 130 fsw/25 min are:

- 30 fsw/5 minutes
- 20 fsw/7 minutes
- 10 fsw/12 minutes

The decompression stops with corrections are:

- 24 fsw/5 minutes *(see #4)*
- 16 fsw/7 minutes *(see #5)*
- 8 fsw/12 minutes *(see #6)*

The corrections for altitude shown in Table 5 only apply to divers who have spent at least 24 hours at the altitude of the dive site.

| Actual Depth (feet) | Depth Correction at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| 30 | +0 | +10 | +10 | +10 | +10 | +10 | +10 | +20 | +20 |
| 40 | +0 | +10 | +10 | +10 | +10 | +10 | +20 | +20 | +20 |
| 50 | +0 | +10 | +10 | +10 | +10 | +20 | +20 | +20 | +20 |
| 60 | +0 | +10 | +10 | +10 | +20 | +20 | +20 | +20 | +30 |
| 70 | +0 | +10 | +10 | +10 | +20 | +20 | +20 | +30 | +30 |
| 80 | +0 | +10 | +10 | +20 | +20 | +20 | +30 | +30 | +40 |
| 90 | +0 | +10 | +10 | +20 | +20 | +20 | +30 | +30 | +40 |
| 100 | +0 | +10 | +10 | +20 | +20 | +30 | +30 | +30 | +40 |
| 110 | +0 | +10 | +20 | +20 | +20 | +30 | +30 | +40 | +50 |
| 120 | +0 | +10 | +20 | +20 | +30 | +30 | +30 | +40 | +50 |
| 130 | +0 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +50 |
| 140 | +0 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +60 |
| 150 | +10 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | +60 |
| 160 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +50 | +60 |
| 170 | +10 | +20 | +20 | +30 | +30 | +40 | +50 | +50 | +70 |
| 180 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | +50 | |
| 190 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | | |
| 200 | +10 | +20 | +20 | +30 | +40 | +40 | | | |
| 210 | +10 | +20 | +20 | +30 | | | | | |
| 220 | +10 | +20 | | | | | | | |
| 230 | +10 | | | | | | | | |

| Sea Level Stop Depth (feet) | Actual Decompression Stop Depth at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| 10 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| 20 | 20 | 20 | 19 | 18 | 18 | 17 | 16 | 16 | 15 |
| 30 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 24 | 23 |
| 40 | 40 | 39 | 38 | 36 | 35 | 34 | 32 | 31 | 30 |
| 50 | 50 | 49 | 47 | 45 | 44 | 42 | 40 | 39 | 38 |
| 60 | 59 | 58 | 56 | 54 | 52 | 50 | 48 | 47 | 45 |
| 70 | 69 | 68 | 66 | 63 | 61 | 59 | 56 | 54 | 52 |
| 80 | 79 | 77 | 75 | 72 | 70 | 67 | 64 | 62 | 60 |
| 90 | 89 | 87 | 84 | 81 | 78 | 75 | 72 | 70 | 67 |

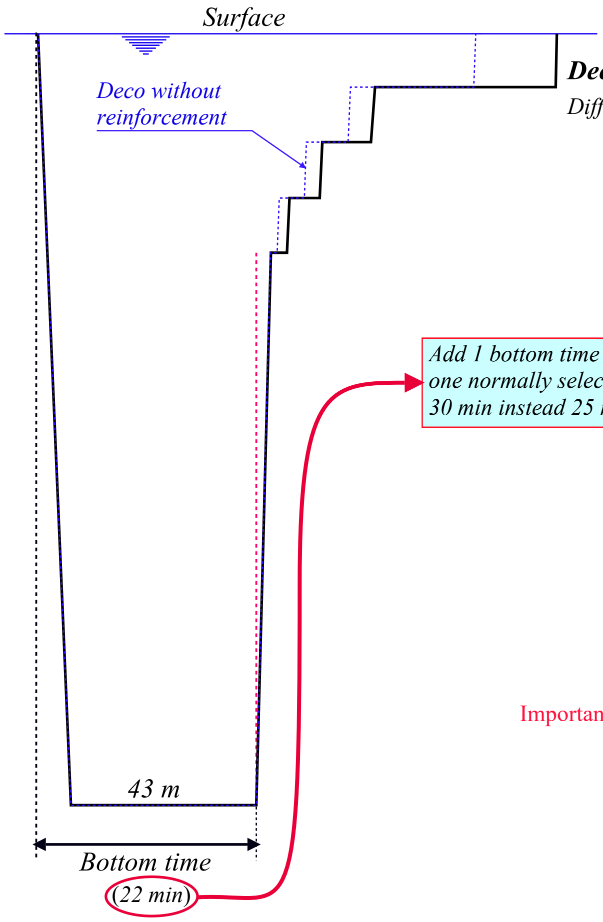
If diving at altitude is conducted within 24 hours of arriving at the altitude of the dive site, apply an additional 10 feet (3 metres) to the actual maximum depth of the dive used in Table 5.

Thus, using the previous example, the depth considered is 100 + 10 = 110 fsw instead of 100 fsw. The depth correction for 110 fsw at 7200 ft altitude is + 40 ft, so the effective depth is 110 + 40 = 150 fsw.

Hyperlink Table of contents

### 2.1.5 - Decompression reinforcements (Jesus factor) implementation

These reinforcements are based on the explanations provided in Section 1.5, which discuss the reinforcement of the original procedures outlined in this manual. The recommendation is to apply an additional bottom time or depth at a minimum, except for light work performed in perfect diving conditions. It is also recommended to reinforce the decompression procedure for divers over 50 years old.



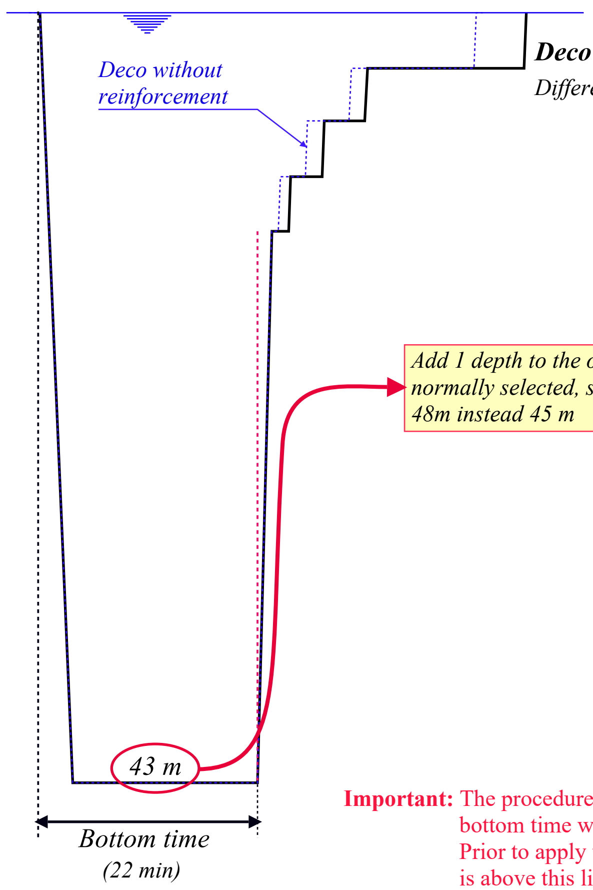

***Deco with reinforcement of 1 additional bottom time***

*Difference = + 15 minutes*

*Add 1 bottom time to the one normally selected, so 30 min instead 25 min*

| Depth (msw) | Bottom Time (min) | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Stop Times (min) at Different Depths (msw) | | | | | | | | | |
| 45 | 7 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 9 | 9 | D |
| | 15 | - | - | - | - | - | - | 8 | 9 | 17 | F |
| | 20 | - | - | - | - | - | 6 | 7 | 11 | 24 | H |
| | 25 | - | - | - | - | 4 | 5 | 8 | 23 | 40 | J |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | 9 | 34 | 55 | K |
| | 35 | - | - | - | 3 | 5 | 7 | 10 | 44 | 69 | M |
| | 40 | - | - | - | 4 | 6 | 7 | 15 | 52 | 84 | O |
| | 45 | - | - | - | 5 | 6 | 8 | 21 | 61 | 101 | |
| | 50 | - | - | - | 6 | 7 | 8 | 27 | 73 | 121 | |
| | 55 | - | - | 3 | 5 | 6 | 9 | 33 | 88 | 144 | |
| | 60 | - | - | 3 | 5 | 7 | 12 | 38 | 103 | 168 | |
| | 65 | - | - | 4 | 5 | 8 | 16 | 42 | 119 | 194 | |
| | 70 | - | - | 5 | 5 | 8 | 20 | 48 | 132 | 218 | |
| | 75 | - | - | 5 | 6 | 8 | 24 | 55 | 142 | 240 | |
| | 80 | - | - | 6 | 6 | 8 | 28 | 63 | 150 | 261 | |

Important: The procedure is a reinforcement of the decompression, and does not change the real bottom time which is limited by the "maximum operational limit UK-HSE" line.
Prior to apply the safety procedure, make sure that the "normal bottom time" on the table is above this limit, them apply the safety procedure…




***Deco with reinforcement of 1 additional depth***

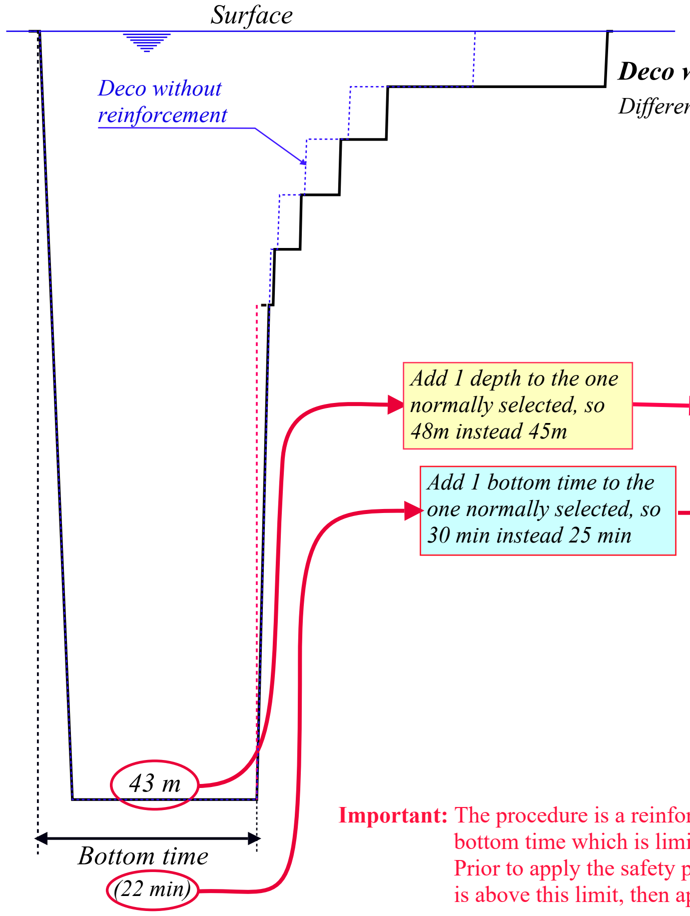
*Difference = + 9 minutes*

*Add 1 depth to the one normally selected, so 48m instead 45 m*

| Depth (msw) | Bottom Time (min) | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Stop Times (min) at Different Depths (msw) | | | | | | | | | |
| 48 | 6 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 11 | 11 | D |
| | 15 | - | - | - | - | - | 4 | 6 | 10 | 20 | G |
| | 20 | - | - | - | - | - | 8 | 8 | 14 | 30 | H |
| | 25 | - | - | - | - | 6 | 6 | 8 | 29 | 49 | K |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | 3 | 5 | 7 | 9 | 40 | 64 | M |
| | 35 | - | - | - | 5 | 5 | 8 | 13 | 49 | 80 | N |
| | 40 | - | - | - | 6 | 6 | 8 | 20 | 59 | 99 | |

| Depth (msw) | Bottom Time (min) | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Stop Times (min) at Different Depths (msw) | | | | | | | | | |
| 45 | 7 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 9 | 9 | D |
| | 15 | - | - | - | - | - | - | 8 | 9 | 17 | F |
| | 20 | - | - | - | - | - | 6 | 7 | 11 | 24 | H |
| | 25 | - | - | - | - | 4 | 5 | 8 | 23 | 40 | J |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | 9 | 34 | 55 | K |
| | 35 | - | - | - | 3 | 5 | 7 | 10 | 44 | 69 | M |
| | 40 | - | - | - | 4 | 6 | 7 | 15 | 52 | 84 | O |
| | 45 | - | - | - | 5 | 6 | 8 | 21 | 61 | 101 | |

**Important:** The procedure is a reinforcement of the decompression, and does not change the real bottom time which is limited by the "maximum operational limit UK-HSE" line.
Prior to apply the safety procedure, make sure that the "normal bottom time" on the table is above this limit, then apply the safety procedure…




***Deco with reinforcement of 1 depth and 1 bottom time***

*Difference = + 24 minutes*

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 6 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 11 | 11 | D |
| | 15 | - | - | - | - | - | 4 | 6 | 10 | 20 | G |
| | 20 | - | - | - | - | - | 8 | 8 | 14 | 30 | H |
| | 25 | - | - | - | - | 6 | 6 | 8 | 29 | 49 | K |
| Maximum operational limit UK-HSE | | | | | | | | | | | |
| | 30 | | | - | 3 | 5 | 7 | 9 | 40 | 64 | M |
| 48 | 35 | - | - | - | 5 | 5 | 8 | 13 | 49 | 80 | N |
| | 40 | - | - | - | 6 | 6 | 8 | 20 | 59 | 99 | |
| | 45 | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] | [illegible] |

| Depth (msw) | Bottom Time (min) | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | - | - | - | - | - | - | 8 | 9 | 17 | F |
| | 20 | - | - | - | - | - | 6 | 7 | 11 | 24 | H |
| | 25 | - | - | - | - | 4 | 5 | 8 | 23 | 40 | J |
| Maximum operational limit UK-HSE | | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | 9 | 34 | 55 | K |
| | 35 | - | - | - | 3 | 5 | 7 | 10 | 44 | 69 | M |
| 45 | 40 | - | - | - | 4 | 6 | 7 | 15 | 52 | 84 | O |
| | 45 | - | - | - | 5 | 6 | 8 | 21 | 61 | 101 | |
| | 50 | - | - | - | 6 | 7 | 8 | 27 | 73 | 121 | |

**Important:** The procedure is a reinforcement of the decompression, and does not change the real bottom time which is limited by the "maximum operational limit UK-HSE" line.
Prior to apply the safety procedure, make sure that the "normal bottom time" on the table is above this limit, then apply the safety procedure…

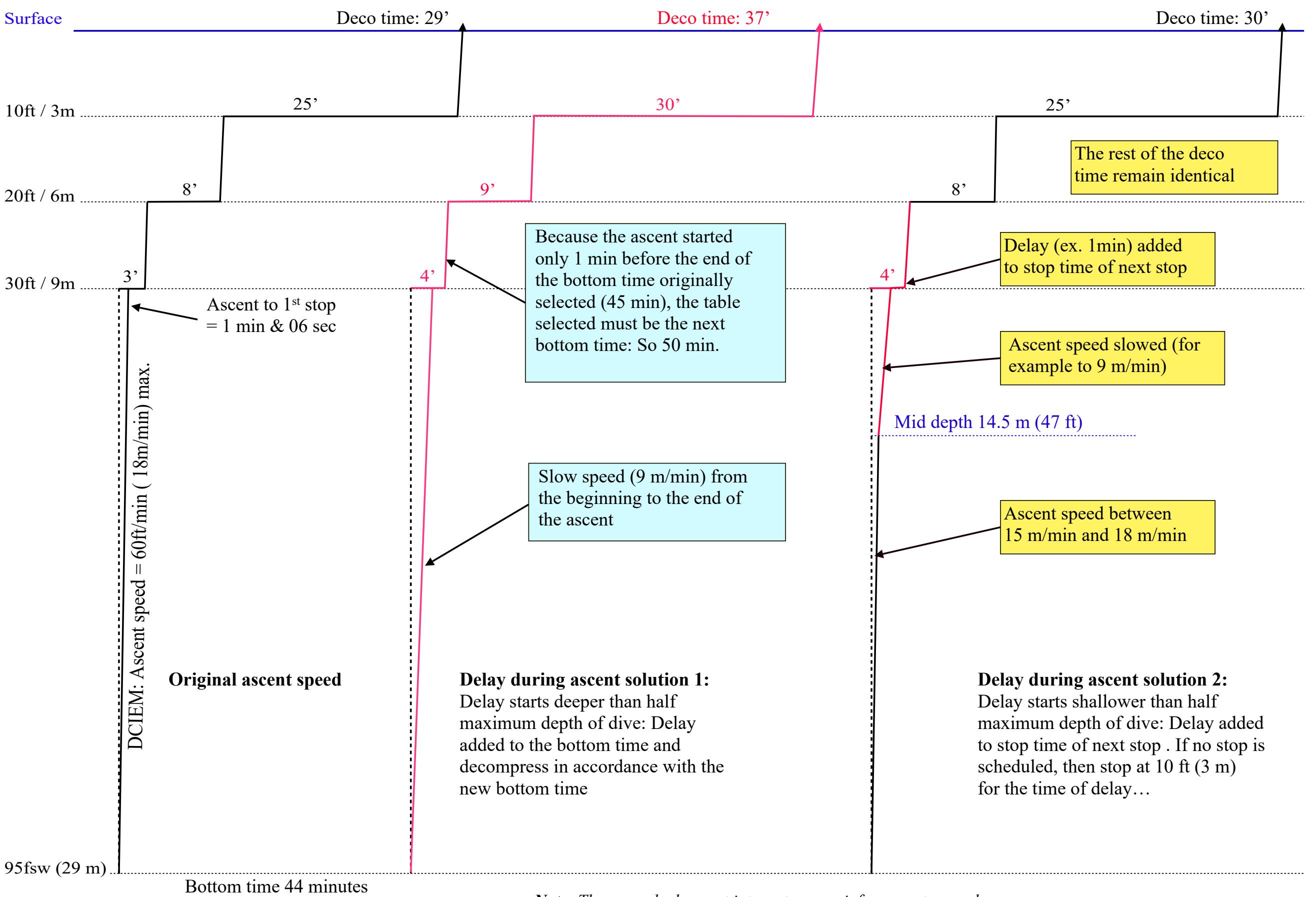
### 2.1.6 - Contingencies

#### *2.1.6.1 - Ascent to 1st stop too slow*

Two procedures are available:

1. Delay starts deeper than half maximum depth of dive:
   "Delay added to the bottom time and decompress in accordance with the new bottom time": The effect of this procedure is additional bottom time.
2. Delay starts shallower than half maximum depth of dive:
   "Delay added to stop time of next stop . If no stop is scheduled, then stop at 10 ft (3 m) for the time of delay"…
   In this case a variable ascent speed with a fast speed followed by a slow speed is applied with a minor modification of the decompression originally selected as the result.

See the example below for a dive at 29 m/ 44 min:




***Note:** The example does not integrate any reinforcement procedure*

Note: If the supervisor decides to select a slower ascent than the one recommended by DCIEM, one of these procedures should be applied. Refer to point #3.5 "About the ascent rate of 18 m (60 ft) per minute", in Book #2 of this handbook for more information regarding this point and the desirability of modifying the ascent rate.

#### *2.1.6.2 - Ascent rate too fast*

There are three possible scenarios:

- If stops have to be performed, DCIEM says that No action is requested because the time at stop includes the travel time.
- If there is no stop to perform, DCIEM recommends observing the diver for at least 1 hour.
- The 3rd procedure is the one applied with all diving tables when detected sufficiently early during the ascent: Slow down the ascent, wait to catch the normal ascent time scheduled and continue the ascent normally.

#### *2.1.6.3 - Omitted decompression*

DCIEM considers scenarios with the chamber not at the direct proximity of the dive station so that more than 7 minutes are necessary for the diver to reach it from the in-water stop at 9 m, and the chamber in immediate proximity so that less than 7 minutes are necessary to reach It from the in-water stop at 9 m.
Note that these timings should be tested using proper drills, considering the time to undress the diver and transfer him to the chamber without running on the deck.

A - If the DDC is not at direct proximity *(Common scenario when using scuba replacement)*:

- Solution #1: Return the diver to the next deeper stop where the omission occurred, repeat this stop and continue the decompression using the original schedule. Then put the diver under 100% O2 and transfer him to DDC.
- Solution #2: If no deeper stop was called for, spend the time of the 1st stop at the next deeper stop and complete the total schedule. Then put the diver under 100% O2 and transfer him to DDC.

- Example #1:

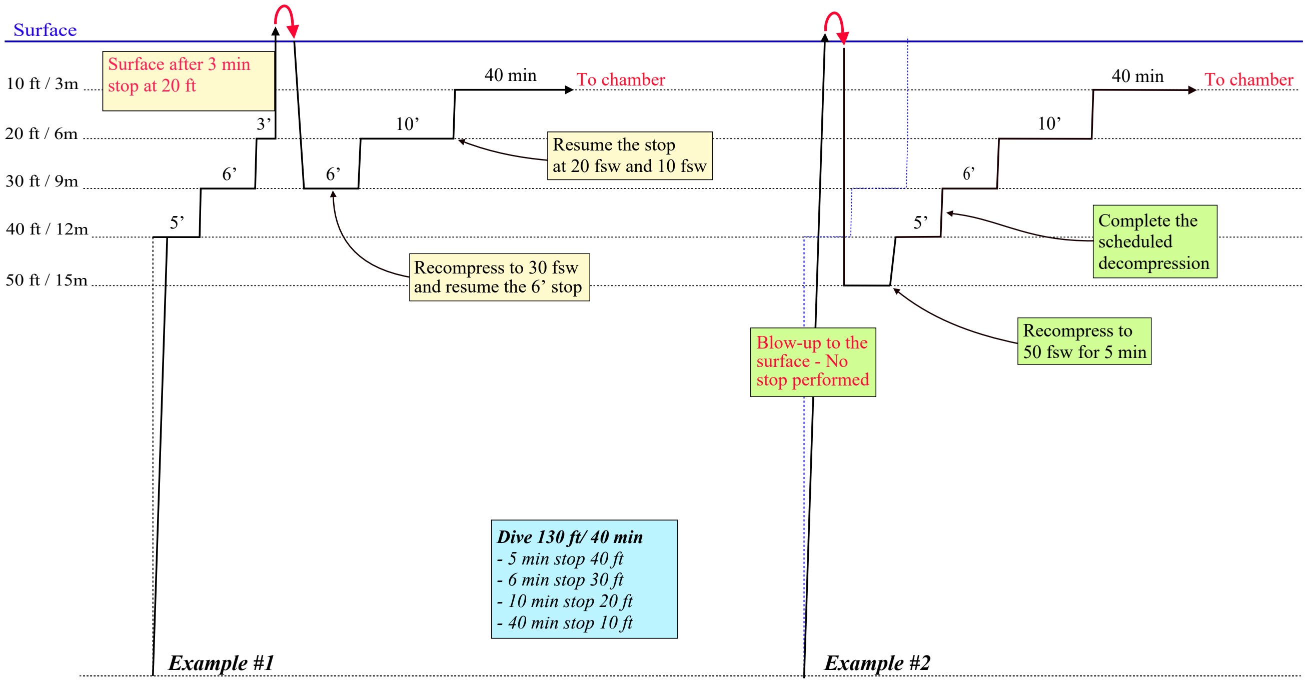
A dive at 130 fsw/40 min bottom time calls for the following stops:

- 40 fsw - 5 min stop.
- 30 fsw - 6 min stop.
- 20 fsw - 10 min stop.
- 10 fsw - 40 min stop.

If the diver surfaces after completing the 40 fsw stop, the 30 fsw stop, and 3 min of the 20 fsw stop and is asymptomatic,
He should be immediately compressed to 30 fsw for 6 min. Then, the schedule beginning with the 20 fsw stop is resumed.

- Example #2:

During a dive with the same parameters as above, if the diver loses control and surfaces (blow-up) while moving to the 40 fsw stop and is asymptomatic, he should be recompressed without delay to 50 fsw, then the scheduled stops are completed.




- Solution #3: This procedure is not indicated by DCIEM. However, it is implemented by many companies when diving with the chamber reachable within 15 minutes. It consists of giving O2 100% to the diver, transferring him to the chamber as soon as possible, and watching for signs of DCS and pulmonary barotrauma during the transfer to DDC. When the diver is in the chamber, the following treatment tables should be applied:
    a) Table 5 if less than 30 min omitted decompression
    b) Table 6 if 30 minutes or more omitted decompression.

B - Recompression in DDC possible in less than 7 minutes:

- If a stop 9 m is completed and no previous decompression omitted, or the stops below 20 ft (6 m) not scheduled; recompress the diver at 40 ft (12 m) in the chamber in less than 7 min, and decompress him using the surface O2 decompression table.
- If a 30 ft (9 m) stop or deeper was scheduled and is not performed, treat as follows:
    a) Use treatment table 5 if less than 30 min omitted decompression
    b) Use treatment table 6 if 30 minutes or more omitted decompression.

C - Important note regarding all treatments:

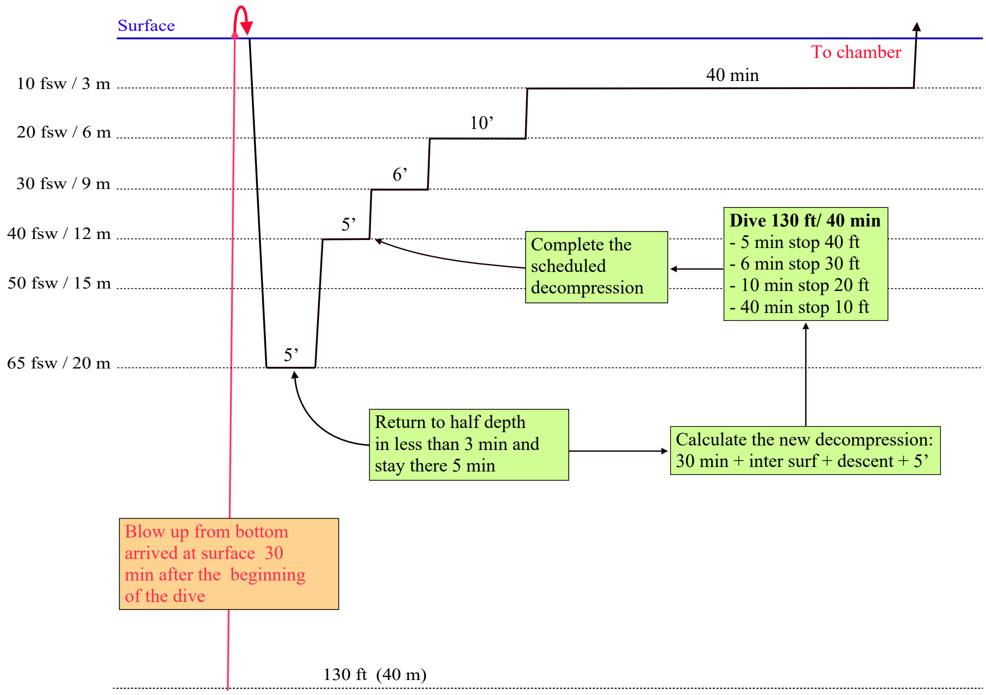
- Contact the Diving medical specialist as soon as possible.
- Examination for DCS and pulmonary barotrauma to be performed before and during the treatment.
- If any suspicion of DCS or pulmonary barotrauma and the diving medical specialist is not reachable, apply the chart for decompression accident.

### *2.1.6.4 - Additional procedures for blow-up*

These procedures have been used for a long time. They are more conservative than the procedure DCIEM for blow-up in the previous point and should be considered for this reason.

A - If the DDC is not at direct proximity:

- If the condition of the diver allows it, he returns to half depth in less than 3 minutes and carry out 5 minutes stop. The decompression is renewed, based on the total diving time, including re-descent and the five minute stop at half depth. When at the surface give 100% O2 to the diver, and transfer him to the chamber. When the diver is in the chamber, treat as follows:
    a) Use treatment table 5 if less than 30 min omitted decompression.
    b) Use treatment table 6 if 30 minutes or more omitted decompression.




B - If the chamber is at direct proximity:

- Transfer to the chamber and treat:
  - a) Use treatment table 5 if less than 30 min omitted decompression.
  - b) Use treatment table 6 if 30 minutes or more omitted decompression.

C - Important note regarding all treatments:

- Contact the Diving medical specialist as soon as possible.
- Examination for DCS and pulmonary barotrauma to be performed before and during the treatment.
- If any suspicion of DCS or pulmonary barotrauma and the diving medical specialist is not reachable, apply the chart for decompression accident.

### *2.1.6.5 - Decompression sickness during the stops*

The treatment cannot be performed in the water:

- Transfer the diver into the chamber and treat according to the charts in Book #2 “Description and prevention of diving accidents”/ Decompression sickness / Part C “recompression tables US navy rev 6.1”
- Contact the Diving medical specialist as soon as possible.

**2.1.7 - Air standard tables DCIEM - Imperial**

***2.1.7.1 - Table 1S "Short standard air decompression" - Imperial***

This table has to be used for information, and to calculate multilevel diving. It is not to be used to manage the dives.

| Depth (fsw) | No-Decompression Bottom Times (min) | | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|---|
| 20 | 30 A<br>60 B<br>90 C<br>120 D | 150 E<br>180 F<br>240 G<br>300 H | 360 I<br>420 J<br>480 K<br>600 L | 720 M<br>∞ | | | | |
| 30 | 30 A<br>45 B<br>60 C<br>90 D | 100 E<br>120 F<br>150 G<br>180 H | 190 I<br>210 J<br>240 K<br>270 L | 300 M | 330 N<br>360 O | 400 | 420 | 450 |
| 40 | 22 A<br>30 B<br>40 C | 60 D<br>70 E<br>80 F | 90 G<br>120 H<br>130 I | 150 J | 160 K<br>170 L | 180 M<br>190 | 200 | 215 |
| 50 | 18 A<br>25 B | 30 C<br>40 D | 50 E<br>60 F | 75 G | 85 H<br>95 I | 105 J<br>115 K | 124 L | 132 M |
| 60 | 14 A<br>20 B | 25 C<br>30 D | 40 E | 50 F | 60 G | 70 H<br>80 I | 85 J | 92 K |
| Decompression Time in minutes at | | | 10 fsw | | 5 | 10 | 15 | 20 |
| 70 | 12 A<br>15 B | 20 C | 25 D | 35 E | 40 F | 50 G | 63 I | 66 J |
| 80 | 10 A<br>13 B | 15 C | 20 D | 25 E | 29 F | 35 G | 48 H | 52 I |
| 90 | 9 A | 12 B | 15 C | 20 D | 23 E | 27 F | 35 G | 43 I |
| 100 | 7 A | 10 B | 12 C | 15 D | 18 D | 21 E | 29 G | 36 H |
| 110 | | 6 A | 10 B | 12 C | 15 D | 18 E | 22 F | 30 H |
| 120 | | 6 A | 8 B | 10 C | 12 D | 15 E | 19 F | 25 G |
| 130 | | | 5 A | 8 B | 10 C | 13 D | 16 F | 21 G |
| 140 | | | 5 A | 7 B | 9 C | 11 D | 14 F | 18 G |
| 150 | | | 4 A | 6 B | 8 C | 10 D | 12 E | 15 F |
| Decompression Time in minutes at | | | 20 fsw | | - | - | 5 | 10 |
| | | | 10 fsw | | 5 | 10 | 10 | 10 |

Table of contents

*2.1.7.2 - Table 1 "Standard air decompression - Imperial"*

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 20 | 30 | - | - | - | - | - | - | - | - | 1 | A |
| | 60 | - | - | - | - | - | - | - | - | 1 | B |
| | 90 | - | - | - | - | - | - | - | - | 1 | C |
| | 120 | - | - | - | - | - | - | - | - | 1 | D |
| | 150 | - | - | - | - | - | - | - | - | 1 | E |
| | 180 | - | - | - | - | - | - | - | - | 1 | F |
| | 240 | - | - | - | - | - | - | - | - | 1 | G |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 300 | - | - | - | - | - | - | - | - | 1 | H |
| | 360 | - | - | - | - | - | - | - | - | 1 | I |
| | 420 | - | - | - | - | - | - | - | - | 1 | J |
| | 480 | - | - | - | - | - | - | - | - | 1 | K |
| | 600 | - | - | - | - | - | - | - | - | 1 | L |
| | 720 | - | - | - | - | - | - | - | - | 1 | M |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 30 | 30 | - | - | - | - | - | - | - | - | 1 | A |
| | 60 | - | - | - | - | - | - | - | - | 1 | C |
| | 90 | - | - | - | - | - | - | - | - | 1 | D |
| | 120 | - | - | - | - | - | - | - | - | 1 | F |
| | 150 | - | - | - | - | - | - | - | - | 1 | G |
| | 180 | - | - | - | - | - | - | - | - | 1 | H |
| | 210 | - | - | - | - | - | - | - | - | 1 | J |
| | 240 | - | - | - | - | - | - | - | - | 1 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 270 | - | - | - | - | - | - | - | - | 1 | L |
| | 300 | - | - | - | - | - | - | - | - | 1 | M |
| | 330 | - | - | - | - | - | - | - | 3 | 3 | N |
| | 360 | - | - | - | - | - | - | - | 5 | 5 | O |
| | 390 | - | - | - | - | - | - | - | 7 | 7 | |
| | 400 | - | - | - | - | - | - | - | 10 | 10 | |
| | 420 | - | - | - | - | - | - | - | 14 | 14 | |
| | 450 | - | - | - | - | - | - | - | 19 | 19 | |
| | 480 | - | - | - | - | - | - | - | 23 | 23 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 40 | 20 | - | - | - | - | - | - | - | - | 1 | A |
| | 30 | - | - | - | - | - | - | - | - | 1 | B |
| | 60 | - | - | - | - | - | - | - | - | 1 | D |
| | 90 | - | - | - | - | - | - | - | - | 1 | G |
| | 120 | - | - | - | - | - | - | - | - | 1 | H |
| | 150 | - | - | - | - | - | - | - | - | 1 | J |
| | 160 | - | - | - | - | - | - | - | 3 | 3 | K |
| | 170 | - | - | - | - | - | - | - | 5 | 5 | L |
| | 180 | - | - | - | - | - | - | - | 8 | 8 | M |
| | 190 | - | - | - | - | - | - | - | 10 | 10 | |
| | 200 | - | - | - | - | - | - | - | 14 | 14 | |
| | 210 | - | - | - | - | - | - | - | 18 | 18 | |
| | 240 | - | - | - | - | - | - | - | 28 | 28 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 270 | - | - | - | - | - | - | - | 38 | 38 | |
| | 300 | - | - | - | - | - | - | - | 48 | 48 | |
| | 330 | - | - | - | - | - | - | - | 57 | 57 | |
| | 360 | - | - | - | - | - | - | - | 66 | 66 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 50 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | C |
| | 40 | - | - | - | - | - | - | - | - | 1 | D |
| | 50 | - | - | - | - | - | - | - | - | 1 | E |
| | 60 | - | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | - | - | 1 | G |
| | 100 | - | - | - | - | - | - | - | 6 | 6 | I |
| | 120 | - | - | - | - | - | - | - | 12 | 12 | K |
| | 130 | - | - | - | - | - | - | - | 18 | 18 | L |
| | 140 | - | - | - | - | - | - | - | 24 | 24 | M |
| | 150 | - | - | - | - | - | - | - | 29 | 29 | |
| | 160 | - | - | - | - | - | - | - | 33 | 33 | |
| | 170 | - | - | - | - | - | - | - | 38 | 38 | |
| | 180 | - | - | - | - | - | - | - | 43 | 43 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 200 | - | - | - | - | - | - | - | 53 | 53 | |
| | 220 | - | - | - | - | - | - | - | 63 | 63 | |
| | 240 | - | - | - | - | - | - | - | 74 | 74 | |
| | 260 | - | - | - | - | - | - | - | 86 | 86 | |
| | 280 | - | - | - | - | - | - | - | 97 | 97 | |

Hyperlink Table of contents

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 60 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | - | - | 1 | F |
| | 60 | - | - | - | - | - | - | - | 5 | 5 | G |
| | 80 | - | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | - | 19 | 19 | J |
| | 100 | - | - | - | - | - | - | - | 26 | 26 | K |
| | 110 | - | - | - | - | - | - | - | 32 | 32 | L |
| | 120 | - | - | - | - | - | - | 2 | 37 | 39 | M |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 130 | - | - | - | - | - | - | 2 | 43 | 45 | |
| | 140 | - | - | - | - | - | - | 3 | 49 | 52 | |
| | 150 | - | - | - | - | - | - | 3 | 55 | 58 | |
| | 160 | - | - | - | - | - | - | 4 | 62 | 66 | |
| | 170 | - | - | - | - | - | - | 4 | 70 | 74 | |
| | 180 | - | - | - | - | - | - | 5 | 77 | 82 | |
| | 190 | - | - | - | - | - | - | 5 | 85 | 90 | |
| | 200 | - | - | - | - | - | - | 11 | 90 | 101 | |
| | 210 | - | - | - | - | - | - | 15 | 96 | 111 | |
| | 220 | - | - | - | - | - | - | 19 | 102 | 121 | |
| | 230 | - | - | - | - | - | - | 23 | 108 | 131 | |
| | 240 | - | - | - | - | - | - | 27 | 114 | 141 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 70 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | C |
| | 25 | - | - | - | - | - | - | - | - | 1 | D |
| | 35 | - | - | - | - | - | - | - | - | 1 | E |
| | 40 | - | - | - | - | - | - | - | 5 | 5 | F |
| | 50 | - | - | - | - | - | - | - | 10 | 10 | G |
| | 60 | - | - | - | - | - | - | 2 | 11 | 13 | H |
| | 70 | - | - | - | - | - | - | 3 | 19 | 22 | J |
| | 80 | - | - | - | - | - | - | 4 | 27 | 31 | K |
| | 90 | - | - | - | - | - | - | 5 | 34 | 39 | M |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 100 | - | - | - | - | - | - | 6 | 41 | 47 | N |
| | 110 | - | - | - | - | - | - | 7 | 48 | 55 | |
| | 120 | - | - | - | - | - | - | 8 | 56 | 64 | |
| | 130 | - | - | - | - | - | - | 9 | 65 | 74 | |
| | 140 | - | - | - | - | - | - | 11 | 74 | 85 | |
| | 150 | - | - | - | - | - | - | 17 | 81 | 98 | |
| | 160 | - | - | - | - | - | - | 22 | 89 | 111 | |
| | 170 | - | - | - | - | - | - | 27 | 98 | 125 | |
| | 180 | - | - | - | - | - | - | 31 | 107 | 138 | |
| | 190 | - | - | - | - | - | - | 36 | 115 | 151 | |
| | 200 | - | - | - | - | - | 2 | 39 | 123 | 164 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 80 | 10 | - | - | - | - | - | - | - | - | 2 | A |
| | 15 | - | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | - | - | 2 | E |
| | 30 | - | - | - | - | - | - | - | 6 | 6 | F |
| | 40 | - | - | - | - | - | - | 2 | 10 | 12 | G |
| | 50 | - | - | - | - | - | - | 4 | 12 | 16 | H |
| | 55 | - | - | - | - | - | - | 5 | 17 | 22 | I |
| | 60 | - | - | - | - | - | - | 6 | 22 | 28 | J |
| | 65 | - | - | - | - | - | - | 7 | 27 | 34 | J |
| | 70 | - | - | - | - | - | - | 8 | 31 | 39 | K |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 75 | - | - | - | - | - | - | 9 | 35 | 44 | L |
| | 80 | - | - | - | - | - | - | 9 | 40 | 49 | M |
| | 85 | - | - | - | - | - | - | 10 | 44 | 54 | |
| | 90 | - | - | - | - | - | - | 11 | 48 | 59 | |
| | 95 | - | - | - | - | - | - | 11 | 53 | 64 | |
| | 100 | - | - | - | - | - | 2 | 10 | 58 | 70 | |
| | 110 | - | - | - | - | - | 3 | 14 | 66 | 83 | |
| | 120 | - | - | - | - | - | 3 | 20 | 76 | 99 | |
| | 130 | - | - | - | - | - | 4 | 24 | 87 | 115 | |
| | 140 | - | - | - | - | - | 5 | 29 | 98 | 132 | |
| | 150 | - | - | - | - | - | 5 | 35 | 109 | 149 | |
| | 160 | - | - | - | - | - | 6 | 40 | 120 | 166 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 90 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 15 | - | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | - | 8 | 8 | E |
| | 30 | - | - | - | - | - | - | 3 | 9 | 12 | F |
| | 40 | - | - | - | - | - | - | 6 | 11 | 17 | H |
| | 45 | - | - | - | - | - | - | 7 | 16 | 23 | I |
| | 50 | - | - | - | - | - | - | 9 | 21 | 30 | J |
| | 55 | - | - | - | - | - | - | 10 | 27 | 37 | K |
| | 60 | - | - | - | - | - | 2 | 9 | 32 | 43 | L |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 65 | - | - | - | - | - | 3 | 9 | 37 | 49 | |
| | 70 | - | - | - | - | - | 4 | 9 | 42 | 55 | |
| | 75 | - | - | - | - | - | 4 | 10 | 47 | 61 | |
| | 80 | - | - | - | - | - | 5 | 10 | 53 | 68 | |
| | 85 | - | - | - | - | - | 5 | 11 | 59 | 75 | |
| | 90 | - | - | - | - | - | 6 | 15 | 62 | 83 | |
| | 95 | - | - | - | - | - | 6 | 18 | 68 | 92 | |
| | 100 | - | - | - | - | - | 7 | 21 | 73 | 101 | |
| | 110 | - | - | - | - | - | 8 | 26 | 87 | 121 | |
| | 120 | - | - | - | - | - | 8 | 33 | 101 | 142 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 15 | - | - | - | - | - | - | - | - | 2 | D |
| | 20 | - | - | - | - | - | - | - | 8 | 8 | E |
| | 25 | - | - | - | - | - | - | 3 | 10 | 13 | F |
| | 30 | - | - | - | - | - | - | 6 | 10 | 16 | G |
| | 35 | - | - | - | - | - | - | 8 | 11 | 19 | H |
| | 40 | - | - | - | - | - | - | 9 | 18 | 27 | I |
| | 45 | - | - | - | - | - | 3 | 8 | 25 | 36 | J |
| | 50 | - | - | - | - | - | 4 | 9 | 30 | 43 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 55 | - | - | - | - | - | 5 | 9 | 37 | 51 | L |
| | 60 | - | - | - | - | - | 6 | 9 | 43 | 58 | |
| | 65 | - | - | - | - | - | 7 | 10 | 48 | 65 | |
| | 70 | - | - | - | - | - | 8 | 10 | 55 | 73 | |
| | 75 | - | - | - | - | - | 8 | 15 | 59 | 82 | |
| | 80 | - | - | - | - | - | 9 | 18 | 65 | 92 | |
| | 85 | - | - | - | - | 2 | 8 | 22 | 71 | 103 | |
| | 90 | - | - | - | - | 2 | 8 | 25 | 79 | 114 | |
| | 95 | - | - | - | - | 3 | 8 | 29 | 87 | 127 | |
| | 100 | - | - | - | - | 3 | 9 | 32 | 95 | 139 | |
| | 105 | - | - | - | - | 4 | 8 | 36 | 104 | 152 | |
| | 110 | - | - | - | - | 4 | 9 | 39 | 112 | 164 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 110 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 12 | - | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | - | 5 | 5 | D |
| | 20 | - | - | - | - | - | - | 3 | 9 | 12 | F |
| | 25 | - | - | - | - | - | - | 6 | 10 | 16 | G |
| | 30 | - | - | - | - | - | - | 9 | 11 | 20 | H |
| | 35 | - | - | - | - | - | 4 | 7 | 19 | 30 | I |
| | 40 | - | - | - | - | - | 5 | 8 | 26 | 39 | J |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 45 | - | - | - | - | - | 6 | 9 | 33 | 48 | K |
| | 50 | - | - | - | - | - | 8 | 9 | 39 | 56 | M |
| | 55 | - | - | - | - | - | 9 | 9 | 46 | 64 | N |
| | 60 | - | - | - | - | 3 | 7 | 11 | 53 | 74 | |
| | 65 | - | - | - | - | 3 | 8 | 16 | 58 | 85 | |
| | 70 | - | - | - | - | 4 | 8 | 20 | 64 | 96 | |
| | 75 | - | - | - | - | 5 | 8 | 23 | 73 | 109 | |
| | 80 | - | - | - | - | 5 | 8 | 28 | 81 | 122 | |
| | 85 | - | - | - | - | 6 | 8 | 32 | 91 | 137 | |
| | 90 | - | - | - | - | 6 | 9 | 35 | 101 | 151 | |
| | 95 | - | - | - | - | 7 | 9 | 40 | 111 | 167 | |
| | 100 | - | - | - | - | 7 | 10 | 44 | 120 | 181 | |
| | 105 | - | - | - | - | 8 | 13 | 46 | 129 | 196 | |
| | 110 | - | - | - | - | 8 | 16 | 50 | 136 | 210 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 120 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | - | 10 | 10 | E |
| | 20 | - | - | - | - | - | - | 5 | 10 | 15 | F |
| | 25 | - | - | - | - | - | - | 9 | 11 | 20 | G |
| | 30 | - | - | - | - | - | 5 | 7 | 17 | 29 | I |
| | 35 | - | - | - | - | - | 6 | 9 | 25 | 40 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | 9 | 33 | 50 | K |
| | 45 | - | - | - | - | 3 | 7 | 9 | 41 | 60 | M |
| | 50 | - | - | - | - | 4 | 7 | 10 | 49 | 70 | N |
| | 55 | - | - | - | - | 5 | 7 | 15 | 54 | 81 | |
| | 60 | - | - | - | - | 6 | 8 | 19 | 61 | 94 | |
| | 65 | - | - | - | - | 7 | 8 | 23 | 70 | 108 | |
| | 70 | - | - | - | - | 7 | 9 | 27 | 80 | 123 | |
| | 75 | - | - | - | 2 | 6 | 9 | 32 | 91 | 140 | |
| | 80 | - | - | - | 3 | 6 | 9 | 37 | 103 | 158 | |
| | 85 | - | - | - | 3 | 7 | 10 | 41 | 114 | 175 | |
| | 90 | - | - | - | 3 | 7 | 14 | 44 | 124 | 192 | |
| | 95 | - | - | - | 4 | 7 | 16 | 49 | 134 | 210 | |
| | 100 | - | - | - | 4 | 7 | 20 | 53 | 142 | 226 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 130 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 8 | - | - | - | - | - | - | - | - | 2 | B |
| | 10 | - | - | - | - | - | - | - | 5 | 5 | C |
| | 15 | - | - | - | - | - | - | 4 | 9 | 13 | E |
| | 20 | - | - | - | - | - | - | 8 | 10 | 18 | G |
| | 25 | - | - | - | - | - | 5 | 7 | 12 | 24 | H |
| | 30 | - | - | - | - | - | 7 | 8 | 23 | 38 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 3 | 6 | 9 | 32 | 50 | K |
| | 40 | - | - | - | - | 5 | 6 | 10 | 40 | 61 | M |
| | 45 | - | - | - | - | 6 | 7 | 10 | 50 | 73 | N |
| | 50 | - | - | - | - | 7 | 8 | 16 | 55 | 86 | |
| | 55 | - | - | - | 2 | 6 | 8 | 21 | 64 | 101 | |
| | 60 | - | - | - | 3 | 6 | 8 | 26 | 75 | 118 | |
| | 65 | - | - | - | 4 | 6 | 9 | 31 | 86 | 136 | |
| | 70 | - | - | - | 5 | 6 | 9 | 36 | 100 | 156 | |
| | 75 | - | - | - | 5 | 7 | 11 | 40 | 113 | 176 | |
| | 80 | - | - | - | 6 | 7 | 15 | 44 | 125 | 197 | |
| | 85 | - | - | - | 6 | 7 | 18 | 49 | 135 | 215 | |
| | 90 | - | - | - | 7 | 7 | 22 | 54 | 144 | 234 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 140 | 7 | - | - | - | - | - | - | - | - | 2 | B |
| | 10 | - | - | - | - | - | - | - | 7 | 7 | D |
| | 15 | - | - | - | - | - | - | 6 | 9 | 15 | F |
| | 20 | - | - | - | - | - | 4 | 7 | 11 | 22 | G |
| | 25 | - | - | - | - | - | 7 | 8 | 19 | 34 | I |
| | 30 | - | - | - | - | 4 | 6 | 9 | 29 | 48 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 6 | 6 | 10 | 39 | 61 | L |
| | 40 | - | - | - | - | 7 | 7 | 10 | 49 | 73 | N |
| | 45 | - | - | - | 3 | 6 | 7 | 17 | 56 | 89 | O |
| | 50 | - | - | - | 4 | 6 | 8 | 22 | 65 | 105 | |
| | 55 | - | - | - | 5 | 6 | 9 | 27 | 78 | 125 | |
| | 60 | - | - | - | 6 | 6 | 9 | 33 | 91 | 145 | |
| | 65 | - | - | - | 7 | 6 | 11 | 38 | 106 | 168 | |
| | 70 | - | - | 2 | 5 | 7 | 15 | 42 | 120 | 191 | |
| | 75 | - | - | 3 | 5 | 8 | 18 | 47 | 133 | 214 | |
| | 80 | - | - | 3 | 6 | 8 | 21 | 54 | 143 | 235 | |
| | 85 | - | - | 4 | 6 | 8 | 25 | 61 | 151 | 255 | |
| | 90 | - | - | 4 | 6 | 8 | 30 | 68 | 157 | 273 | |

Table of contents

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 150 | 6 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 9 | 9 | D |
| | 15 | - | - | - | - | - | - | 8 | 10 | 18 | F |
| | 20 | - | - | - | - | - | 6 | 8 | 11 | 25 | H |
| | 25 | - | - | - | - | 4 | 6 | 8 | 25 | 43 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 7 | 9 | 35 | 57 | K |
| | 35 | - | - | - | 3 | 5 | 7 | 10 | 46 | 71 | M |
| | 40 | - | - | - | 4 | 6 | 8 | 16 | 54 | 88 | O |
| | 45 | - | - | - | 6 | 6 | 8 | 22 | 65 | 107 | |
| | 50 | - | - | - | 7 | 6 | 9 | 28 | 78 | 128 | |
| | 55 | - | - | 3 | 5 | 6 | 10 | 34 | 94 | 152 | |
| | 60 | - | - | 4 | 5 | 7 | 13 | 39 | 110 | 178 | |
| | 65 | - | - | 4 | 6 | 7 | 17 | 44 | 125 | 203 | |
| | 70 | - | - | 5 | 6 | 7 | 21 | 50 | 139 | 228 | |
| | 75 | - | - | 6 | 5 | 8 | 25 | 58 | 148 | 250 | |
| | 80 | - | - | 6 | 6 | 8 | 29 | 67 | 155 | 271 | |

Air standard tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 160 | 6 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 3 | 9 | 12 | D |
| | 15 | - | - | - | - | - | 4 | 7 | 10 | 21 | G |
| | 20 | - | - | - | - | 3 | 5 | 8 | 16 | 32 | H |
| | 25 | - | - | - | - | 6 | 6 | 9 | 30 | 51 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 30 | - | - | - | 4 | 5 | 6 | 10 | 42 | 67 | M |
| | 35 | - | - | - | 5 | 6 | 7 | 14 | 52 | 84 | N |
| | 40 | - | - | - | 7 | 6 | 8 | 21 | 62 | 104 | |
| | 45 | - | - | 3 | 5 | 6 | 9 | 28 | 76 | 127 | |
| | 50 | - | - | 4 | 5 | 7 | 9 | 35 | 93 | 153 | |
| | 55 | - | - | 5 | 6 | 7 | 14 | 39 | 112 | 183 | |
| | 60 | - | - | 6 | 6 | 7 | 18 | 45 | 129 | 211 | |
| | 65 | - | 3 | 4 | 6 | 8 | 22 | 53 | 142 | 238 | |
| | 70 | - | 3 | 5 | 6 | 8 | 27 | 62 | 152 | 263 | |

Air standard tables DCIEM / Imperial

| Warning: The maximum operational depth UK-HSE is 164 ft | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 170 | 5 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 5 | 9 | 14 | D |
| | 15 | - | - | - | - | - | 6 | 7 | 10 | 23 | G |
| | 20 | - | - | - | - | 5 | 6 | 8 | 22 | 41 | I |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 25 | - | - | - | 3 | 5 | 6 | 10 | 35 | 59 | K |
| | 30 | - | - | - | 6 | 5 | 7 | 11 | 48 | 77 | M |
| | 35 | - | - | 3 | 4 | 6 | 8 | 19 | 58 | 98 | O |
| | 40 | - | - | 4 | 5 | 6 | 9 | 26 | 72 | 122 | |
| | 45 | - | - | 6 | 5 | 6 | 10 | 34 | 91 | 152 | |
| | 50 | - | 3 | 4 | 5 | 7 | 14 | 39 | 111 | 183 | |
| | 55 | - | 3 | 5 | 5 | 8 | 19 | 45 | 129 | 214 | |
| | 60 | - | 4 | 5 | 6 | 8 | 23 | 54 | 144 | 244 | |
| | 65 | - | 5 | 5 | 6 | 8 | 29 | 64 | 154 | 271 | |
| | 70 | - | 5 | 5 | 7 | 12 | 31 | 76 | 160 | 296 | |

Air standard tables DCIEM / Imperial

| Warning: The maximum operational depth UK-HSE is 164 ft | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 180 | 5 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 7 | 9 | 16 | E |
| | 15 | - | - | - | - | - | 8 | 7 | 11 | 26 | H |
| | 20 | - | - | - | - | 7 | 6 | 8 | 27 | 48 | J |
| | 25 | - | - | - | 5 | 5 | 7 | 10 | 40 | 67 | M |
| | 30 | - | - | 3 | 5 | 5 | 8 | 15 | 53 | 89 | O |
| | 35 | - | - | 5 | 5 | 6 | 8 | 24 | 66 | 114 | |
| | 40 | - | 3 | 4 | 5 | 6 | 9 | 32 | 85 | 144 | |
| | 45 | - | 4 | 4 | 5 | 7 | 14 | 38 | 107 | 179 | |
| | 50 | - | 5 | 4 | 6 | 7 | 19 | 45 | 127 | 213 | |
| | 55 | - | 5 | 5 | 6 | 8 | 24 | 53 | 144 | 245 | |
| | 60 | 3 | 3 | 5 | 7 | 9 | 29 | 65 | 155 | 276 | |

Air standard tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | |
| 190 | 5 | - | - | - | - | - | - | - | - | - | - | 3 |
| | 10 | - | - | - | - | - | - | - | - | 8 | 10 | 18 |
| | 15 | - | - | - | - | - | - | 4 | 5 | 8 | 13 | 30 |
| | 20 | - | - | - | - | - | 4 | 5 | 6 | 9 | 31 | 55 |
| | 25 | - | - | - | - | 3 | 4 | 5 | 7 | 11 | 46 | 76 |
| | 30 | - | - | - | - | 5 | 5 | 5 | 8 | 20 | 58 | 101 |
| | 35 | - | - | - | 3 | 4 | 5 | 6 | 9 | 29 | 76 | 132 |
| | 40 | - | - | - | 5 | 4 | 5 | 7 | 12 | 36 | 100 | 169 |
| | 45 | - | - | - | 6 | 4 | 6 | 7 | 18 | 43 | 123 | 207 |
| | 50 | - | - | 3 | 4 | 4 | 6 | 8 | 24 | 52 | 141 | 242 |
| | 55 | - | - | 4 | 4 | 5 | 6 | 10 | 28 | 65 | 154 | 276 |

Air standard tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | |
| 200 | 5 | - | - | - | - | - | - | - | - | - | 4 | 4 |
| | 10 | - | - | - | - | - | - | - | 4 | 6 | 10 | 20 |
| | 15 | - | - | - | - | - | - | 6 | 5 | 8 | 18 | 37 |
| | 20 | - | - | - | - | - | 6 | 4 | 7 | 9 | 36 | 62 |
| | 25 | - | - | - | - | 5 | 4 | 5 | 8 | 14 | 51 | 87 |
| | 30 | - | - | - | 3 | 4 | 5 | 6 | 8 | 24 | 67 | 117 |
| | 35 | - | - | - | 5 | 4 | 5 | 7 | 9 | 34 | 89 | 153 |
| | 40 | - | - | 3 | 3 | 5 | 5 | 8 | 16 | 40 | 115 | 195 |
| | 45 | - | - | 4 | 4 | 4 | 6 | 8 | 22 | 49 | 137 | 234 |
| | 50 | - | - | 5 | 4 | 5 | 6 | 10 | 27 | 62 | 153 | 272 |

Air standard tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | |
| 210 | 5 | - | - | - | - | - | - | - | - | - | 6 | 6 |
| | 10 | - | - | - | - | - | - | - | 5 | 7 | 10 | 22 |
| | 15 | - | - | - | - | - | - | 7 | 6 | 8 | 22 | 43 |
| | 20 | - | - | - | - | 4 | 3 | 5 | 7 | 10 | 40 | 69 |
| | 25 | - | - | - | - | 6 | 5 | 5 | 8 | 18 | 55 | 97 |
| | 30 | - | - | - | 5 | 4 | 5 | 6 | 9 | 29 | 76 | 134 |
| | 35 | - | - | 3 | 4 | 4 | 5 | 7 | 14 | 36 | 103 | 176 |
| | 40 | - | - | 5 | 3 | 5 | 6 | 8 | 19 | 46 | 130 | 222 |
| | 45 | - | - | 6 | 4 | 4 | 7 | 8 | 27 | 57 | 149 | 262 |
| | 50 | - | 3 | 4 | 4 | 5 | 7 | 13 | 31 | 74 | 160 | 301 |

Air standard tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | |
| 220 | 5 | - | - | - | - | - | - | - | - | - | 7 | 7 |
| | 10 | - | - | - | - | - | - | - | 7 | 7 | 10 | 24 |
| | 15 | - | - | - | - | - | 5 | 4 | 6 | 8 | 27 | 50 |
| | 20 | - | - | - | - | 5 | 4 | 5 | 7 | 10 | 46 | 77 |
| | 25 | - | - | - | 4 | 4 | 4 | 6 | 9 | 22 | 61 | 110 |
| | 30 | - | - | 3 | 4 | 4 | 5 | 7 | 9 | 33 | 87 | 152 |
| | 35 | - | - | 5 | 3 | 5 | 5 | 8 | 17 | 40 | 117 | 200 |
| | 40 | - | 3 | 3 | 4 | 5 | 6 | 8 | 24 | 52 | 142 | 247 |
| | 45 | | 4 | 3 | 4 | 6 | 6 | 12 | 29 | 68 | 157 | 289 |

Air standard tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | |
| 230 | 5 | - | - | - | - | - | - | - | - | - | 8 | 8 |
| | 10 | - | - | - | - | - | - | - | 8 | 7 | 11 | 26 |
| | 15 | - | - | - | - | - | 6 | 4 | 7 | 9 | 30 | 56 |
| | 20 | - | - | - | - | 6 | 4 | 6 | 7 | 14 | 48 | 85 |
| | 25 | - | - | - | 6 | 4 | 4 | 7 | 8 | 26 | 69 | 124 |
| | 30 | - | - | 5 | 3 | 4 | 6 | 7 | 12 | 36 | 100 | 173 |
| | 35 | - | 4 | 3 | 3 | 5 | 6 | 8 | 20 | 46 | 131 | 226 |
| | 40 | - | 5 | 3 | 4 | 5 | 6 | 10 | 27 | 61 | 151 | 272 |

Air standard tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | |
| 240 | 5 | - | - | - | - | - | - | - | - | - | 9 | 9 |
| | 10 | - | - | - | - | - | - | 5 | 5 | 7 | 11 | 28 |
| | 15 | - | - | - | - | - | 7 | 5 | 6 | 9 | 34 | 61 |
| | 20 | - | - | - | 5 | 3 | 4 | 6 | 8 | 17 | 53 | 96 |
| | 25 | - | - | 4 | 3 | 4 | 5 | 7 | 9 | 29 | 78 | 139 |
| | 30 | - | 4 | 2 | 4 | 4 | 6 | 7 | 16 | 39 | 113 | 195 |
| | 35 | - | 5 | 3 | 4 | 5 | 6 | 8 | 24 | 52 | 142 | 249 |
| | 40 | 4 | 2 | 4 | 4 | 5 | 7 | 13 | 30 | 71 | 159 | 299 |

*2.1.7.3 - Tables A and B for repetitive dive calculation - Imperial*

| A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

| B. NO-DECOMPRESSION REPETITIVE DIVING TABLE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

*2.1.7.4 - Table #5 - Depth correction for diving at altitude - Imperial*

| Actual Depth (feet) | Depth Correction at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| 30 | +0 | +10 | +10 | +10 | +10 | +10 | +10 | +20 | +20 |
| 40 | +0 | +10 | +10 | +10 | +10 | +10 | +20 | +20 | +20 |
| 50 | +0 | +10 | +10 | +10 | +10 | +20 | +20 | +20 | +20 |
| 60 | +0 | +10 | +10 | +10 | +20 | +20 | +20 | +20 | +30 |
| 70 | +0 | +10 | +10 | +10 | +20 | +20 | +20 | +30 | +30 |
| 80 | +0 | +10 | +10 | +20 | +20 | +20 | +30 | +30 | +40 |
| 90 | +0 | +10 | +10 | +20 | +20 | +20 | +30 | +30 | +40 |
| 100 | +0 | +10 | +10 | +20 | +20 | +30 | +30 | +30 | +40 |
| 110 | +0 | +10 | +20 | +20 | +20 | +30 | +30 | +40 | +50 |
| 120 | +0 | +10 | +20 | +20 | +30 | +30 | +30 | +40 | +50 |
| 130 | +0 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +50 |
| 140 | +0 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +60 |
| 150 | +10 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | +60 |
| 160 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +50 | +60 |
| 170 | +10 | +20 | +20 | +30 | +30 | +40 | +50 | +50 | +70 |
| 180 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | +50 | |
| 190 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | | |
| 200 | +10 | +20 | +20 | +30 | +40 | +40 | | | |
| 210 | +10 | +20 | +20 | +30 | | | | | |
| 220 | +10 | +20 | | | | | | | |
| 230 | +10 | | | | | | | | |
| **Sea Level Stop Depth (feet)** | **Actual Decompression Stop Depth at Altitude (feet)** | | | | | | | | |
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| 10 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| 20 | 20 | 20 | 19 | 18 | 18 | 17 | 16 | 16 | 15 |
| 30 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 24 | 23 |
| 40 | 40 | 39 | 38 | 36 | 35 | 34 | 32 | 31 | 30 |
| 50 | 50 | 49 | 47 | 45 | 44 | 42 | 40 | 39 | 38 |
| 60 | 59 | 58 | 56 | 54 | 52 | 50 | 48 | 47 | 45 |
| 70 | 69 | 68 | 66 | 63 | 61 | 59 | 56 | 54 | 52 |
| 80 | 79 | 77 | 75 | 72 | 70 | 67 | 64 | 62 | 60 |
| 90 | 89 | 87 | 84 | 81 | 78 | 75 | 72 | 70 | 67 |

## 2.1.8 - Air standard tables DCIEM - Metric

### *2.1.8.1 - Table 1S "Short standard air decompression" - Metric*

This table has to be used for information, and to calculate multilevel diving. It is not to be used to manage the dives.

| Depth (msw) | No-Decompression Bottom Times (min) | | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | 30 A<br>60 B<br>90 C<br>120 D | 150 E<br>180 F<br>240 G<br>300 H | 360 I<br>420 J<br>480 K<br>600 L | 720 M<br>∞ | | | | |
| 9 | 30 A<br>45 B<br>60 C<br>90 D | 100 E<br>120 F<br>150 G<br>180 H | 190 I<br>210 J<br>240 K<br>270 L | 300 M | 330 N<br>360 O | 400 | 420 | 480 |
| 12 | 22 A<br>30 B<br>40 C | 60 D<br>70 E<br>80 F | 90 G<br>120 H<br>130 I | 150 J | 160 K<br>170 L<br>180 M | 200 | 210 | 220 |
| 15 | 18 A<br>25 B | 30 C<br>40 D | 50 E<br>60 F | 75 G | 90 H<br>100 I | 110 J<br>120 K | 128 L | 137 M |
| 18 | 14 A<br>20 B | 25 C<br>30 D | 40 E | 50 F | 60 G | 70 H<br>80 I | 88 J | 95 K |
| Decompression Time in minutes at | | | 3 msw | | 5 | 10 | 15 | 20 |
| 21 | 12 A<br>15 B | 20 C | 25 D | 35 E | 40 F | 53 H | 65 I | 68 J |
| 24 | 10 A<br>13 B | 15 C | 20 D | 25 E | 30 F | 37 G | 50 H | 54 I |
| 27 | 9 A | 12 B | 15 C | 20 D | 24 E | 28 F | 35 G | 44 I |
| 30 | 7 A | 10 B | 12 C | 15 D | 18 D | 22 F | 30 G | 37 H |
| 33 | | 6 A | 10 B | 12 C | 15 D | 18 E | 24 G | 31 H |
| 36 | | 6 A | 8 B | 10 C | 12 D | 15 E | 19 F | 25 G |
| 39 | | | 5 A | 8 B | 10 C | 13 D | 17 F | 21 G |
| 42 | | | 5 A | 7 B | 9 C | 12 D | 14 F | 18 G |
| 45 | | | 4 A | 7 B | 8 C | 10 D | 13 F | 16 G |
| Decompression Time in minutes at | | | 6 msw | | - | - | 5 | 10 |
| | | | 3 msw | | 5 | 10 | 10 | 10 |

*2.1.8.2 - Table 1 "Standard air decompression" - Metric*

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 6 | 30 | - | - | - | - | - | - | - | - | 1 | A |
| | 60 | - | - | - | - | - | - | - | - | 1 | B |
| | 90 | - | - | - | - | - | - | - | - | 1 | C |
| | 120 | - | - | - | - | - | - | - | - | 1 | D |
| | 150 | - | - | - | - | - | - | - | - | 1 | E |
| | 180 | - | - | - | - | - | - | - | - | 1 | F |
| | 240 | - | - | - | - | - | - | - | - | 1 | G |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 300 | - | - | - | - | - | - | - | - | 1 | H |
| | 360 | - | - | - | - | - | - | - | - | 1 | I |
| | 420 | - | - | - | - | - | - | - | - | 1 | J |
| | 480 | - | - | - | - | - | - | - | - | 1 | K |
| | 600 | - | - | - | - | - | - | - | - | 1 | L |
| | 720 | - | - | - | - | - | - | - | - | 1 | M |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 9 | 30 | - | - | - | - | - | - | - | - | 1 | A |
| | 60 | - | - | - | - | - | - | - | - | 1 | C |
| | 90 | - | - | - | - | - | - | - | - | 1 | D |
| | 120 | - | - | - | - | - | - | - | - | 1 | F |
| | 150 | - | - | - | - | - | - | - | - | 1 | G |
| | 180 | - | - | - | - | - | - | - | - | 1 | H |
| | 210 | - | - | - | - | - | - | - | - | 1 | J |
| | 240 | - | - | - | - | - | - | - | - | 1 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 270 | - | - | - | - | - | - | - | - | 1 | L |
| | 300 | - | - | - | - | - | - | - | - | 1 | M |
| | 330 | - | - | - | - | - | - | - | 3 | 3 | N |
| | 360 | - | - | - | - | - | - | - | 5 | 5 | O |
| | 400 | - | - | - | - | - | - | - | 7 | 7 | |
| | 420 | - | - | - | - | - | - | - | 10 | 10 | |
| | 450 | - | - | - | - | - | - | - | 15 | 15 | |
| | 480 | - | - | - | - | - | - | - | 20 | 20 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 12 | 20 | - | - | - | - | - | - | - | - | 1 | A |
| | 30 | - | - | - | - | - | - | - | - | 1 | B |
| | 60 | - | - | - | - | - | - | - | - | 1 | D |
| | 90 | - | - | - | - | - | - | - | - | 1 | G |
| | 120 | - | - | - | - | - | - | - | - | 1 | H |
| | 150 | - | - | - | - | - | - | - | - | 1 | J |
| | 180 | - | - | - | - | - | - | - | 5 | 5 | M |
| | 200 | - | - | - | - | - | - | - | 10 | 10 | |
| | 210 | - | - | - | - | - | - | - | 15 | 15 | |
| | 220 | - | - | - | - | - | - | - | 19 | 19 | |
| | 240 | - | - | - | - | - | - | - | 26 | 26 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 270 | - | - | - | - | - | - | - | 35 | 35 | |
| | 300 | - | - | - | - | - | - | - | 44 | 44 | |
| | 330 | - | - | - | - | - | - | - | 53 | 53 | |
| | 360 | - | - | - | - | - | - | - | 62 | 62 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | C |
| | 40 | - | - | - | - | - | - | - | - | 1 | D |
| | 50 | - | - | - | - | - | - | - | - | 1 | E |
| | 60 | - | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | - | - | 1 | G |
| | 100 | - | - | - | - | - | - | - | 5 | 5 | I |
| | 120 | - | - | - | - | - | - | - | 10 | 10 | K |
| | 125 | - | - | - | - | - | - | - | 13 | 13 | K |
| | 130 | - | - | - | - | - | - | - | 16 | 16 | L |
| | 140 | - | - | - | - | - | - | - | 21 | 21 | M |
| | 150 | - | - | - | - | - | - | - | 26 | 26 | |
| | 160 | - | - | - | - | - | - | - | 31 | 31 | |
| | 170 | - | - | - | - | - | - | - | 35 | 35 | |
| | 180 | - | - | - | - | - | - | - | 40 | 40 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 200 | - | - | - | - | - | - | - | 50 | 50 | |
| | 220 | - | - | - | - | - | - | - | 59 | 59 | |
| | 240 | - | - | - | - | - | - | - | 70 | 70 | |
| | 260 | - | - | - | - | - | - | - | 81 | 81 | |
| | 280 | - | - | - | - | - | - | - | 91 | 91 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 18 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | - | - | 1 | F |
| | 60 | - | - | - | - | - | - | - | 5 | 5 | G |
| | 80 | - | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | - | 16 | 16 | J |
| | 100 | - | - | - | - | - | - | - | 24 | 24 | K |
| | 110 | - | - | - | - | - | - | - | 30 | 30 | L |
| | 120 | - | - | - | - | - | - | - | 36 | 36 | M |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 130 | - | - | - | - | - | - | 2 | 40 | 42 | |
| | 140 | - | - | - | - | - | - | 2 | 46 | 48 | |
| | 150 | - | - | - | - | - | - | 3 | 52 | 55 | |
| | 160 | - | - | - | - | - | - | 3 | 59 | 62 | |
| | 170 | - | - | - | - | - | - | 4 | 65 | 69 | |
| | 180 | - | - | - | - | - | - | 4 | 73 | 77 | |
| | 190 | - | - | - | - | - | - | 5 | 80 | 85 | |
| | 200 | - | - | - | - | - | - | 7 | 87 | 94 | |
| | 210 | - | - | - | - | - | - | 13 | 91 | 104 | |
| | 220 | - | - | - | - | - | - | 17 | 97 | 114 | |
| | 230 | - | - | - | - | - | - | 21 | 103 | 124 | |
| | 240 | - | - | - | - | - | - | 24 | 109 | 133 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 21 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | C |
| | 25 | - | - | - | - | - | - | - | - | 1 | D |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 35 | - | - | - | - | - | - | - | - | 1 | E |
| | 40 | - | - | - | - | - | - | - | 5 | 5 | F |
| | 50 | - | - | - | - | - | - | - | 10 | 10 | G |
| | 60 | - | - | - | - | - | - | - | 12 | 12 | H |
| | 70 | - | - | - | - | - | - | 3 | 17 | 20 | J |
| | 80 | - | - | - | - | - | - | 4 | 25 | 29 | K |
| | 90 | - | - | - | - | - | - | 5 | 32 | 37 | M |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 100 | - | - | - | - | - | - | 6 | 39 | 45 | N |
| | 110 | - | - | - | - | - | - | 7 | 46 | 53 | |
| | 120 | - | - | - | - | - | - | 7 | 54 | 61 | |
| | 130 | - | - | - | - | - | - | 8 | 62 | 70 | |
| | 140 | - | - | - | - | - | - | 9 | 71 | 80 | |
| | 150 | - | - | - | - | - | - | 15 | 77 | 92 | |
| | 160 | - | - | - | - | - | - | 20 | 85 | 105 | |
| | 170 | - | - | - | - | - | - | 25 | 93 | 118 | |
| | 180 | - | - | - | - | - | - | 29 | 101 | 130 | |
| | 190 | - | - | - | - | - | - | 34 | 109 | 143 | |
| | 200 | - | - | - | - | - | - | 38 | 117 | 155 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 24 | 10 | - | - | - | - | - | - | - | - | 2 | A |
| | 15 | - | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | - | - | 2 | E |
| | 30 | - | - | - | - | - | - | - | 5 | 5 | F |
| | 40 | - | - | - | - | - | - | - | 11 | 11 | G |
| | 50 | - | - | - | - | - | - | 4 | 11 | 15 | H |
| | 55 | - | - | - | - | - | - | 5 | 15 | 20 | I |
| | 60 | - | - | - | - | - | - | 6 | 21 | 27 | J |
| | 65 | - | - | - | - | - | - | 7 | 25 | 32 | J |
| | 70 | - | - | - | - | - | - | 7 | 30 | 37 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 75 | - | - | - | - | - | - | 8 | 34 | 42 | L |
| | 80 | - | - | - | - | - | - | 9 | 37 | 46 | M |
| | 85 | - | - | - | - | - | - | 9 | 42 | 51 | |
| | 90 | - | - | - | - | - | - | 10 | 46 | 56 | |
| | 95 | - | - | - | - | - | - | 11 | 50 | 61 | |
| | 100 | - | - | - | - | - | - | 11 | 55 | 66 | |
| | 110 | - | - | - | - | - | 2 | 12 | 64 | 78 | |
| | 120 | - | - | - | - | - | 3 | 18 | 72 | 93 | |
| | 130 | - | - | - | - | - | 4 | 23 | 82 | 109 | |
| | 140 | - | - | - | - | - | 4 | 28 | 93 | 125 | |
| | 150 | - | - | - | - | - | 5 | 33 | 104 | 142 | |
| | 160 | - | - | - | - | - | 5 | 39 | 114 | 158 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 27 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 15 | - | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | - | 7 | 7 | E |
| | 30 | - | - | - | - | - | - | 2 | 9 | 11 | F |
| | 40 | - | - | - | - | - | - | 6 | 10 | 16 | H |
| | 45 | - | - | - | - | - | - | 7 | 14 | 21 | I |
| | 50 | - | - | - | - | - | - | 8 | 20 | 28 | J |
| | 55 | - | - | - | - | - | - | 9 | 26 | 35 | K |
| | 60 | - | - | - | - | - | 2 | 8 | 31 | 41 | L |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 65 | - | - | - | - | - | 3 | 8 | 36 | 47 | |
| | 70 | - | - | - | - | - | 3 | 9 | 40 | 52 | |
| | 75 | - | - | - | - | - | 4 | 9 | 46 | 59 | |
| | 80 | - | - | - | - | - | 4 | 10 | 51 | 65 | |
| | 85 | - | - | - | - | - | 5 | 10 | 56 | 71 | |
| | 90 | - | - | - | - | - | 5 | 14 | 60 | 79 | |
| | 95 | - | - | - | - | - | 6 | 17 | 64 | 87 | |
| | 100 | - | - | - | - | - | 6 | 20 | 70 | 96 | |
| | 110 | - | - | - | - | - | 7 | 26 | 82 | 115 | |
| | 120 | - | - | - | - | - | 8 | 31 | 95 | 134 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 30 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 15 | - | - | - | - | - | - | - | - | 2 | D |
| | 20 | - | - | - | - | - | - | - | 8 | 8 | E |
| | 25 | - | - | - | - | - | - | 3 | 9 | 12 | F |
| | 30 | - | - | - | - | - | - | 5 | 10 | 15 | G |
| | 35 | - | - | - | - | - | - | 7 | 11 | 18 | H |
| | 40 | - | - | - | - | - | - | 9 | 16 | 25 | I |
| | 45 | - | - | - | - | - | 3 | 8 | 23 | 34 | J |
| | 50 | - | - | - | - | - | 4 | 8 | 29 | 41 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 55 | - | - | - | - | - | 5 | 9 | 34 | 48 | L |
| | 60 | - | - | - | - | - | 6 | 9 | 40 | 55 | |
| | 65 | - | - | - | - | - | 6 | 10 | 46 | 62 | |
| | 70 | - | - | - | - | - | 7 | 10 | 52 | 69 | |
| | 75 | - | - | - | - | - | 8 | 14 | 56 | 78 | |
| | 80 | - | - | - | - | - | 8 | 18 | 61 | 87 | |
| | 85 | - | - | - | - | - | 9 | 21 | 67 | 97 | |
| | 90 | - | - | - | - | 2 | 8 | 24 | 75 | 109 | |
| | 95 | - | - | - | - | 3 | 8 | 27 | 82 | 120 | |
| | 100 | - | - | - | - | 3 | 8 | 31 | 90 | 132 | |
| | 105 | - | - | - | - | 3 | 9 | 34 | 98 | 144 | |
| | 110 | - | - | - | - | 4 | 8 | 38 | 106 | 156 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 33 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | B |
| | 12 | - | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | - | 5 | 5 | D |
| | 20 | - | - | - | - | - | - | 3 | 9 | 12 | F |
| | 25 | - | - | - | - | - | - | 6 | 10 | 16 | G |
| | 30 | - | - | - | - | - | - | 9 | 10 | 19 | H |
| | 35 | - | - | - | - | - | 3 | 8 | 16 | 27 | I |
| | 40 | - | - | - | - | - | 5 | 8 | 24 | 37 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 45 | - | - | - | - | - | 6 | 9 | 31 | 46 | K |
| | 50 | - | - | - | - | - | 7 | 9 | 38 | 54 | M |
| | 55 | - | - | - | - | - | 8 | 10 | 44 | 62 | N |
| | 60 | - | - | - | - | 2 | 7 | 10 | 51 | 70 | |
| | 65 | - | - | - | - | 3 | 7 | 15 | 55 | 80 | |
| | 70 | - | - | - | - | 4 | 7 | 19 | 62 | 92 | |
| | 75 | - | - | - | - | 4 | 8 | 23 | 68 | 103 | |
| | 80 | - | - | - | - | 5 | 8 | 26 | 77 | 116 | |
| | 85 | - | - | - | - | 5 | 9 | 30 | 86 | 130 | |
| | 90 | - | - | - | - | 6 | 9 | 34 | 95 | 144 | |
| | 95 | - | - | - | - | 6 | 9 | 38 | 105 | 158 | |
| | 100 | - | - | - | - | 7 | 9 | 42 | 114 | 172 | |
| | 105 | - | - | - | - | 7 | 12 | 45 | 123 | 187 | |
| | 110 | - | - | - | - | 8 | 15 | 48 | 130 | 201 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 36 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | - | 10 | 10 | E |
| | 20 | - | - | - | - | - | - | 5 | 10 | 15 | F |
| | 25 | - | - | - | - | - | - | 9 | 10 | 19 | G |
| | 30 | - | - | - | - | - | 4 | 8 | 14 | 26 | I |
| | 35 | - | - | - | - | - | 6 | 8 | 24 | 38 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | 8 | 32 | 48 | K |
| | 45 | - | - | - | - | 3 | 6 | 10 | 38 | 57 | M |
| | 50 | - | - | - | - | 4 | 7 | 10 | 46 | 67 | N |
| | 55 | - | - | - | - | 5 | 7 | 13 | 53 | 78 | |
| | 60 | - | - | - | - | 6 | 7 | 18 | 59 | 90 | |
| | 65 | - | - | - | - | 6 | 8 | 22 | 66 | 102 | |
| | 70 | - | - | - | - | 7 | 8 | 27 | 75 | 117 | |
| | 75 | - | - | - | - | 8 | 8 | 31 | 86 | 133 | |
| | 80 | - | - | - | 2 | 6 | 9 | 35 | 97 | 149 | |
| | 85 | - | - | - | 3 | 6 | 10 | 40 | 107 | 166 | |
| | 90 | - | - | - | 3 | 7 | 13 | 42 | 118 | 183 | |
| | 95 | - | - | - | 4 | 6 | 16 | 46 | 128 | 200 | |
| | 100 | - | - | - | 4 | 7 | 19 | 50 | 136 | 216 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw): 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 8 | - | - | - | - | - | - | - | - | 2 | B |
| | 10 | - | - | - | - | - | - | - | 5 | 5 | C |
| | 15 | - | - | - | - | - | - | 4 | 8 | 12 | E |
| | 20 | - | - | - | - | - | - | 8 | 10 | 18 | G |
| | 25 | - | - | - | - | - | 5 | 7 | 11 | 23 | H |
| | 30 | - | - | - | - | - | 7 | 8 | 22 | 37 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 3 | 6 | 9 | 30 | 48 | K |
| | 40 | - | - | - | - | 4 | 7 | 9 | 39 | 59 | M |
| 39 | 45 | - | - | - | - | 6 | 7 | 10 | 47 | 70 | N |
| | 50 | - | - | - | - | 7 | 7 | 15 | 53 | 82 | |
| | 55 | - | - | - | 2 | 6 | 8 | 20 | 61 | 97 | |
| | 60 | - | - | - | 3 | 6 | 8 | 25 | 70 | 112 | |
| | 65 | - | - | - | 4 | 6 | 8 | 30 | 82 | 130 | |
| | 70 | - | - | - | 4 | 7 | 9 | 34 | 94 | 148 | |
| | 75 | - | - | - | 5 | 6 | 11 | 39 | 106 | 167 | |
| | 80 | - | - | - | 5 | 7 | 14 | 42 | 118 | 186 | |
| | 85 | - | - | - | 6 | 7 | 17 | 47 | 129 | 206 | |
| | 90 | - | - | - | 6 | 8 | 20 | 52 | 138 | 224 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 42 | 7 | - | - | - | - | - | - | - | - | 2 | B |
| | 10 | - | - | - | - | - | - | - | 7 | 7 | D |
| | 15 | - | - | - | - | - | - | 6 | 9 | 15 | F |
| | 20 | - | - | - | - | - | 4 | 7 | 10 | 21 | G |
| | 25 | - | - | - | - | - | 7 | 8 | 17 | 32 | I |
| | 30 | - | - | - | - | 4 | 6 | 8 | 28 | 46 | K |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 35 | - | - | - | - | 5 | 7 | 9 | 37 | 58 | L |
| | 40 | - | - | - | - | 7 | 7 | 10 | 46 | 70 | N |
| | 45 | - | - | - | 3 | 5 | 8 | 16 | 53 | 85 | O |
| | 50 | - | - | - | 4 | 6 | 8 | 21 | 62 | 101 | |
| | 55 | - | - | - | 5 | 6 | 8 | 27 | 73 | 119 | |
| | 60 | - | - | - | 6 | 6 | 9 | 32 | 86 | 139 | |
| | 65 | - | - | - | 6 | 7 | 10 | 37 | 99 | 159 | |
| | 70 | - | - | - | 7 | 7 | 14 | 40 | 114 | 182 | |
| | 75 | - | - | 3 | 5 | 7 | 18 | 45 | 126 | 204 | |
| | 80 | - | - | 3 | 6 | 7 | 21 | 51 | 137 | 225 | |
| | 85 | - | - | 4 | 5 | 8 | 25 | 57 | 146 | 245 | |
| | 90 | - | - | 4 | 6 | 8 | 28 | 65 | 152 | 263 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 45 | 7 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 9 | 9 | D |
| | 15 | - | - | - | - | - | - | 8 | 9 | 17 | F |
| | 20 | - | - | - | - | - | 6 | 7 | 11 | 24 | H |
| | 25 | - | - | - | - | 4 | 5 | 8 | 23 | 40 | J |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | 9 | 34 | 55 | K |
| | 35 | - | - | - | 3 | 5 | 7 | 10 | 44 | 69 | M |
| | 40 | - | - | - | 4 | 6 | 7 | 15 | 52 | 84 | O |
| | 45 | - | - | - | 5 | 6 | 8 | 21 | 61 | 101 | |
| | 50 | - | - | - | 6 | 7 | 8 | 27 | 73 | 121 | |
| | 55 | - | - | 3 | 5 | 6 | 9 | 33 | 88 | 144 | |
| | 60 | - | - | 3 | 5 | 7 | 12 | 38 | 103 | 168 | |
| | 65 | - | - | 4 | 5 | 8 | 16 | 42 | 119 | 194 | |
| | 70 | - | - | 5 | 5 | 8 | 20 | 48 | 132 | 218 | |
| | 75 | - | - | 5 | 6 | 8 | 24 | 55 | 142 | 240 | |
| | 80 | - | - | 6 | 6 | 8 | 28 | 63 | 150 | 261 | |

Air standard tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 48 | 6 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | - | 11 | 11 | D |
| | 15 | - | - | - | - | - | 4 | 6 | 10 | 20 | G |
| | 20 | - | - | - | - | - | 8 | 8 | 14 | 30 | H |
| | 25 | - | - | - | - | 6 | 6 | 8 | 29 | 49 | K |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | 3 | 5 | 7 | 9 | 40 | 64 | M |
| | 35 | - | - | - | 5 | 5 | 8 | 13 | 49 | 80 | N |
| | 40 | - | - | - | 6 | 6 | 8 | 20 | 59 | 99 | |
| | 45 | - | - | 3 | 5 | 6 | 9 | 26 | 72 | 121 | |
| | 50 | - | - | 4 | 5 | 7 | 9 | 33 | 88 | 146 | |
| | 55 | - | - | 5 | 5 | 7 | 13 | 38 | 105 | 173 | |
| | 60 | - | - | 6 | 5 | 8 | 17 | 43 | 122 | 201 | |
| | 65 | - | - | 7 | 5 | 8 | 22 | 50 | 135 | 227 | |
| | 70 | - | 3 | 4 | 6 | 8 | 26 | 58 | 146 | 251 | |

Air standard tables DCIEM / Metric

| Warning: The maximum operational limit UK-HSE is 50 m | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 51 | 6 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 5 | 8 | 13 | D |
| | 15 | - | - | - | - | - | 5 | 7 | 10 | 22 | G |
| | 20 | - | - | - | - | 5 | 5 | 8 | 20 | 38 | I |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 25 | - | - | - | 3 | 5 | 6 | 9 | 33 | 56 | K |
| | 30 | - | - | - | 5 | 5 | 7 | 10 | 46 | 73 | M |
| | 35 | - | - | 3 | 4 | 6 | 8 | 18 | 55 | 94 | O |
| | 40 | - | - | 4 | 5 | 6 | 8 | 26 | 68 | 117 | |
| | 45 | - | - | 5 | 5 | 7 | 9 | 32 | 85 | 143 | |
| | 50 | - | - | 6 | 6 | 7 | 13 | 37 | 105 | 174 | |
| | 55 | - | 3 | 4 | 6 | 7 | 18 | 44 | 122 | 204 | |
| | 60 | - | 4 | 4 | 6 | 8 | 23 | 51 | 137 | 233 | |
| | 65 | - | 5 | 4 | 6 | 9 | 27 | 61 | 148 | 260 | |
| | 70 | - | 5 | 5 | 6 | 12 | 30 | 72 | 155 | 285 | |

Air standard tables DCIEM / Metric

| Warning: The maximum operational limit UK-HSE is 50 m | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | | |
| 54 | 5 | - | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 6 | 9 | 15 | E |
| | 15 | - | - | - | - | - | 7 | 7 | 11 | 25 | H |
| | 20 | - | - | - | - | 6 | 6 | 8 | 25 | 45 | J |
| | 25 | - | - | - | 5 | 5 | 7 | 9 | 39 | 65 | M |
| | 30 | - | - | 3 | 4 | 6 | 7 | 15 | 50 | 85 | O |
| | 35 | - | - | 5 | 4 | 6 | 8 | 23 | 62 | 108 | |
| | 40 | - | - | 6 | 5 | 7 | 9 | 30 | 80 | 137 | |
| | 45 | - | 4 | 4 | 5 | 7 | 13 | 36 | 101 | 170 | |
| | 50 | - | 4 | 5 | 5 | 8 | 18 | 42 | 121 | 203 | |
| | 55 | - | 5 | 5 | 6 | 8 | 23 | 51 | 137 | 235 | |
| | 60 | - | 6 | 5 | 6 | 9 | 28 | 61 | 149 | 264 | |

Air standard tables DCIEM / Metric

| Warning: The maximum operational limit UK-HSE is 50 m | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| 57 | 5 | - | - | - | - | - | - | - | - | - | - | 3 |
| | 10 | - | - | - | - | - | - | - | - | 8 | 9 | 17 |
| | 15 | - | - | - | - | - | - | 4 | 5 | 7 | 11 | 27 |
| | 20 | - | - | - | - | - | 4 | 4 | 6 | 9 | 29 | 52 |
| | 25 | - | - | - | - | - | 7 | 5 | 7 | 10 | 44 | 73 |
| | 30 | - | - | - | - | 5 | 4 | 6 | 8 | 19 | 55 | 97 |
| | 35 | - | - | - | 3 | 4 | 5 | 6 | 9 | 27 | 72 | 126 |
| | 40 | - | - | - | 4 | 4 | 5 | 7 | 11 | 35 | 93 | 159 |
| | 45 | - | - | - | 5 | 5 | 5 | 8 | 17 | 41 | 116 | 197 |
| | 50 | - | - | 3 | 3 | 5 | 6 | 8 | 22 | 50 | 135 | 232 |
| | 55 | - | - | 4 | 3 | 5 | 7 | 9 | 27 | 61 | 149 | 265 |

Air standard tables DCIEM / Metric

| Warning: The maximum operational limit UK-HSE is 50 m | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| 60 | 5 | - | - | - | - | - | - | - | - | - | - | 4 |
| | 10 | - | - | - | - | - | - | - | - | 10 | 9 | 19 |
| | 15 | - | - | - | - | - | - | 5 | 6 | 8 | 16 | 35 |
| | 20 | - | - | - | - | - | 5 | 5 | 6 | 10 | 33 | 59 |
| | 25 | - | - | - | - | 5 | 4 | 5 | 7 | 14 | 48 | 83 |
| | 30 | - | - | - | 3 | 4 | 4 | 6 | 9 | 23 | 62 | 111 |
| | 35 | - | - | - | 5 | 4 | 5 | 6 | 10 | 32 | 84 | 146 |
| | 40 | - | - | - | 6 | 4 | 6 | 7 | 15 | 38 | 109 | 185 |
| | 45 | - | - | 4 | 3 | 5 | 6 | 8 | 21 | 47 | 131 | 225 |
| | 50 | - | - | 5 | 4 | 4 | 7 | 9 | 27 | 58 | 147 | 261 |

Air standard tables DCIEM / Metric

| Warning: The maximum operational limit UK-HSE is 50 m | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| 63 | 5 | - | - | - | - | - | - | - | - | - | 5 | 5 |
| | 10 | - | - | - | - | - | - | - | 5 | 6 | 10 | 21 |
| | 15 | - | - | - | - | - | - | 7 | 6 | 8 | 20 | 41 |
| | 20 | - | - | - | - | - | 7 | 5 | 7 | 9 | 39 | 67 |
| | 25 | - | - | - | - | 6 | 4 | 6 | 8 | 17 | 52 | 93 |
| | 30 | - | - | - | 5 | 4 | 4 | 7 | 8 | 28 | 71 | 127 |
| | 35 | - | - | 3 | 3 | 4 | 6 | 7 | 12 | 35 | 97 | 167 |
| | 40 | - | - | 4 | 4 | 4 | 6 | 8 | 19 | 43 | 123 | 211 |
| | 45 | - | - | 5 | 4 | 5 | 6 | 9 | 25 | 54 | 142 | 250 |
| | 50 | - | 3 | 3 | 4 | 6 | 6 | 13 | 29 | 70 | 154 | 288 |

Air standard tables DCIEM / Metric

| Warning: The maximum operational limit UK-HSE is 50 m | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| 66 | 5 | - | - | - | - | - | - | - | - | - | 7 | 7 |
| | 10 | - | - | - | - | - | - | - | 7 | 6 | 10 | 23 |
| | 15 | - | - | - | - | - | 4 | 5 | 5 | 9 | 24 | 47 |
| | 20 | - | - | - | - | 5 | 4 | 5 | 7 | 10 | 43 | 74 |
| | 25 | - | - | - | 4 | 4 | 4 | 6 | 8 | 21 | 58 | 105 |
| | 30 | - | - | 3 | 3 | 4 | 5 | 7 | 9 | 32 | 81 | 144 |
| | 35 | - | - | 5 | 3 | 4 | 6 | 7 | 16 | 39 | 110 | 190 |
| | 40 | - | 3 | 3 | 4 | 4 | 7 | 8 | 23 | 49 | 135 | 236 |
| | 45 | - | 4 | 3 | 4 | 5 | 7 | 11 | 28 | 65 | 151 | 278 |

Air standard tables DCIEM / Metric

**Warning: The maximum operational limit UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| 69 | 5 | - | - | - | - | - | - | - | - | - | 8 | 8 |
| | 10 | - | - | - | - | - | - | - | 8 | 7 | 10 | 25 |
| | 15 | - | - | - | - | - | 6 | 4 | 6 | 9 | 28 | 53 |
| | 20 | - | - | - | - | 6 | 4 | 6 | 7 | 12 | 47 | 82 |
| | 25 | - | - | - | 6 | 3 | 5 | 6 | 9 | 24 | 65 | 118 |
| | 30 | - | - | 5 | 3 | 4 | 5 | 7 | 12 | 35 | 93 | 164 |
| | 35 | - | 3 | 3 | 4 | 4 | 6 | 8 | 19 | 44 | 123 | 214 |
| | 40 | - | 5 | 3 | 4 | 5 | 6 | 9 | 27 | 57 | 146 | 262 |

Air standard tables DCIEM / Metric

**Warning: The maximum operational limit UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | 3 | |
| 72 | 5 | - | - | - | - | - | - | - | - | - | 9 | 9 |
| | 10 | - | - | - | - | - | - | 4 | 5 | 7 | 11 | 27 |
| | 15 | - | - | - | - | - | 7 | 5 | 6 | 9 | 32 | 59 |
| | 20 | - | - | - | 4 | 4 | 4 | 5 | 8 | 16 | 50 | 91 |
| | 25 | - | - | 4 | 3 | 4 | 5 | 6 | 9 | 28 | 73 | 132 |
| | 30 | - | - | 6 | 3 | 5 | 5 | 8 | 15 | 37 | 106 | 185 |
| | 35 | - | 5 | 3 | 4 | 4 | 6 | 9 | 23 | 49 | 135 | 238 |
| | 40 | 3 | 3 | 3 | 4 | 6 | 6 | 13 | 28 | 67 | 153 | 286 |

*2.1.8.3 - Tables A and B for repetitive dive calculation - Metric*

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 → 11:59 | 12:00 → 14:59 | 15:00 → 18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (msw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 9 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 12 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 15 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 18 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 21 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 24 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 27 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 30 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 33 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 36 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 39 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 42 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 45 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

*2.1.8.4 - Table #5 - Depth correction for diving at altitude - Metric*

| Actual Depth (metres) | Depth Correction at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 → 299 | 300 → 599 | 600 → 899 | 900 → 1199 | 1200 → 1499 | 1500 → 1799 | 1800 → 2099 | 2100 → 2399 | 2400 → 3000 |
| 9 | +0 | +3 | +3 | +3 | +3 | +3 | +3 | +6 | +6 |
| 12 | +0 | +3 | +3 | +3 | +3 | +3 | +6 | +6 | +6 |
| 15 | +0 | +3 | +3 | +3 | +3 | +6 | +6 | +6 | +6 |
| 18 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +6 | +9 |
| 21 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +9 | +9 |
| 24 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 27 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 30 | +0 | +3 | +3 | +6 | +6 | +9 | +9 | +9 | +12 |
| 33 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 36 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 39 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 |
| 42 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +18 |
| 45 | +3 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +18 |
| 48 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 | +18 |
| 51 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | +21 |
| 54 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | |
| 57 | +3 | +6 | +6 | +9 | +12 | +12 | +15 | | |
| 60 | +3 | +6 | +6 | +9 | +12 | +12 | | | |
| 63 | +3 | +6 | +6 | +9 | | | | | |
| 66 | +3 | +6 | | | | | | | |
| 69 | +3 | | | | | | | | |

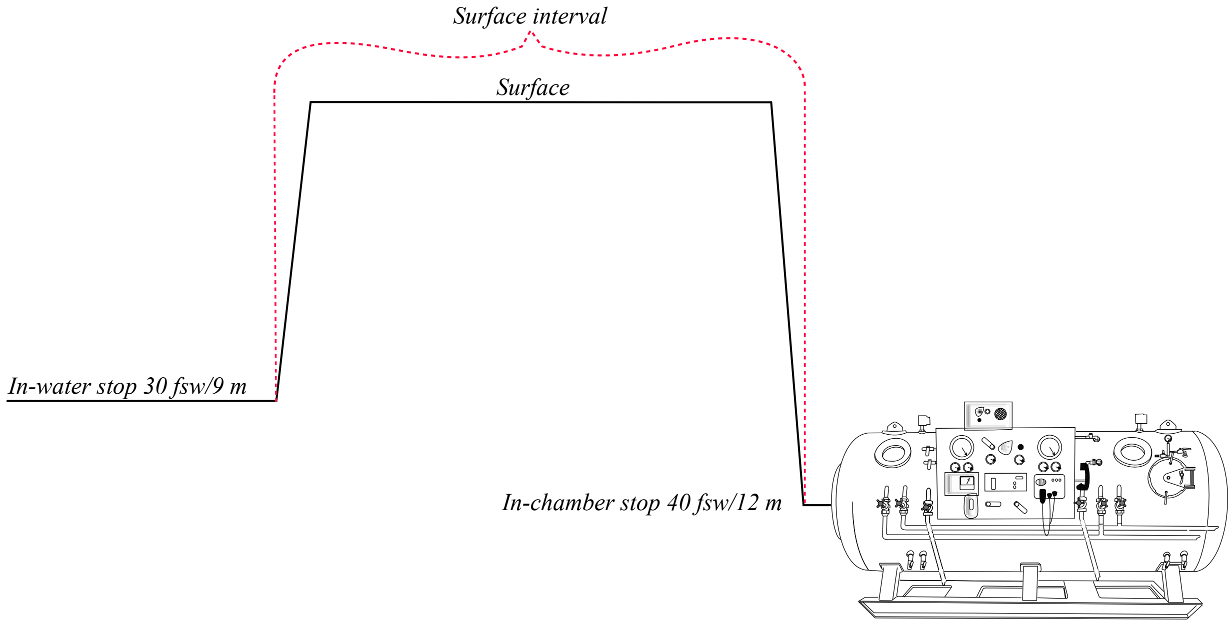
| Sea Level Stop Depth (metres) | Actual Decompression Stop Depth at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 → 299 | 300 → 599 | 600 → 899 | 900 → 1199 | 1200 → 1499 | 1500 → 1799 | 1800 → 2099 | 2100 → 2399 | 2400 → 3000 |
| 3 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 2.5 | 2.5 | 2.5 | 2.5 |
| 6 | 6.0 | 6.0 | 6.0 | 5.5 | 5.5 | 5.0 | 5.0 | 5.0 | 4.5 |
| 9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.0 | 7.5 | 7.5 | 7.0 | 7.0 |
| 12 | 12.0 | 12.0 | 11.5 | 11.0 | 10.5 | 10.0 | 10.0 | 9.5 | 9.0 |
| 15 | 15.0 | 14.5 | 14.0 | 13.5 | 13.0 | 12.5 | 12.0 | 12.0 | 11.5 |
| 18 | 18.0 | 17.5 | 17.0 | 16.5 | 16.0 | 15.0 | 14.5 | 14.0 | 13.5 |
| 21 | 21.0 | 20.5 | 20.0 | 19.0 | 18.5 | 17.5 | 17.0 | 16.5 | 16.0 |
| 24 | 24.0 | 23.5 | 22.5 | 21.5 | 21.0 | 20.0 | 19.5 | 19.0 | 18.0 |
| 27 | 27.0 | 26.0 | 25.5 | 24.5 | 23.5 | 22.5 | 22.0 | 21.0 | 20.0 |

## 2.2 - Tables standard air with oxygen surface decompression

### 2.2.1 - Presentation

#### *2.2.1.1 - About surface decompression procedures*

Surface decompression is a procedure that consists of partially performing the decompression in water and then transferring the diver to the chamber to complete it. With DCIEM procedures, the in-water stops are performed up to 30 ft/9 m, and the diver is then recovered to the surface and compressed to 40 ft/12 m in the chamber. The time from leaving the in-water stop to the time being at the 1st in-chamber stop is usually called the "surface interval".




With this procedure, the diver is transferred to the surface without having completed his decompression. It is based on the fact that, generally, a decompression accident is not detectable immediately after surfacing and that a short period is necessary for the process to develop and symptoms becoming visible. Thus, the diver is transferred to the chamber and recompressed during this very short period. It is obvious that the diver must be transferred to the chamber as quickly as possible.
During the seventies, these tables were considered the first choice because it was said that the diver is removed from the water and under control into the chamber. Nevertheless, studies started during this period and continued until now have demonstrated that despite some advantages, this procedure is not the safest and has a lot of inconveniences.
Among the inconveniences, we can highlight the following points (also listed in the diving study CCO Ltd #1):

- Decompression stress during the surface interval (diver experiencing DCS symptoms):
  DCIEM says that during the surface interval, the diver is exposed to a higher level of decompression stress than would be encountered if in-water decompression only had been executed. Therefore, the diver may experience signs and/or symptoms of decompression stress.
  Manned validation has indicated that when symptoms do occur during the surface interval, they are almost always very mild and late into the surface interval. In addition, the symptoms usually completely resolve during the pressurization to 12 m in the chamber. Experimental dives have demonstrated that the divers who experienced surface interval symptoms had the same incidence of decompression sickness after the completion of the dive as those divers who did not experience signs or symptoms during the surface interval. Therefore, during surface oxygen decompression diving, when all signs and symptoms of surface interval stress have been completely resolved by the time, the diver is confirmed on oxygen at 12 m in the chamber and the decompression profile is to be completed as planned.
  When the signs and symptoms of the surface interval stress have not been completely resolved by the time the diver is confirmed on oxygen at 40 feet (12 m), it should be treated as decompression sickness. The diver must be immediately pressed to 60 feet (18m) , a Treatment table 6 initiated, and the Diving Medical Officer contacted.
- Interval from in water stop 9 m to in-chamber stop 12 m can exceed the allocated time:
  If the surface interval exceeds the allocated time, the dive is considered as a shortened decompression, and a medical table for decompression accidents must be applied. Also, considering the possibility of complex decompression illness involving, for instance, the central nervous system, the diving medical specialist must be contacted and his recommendations applied. The surface decompression dives have to be stopped for the duration of the treatment. To finish on this point, this incident must be reported to the client.
- The diver may be unable to reach the 12 m (40 ft) stop:
  The problem is generally linked to divers who cannot equalize their ears during the recompression in the chamber. This problem is common and, unfortunately, sometimes ignored by diving managers or client representatives who consider that surface decompression is the sole efficient decompression procedure.
  Note that the efforts resulting from Vasalva manoeuvre which might be performed by the diver could increase

the intra-thoracic pressure and ease the transfer of small bubbles from the right heart atrium to the left heart atrium in case of presence of patent foramen ovale (PFO) or through intra-pulmonary shunts.
This handbook proposes two “safe way out procedures” that are based on the US Navy procedures to solve this problem. Nevertheless applying such procedure is equivalent to applying a medical table: The dives must be stopped during the treatment, and the incident reported.

- According to studies, the risk of type 2 decompression accidents is higher with surface decompression:
  During the 70’s and the 80’s doctors T. Shields & Lee, COMEX, and other teams made investigations to find solutions to lower the frequency of the too numerous decompression accidents in the north sea. These studies have initiated the implementation of reinforcement procedures, the generalization of techniques such as saturation, and the publication of safer decompression tables than those that were in service.
  COMEX tables MT74 and MT92 are examples of the decompression models studied and published .
  Comparisons between in-water and surface oxygen decompression techniques were made to determine the impact of the techniques of decompressions regarding decompression accidents.
  In an article entitled “Decompression in surface-based diving”, that was the safety analysis of MT74 air decompression tables, explained by J.P. Imbert and M. Bontoux (COMEX) in a workshop in Tokyo in 1986 it is said: *In order to detect possible advantages of in-water decompression over surface decompression, the performances of the air/oxy tables were compared to the surface decompression tables from report to DOE. Once again, such a comparison is reasonable because the tables were used over similar exposures. The results of table n° 8 (see below) indicate that, although the overall DCS incidence appeared similar:*
  - *in-water decompressions tend to produce type I accidents only,*
  - *surface decompressions tend to produce a large proportion of type II accidents, and thus in-water decompression should be preferred to surface decompression, at least for the tables considered.*

| | ***Surface decompression*** | ***In water Air Oxy tables*** |
|---|---|---|
| ***Number of dives*** | 14691 | 10063 |
| ***Type 1 DCS*** | 39 | 67 |
| ***Type 2 DCS*** | 34 | 1 |
| ***Total DCS*** | 73 | 68 |
| ***% DCS*** | 0.0049 | 0.0068 |
| ***% type 2 / Total DCS*** | 0.46585 | 0.0147 |

  In another article entitled “ Decompression safety” published in 1993 J.P. Imbert (COMEX) said: *The comparison of the type I DCS occurrences does not allow differentiating between the two techniques of decompression. However, the comparison of the type II DCS occurrences shows that their incidence becomes significantly much higher with the surface decompression than with in-water decompression (see below).*

| ***Exposures*** | ***Prt ≤ 25*** *(Dr T. Shields)* ***Moderate*** | | ***Prt < 25 ≤ 35*** *(Dr T. Shields)* ***Standard*** | | ***Prt > 35*** *(Dr T. Shields)* ***Severe*** | |
|---|---|---|---|---|---|---|
| ***Method*** | ***In-water deco.*** | ***Surface O2 deco.*** | ***In-water deco.*** | ***Surface O2 deco.*** | ***In-water deco.*** | ***Surface O2 deco.*** |
| ***Number of dives*** | 37551 | 10674 | 22643 | 54230 | 8349 | 9323 |
| ***Number of Type 1 DCS %*** | 30 0.08% | 4 0.04% | 78 0.34% | 118 0.22% | 77 0.92% | 87 0.93% |
| ***Number of Type 2 DCS %*** | 5 0.01% | 1 0.01% | 3 0.01% | 74 0.14% | 12 0.14% | 35 0.38% |

- The diver breathes oxygen at 2.2 bar in the chamber:
  High partial pressure of oxygen can trigger acute oxygen poisoning. The procedure for managing such incident is explained in this handbook. Nevertheless it is an undesirable event .
  In the case of a loss of oxygen supply, the procedure promoted by DCIEM is to apply a Std air table with additional reinforcements. Nevertheless, that will have the effect of delaying the deco time.

Despite these inconveniences, surface decompression tables offer some advantages that must be considered:

- The diver is dry and not exposed to cold water, strong currents, and the effects of the waves during the decompression in the chamber.
- In the case of an incident such as acute O2 poisoning or decompression accident, the diver medic can easily

intervene.

- Decompression using surface decompression is possible if the decompression in the water becomes impractical.
- Decompression is possible when the vessel is retrieving anchors or sailing.
- Change of decompression procedure from in-water deco to surface decompression is possible any time when the 9 m stop has been completed (or if it is not scheduled).

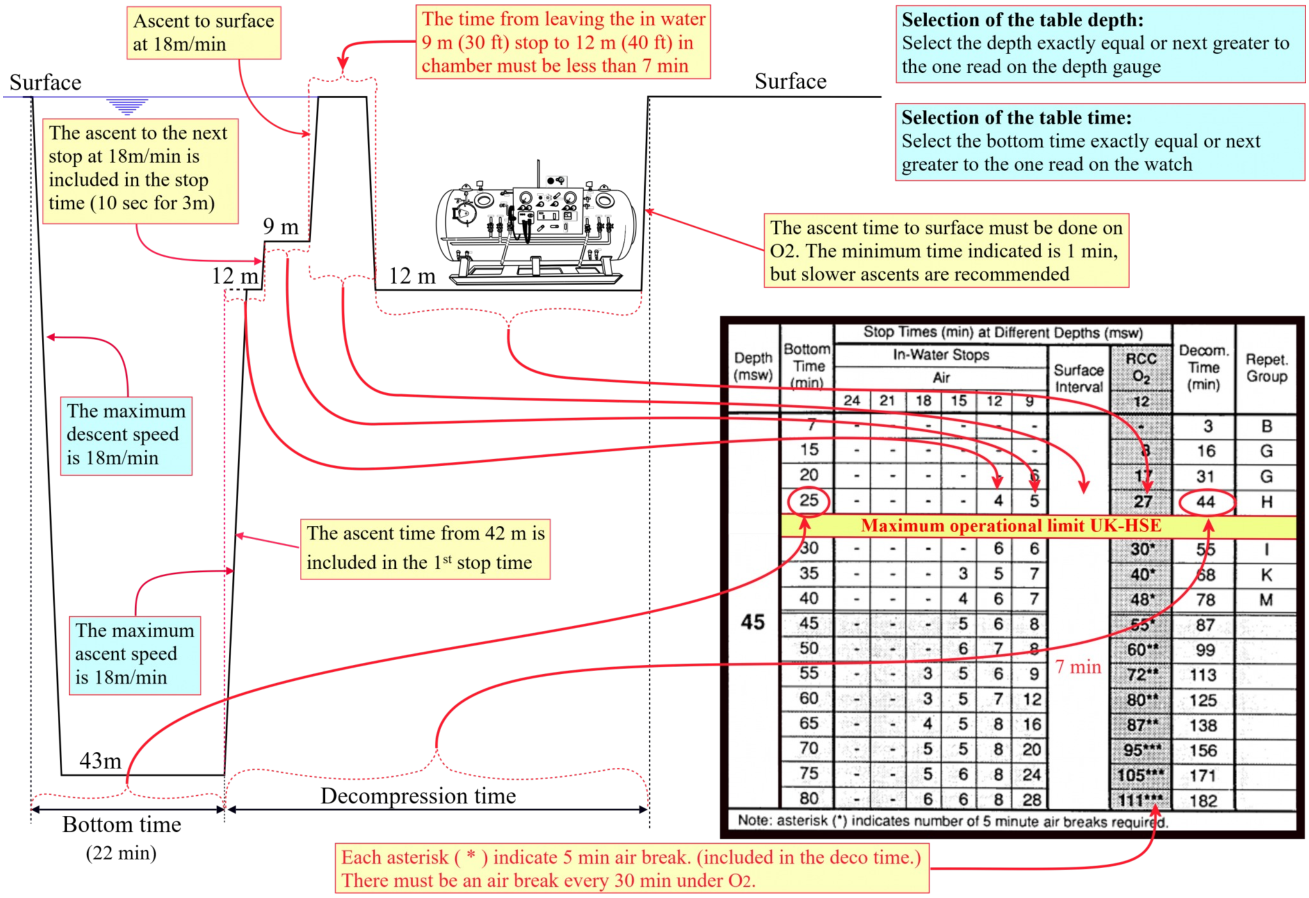
A common assumption should be reconsidered:
A lot of people think that diving operations using surface decompression are possible when they are not possible using in-water decompression.
This assumption must be reconsidered, because if it is true that surface decompression should be used to complete an in-water decompression that becomes difficult or impossible due to suddenly degraded conditions, it must be remembered that the in-water decompression procedure is the recovery table of the surface decompression procedure. In the case that the chamber is not available, or the transfer to the deck is not possible using the basket/bell for technical reasons or an incident, the decompression will have to be completed in the water.
For these reasons, decompression using oxygen is not a substitute for in-water decompression when the pre-dive assessment shows that in-water decompression cannot be performed.

### *2.2.1.2 - Description of DCIEM surface decompression tables*

DCIEM surface decompression tables are an evolution of the standard air tables. Thus, they are designed in the same manner in Imperial and metric, and each table displays the following information:

- Depth of the table selected in feet or meters
- Bottom times in minutes
- Stops depth in feet or meters & time to be performed at the indicated depth
- The interval surface from leaving the water stop 9 m to the stop at 12 m in chamber
- Total deco time
- Repetitive group
- The operational limits UK-HSE have been integrated into the tables

The calculation of the decompression should be performed taking into account the following parameters:




| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) — In-Water Stops — Air 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC $O_2$ 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7 | - | - | - | - | - | - | | - | 3 | B |
| | 15 | - | - | - | - | - | - | | 8 | 16 | G |
| | 20 | - | - | - | - | - | 6 | | 17 | 31 | G |
| | 25 | - | - | - | - | 4 | 5 | | 27 | 44 | H |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | | 30* | 55 | I |
| | 35 | - | - | - | 3 | 5 | 7 | | 40* | 68 | K |
| | 40 | - | - | - | 4 | 6 | 7 | | 48* | 78 | M |
| 45 | 45 | - | - | - | 5 | 6 | 8 | | 55* | 87 | |
| | 50 | - | - | - | 6 | 7 | 8 | | 60** | 99 | |
| | 55 | - | - | 3 | 5 | 6 | 9 | 7 min | 72** | 113 | |
| | 60 | - | - | 3 | 5 | 7 | 12 | | 80** | 125 | |
| | 65 | - | - | 4 | 5 | 8 | 16 | | 87** | 138 | |
| | 70 | - | - | 5 | 5 | 8 | 20 | | 95*** | 156 | |
| | 75 | - | - | 5 | 6 | 8 | 24 | | 105*** | 171 | |
| | 80 | - | - | 6 | 6 | 8 | 28 | | 111*** | 182 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

- The depth to select is exactly equal to or next greater than the one read on the depth gauge.
- The bottom time to select is exactly equal to or greater than the one indicated on the watch.
- The decompression depth is indicated in the ribbon between the column “bottom time” and “Decom time”. The
- duration of the stops are in the columns below.
- The “deco time” is the addition of the ascent and the stops.
- The decent has to be performed at 18 m/min (60 ft/min) maximum.

- The ascent speed proposed by DCIEM is 18 m/min + or - 3 m (60 ft/min + or - 10 ft) . A slower ascent can be selected by the supervisor, but in this case the procedure for too slow ascent rate (see next) must be applied.
- The ascent from the bottom to the 1st stop at 18 m/min (60 ft/min) is integrated in the stop time.
- The accent to the next stop at 18 m/min (60 ft/min) is integrated in the stop time.
- The interval from leaving the in water stop at 9 m (30 ft) to the stop in chamber at 12 m (40 ft) must not be longer than 7 minutes because the diver has not completed his decompression, and some divers may suffer from decompression stress during this interval, it is recommended to minimise the most possible the time of transfer.
- The diver must be on O2 immediately, upon his arrival in the chamber.
- The O2 breathing periods are 30 min O2 followed by 5 minute air breaks
- The air breaks are indicated by asterisks ( * ) in the column "RCC O2" . Each asterisk indicates 1 air break For example 2 asterisks ( * * ) means 30 min O2 + 5 min Air + 30 min O2 + 5 min Air + O2 for less than 30 min … the air breaks are included in the deco time.
- O2 must be breathed during the ascent to surface from 12 m in chamber. The minimum ascent time indicated by DCIEM is 1 min but slower ascents are highly recommended.

#### *2.2.1.3 - Other procedures*

As the tables for surface decompression are an adaptation of the standard air in-water decompression, the only difference between the two tables is that the decompression stops after 9 m are performed in the chamber. Thus, the procedures for implementing successive dives, multilevel diving, depth correction for diving at altitude, operational limits UK-HSE, and reinforcement of the decompression are exactly the same.

### 2.2.2 - Contingencies

As the chamber is used for decompression, it is in direct proximity to the launching station, which results in many procedures consisting of transferring the diver into it. Thus, except for the phases involving the transfer to the chamber and the final phase of decompression in it, the contingency procedures are the same as those used for in-water decompression at the direct proximity of the chamber.

#### *2.2.2.1 - Ascent rate too fast*

There are two possible procedures:

- DCIEM says that no action is requested because the time at stop includes travel time.
- When detected sufficiently early enough during the ascent, apply the classical procedure: Slow down the ascent, wait to catch the normal ascent time scheduled, and continue the ascent normally.

#### *2.2.2.2 - Ascent speed too slow*

Apply the procedure described for air standard:

- The delay starts deeper than half maximum depth of dive:
  *"Delay added to the bottom time and decompress in accordance with the new bottom time".*
- The delay starts shallower than half maximum depth of dive:
  *"Delay added to stop time of next stop. If no stop is scheduled, then stop at 10 ft (3 m) for the time of delay".*

#### *2.2.2.3 - Omitted decompression*

Transfer the diver into the chamber and treat:

- Use table #5 USN if less than 30 minutes omitted decompression
- Use table #6 USN if 30 minutes or more omitted decompression

#### *2.2.2.4 - Decompression stress during the surface interval (diver experiencing DCS symptoms)*

Apply the procedure indicated in point 4.2.1.1 "About surface decompression procedures":

- If the symptoms have resolved when the diver is confirmed on oxygen at 40 ft (12 m ) in the chamber, the decompression profile is to be completed as planned.
- If the symptoms have not been completely resolved, when the diver is confirmed on Oxygen at 40 ft (12 m) in the chamber, compress him to 18 m/60 fsw, and apply the treatment table #6 USN

#### *2.2.2.5 - Interval surface longer than 7 minutes*

Apply the procedure for omitted decompression:

- Use table #5 USN if less than 30 minutes omitted decompression
- Use table #6 USN if 30 minutes or more omitted decompression

#### *2.2.2.6 - For all procedures involving treatment in the chamber*

- Contact the Diving medical specialist as soon as possible.
- Examination for DCS and barotrauma is to be performed before and during the treatment.
- If there is any suspicion of DCS or barotrauma, and the diving medical specialist is not reachable, apply the chart for decompression accidents or barotraumas in Book #1, "Description and prevention of diving accidents".

Hyperlink Table of contents

### *2.2.2.7 - Diver unable to reach the 12 m (40 ft) stop*

Apply the safe way out procedure.
DCIEM did not publish any "safe way out procedure". Two procedures can be used to solve this problem:
- The procedure US Navy indicated in the US Navy manual revision 7
- The procedure US Navy "reinforced" which is the original procedure USN with additional O2 stops at 3m (10 ft).

**US Navy**

Compress the diver to the deepest depth he can attain initially

↓

Begin oxygen breathing at that depth.
Continue attempts to gradually compress the diver deeper.
- If the deco schedule requests an in water stop at 6 m (20 ft) try to compress the diver to 6 m
- If the deco schedule requests an in water stop at 9 m (30 ft) attempt to compress to this depth

↓

Double the number of O2 periods indicated on the table

Interrupt the O2 breathing every 60 min with 15 min air breaks

The air breaks do not count toward the total oxygen time

↓

At completion: Ascend the diver at 9 m/min (30 ft /min)

**US Navy reinforced**

Compress the diver to the deepest depth he can support initially

↓

Begin oxygen breathing at that depth.
Continue attempts to gradually compress the diver deeper.
- If the deco schedule requests an in water stop at 6 m (20 ft) try to compress the diver to 6 m
- If the deco schedule requests an in water stop at 9 m (30 ft) attempt to compress to this depth

↓

Double the number of O2 periods indicated on the table

Interrupt the O2 breathing every 60 min with 15 min air breaks

The air breaks do not count toward the total oxygen time

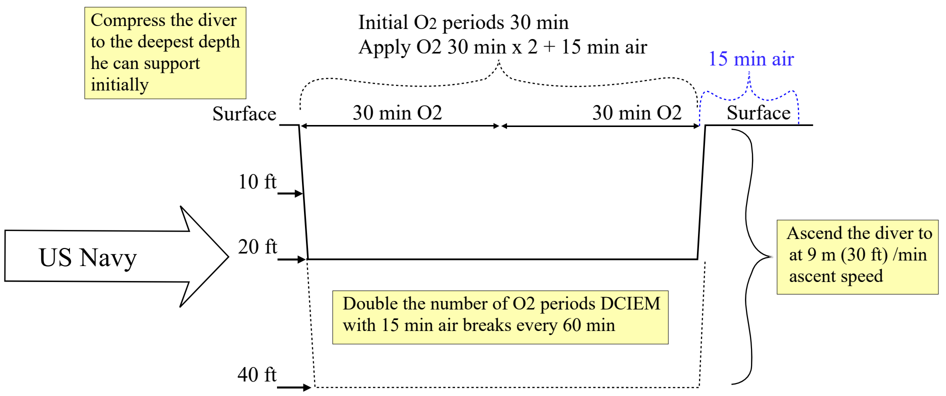
↓

At completion:
- Ascend the diver to 3 m (10 ft) at 9 m/min (30ft/min) ascent speed
- Stop the ascent at 3 m (10 ft) and start another stop with the same O2 periods than requested for the stop at 12 m (40 ft) with air breaks 5 min every 30 min (Normal Period DCIEM)

↓

At completion: Ascend the diver at 9 m/min (30 ft /min)

To compare the 2 procedures see below an example for a dive at 42 m / 30 min bottom time
The decompression requested is initially:
- 4 min Air 12 m in water
- 6 min Air 9 m in water
- 30 minutes O2 in chamber

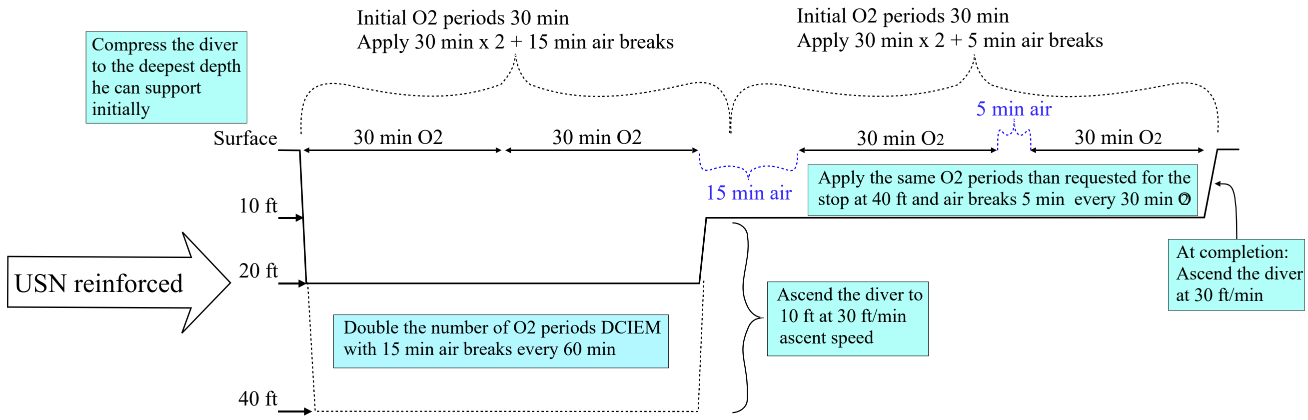



**Important**

Consult the diving medical specialist.

Observe the diver for decompression sickness and check for rest and hydration.

The diver is not allowed to dive without medical advice.



### *2.2.2.8 - Acute oxygen poisoning during the decompression*

Apply the procedure in chapter "Acute O2 poisoning" of Book #1, "Description and prevention of diving accidents":

- The procedure is to remove the O2 mask, breathe air for 15 minutes , then resume the decompression at the point of interruption. Generally it will not happen again, but the diver must be followed . In the case that a 2nd crisis starts, the decompression will have to be completed on air…
  In case of convulsion, the attendant must prevent the casualty from damaging himself, check the airways and make sure the tongue will not be be swallowed (A padded mouth piece may be gently placed between the teeth to protect the tongue.).
  After the convulsion, the patient may be unconscious for a short time.
- Important: DO NOT attempt to decompress a diver during a convulsion: The casualty will be unable to exhale with the high risk to create a pulmonary barotrauma. The ascent to the next step must begin only after full recovery and the patient is relaxed.
- If the decompression has to be completed on air the procedure DCIEM is to use the "Air standard Table" ( in water Air) as explained in the the example below:

Dive 140 fsw / 30 min bottom time
decompression using surface O2 deco

The table selected calls for : 30 min on O2

The O2 periods of the DCIEM are 30 min
So, no air break is planned for this deco.

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) — In-Water Stops — Air: 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 7 | - | - | - | - | - | - | Time from leaving the 30 fsw stop (or the bottom, if no in-water stop is required) to reaching the 40 fsw Chamber stop must not exceed 7 minutes. | - | 3 | B |
| | 15 | - | - | - | - | - | - | | 7 | 15 | F |
| | 20 | - | - | - | - | - | 4 | | 12 | 24 | G |
| | 25 | - | - | - | - | - | 7 | | 23 | 38 | H |
| | 30 | - | - | - | - | 4 | 6 | | 30 | 48 | I |
| | 35 | - | - | - | - | 6 | 6 | | 34* | 59 | J |
| | 40 | - | - | - | - | 7 | 7 | | 42* | 69 | K |
| | 45 | - | - | - | 3 | 6 | 7 | | 49* | 78 | M |
| | 50 | - | - | - | 4 | 6 | 8 | | 56* | 87 | |
| | 55 | - | - | - | 5 | 6 | 9 | | 60** | 98 | |
| | 60 | - | - | - | 6 | 6 | 9 | | 71** | 110 | |
| | 65 | - | - | - | 7 | 6 | 11 | | 79** | 121 | |
| | 70 | - | - | 2 | 5 | 7 | 15 | | 85** | 132 | |
| | 75 | - | - | 3 | 5 | 8 | 18 | | 90** | 142 | |
| | 80 | - | - | 3 | 6 | 8 | 21 | | 101*** | 162 | |
| | 85 | - | - | 4 | 6 | 8 | 25 | | 108*** | 174 | |
| | 90 | - | - | 4 | 6 | 8 | 30 | | 113*** | 184 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

- Decision to pass on Air after 24 min O2 at 30 ft
- The table to be used is the "Standard Air Table" despite the fact that the decompression is performed in the chamber .

- The deco for 140 fsw/ 30 min using the standard Air table is:
  - 4 min stop at 40 ft
  - 6 min stop at 30 ft
  - 9 min stop at 20 ft
  - 29 min stop at 10 ft

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw): 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 7 | - | - | - | - | - | - | - | - | 2 | B |
| | 10 | - | - | - | - | - | - | - | 7 | 7 | D |
| | 15 | - | - | - | - | - | - | 6 | 9 | 15 | F |
| | 20 | - | - | - | - | - | 4 | 7 | 11 | 22 | G |
| | 25 | - | - | - | - | - | 7 | 8 | 19 | 34 | I |
| | 30 | - | - | - | - | 4 | 6 | 9 | 29 | 48 | K |
| | 35 | - | - | - | - | 6 | 6 | 10 | 39 | 61 | L |
| | 40 | - | - | - | - | 7 | 7 | 10 | 49 | 73 | N |
| | 45 | - | - | - | 3 | 6 | 7 | 17 | 56 | 89 | O |
| | 50 | - | - | - | 4 | 6 | 8 | 22 | 65 | 105 | |
| | 55 | - | - | - | 5 | 6 | 9 | 27 | 78 | 125 | |
| | 60 | - | - | - | 6 | 6 | 9 | 33 | 91 | 145 | |
| | 65 | - | - | - | 7 | 6 | 11 | 38 | 106 | 168 | |
| | 70 | - | - | 2 | 5 | 7 | 15 | 42 | 120 | 191 | |
| | 75 | - | - | 3 | 5 | 8 | 18 | 47 | 133 | 214 | |
| | 80 | - | - | 3 | 6 | 8 | 21 | 54 | 143 | 235 | |
| | 85 | - | - | 4 | 6 | 8 | 25 | 61 | 151 | 255 | |
| | 90 | - | - | 4 | 6 | 8 | 30 | 68 | 157 | 273 | |

- To allow to pass from the "Surface O2 decompression" table to the "Standard Air" table, the designers have considered that the total time of the stops performed using O2 have to be subtracted from the total time of the stops to be performed on air. That gives the following calculation:
  - The total of stops to do normally using standard air table is: 4 + 6 + 9 + 29 = 48 min
  - The total of stops O2 performed at 40 ft is: 24 min
  - Total of stops to perform using the "standard air table' is: 48 min Air - 24 min O2 completed = 24 min Air

*2.2.2.9 - Oxygen supply breakdown*

- For temporary loss of oxygen supply:
  The divers breathe chamber air. Return the divers to oxygen breathing when the supply is reestablished. Consider any time spent on air as dead time *(The valid decompression is the time spent on $O_2$)*.
- If the loss of the oxygen supply is permanent:
  Decompress the divers on air using the procedure explained in the previous point

### 2.2.3 - Oxygen surface decompression DCIEM - Imperial

#### *2.2.3.1 - Table 1S “Short standard air decompression” - Imperial*

This table has to be used for information, and to calculate multilevel diving. It is not to be used to manage the dives.

| Depth (fsw) | No-Decompression Bottom Times (min) | | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|---|
| 20 | 30 A<br>60 B<br>90 C<br>120 D | 150 E<br>180 F<br>240 G<br>300 H | 360 I<br>420 J<br>480 K<br>600 L | 720 M<br>∞ | | | | |
| 30 | 30 A<br>45 B<br>60 C<br>90 D | 100 E<br>120 F<br>150 G<br>180 H | 190 I<br>210 J<br>240 K<br>270 L | 300 M | 330 N<br>360 O | 400 | 420 | 450 |
| 40 | 22 A<br>30 B<br>40 C | 60 D<br>70 E<br>80 F | 90 G<br>120 H<br>130 I | 150 J | 160 K<br>170 L | 180 M<br>190 | 200 | 215 |
| 50 | 18 A<br>25 B | 30 C<br>40 D | 50 E<br>60 F | 75 G | 85 H<br>95 I | 105 J<br>115 K | 124 L | 132 M |
| 60 | 14 A<br>20 B | 25 C<br>30 D | 40 E | 50 F | 60 G | 70 H<br>80 I | 85 J | 92 K |
| Decompression Time in minutes at | | | 10 fsw | | 5 | 10 | 15 | 20 |
| 70 | 12 A<br>15 B | 20 C | 25 D | 35 E | 40 F | 50 G | 63 I | 66 J |
| 80 | 10 A<br>13 B | 15 C | 20 D | 25 E | 29 F | 35 G | 48 H | 52 I |
| 90 | 9 A | 12 B | 15 C | 20 D | 23 E | 27 F | 35 G | 43 I |
| 100 | 7 A | 10 B | 12 C | 15 D | 18 D | 21 E | 29 G | 36 H |
| 110 | | 6 A | 10 B | 12 C | 15 D | 18 E | 22 F | 30 H |
| 120 | | 6 A | 8 B | 10 C | 12 D | 15 E | 19 F | 25 G |
| 130 | | | 5 A | 8 B | 10 C | 13 D | 16 F | 21 G |
| 140 | | | 5 A | 7 B | 9 C | 11 D | 14 F | 18 G |
| 150 | | | 4 A | 6 B | 8 C | 10 D | 12 E | 15 F |
| Decompression Time in minutes at | | | 20 fsw | | - | - | 5 | 10 |
| | | | 10 fsw | | 5 | 10 | 10 | 10 |

***2.2.3.2 - Table #3 - "Surface oxygen decompression - Imperial"***

Air surface $O_2$ decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) – In-Water Stops – Air | | | | | | Surface Interval | RCC $O_2$ | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| | 50 | - | - | - | - | - | - | | - | 1 | F |
| | 70 | - | - | - | - | - | - | | 10 | 18 | H |
| | 80 | - | - | - | - | - | - | | 16 | 24 | H |
| | 90 | - | - | - | - | - | - | 7 min | 20 | 28 | I |
| | 100 | - | - | - | - | - | - | | 24 | 32 | J |
| | 110 | - | - | - | - | - | - | | 28 | 36 | K |
| | 120 | - | - | - | - | - | - | | 30 | 38 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 130 | - | - | - | - | - | - | | 33* | 46 | |
| | 140 | - | - | - | - | - | - | | 38* | 51 | |
| 60 | 150 | - | - | - | - | - | - | | 43* | 56 | |
| | 160 | - | - | - | - | - | - | | 47* | 60 | |
| | 170 | - | - | - | - | - | - | | 50* | 63 | |
| | 180 | - | - | - | - | - | - | | 54* | 67 | |
| | 190 | - | - | - | - | - | - | 7 min | 57* | 70 | |
| | 200 | - | - | - | - | - | - | | 60** | 78 | |
| | 210 | - | - | - | - | - | - | | 64** | 82 | |
| | 220 | - | - | - | - | - | - | | 70** | 88 | |
| | 230 | - | - | - | - | - | - | | 74** | 92 | |
| | 240 | - | - | - | - | - | - | | 77** | 95 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) — In-Water Stops — Air 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | 35 | - | - | - | - | - | - | | - | 1 | E |
| | 50 | - | - | - | - | - | - | | 6 | 14 | H |
| | 60 | - | - | - | - | - | - | | 15 | 23 | H |
| | 70 | - | - | - | - | - | - | 7 min | 21 | 29 | I |
| | 80 | - | - | - | - | - | - | | 26 | 34 | J |
| | 90 | - | - | - | - | - | - | | 30 | 38 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 100 | - | - | - | - | - | - | | 34* | 47 | K |
| | 110 | - | - | - | - | - | - | | 40* | 53 | |
| | 120 | - | - | - | - | - | - | | 46* | 59 | |
| | 130 | - | - | - | - | - | - | | 50* | 63 | |
| | 140 | - | - | - | - | - | - | | 55* | 68 | |
| | 150 | - | - | - | - | - | - | 7 min | 60* | 73 | |
| | 160 | - | - | - | - | - | - | | 64** | 82 | |
| | 170 | - | - | - | - | - | - | | 71** | 89 | |
| | 180 | - | - | - | - | - | - | | 76** | 94 | |
| | 190 | - | - | - | - | - | 1 | | 81** | 100 | |
| | 200 | - | - | - | - | - | 2 | | 85** | 105 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) — In-Water Stops — Air 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 80 | 25 | - | - | - | - | - | - | 7 min | - | 2 | E |
| | 45 | - | - | - | - | - | - | | 12 | 20 | H |
| | 50 | - | - | - | - | - | - | | 17 | 25 | H |
| | 55 | - | - | - | - | - | - | | 21 | 29 | H |
| | 60 | - | - | - | - | - | - | | 24 | 32 | I |
| | 70 | - | - | - | - | - | - | | 30 | 38 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 80 | - | - | - | - | - | - | 7 min | 35* | 48 | K |
| | 90 | - | - | - | - | - | 1 | | 41* | 55 | |
| | 100 | - | - | - | - | - | 2 | | 47* | 62 | |
| | 110 | - | - | - | - | - | 3 | | 53* | 69 | |
| | 120 | - | - | - | - | - | 3 | | 59* | 75 | |
| | 130 | - | - | - | - | - | 4 | | 63** | 85 | |
| | 140 | - | - | - | - | - | 5 | | 72** | 95 | |
| | 150 | - | - | - | - | - | 5 | | 79** | 102 | |
| | 160 | - | - | - | - | - | 6 | | 84** | 108 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 90 | 20 | - | - | - | - | - | - | 7 min | - | 2 | D |
| | 35 | - | - | - | - | - | - | | 8 | 16 | G |
| | 40 | - | - | - | - | - | - | | 16 | 24 | G |
| | 45 | - | - | - | - | - | - | | 21 | 29 | H |
| | 50 | - | - | - | - | - | - | | 25 | 33 | H |
| | 55 | - | - | - | - | - | 1 | | 28 | 37 | I |
| | 60 | - | - | - | - | - | 2 | | 30* | 45 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 70 | - | - | - | - | - | 4 | 7 min | 37* | 54 | |
| | 80 | - | - | - | - | - | 5 | | 45* | 63 | |
| | 90 | - | - | - | - | - | 6 | | 52* | 71 | |
| | 100 | - | - | - | - | - | 7 | | 58* | 78 | |
| | 110 | - | - | - | - | - | 8 | | 65** | 91 | |
| | 120 | - | - | - | - | - | 8 | | 75** | 101 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) – In-Water Stops – Air: 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 15 | - | - | - | - | - | - | | - | 2 | D |
| | 30 | - | - | - | - | - | - | | 8 | 16 | G |
| | 35 | - | - | - | - | - | - | | 17 | 25 | G |
| | 40 | - | - | - | - | - | 2 | 7 min | 22 | 32 | H |
| | 45 | - | - | - | - | - | 3 | | 27 | 38 | I |
| | 50 | - | - | - | - | - | 4 | | 30 | 42 | I |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| 100 | 55 | - | - | - | - | - | 5 | | 31* | 49 | J |
| | 60 | - | - | - | - | - | 6 | | 37* | 56 | |
| | 70 | - | - | - | - | - | 8 | | 46* | 67 | |
| | 80 | - | - | - | - | - | 9 | 7 min | 54* | 76 | |
| | 90 | - | - | - | - | 2 | 8 | | 60* | 83 | |
| | 100 | - | - | - | - | 3 | 9 | | 72** | 102 | |
| | 110 | - | - | - | - | 4 | 9 | | 81** | 112 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC O2 | Decom. Time (min) | Repet. Group |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 110 | 12 | - | - | - | - | - | - | 7 min | - | 2 | C |
| | 25 | - | - | - | - | - | - | | 7 | 15 | G |
| | 30 | - | - | - | - | - | 2 | | 16 | 26 | G |
| | 35 | - | - | - | - | - | 4 | | 22 | 34 | H |
| | 40 | - | - | - | - | - | 5 | | 27 | 40 | I |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 45 | - | - | - | - | - | 6 | 7 min | 30* | 49 | J |
| | 50 | - | - | - | - | - | 8 | | 34* | 55 | K |
| | 55 | - | - | - | - | - | 9 | | 40* | 62 | K |
| | 60 | - | - | - | - | 3 | 7 | | 45* | 68 | |
| | 65 | - | - | - | - | 3 | 8 | | 50* | 74 | |
| | 70 | - | - | - | - | 4 | 8 | | 54* | 79 | |
| | 75 | - | - | - | - | 5 | 8 | | 59* | 85 | |
| | 80 | - | - | - | - | 5 | 8 | | 61** | 92 | |
| | 85 | - | - | - | - | 6 | 8 | | 70** | 102 | |
| | 90 | - | - | - | - | 6 | 9 | | 76** | 109 | |
| | 95 | - | - | - | - | 7 | 9 | | 81** | 115 | |
| | 100 | - | - | - | - | 7 | 10 | | 86** | 121 | |
| | 105 | - | - | - | - | 8 | 13 | | 90** | 129 | |
| | 110 | - | - | - | - | 8 | 16 | | 95*** | 142 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 120 | 10 | - | - | - | - | - | - | 7 min | - | 2 | C |
| | 20 | - | - | - | - | - | - | | 7 | 15 | F |
| | 25 | - | - | - | - | - | 2 | | 13 | 23 | G |
| | 30 | - | - | - | - | - | 5 | | 21 | 34 | G |
| | 35 | - | - | - | - | - | 6 | | 27 | 41 | H |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | 7 min | 30* | 51 | I |
| | 45 | - | - | - | - | 3 | 7 | | 36* | 59 | J |
| | 50 | - | - | - | - | 4 | 7 | | 42* | 66 | K |
| | 55 | - | - | - | - | 5 | 7 | | 48* | 73 | |
| | 60 | - | - | - | - | 6 | 8 | | 53* | 80 | |
| | 65 | - | - | - | - | 7 | 8 | | 58* | 86 | |
| | 70 | - | - | - | - | 7 | 9 | | 60** | 94 | |
| | 75 | - | - | - | 2 | 6 | 9 | | 70** | 105 | |
| | 80 | - | - | - | 3 | 6 | 9 | | 77** | 113 | |
| | 85 | - | - | - | 3 | 7 | 10 | | 83** | 121 | |
| | 90 | - | - | - | 3 | 7 | 14 | | 87** | 129 | |
| | 95 | - | - | - | 4 | 7 | 16 | | 90** | 135 | |
| | 100 | - | - | - | 4 | 7 | 20 | | 100*** | 154 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 130 | 8 | - | - | - | - | - | - | 7 min | - | 2 | B |
| | 20 | - | - | - | - | - | - | | 9 | 17 | G |
| | 25 | - | - | - | - | - | 5 | | 18 | 31 | G |
| | 30 | - | - | - | - | - | 7 | | 26 | 41 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 3 | 6 | 7 min | 30* | 52 | I |
| | 40 | - | - | - | - | 5 | 6 | | 36* | 60 | J |
| | 45 | - | - | - | - | 6 | 7 | | 43* | 69 | K |
| | 50 | - | - | - | - | 7 | 8 | | 49* | 77 | |
| | 55 | - | - | - | 2 | 6 | 8 | | 55* | 84 | |
| | 60 | - | - | - | 3 | 6 | 8 | | 60** | 95 | |
| | 65 | - | - | - | 4 | 6 | 9 | | 68** | 105 | |
| | 70 | - | - | - | 5 | 6 | 9 | | 76** | 114 | |
| | 75 | - | - | - | 5 | 7 | 11 | | 82** | 123 | |
| | 80 | - | - | - | 6 | 7 | 15 | | 87** | 133 | |
| | 85 | - | - | - | 6 | 7 | 18 | | 90*** | 144 | |
| | 90 | - | - | - | 7 | 7 | 22 | | 102*** | 161 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw): In-Water Stops: Air 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 140 | 7 | - | - | - | - | - | - | 7 min | - | 3 | B |
| | 15 | - | - | - | - | - | - | | 7 | 15 | F |
| | 20 | - | - | - | - | - | 4 | | 12 | 24 | G |
| | 25 | - | - | - | - | - | 7 | | 23 | 38 | H |
| | 30 | - | - | - | - | 4 | 6 | | 30 | 48 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 6 | 6 | 7 min | 34* | 59 | J |
| | 40 | - | - | - | - | 7 | 7 | | 42* | 69 | K |
| | 45 | - | - | - | 3 | 6 | 7 | | 49* | 78 | M |
| | 50 | - | - | - | 4 | 6 | 8 | | 56* | 87 | |
| | 55 | - | - | - | 5 | 6 | 9 | | 60** | 98 | |
| | 60 | - | - | - | 6 | 6 | 9 | | 71** | 110 | |
| | 65 | - | - | - | 7 | 6 | 11 | | 79** | 121 | |
| | 70 | - | - | 2 | 5 | 7 | 15 | | 85** | 132 | |
| | 75 | - | - | 3 | 5 | 8 | 18 | | 90** | 142 | |
| | 80 | - | - | 3 | 6 | 8 | 21 | | 101*** | 162 | |
| | 85 | - | - | 4 | 6 | 8 | 25 | | 108*** | 174 | |
| | 90 | - | - | 4 | 6 | 8 | 30 | | 113*** | 184 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops Air | | | | | | Surface Interval | RCC $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 150 | 6 | - | - | - | - | - | - | | - | 3 | B |
| | 15 | - | - | - | - | - | - | 7 min | 8 | 16 | G |
| | 20 | - | - | - | - | - | 6 | | 17 | 31 | G |
| | 25 | - | - | - | - | 4 | 6 | | 26 | 44 | H |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 7 | | 30* | 56 | I |
| | 35 | - | - | - | 3 | 5 | 7 | | 40* | 68 | K |
| | 40 | - | - | - | 4 | 6 | 8 | | 48* | 79 | M |
| | 45 | - | - | - | 6 | 6 | 8 | | 55* | 88 | |
| | 50 | - | - | - | 7 | 6 | 9 | | 60** | 100 | |
| | 55 | - | - | 3 | 5 | 6 | 10 | 7 min | 73** | 115 | |
| | 60 | - | - | 4 | 5 | 7 | 13 | | 81** | 128 | |
| | 65 | - | - | 4 | 6 | 7 | 17 | | 87** | 139 | |
| | 70 | - | - | 5 | 6 | 7 | 21 | | 97*** | 159 | |
| | 75 | - | - | 6 | 5 | 8 | 25 | | 106*** | 173 | |
| | 80 | - | - | 6 | 6 | 8 | 29 | | 112*** | 184 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 160 | 6 | - | - | - | - | - | - | | - | 3 | B |
| | 15 | - | - | - | - | - | 4 | 7 min | 7 | 19 | G |
| | 20 | - | - | - | - | 3 | 5 | | 21 | 37 | G |
| | 25 | - | - | - | - | 6 | 6 | | 30 | 50 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 30 | - | - | - | 4 | 5 | 6 | | 37* | 65 | J |
| | 35 | - | - | - | 5 | 6 | 7 | | 46* | 77 | L |
| | 40 | - | - | - | 7 | 6 | 8 | | 54* | 88 | |
| | 45 | - | - | 3 | 5 | 6 | 9 | | 60* | 96 | |
| | 50 | - | - | 4 | 5 | 7 | 9 | 7 min | 73** | 116 | |
| | 55 | - | - | 5 | 6 | 7 | 14 | | 81** | 131 | |
| | 60 | - | - | 6 | 6 | 7 | 18 | | 89** | 144 | |
| | 65 | - | 3 | 4 | 6 | 8 | 22 | | 101*** | 167 | |
| | 70 | - | 3 | 5 | 6 | 8 | 27 | | 109*** | 181 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 170 | 5 | - | - | - | - | - | - | 7 min | - | 3 | B |
| | 10 | - | - | - | - | - | - | | 6 | 14 | D |
| | 15 | - | - | - | - | - | 6 | | 11 | 25 | G |
| | 20 | - | - | - | - | 5 | 6 | | 25 | 44 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 25 | - | - | - | 3 | 5 | 6 | 7 min | 30* | 57 | J |
| | 30 | - | - | - | 6 | 5 | 7 | | 42* | 73 | K |
| | 35 | - | - | 3 | 4 | 6 | 8 | | 51* | 85 | M |
| | 40 | - | - | 4 | 5 | 6 | 9 | | 60* | 97 | |
| | 45 | - | - | 6 | 5 | 6 | 10 | | 71** | 116 | |
| | 50 | - | 3 | 4 | 5 | 7 | 14 | | 81** | 132 | |
| | 55 | - | 3 | 5 | 5 | 8 | 19 | | 89** | 147 | |
| | 60 | - | 4 | 5 | 6 | 8 | 23 | | 102*** | 171 | |
| | 65 | - | 5 | 5 | 6 | 8 | 29 | | 111*** | 187 | |
| | 70 | - | 5 | 5 | 7 | 12 | 31 | | 118*** | 201 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC O2 | | |
| | | Air | | | | | | | | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | | |
| 180 | 5 | - | - | - | - | - | - | | - | 3 | B |
| | 10 | - | - | - | - | - | - | | 7 | 15 | E |
| | 15 | - | - | - | - | - | 8 | | 15 | 31 | G |
| | 20 | - | - | - | - | 7 | 6 | | 28 | 49 | H |
| | 25 | - | - | - | 5 | 5 | 7 | | 36* | 66 | J |
| | 30 | - | - | 3 | 5 | 5 | 8 | 7 min | 47* | 81 | M |
| | 35 | - | - | 5 | 5 | 6 | 8 | | 57* | 94 | |
| | 40 | - | 3 | 4 | 5 | 6 | 9 | | 68** | 113 | |
| | 45 | - | 4 | 4 | 5 | 7 | 14 | | 79** | 131 | |
| | 50 | - | 5 | 4 | 6 | 7 | 19 | | 88** | 147 | |
| | 55 | - | 5 | 5 | 6 | 8 | 24 | | 102*** | 173 | |
| | 60 | 3 | 3 | 5 | 7 | 9 | 29 | | 111*** | 190 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC O2 | |
| | | Air | | | | | | | | | | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | |
| 190 | 5 | - | - | - | - | - | - | - | - | | - | 3 |
| | 10 | - | - | - | - | - | - | - | - | | 8 | 16 |
| | 15 | - | - | - | - | - | - | 4 | 5 | | 19 | 36 |
| | 20 | - | - | - | - | - | 4 | 5 | 6 | | 30 | 53 |
| | 25 | - | - | - | - | 3 | 4 | 5 | 7 | | 41* | 73 |
| | 30 | - | - | - | - | 5 | 5 | 5 | 8 | 7 min | 52* | 88 |
| | 35 | - | - | - | 3 | 4 | 5 | 6 | 9 | | 60* | 100 |
| | 40 | - | - | - | 5 | 4 | 5 | 7 | 12 | | 76** | 127 |
| | 45 | - | - | - | 6 | 4 | 6 | 7 | 18 | | 86** | 145 |
| | 50 | - | - | 3 | 4 | 4 | 6 | 8 | 24 | | 100*** | 172 |
| | 55 | - | - | 4 | 4 | 5 | 6 | 10 | 28 | | 111*** | 191 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | |
| 200 | 10 | - | - | - | - | - | - | - | - | 7 min | 10 | 18 |
| | 15 | - | - | - | - | - | - | 6 | 5 | | 22 | 41 |
| | 20 | - | - | - | - | - | 6 | 4 | 7 | | 31* | 61 |
| | 25 | - | - | - | - | 5 | 4 | 5 | 8 | | 45* | 80 |
| | 30 | - | - | - | 3 | 4 | 5 | 6 | 8 | | 57* | 96 |
| | 35 | - | - | - | 5 | 4 | 5 | 7 | 9 | | 70** | 118 |
| | 40 | - | - | 3 | 3 | 5 | 5 | 8 | 16 | | 83** | 141 |
| | 45 | - | - | 4 | 4 | 4 | 6 | 8 | 22 | | 95*** | 166 |
| | 50 | - | - | 5 | 4 | 5 | 6 | 10 | 27 | | 109*** | 189 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | |
| 210 | 10 | - | - | - | - | - | - | - | 5 | 7 min | 7 | 20 |
| | 15 | - | - | - | - | - | - | 7 | 6 | | 25 | 46 |
| | 20 | - | - | - | - | 4 | 3 | 5 | 7 | | 36* | 68 |
| | 25 | - | - | - | - | 6 | 5 | 5 | 8 | | 50* | 87 |
| | 30 | - | - | - | 5 | 4 | 5 | 6 | 9 | | 60* | 102 |
| | 35 | - | - | 3 | 4 | 4 | 5 | 7 | 14 | | 77** | 132 |
| | 40 | - | - | 5 | 3 | 5 | 6 | 8 | 19 | | 90** | 154 |
| | 45 | - | - | 6 | 4 | 4 | 7 | 8 | 27 | | 106*** | 185 |
| | 50 | - | 3 | 4 | 4 | 5 | 7 | 13 | 31 | | 117*** | 207 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | |
| | 10 | - | - | - | - | - | - | - | 7 | | 7 | 22 |
| | 15 | - | - | - | - | - | 5 | 4 | 6 | | 28 | 51 |
| | 20 | - | - | - | - | 5 | 4 | 5 | 7 | | 40* | 74 |
| | 25 | - | - | - | 4 | 4 | 4 | 6 | 9 | | 54* | 94 |
| 220 | 30 | - | - | 3 | 4 | 4 | 5 | 7 | 9 | 7 min | 69** | 119 |
| | 35 | - | - | 5 | 3 | 5 | 5 | 8 | 17 | | 83** | 144 |
| | 40 | - | 3 | 3 | 4 | 5 | 6 | 8 | 24 | | 100*** | 176 |
| | 45 | - | 4 | 3 | 4 | 6 | 6 | 12 | 29 | | 113*** | 200 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Imperial

**Warning: The maximum operational depth UK-HSE is 164 ft**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | | 40 | |
| | 10 | - | - | - | - | - | - | - | 8 | | 11 | 27 |
| | 15 | - | - | - | - | - | 6 | 4 | 7 | | 30 | 55 |
| | 20 | - | - | - | - | 6 | 4 | 6 | 7 | | 44* | 80 |
| 230 | 25 | - | - | - | 6 | 4 | 4 | 7 | 8 | 7 min | 59* | 101 |
| | 30 | - | - | 5 | 3 | 4 | 6 | 7 | 12 | | 76** | 131 |
| | 35 | - | 4 | 3 | 3 | 5 | 6 | 8 | 20 | | 90** | 157 |
| | 40 | - | 5 | 3 | 4 | 5 | 6 | 10 | 27 | | 108*** | 191 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

*2.2.3.3 - Tables A and B for repetitive dive calculation - Imperial*

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

**B. NO-DECOMPRESSION REPETITIVE DIVING TABLE**

| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

*2.2.3.4 - Table #5 - Depth correction for diving at altitude - Imperial*

| Actual Depth (feet) | Depth Correction at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| **30** | **+0** | **+10** | **+10** | **+10** | **+10** | **+10** | **+10** | **+20** | **+20** |
| **40** | **+0** | **+10** | **+10** | **+10** | **+10** | **+10** | **+20** | **+20** | **+20** |
| **50** | **+0** | **+10** | **+10** | **+10** | **+10** | **+20** | **+20** | **+20** | **+20** |
| **60** | **+0** | **+10** | **+10** | **+10** | **+20** | **+20** | **+20** | **+20** | **+30** |
| **70** | **+0** | **+10** | **+10** | **+10** | **+20** | **+20** | **+20** | **+30** | **+30** |
| **80** | **+0** | **+10** | **+10** | **+20** | **+20** | **+20** | **+30** | **+30** | **+40** |
| **90** | **+0** | **+10** | **+10** | **+20** | **+20** | **+20** | **+30** | **+30** | **+40** |
| **100** | **+0** | **+10** | **+10** | **+20** | **+20** | **+30** | **+30** | **+30** | **+40** |
| **110** | **+0** | **+10** | **+20** | **+20** | **+20** | **+30** | **+30** | **+40** | **+50** |
| **120** | **+0** | **+10** | **+20** | **+20** | **+30** | **+30** | **+30** | **+40** | **+50** |
| **130** | **+0** | **+10** | **+20** | **+20** | **+30** | **+30** | **+40** | **+40** | **+50** |
| **140** | **+0** | **+10** | **+20** | **+20** | **+30** | **+30** | **+40** | **+40** | **+60** |
| **150** | **+10** | **+10** | **+20** | **+20** | **+30** | **+40** | **+40** | **+50** | **+60** |
| **160** | **+10** | **+20** | **+20** | **+30** | **+30** | **+40** | **+40** | **+50** | **+60** |
| **170** | **+10** | **+20** | **+20** | **+30** | **+30** | **+40** | **+50** | **+50** | **+70** |
| **180** | **+10** | **+20** | **+20** | **+30** | **+40** | **+40** | **+50** | **+50** | |
| **190** | **+10** | **+20** | **+20** | **+30** | **+40** | **+40** | **+50** | | |
| **200** | **+10** | **+20** | **+20** | **+30** | **+40** | **+40** | | | |
| **210** | **+10** | **+20** | **+20** | **+30** | | | | | |
| **220** | **+10** | **+20** | | | | | | | |
| **230** | **+10** | | | | | | | | |

| Sea Level Stop Depth (feet) | Actual Decompression Stop Depth at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| **10** | **10** | **10** | **10** | **9** | **9** | **9** | **8** | **8** | **8** |
| **20** | **20** | **20** | **19** | **18** | **18** | **17** | **16** | **16** | **15** |
| **30** | **30** | **29** | **28** | **27** | **26** | **25** | **24** | **24** | **23** |
| **40** | **40** | **39** | **38** | **36** | **35** | **34** | **32** | **31** | **30** |
| **50** | **50** | **49** | **47** | **45** | **44** | **42** | **40** | **39** | **38** |
| **60** | **59** | **58** | **56** | **54** | **52** | **50** | **48** | **47** | **45** |
| **70** | **69** | **68** | **66** | **63** | **61** | **59** | **56** | **54** | **52** |
| **80** | **79** | **77** | **75** | **72** | **70** | **67** | **64** | **62** | **60** |
| **90** | **89** | **87** | **84** | **81** | **78** | **75** | **72** | **70** | **67** |

### 2.2.5 - Oxygen surface decompression DCIEM - Metric

#### *2.2.5.1 - Table 1S “Short standard air decompression” - Metric*

This table has to be used for information, and to calculate multilevel diving. It is not to be used to manage the dives.

| Depth (msw) | No-Decompression Bottom Times (min) | | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|---|
| 6 | 30 A<br>60 B<br>90 C<br>120 D | 150 E<br>180 F<br>240 G<br>300 H | 360 I<br>420 J<br>480 K<br>600 L | 720 M<br>∞ | | | | |
| 9 | 30 A<br>45 B<br>60 C<br>90 D | 100 E<br>120 F<br>150 G<br>180 H | 190 I<br>210 J<br>240 K<br>270 L | 300 M | 330 N<br>360 O | 400 | 420 | 480 |
| 12 | 22 A<br>30 B<br>40 C | 60 D<br>70 E<br>80 F | 90 G<br>120 H<br>130 I | 150 J | 160 K<br>170 L<br>180 M | 200 | 210 | 220 |
| 15 | 18 A<br>25 B | 30 C<br>40 D | 50 E<br>60 F | 75 G | 90 H<br>100 I | 110 J<br>120 K | 128 L | 137 M |
| 18 | 14 A<br>20 B | 25 C<br>30 D | 40 E | 50 F | 60 G | 70 H<br>80 I | 88 J | 95 K |
| Decompression Time in minutes at | | | 3 msw | | 5 | 10 | 15 | 20 |
| 21 | 12 A<br>15 B | 20 C | 25 D | 35 E | 40 F | 53 H | 65 I | 68 J |
| 24 | 10 A<br>13 B | 15 C | 20 D | 25 E | 30 F | 37 G | 50 H | 54 I |
| 27 | 9 A | 12 B | 15 C | 20 D | 24 E | 28 F | 35 G | 44 I |
| 30 | 7 A | 10 B | 12 C | 15 D | 18 D | 22 F | 30 G | 37 H |
| 33 | | 6 A | 10 B | 12 C | 15 D | 18 E | 24 G | 31 H |
| 36 | | 6 A | 8 B | 10 C | 12 D | 15 E | 19 F | 25 G |
| 39 | | | 5 A | 8 B | 10 C | 13 D | 17 F | 21 G |
| 42 | | | 5 A | 7 B | 9 C | 12 D | 14 F | 18 G |
| 45 | | | 4 A | 7 B | 8 C | 10 D | 13 F | 16 G |
| Decompression Time in minutes at | | | 6 msw | | - | - | 5 | 10 |
| | | | 3 msw | | 5 | 10 | 10 | 10 |

*2.2.5.2 - Table #3 - “Surface oxygen decompression” - Metric*

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| | 50 | - | - | - | - | - | - | | • | 1 | F |
| | 70 | - | - | - | - | - | - | | 10 | 18 | H |
| | 80 | - | - | - | - | - | - | | 16 | 24 | H |
| | 90 | - | - | - | - | - | - | 7 min | 20 | 28 | I |
| | 100 | - | - | - | - | - | - | | 24 | 32 | J |
| | 110 | - | - | - | - | - | - | | 28 | 36 | K |
| | 120 | - | - | - | - | - | - | | 30 | 38 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 130 | - | - | - | - | - | - | | 32* | 45 | |
| | 140 | - | - | - | - | - | - | | 38* | 51 | |
| 18 | 150 | - | - | - | - | - | - | | 42* | 55 | |
| | 160 | - | - | - | - | - | - | | 46* | 59 | |
| | 170 | - | - | - | - | - | - | | 50* | 65 | |
| | 180 | - | - | - | - | - | - | | 54* | 68 | |
| | 190 | - | - | - | - | - | - | 7 min | 57* | 70 | |
| | 200 | - | - | - | - | - | - | | 60* | 73 | |
| | 210 | - | - | - | - | - | - | | 63** | 81 | |
| | 220 | - | - | - | - | - | - | | 69** | 87 | |
| | 230 | - | - | - | - | - | - | | 73** | 92 | |
| | 240 | - | - | - | - | - | - | | 77** | 95 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) – In-Water Stops – Air 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC $O_2$ 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 21 | 35 | - | - | - | - | - | - | 7 min | - | 1 | E |
| | 50 | - | - | - | - | - | - | | 6 | 14 | H |
| | 60 | - | - | - | - | - | - | | 15 | 23 | H |
| | 70 | - | - | - | - | - | - | | 21 | 29 | I |
| | 80 | - | - | - | - | - | - | | 26 | 34 | J |
| | 90 | - | - | - | - | - | - | | 30 | 38 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 100 | - | - | - | - | - | - | 7 min | 34* | 47 | K |
| | 110 | - | - | - | - | - | - | | 40* | 53 | |
| | 120 | - | - | - | - | - | - | | 45* | 58 | |
| | 130 | - | - | - | - | - | - | | 50* | 63 | |
| | 140 | - | - | - | - | - | - | | 55* | 68 | |
| | 150 | - | - | - | - | - | - | | 59* | 72 | |
| | 160 | - | - | - | - | - | - | | 63** | 81 | |
| | 170 | - | - | - | - | - | - | | 71** | 89 | |
| | 180 | - | - | - | - | - | - | | 76** | 94 | |
| | 190 | - | - | - | - | - | - | | 81** | 99 | |
| | 200 | - | - | - | - | - | 1 | | 85** | 104 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| 24 | 25 | - | - | - | - | - | - | 7 min | - | 2 | E |
| | 45 | - | - | - | - | - | - | | 12 | 20 | H |
| | 50 | - | - | - | - | - | - | | 17 | 25 | H |
| | 55 | - | - | - | - | - | - | | 21 | 29 | H |
| | 60 | - | - | - | - | - | - | | 24 | 32 | I |
| | 70 | - | - | - | - | - | - | | 30 | 38 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 80 | - | - | - | - | - | - | 7 min | 35* | 48 | K |
| | 90 | - | - | - | - | - | - | | 42* | 55 | |
| | 100 | - | - | - | - | - | 2 | | 47* | 62 | |
| | 110 | - | - | - | - | - | 2 | | 53* | 68 | |
| | 120 | - | - | - | - | - | 3 | | 58* | 74 | |
| | 130 | - | - | - | - | - | 4 | | 62** | 84 | |
| | 140 | - | - | - | - | - | 4 | | 72** | 94 | |
| | 150 | - | - | - | - | - | 5 | | 78** | 101 | |
| | 160 | - | - | - | - | - | 5 | | 84** | 107 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) – In-Water Stops – Air: 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC $O_2$ 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 27 | 20 | - | - | - | - | - | - | 7 min | - | 2 | D |
| | 35 | - | - | - | - | - | - | | 8 | 16 | G |
| | 40 | - | - | - | - | - | - | | 16 | 24 | G |
| | 45 | - | - | - | - | - | - | | 21 | 29 | H |
| | 50 | - | - | - | - | - | - | | 25 | 33 | H |
| | 55 | - | - | - | - | - | 1 | | 28 | 37 | I |
| | 60 | - | - | - | - | - | 2 | | 30* | 45 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 70 | - | - | - | - | - | 3 | 7 min | 37* | 53 | |
| | 80 | - | - | - | - | - | 4 | | 45* | 62 | |
| | 90 | - | - | - | - | - | 5 | | 52* | 70 | |
| | 100 | - | - | - | - | - | 6 | | 58* | 77 | |
| | 110 | - | - | - | - | - | 7 | | 65** | 90 | |
| | 120 | - | - | - | - | - | 8 | | 74** | 100 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| 30 | 15 | - | - | - | - | - | - | 7 min | - | 2 | D |
| | 30 | - | - | - | - | - | - | | 8 | 16 | G |
| | 35 | - | - | - | - | - | - | | 17 | 25 | G |
| | 40 | - | - | - | - | - | 2 | | 22 | 32 | H |
| | 45 | - | - | - | - | - | 3 | | 27 | 38 | I |
| | 50 | - | - | - | - | - | 4 | | 30 | 42 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 55 | - | - | - | - | - | 5 | 7 min | 31* | 49 | J |
| | 60 | - | - | - | - | - | 6 | | 37* | 56 | |
| | 70 | - | - | - | - | - | 7 | | 46* | 66 | |
| | 80 | - | - | - | - | - | 8 | | 54* | 75 | |
| | 90 | - | - | - | - | 2 | 8 | | 60* | 83 | |
| | 100 | - | - | - | - | 3 | 8 | | 72** | 101 | |
| | 110 | - | - | - | - | 4 | 8 | | 81** | 111 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| 33 | 12 | - | - | - | - | - | - | | - | 2 | C |
| | 25 | - | - | - | - | - | - | | 7 | 15 | G |
| | 30 | - | - | - | - | - | 2 | 7 min | 16 | 28 | G |
| | 35 | - | - | - | - | - | 3 | | 22 | 33 | H |
| | 40 | - | - | - | - | - | 5 | | 27 | 40 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 45 | - | - | - | - | - | 6 | | 30* | 49 | J |
| | 50 | - | - | - | - | - | 7 | | 35* | 55 | K |
| | 55 | - | - | - | - | - | 8 | | 40* | 61 | K |
| | 60 | - | - | - | - | 2 | 7 | | 45* | 67 | |
| | 65 | - | - | - | - | 3 | 7 | | 50* | 73 | |
| | 70 | - | - | - | - | 4 | 7 | | 54* | 78 | |
| | 75 | - | - | - | - | 4 | 8 | | 59* | 84 | |
| | 80 | - | - | - | - | 5 | 8 | 7 min | 60** | 91 | |
| | 85 | - | - | - | - | 5 | 9 | | 69** | 101 | |
| | 90 | - | - | - | - | 6 | 9 | | 75** | 108 | |
| | 95 | - | - | - | - | 6 | 9 | | 80** | 113 | |
| | 100 | - | - | - | - | 7 | 9 | | 85** | 119 | |
| | 105 | - | - | - | - | 7 | 12 | | 89** | 126 | |
| | 110 | - | - | - | - | 8 | 15 | | 93*** | 139 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) — In-Water Stops — Air: 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC $O_2$ 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | - | - | - | - | - | - | | - | 2 | C |
| | 20 | - | - | - | - | - | - | | 7 | 15 | F |
| | 25 | - | - | - | - | - | 2 | 7 min | 13 | 23 | G |
| | 30 | - | - | - | - | - | 4 | | 21 | 33 | G |
| | 35 | - | - | - | - | - | 6 | | 27 | 41 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | | 30* | 51 | I |
| | 45 | - | - | - | - | 3 | 6 | | 36* | 58 | J |
| | 50 | - | - | - | - | 4 | 7 | | 42* | 66 | K |
| 36 | 55 | - | - | - | - | 5 | 7 | | 48* | 73 | |
| | 60 | - | - | - | - | 6 | 7 | | 53* | 79 | |
| | 65 | - | - | - | - | 6 | 8 | | 58* | 85 | |
| | 70 | - | - | - | - | 7 | 8 | 7 min | 60** | 93 | |
| | 75 | - | - | - | - | 8 | 8 | | 70** | 104 | |
| | 80 | - | - | - | 2 | 6 | 9 | | 76** | 111 | |
| | 85 | - | - | - | 3 | 6 | 10 | | 82** | 119 | |
| | 90 | - | - | - | 3 | 7 | 13 | | 87** | 128 | |
| | 95 | - | - | - | 4 | 6 | 16 | | 90** | 134 | |
| | 100 | - | - | - | 4 | 7 | 19 | | 100*** | 153 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) – In-Water Stops – Air: 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC $O_2$: 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 39 | 8 | - | - | - | - | - | - | 7 min | - | 2 | B |
| | 20 | - | - | - | - | - | - | | 8 | 16 | G |
| | 25 | - | - | - | - | - | 5 | | 18 | 31 | G |
| | 30 | - | - | - | - | - | 7 | | 26 | 41 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 3 | 6 | 7 min | 30* | 52 | I |
| | 40 | - | - | - | - | 4 | 7 | | 36* | 60 | J |
| | 45 | - | - | - | - | 6 | 7 | | 43* | 69 | K |
| | 50 | - | - | - | - | 7 | 7 | | 49* | 76 | |
| | 55 | - | - | - | 2 | 6 | 8 | | 54* | 83 | |
| | 60 | - | - | - | 3 | 6 | 8 | | 60* | 90 | |
| | 65 | - | - | - | 4 | 6 | 8 | | 67** | 103 | |
| | 70 | - | - | - | 4 | 7 | 9 | | 75** | 113 | |
| | 75 | - | - | - | 5 | 6 | 11 | | 81** | 121 | |
| | 80 | - | - | - | 5 | 7 | 14 | | 87** | 131 | |
| | 85 | - | - | - | 6 | 7 | 17 | | 90*** | 143 | |
| | 90 | - | - | - | 6 | 8 | 20 | | 101*** | 158 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| 42 | 7 | - | - | - | - | - | - | | - | 3 | B |
| | 15 | - | - | - | - | - | - | | 7 | 15 | F |
| | 20 | - | - | - | - | - | 4 | 7 min | 12 | 24 | G |
| | 25 | - | - | - | - | - | 7 | | 23 | 38 | H |
| | 30 | - | - | - | - | 4 | 6 | | 30 | 48 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 35 | - | - | - | - | 5 | 7 | | 34* | 59 | J |
| | 40 | - | - | - | - | 7 | 7 | | 42* | 69 | K |
| | 45 | - | - | - | 3 | 5 | 8 | | 49* | 78 | M |
| | 50 | - | - | - | 4 | 6 | 8 | | 55* | 86 | |
| | 55 | - | - | - | 5 | 6 | 8 | | 60** | 97 | |
| | 60 | - | - | - | 6 | 6 | 9 | | 70** | 109 | |
| | 65 | - | - | - | 6 | 7 | 10 | 7 min | 78** | 119 | |
| | 70 | - | - | - | 7 | 7 | 14 | | 84** | 130 | |
| | 75 | - | - | 3 | 5 | 7 | 18 | | 90** | 141 | |
| | 80 | - | - | 3 | 6 | 7 | 21 | | 100*** | 160 | |
| | 85 | - | - | 4 | 5 | 8 | 25 | | 107*** | 172 | |
| | 90 | - | - | 4 | 6 | 8 | 28 | | 113*** | 182 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Hyperlink Table of contents

Air surface $O_2$ decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw): In-Water Stops, Air: 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC $O_2$ 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 45 | 7 | - | - | - | - | - | - | 7 min | - | 3 | B |
| | 15 | - | - | - | - | - | - | | 8 | 16 | G |
| | 20 | - | - | - | - | - | 6 | | 17 | 31 | G |
| | 25 | - | - | - | - | 4 | 5 | | 27 | 44 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | 7 min | 30* | 55 | I |
| | 35 | - | - | - | 3 | 5 | 7 | | 40* | 68 | K |
| | 40 | - | - | - | 4 | 6 | 7 | | 48* | 78 | M |
| | 45 | - | - | - | 5 | 6 | 8 | | 55* | 87 | |
| | 50 | - | - | - | 6 | 7 | 8 | | 60** | 99 | |
| | 55 | - | - | 3 | 5 | 6 | 9 | | 72** | 113 | |
| | 60 | - | - | 3 | 5 | 7 | 12 | | 80** | 125 | |
| | 65 | - | - | 4 | 5 | 8 | 16 | | 87** | 138 | |
| | 70 | - | - | 5 | 5 | 8 | 20 | | 95*** | 156 | |
| | 75 | - | - | 5 | 6 | 8 | 24 | | 105*** | 171 | |
| | 80 | - | - | 6 | 6 | 8 | 28 | | 111*** | 182 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) In-Water Stops Air 24 | 21 | 18 | 15 | 12 | 9 | Surface Interval | RCC O2 12 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 48 | 6 | - | - | - | - | - | - | 7 min | - | 3 | B |
| | 15 | - | - | - | - | - | 4 | | 7 | 19 | G |
| | 20 | - | - | - | - | - | 8 | | 21 | 37 | G |
| | 25 | - | - | - | - | 6 | 6 | | 30 | 50 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 30 | - | - | - | 3 | 5 | 7 | 7 min | 37* | 65 | J |
| | 35 | - | - | - | 5 | 5 | 8 | | 46* | 77 | L |
| | 40 | - | - | - | 6 | 6 | 8 | | 54* | 87 | |
| | 45 | - | - | 3 | 5 | 6 | 9 | | 60* | 96 | |
| | 50 | - | - | 4 | 5 | 7 | 9 | | 72** | 115 | |
| | 55 | - | - | 5 | 5 | 7 | 13 | | 81** | 129 | |
| | 60 | - | - | 6 | 5 | 8 | 17 | | 88** | 142 | |
| | 65 | - | - | 7 | 5 | 8 | 22 | | 99*** | 164 | |
| | 70 | - | 3 | 4 | 6 | 8 | 26 | | 108*** | 178 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| 51 | 6 | - | - | - | - | - | - | 7 min | - | 3 | B |
| | 10 | - | - | - | - | - | - | | 6 | 14 | D |
| | 15 | - | - | - | - | - | 5 | | 11 | 24 | G |
| | 20 | - | - | - | - | 5 | 5 | | 25 | 43 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 25 | - | - | - | 3 | 5 | 6 | 7 min | 30* | 57 | J |
| | 30 | - | - | - | 5 | 5 | 7 | | 42* | 72 | K |
| | 35 | - | - | 3 | 4 | 6 | 8 | | 51* | 85 | M |
| | 40 | - | - | 4 | 5 | 6 | 8 | | 60* | 96 | |
| | 45 | - | - | 5 | 5 | 7 | 9 | | 70** | 114 | |
| | 50 | - | - | 6 | 6 | 7 | 13 | | 80** | 130 | |
| | 55 | - | 3 | 4 | 6 | 7 | 18 | | 89** | 145 | |
| | 60 | - | 4 | 4 | 6 | 8 | 23 | | 101*** | 169 | |
| | 65 | - | 5 | 4 | 6 | 9 | 27 | | 110*** | 184 | |
| | 70 | - | 5 | 5 | 6 | 12 | 30 | | 117*** | 198 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | Surface Interval | RCC $O_2$ | | |
| | | Air | | | | | | | | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | | |
| | 5 | - | - | - | - | - | - | | - | 3 | B |
| | 10 | - | - | - | - | - | - | | 7 | 15 | E |
| | 15 | - | - | - | - | - | 7 | | 15 | 30 | G |
| | 20 | - | - | - | - | 6 | 6 | | 28 | 48 | H |
| | 25 | - | - | - | 5 | 5 | 7 | | 36* | 66 | J |
| 54 | 30 | - | - | 3 | 4 | 6 | 7 | 7 min | 47* | 80 | M |
| | 35 | - | - | 5 | 4 | 6 | 8 | | 56* | 92 | |
| | 40 | - | - | 6 | 5 | 7 | 9 | | 66** | 111 | |
| | 45 | - | 4 | 4 | 5 | 7 | 13 | | 78** | 129 | |
| | 50 | - | 4 | 5 | 5 | 8 | 18 | | 88** | 146 | |
| | 55 | - | 5 | 5 | 6 | 8 | 23 | | 101*** | 171 | |
| | 60 | - | 6 | 5 | 6 | 9 | 28 | | 110*** | 187 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface O2 decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | |
| | 5 | - | - | - | - | - | - | - | - | | - | 3 |
| | 10 | - | - | - | - | - | - | - | - | | 8 | 16 |
| | 15 | - | - | - | - | - | - | 4 | 5 | | 19 | 36 |
| | 20 | - | - | - | - | - | 4 | 4 | 6 | | 30 | 54 |
| | 25 | - | - | - | - | - | 7 | 5 | 7 | | 41* | 73 |
| 57 | 30 | - | - | - | - | 5 | 4 | 6 | 8 | 7 min | 52* | 88 |
| | 35 | - | - | - | 3 | 4 | 5 | 6 | 9 | | 60* | 100 |
| | 40 | - | - | - | 4 | 4 | 5 | 7 | 11 | | 75** | 124 |
| | 45 | - | - | - | 5 | 5 | 5 | 8 | 17 | | 85** | 143 |
| | 50 | - | - | 3 | 3 | 5 | 6 | 8 | 22 | | 99*** | 169 |
| | 55 | - | - | 4 | 3 | 5 | 7 | 9 | 27 | | 110*** | 188 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | |
| 60 | 5 | - | - | - | - | - | - | - | - | 7 min | - | 4 |
| | 10 | - | - | - | - | - | - | - | - | | 9 | 17 |
| | 15 | - | - | - | - | - | - | 5 | 6 | | 22 | 41 |
| | 20 | - | - | - | - | - | 5 | 5 | 6 | | 31* | 60 |
| | 25 | - | - | - | - | 5 | 4 | 5 | 7 | | 45* | 79 |
| | 30 | - | - | - | 3 | 4 | 4 | 6 | 9 | | 56* | 95 |
| | 35 | - | - | - | 5 | 4 | 5 | 6 | 10 | | 69** | 117 |
| | 40 | - | - | - | 6 | 4 | 6 | 7 | 15 | | 82** | 138 |
| | 45 | - | - | 4 | 3 | 5 | 6 | 8 | 21 | | 92*** | 162 |
| | 50 | - | - | 5 | 4 | 4 | 7 | 9 | 27 | | 108*** | 187 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | |
| 63 | 10 | - | - | - | - | - | - | - | 5 | 7 min | 7 | 20 |
| | 15 | - | - | - | - | - | - | 7 | 6 | | 25 | 46 |
| | 20 | - | - | - | - | - | 7 | 5 | 7 | | 36* | 68 |
| | 25 | - | - | - | - | 6 | 4 | 6 | 8 | | 49* | 86 |
| | 30 | - | - | - | 5 | 4 | 4 | 7 | 8 | | 60* | 101 |
| | 35 | - | - | 3 | 3 | 4 | 6 | 7 | 12 | | 76** | 129 |
| | 40 | - | - | 4 | 4 | 4 | 6 | 8 | 19 | | 88** | 151 |
| | 45 | - | - | 5 | 4 | 5 | 6 | 9 | 25 | | 105*** | 182 |
| | 50 | - | 3 | 3 | 4 | 6 | 6 | 13 | 29 | | 116*** | 203 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | |
| 66 | 10 | - | - | - | - | - | - | - | 7 | 7 min | 7 | 22 |
| | 15 | - | - | - | - | - | 4 | 5 | 5 | | 28 | 50 |
| | 20 | - | - | - | - | 5 | 4 | 5 | 7 | | 40* | 74 |
| | 25 | - | - | - | 4 | 4 | 4 | 6 | 8 | | 54* | 93 |
| | 30 | - | - | 3 | 3 | 4 | 5 | 7 | 9 | | 68** | 117 |
| | 35 | - | - | 5 | 3 | 4 | 6 | 7 | 16 | | 83** | 142 |
| | 40 | - | 3 | 3 | 4 | 4 | 7 | 8 | 23 | | 99*** | 174 |
| | 45 | - | 4 | 3 | 4 | 5 | 7 | 11 | 28 | | 112*** | 197 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

Air surface $O_2$ decompression tables DCIEM / Metric

**Warning: The maximum operational depth UK-HSE is 50 m**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | In-Water Stops | | | | | | | | Surface Interval | RCC $O_2$ | |
| | | Air | | | | | | | | | | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | | 12 | |
| 69 | 10 | - | - | - | - | - | - | - | 8 | 7 min | 11 | 27 |
| | 15 | - | - | - | - | - | 6 | 4 | 6 | | 30 | 54 |
| | 20 | - | - | - | - | 6 | 4 | 6 | 7 | | 44* | 80 |
| | 25 | - | - | - | 6 | 3 | 5 | 6 | 9 | | 58* | 100 |
| | 30 | - | - | 5 | 3 | 4 | 5 | 7 | 12 | | 75** | 129 |
| | 35 | - | 3 | 3 | 4 | 4 | 6 | 8 | 19 | | 89** | 154 |
| | 40 | - | 5 | 3 | 4 | 5 | 6 | 9 | 27 | | 107*** | 189 |

Note: asterisk (*) indicates number of 5 minute air breaks required.

*2.2.5.3 - Tables A and B for repetitive dive calculation - Metric*

| A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

| B. NO-DECOMPRESSION REPETITIVE DIVING TABLE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 9 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 12 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 15 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 18 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 21 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 24 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 27 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 30 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 33 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 36 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 39 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 42 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 45 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

### 2.2.5.4 - Table #5 - Depth correction for diving at altitude - Metric

| Actual Depth (metres) | Depth Correction at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 → 299 | 300 → 599 | 600 → 899 | 900 → 1199 | 1200 → 1499 | 1500 → 1799 | 1800 → 2099 | 2100 → 2399 | 2400 → 3000 |
| 9 | +0 | +3 | +3 | +3 | +3 | +3 | +3 | +6 | +6 |
| 12 | +0 | +3 | +3 | +3 | +3 | +3 | +6 | +6 | +6 |
| 15 | +0 | +3 | +3 | +3 | +3 | +6 | +6 | +6 | +6 |
| 18 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +6 | +9 |
| 21 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +9 | +9 |
| 24 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 27 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 30 | +0 | +3 | +3 | +6 | +6 | +9 | +9 | +9 | +12 |
| 33 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 36 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 39 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 |
| 42 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +18 |
| 45 | +3 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +18 |
| 48 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 | +18 |
| 51 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | +21 |
| 54 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | |
| 57 | +3 | +6 | +6 | +9 | +12 | +12 | +15 | | |
| 60 | +3 | +6 | +6 | +9 | +12 | +12 | | | |
| 63 | +3 | +6 | +6 | +9 | | | | | |
| 66 | +3 | +6 | | | | | | | |
| 69 | +3 | | | | | | | | |

| Sea Level Stop Depth (metres) | Actual Decompression Stop Depth at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 → 299 | 300 → 599 | 600 → 899 | 900 → 1199 | 1200 → 1499 | 1500 → 1799 | 1800 → 2099 | 2100 → 2399 | 2400 → 3000 |
| 3 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 2.5 | 2.5 | 2.5 | 2.5 |
| 6 | 6.0 | 6.0 | 6.0 | 5.5 | 5.5 | 5.0 | 5.0 | 5.0 | 4.5 |
| 9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.0 | 7.5 | 7.5 | 7.0 | 7.0 |
| 12 | 12.0 | 12.0 | 11.5 | 11.0 | 10.5 | 10.0 | 10.0 | 9.5 | 9.0 |
| 15 | 15.0 | 14.5 | 14.0 | 13.5 | 13.0 | 12.5 | 12.0 | 12.0 | 11.5 |
| 18 | 18.0 | 17.5 | 17.0 | 16.5 | 16.0 | 15.0 | 14.5 | 14.0 | 13.5 |
| 21 | 21.0 | 20.5 | 20.0 | 19.0 | 18.5 | 17.5 | 17.0 | 16.5 | 16.0 |
| 24 | 24.0 | 23.5 | 22.5 | 21.5 | 21.0 | 20.0 | 19.5 | 19.0 | 18.0 |
| 27 | 27.0 | 26.0 | 25.5 | 24.5 | 23.5 | 22.5 | 22.0 | 21.0 | 20.0 |

# 2.3 - Tables standard air with in-water oxygen decompression at 20 fsw/6 msw

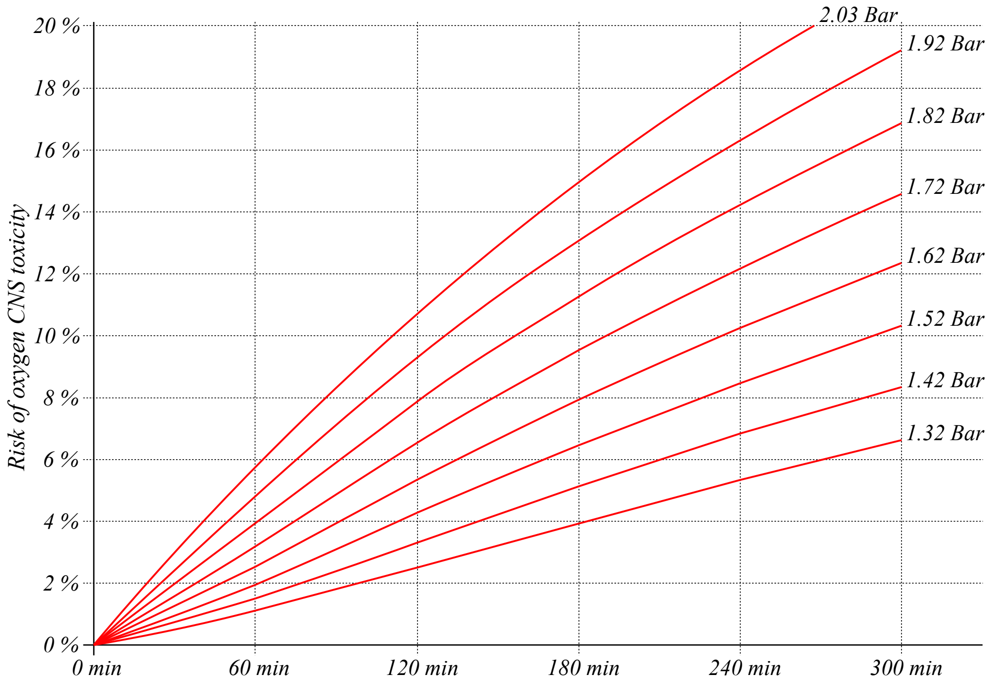
## 2.3.1 - Description and procedures

### *2.3.1.1 - Advantages of $O_2$ decompression*

In-water O2 decompression is a well known procedure used to speed up the decompression by replacing the nitrogen by oxygen during the stop at 6 m. The inhalation of pure oxygen creates a wash out which removes the nitrogen more efficiently. It has been demonstrated that systematic use of oxygen during the stops reduces the number of decompression sicknesses.

### *2.3.1.2 - Partial pressure of 1.6 bar during the stops*

For a few years, there has been a consensus that 1.3 bar is the limit allowing long exposures without triggering acute oxygen poisoning. An example, in the study "Oxygen Toxicity and Special Operations Forces Diving: Hidden and Dangerous", doctors Thijs T. Wingelaar, Pieter-Jan A. M. van Ooij, & Rob A. van Hulst say that no oxygen-induced convulsions have been described with a PO2 lower than 1.3 bar in humans.
In another study called "Pulmonary effects of repeated six-hour normoxic and hyperoxic dives", doctors Barbara E. Shykoff & John P. Florian examined differential effects of immersion, elevated oxygen partial pressure, and exercise on pulmonary function after a series of five daily six-hour dives at 130 kPa (1.3 bar) that did not result in acute oxygen poisoning. Note that Barbara Shykoff did other experiments at 1.35 ata that also did not result in CNS toxicity.
These discoveries are reinforced by the publications of scientists such as Ran Arieli, the estimation curve below is extracted from his papers.




Based on these studies, the US Navy has limited the maximum partial pressure at work of surface-supplied diving operations to 1.4 ata, and those with Electronically Controlled Closed-Circuit Underwater Breathing Apparatus (EC-UBA) to 1.3 ata. However, the US Navy has kept the in-water oxygen stops at 30 and 20 feet.
A lot of organizations have also adopted the limitation at 1.4 bar, such as the Diving Medical Advisory Committee (DMAC) through the guidance "Oxygen content in open circuit bail-out bottles for heliox saturation diving", or IMCA that, in addition to recommending 1.4 bar as the upper limit for partial pressure of oxygen in the nitrox mix breathed by the diver when at depth if using surface-supplied diving techniques, says that higher partial pressures than 1.4 bar can be used for the decompression stops. Also, in its “Diving Standards & Safety manual”, NOAA (National Oceanic and Atmospheric Administration - USA) says that the $PO_2$ of any gas mixture breathed during a dive must not exceed 1.4 absolute atmospheres (ata), except during the decompression phase when a $PO_2$ of 1.6 is allowed. For information, this limitation of the in-water stops to 1.6 ata or bar is not new, as it was already in force with COMEX offshore since the seventies. It is the limitation adopted in this handbook.

Note that the depth of 20 fsw/6 msw (1.6 bar) is usually selected for oxygen decompression instead of 3 metres (1.3 bar) as it provides a better oxygen intake and so a more efficient decompression.
Also, the oxygen stops times at 20 fsw/6 msw of these tables are not long enough to to trigger acute oxygen poisoning. This is particularly true if the recommended UK-HSE operational limits (from doctors Shield & Lee) are implemented.
To comply with good practices, the air standard should be always available on panel.

### *2.3.1.3 - Description of Table #2M DCIEM*

The 1st in-water oxygen decompression procedure published by DCIEM is table #2, which groups the final stops under oxygen at 30 fsw/9 msw. However, some concern has been expressed by divers regarding the potential risk of Central Nervous System oxygen toxicity at 30 fsw (9 msw) if the decompression is not performed in a basket. For this reason, DCIEM has published table 2M, which groups the oxygen stops at 6 m instead of 9 m. For the reasons discussed previously, exposure to acute oxygen poisoning is more reduced with this table than the procedure at 9 m, which is the reason it is selected for this handbook.
Table 2M is also an evolution of table #1. The differences are that the final stops under oxygen are grouped at 6 m, the ascent to surface from the 20 fsw/6 msw stop is not included in the stop time, the repeat groups differ, some bottom times are different, and the short in-water table is specific for in-water oxygen decompression (table 2S).
The procedures for repeat diving, altitude diving, ascent diving, and decompression reinforcement are the same.

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | C |
| | 40 | - | - | - | - | - | - | - | - | 1 | D |
| | 50 | - | - | - | - | - | - | - | - | 1 | E |
| | 60 | - | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | - | - | 1 | G |
| | 100 | - | - | - | - | - | - | - | 6 | 6 | I |
| | 120 | - | - | - | - | - | - | - | 12 | 12 | K |
| | 130 | - | - | - | - | - | - | - | 18 | 18 | L |
| | 140 | - | - | - | - | - | - | - | 24 | 24 | M |
| | 150 | - | - | - | - | - | - | - | 29 | 29 | |
| | 160 | - | - | - | - | - | - | - | 33 | 33 | |
| | 170 | - | - | - | - | - | - | - | 38 | 38 | |
| | 180 | - | - | - | - | - | - | - | 43 | 43 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 200 | - | - | - | - | - | - | - | 53 | 53 | |
| | 220 | - | - | - | - | - | - | - | 63 | 63 | |
| | 240 | - | - | - | - | - | - | - | 74 | 74 | |
| | 260 | - | - | - | - | - | - | - | 86 | 86 | |
| | 280 | - | - | - | - | - | - | - | 97 | 97 | |

*Air decompression (table #1)*

*Stops 20 & 10 fsw grouped at 20 fsw*

*The ascent to the surface is not included in the O2 stop*

*The repeat groups are modified*

*Some bottom times are different.*

*Deco time reduced by 40 to 55%*

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) Air 80 | 70 | 60 | 50 | 40 | 30 | $O_2$ 20 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 75 | - | - | - | - | - | - | - | 1 | G |
| | 115 | - | - | - | - | - | - | 5 | 6 | J |
| | 130 | - | - | - | - | - | - | 12 | 13 | J |
| | 140 | - | - | - | - | - | - | 15 | 16 | K |
| | 160 | - | - | - | - | - | - | 20 | 21 | |
| | 180 | - | - | - | - | - | - | 24 | 25 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 200 | - | - | - | - | - | - | 28 | 29 | |
| | 220 | - | - | - | - | - | - | 32 | 33 | |
| | 240 | - | - | - | - | - | - | 36 | 37 | |
| | 260 | - | - | - | - | - | - | 39 | 40 | |
| | 280 | - | - | - | - | - | - | 43 | 44 | |

*Oxy 6 m decompression (table #2M)*

### *2.3.1.4 - Precautions to be in place and implementation*

As described previously in this document the use of pure oxygen imply precautions, and backups to be in place to avoid or solve quickly the problems which may arise.

- Suitable diving system:
  As indicated in point 2.18.4, “Diving panels allowing in-water oxygen decompression”, the diving panel, and the other components of the gas circuit must be suitable for oxygen use or at least oxygen compatible for the parts not carrying this gas but linked to its circuit. Example: The air from compressors must be O2 compatible. When performing in-water oxygen decompression (20 fsw/6 msw), it is vital to be 100% sure that the oxygen supply cannot be connected inadvertently.
  - The 1st option is to isolate the oxygen supply by two shutoff valves with venting valves in between so that the oxygen supply and distribution valves are closed, the line fully vented with the vent valve kept open, and the regulator set to zero as long as the diver is not at the required stop depth. Thus, the line is activated only when the diver arrives at his stop. Also, a gauge is installed to warn the supervisor when the pipe section is under pressure.
  - The 2nd option is to supply the panel with a removable flexible hose connected to a separate oxygen panel. This line is physically disconnected during the dive and connected and pressurized only when the diver arrives at his stop.
- The O2 supply must be kept physically disconnected or fully isolated from the diving panel during the dive and the stops to be done using air.
- At completion of the 30 ft stop (if there was one), the diver ascends at normal rate (60 ft/min - 18 m/min) to the 20 fsw stop. If there is no stop at 30 ft, the diver ascent to the stop at 20 fsw.
- When the diver is at the 20 fsw (6 m) stop
  1. The supervisor makes sure that the diver arrived at 20 ft and is secured at this depth. The Clump weight of the basket should be adjusted 1 or 2 m below to limit the drop in case of failure of the main wire.
  2. When the diver is secured at 20 fsw, the supervisor connects the oxygen supply hose onto the diving panel.
  3. When the line is connected, the supervisor closes the air supply and asks the diver to flush his helmet.
     - A standard procedure is to wait for the pressure in the umbilical pressure to come down around 5 bars and then open the O2 valve smoothly.
     - Another procedure is to close the air supply, open the O2 valve, then ask the diver to flush this helmet.

4. When the valve is opened, the oxygen fills the umbilical. The supervisor must ensure a maximum fill rate of 5 bar (70 psi) per minute. He must always remember that:
    - When oxygen flows from high to low pressure through an orifice, such as when a valve is opened quickly, it often reaches sonic velocity and compresses the oxygen downstream against an obstruction, such as the seat of the next closed valve or regulator. The gas temperature can reach the auto-ignition point of plastics, organic contaminants, or small metal particles.
    - Small particles carried by flowing gas in the oxygen system strike surfaces of the system, such as piping intersections or valve seats. The kinetic energy of the particle creates heat at the point of impact, which can ignite either the particle or the target material.
5. When the oxygen fills the umbilical, the analyser registers, but does not indicate 100% $O_2$ immediately, even if the air has been already purged. Depending on the analyser, up to 2 minutes may be needed to have an accurate reading.
6. Oxygen has a particular taste, and makes a tickling sensation on the lips: If the diver omit to indicates that he is on $O_2$ , the supervisor should ask him to confirm it. That is the 2nd indicator
7. When the diver has confirmed he is on $O_2$, the supervisor checks the analyser again: It should indicate 99.5 % $O_2$ minimum.
8. When the supervisor has confirmation that the diver is on pure $O_2$, he starts the stopwatch.
9. The diver is decompressed according to the stop time indicated in the table. DCIEM indicates that an optional 5 minutes air break can be taken after each 30 minutes of decompression on oxygen.
10. At completion of the 20 fsw oxygen stop, the diver ascends to surface at a maximum rate of one foot per second. Slower rates are recommended. The supervisor should keep the diver on oxygen during the ascent and the transfer to deck.

- When the diver is back on deck
    1. When the hat is off, the supervisor closes the oxygen supply (separated $O_2$ panel)
    2. The diver flushes the helmet and lets the free flow open
    3. The supervisor disconnects the oxygen line from the diving panel or, depending on the installation, isolates it by closing the two inlet valves and opening the vent valve in between, so an accidental oxygen supply is impossible.
    4. The supervisor opens the air and flushes the line using air so that the remaining oxygen in the line is removed.
    5. The supervisor checks the analyser (it should go down…)
    6. The supervisor closes and secures the air valve.
    7. The supervisor Installs the tags on the diving panel, and on the separated $O_2$ supply panel.
    8. The supervisor asks the lead diver to check and report the pressures in the quads. If necessary, the bottles are changed. If another dive is planned; the team prepares the next check list.

### 2.3.2 - Contingencies (linked to O2 stops)

The contingencies for “air standard in-water decompression” and “in-water O2 decompression” are the same except for the problems linked to oxygen in the water. For this reason, this point focuses only on those related to this gas.

#### *2.3.2.1 - Acute oxygen poisoning*

Resolution during the in water stop *(minor cases only):*

1. The O2 supply must be stopped, and the helmet flushed with air.
2. For minor symptoms, when the diver is supplied on air, wait for the symptoms to subside then wait 15 more minutes , and recommence O2 at the point of interruption. Or switch immediately to the standard Air table and resume the decompression using this table. The procedure to move from “in water $O_2$ decompression procedure” to “in-water air procedure” is explained in the example below:

Dive at 112 ft / 32 min bottom time

Decompression using the “in-water $O_2$ table 20 fsw”

The table selected is : 120 ft / 35 min

*Note: The decompression reinforcement procedure is not integrated into the example.*

The stops to perform are :

- 6 min at 30 ft using Air
- 24 min at 30 ft using O2
- Total deco stops is 30 min

***In-water $O_2$ decompression table 20 fsw DCIEM / Imperial***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 120 | 10 | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | 6 | 8 | E |
| | 20 | - | - | - | - | - | - | 9 | 11 | F |
| | 25 | - | - | - | - | - | - | 11 | 13 | G |
| | 30 | - | - | - | - | - | 5 | 15 | 21 | H |
| | 35 | - | - | - | - | - | 6 | 24 | 31 | H |
| | Maximum operational limit UK-HSE | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | 29 | 38 | I |
| | 45 | - | - | - | - | 3 | 7 | 34 | 45 | J |
| | 50 | - | - | - | - | 4 | 7 | 38 | 50 | K |
| | 55 | - | - | - | - | 5 | 7 | 42 | 55 | |
| | 60 | - | - | - | - | 6 | 8 | 46 | 61 | |
| | 65 | - | - | - | - | 7 | 8 | 50 | 66 | |
| | 70 | - | - | - | - | 7 | 9 | 54 | 71 | |
| | 75 | - | - | - | 2 | 6 | 9 | 58 | 76 | |
| | 80 | - | - | - | 3 | 6 | 9 | 62 | 81 | |
| | 85 | - | - | - | 3 | 7 | 10 | 66 | 87 | |
| | 90 | - | - | - | 3 | 7 | 14 | 70 | 95 | |
| | 95 | - | - | - | 4 | 7 | 16 | 74 | 102 | |
| | 100 | - | - | - | 4 | 7 | 20 | 79 | 111 | |

Decision to switch to the “standard Air table’ after 9 minutes on O2 at 20 ft:
To allow to pass from the “in water O2 deco” table 30 ft to the “Standard Air” table, the designers have considered that the total time of the stops performed using O2 have to be subtracted from the total time of the stops to be performed on air. That gives the following calculation:

The total of the stops standard air table to do normally is: 6 + 9 + 25 = 40 min

The total of the stops performed at 30 ft (air) and 20 ft (O2) using the 20 ft O2 table is:
6 + 9 min = 15 min

The stop time to perform using the “standard air” table is:
40 min to be done on Air - 15 min completed = 25 min to be performed on Air.

That gives 25 min at 10 ft

***Air standard table DCIEM / Imperial***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | | |
| 120 | 5 | - | - | - | - | - | - | - | - | 2 | A |
| | 10 | - | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | - | 10 | 10 | E |
| | 20 | - | - | - | - | - | - | 5 | 10 | 15 | F |
| | 25 | - | - | - | - | - | - | 9 | 11 | 20 | G |
| | 30 | - | - | - | - | - | 5 | 7 | 17 | 29 | I |
| | 35 | - | - | - | - | - | 6 | 9 | 25 | 40 | J |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | 9 | 33 | 50 | K |
| | 45 | - | - | - | - | 3 | 7 | 9 | 41 | 60 | M |
| | 50 | - | - | - | - | 4 | 7 | 10 | 49 | 70 | N |
| | 55 | - | - | - | - | 5 | 7 | 15 | 54 | 81 | |
| | 60 | - | - | - | - | 6 | 8 | 19 | 61 | 94 | |
| | 65 | - | - | - | - | 7 | 8 | 23 | 70 | 108 | |
| | 70 | - | - | - | - | 7 | 9 | 27 | 80 | 123 | |
| | 75 | - | - | - | 2 | 6 | 9 | 32 | 91 | 140 | |
| | 80 | - | - | - | 3 | 6 | 9 | 37 | 103 | 158 | |
| | 85 | - | - | - | 3 | 7 | 10 | 41 | 114 | 175 | |
| | 90 | - | - | - | 3 | 7 | 14 | 44 | 124 | 192 | |
| | 95 | - | - | - | 4 | 7 | 16 | 49 | 134 | 210 | |
| | 100 | - | - | - | 4 | 7 | 20 | 53 | 142 | 226 | |

Resolution in the chamber:
If the symptoms are too severe, the diver must be removed from the water and transferred to the Deck Decompression Chamber (DDC), where a diver medic can assist him. The surface decompression procedure should be applied to do it safely *(see on the next page)*.

Switch to surface decompression:

Surface decompression should be considered instead of switching to air, even for trivial cases, and must be organized for all issues which could become more serious:

- In the eventuality that the incommoded diver is vomiting in his helmet or has a deep crisis, things can become quickly unmanageable with additional risks like drowning or injuries for the casualty in addition to the problems posed by oxygen poisoning... Prudence must be the rule…
- Because the Air stops and a part of the O2 stops have normally been completed, switching from the in-water or wet bell O2 decompression to the surface O2 decompression table is easy and does not pose any problems. As demonstrated below, the in-water air stops prior to the deco time in the chamber of the surface O2 decompression table are the same as for the "in water Air O2" or "in wet bell O2" decompression tables, allowing to jump from one to the other. What is essential is to be sure that the deco time corresponding to the air stops of the surface decompression table are fully completed before ordering the transfer to the chamber, which should be the case with acute O2 poisoning.

***In-water $O_2$ decompression table 20 fsw DCIEM / Imperial***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) – Air 80 | 70 | 60 | 50 | 40 | 30 | $O_2$ 20 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| 120 | 10 | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | 6 | 8 | E |
| | 20 | - | - | - | - | - | - | 9 | 11 | F |
| | 25 | - | - | - | - | - | - | 11 | 13 | G |
| | 30 | - | - | - | - | - | 5 | 15 | 21 | H |
| | 35 | - | - | - | - | - | 6 | 24 | 31 | H |
| | Maximum operational limit UK-HSE | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | 29 | 38 | I |
| | 45 | - | - | - | - | 3 | 7 | 34 | 45 | J |
| | 50 | - | - | - | - | 4 | 7 | 38 | 50 | K |
| | 55 | - | - | - | - | 5 | 7 | 42 | 55 | |
| | 60 | - | - | - | - | 6 | 8 | 46 | 61 | |
| | 65 | - | - | - | - | 7 | 8 | 50 | 66 | |
| | 70 | - | - | - | - | 7 | 9 | 54 | 71 | |
| | 75 | - | - | - | 2 | 6 | 9 | 58 | 76 | |
| | 80 | - | - | - | 3 | 6 | 9 | 62 | 81 | |
| | 85 | - | - | - | 3 | 7 | 10 | 66 | 87 | |
| | 90 | - | - | - | 3 | 7 | 14 | 70 | 95 | |
| | 95 | - | - | - | 4 | 7 | 16 | 74 | 102 | |
| | 100 | - | - | - | 4 | 7 | 20 | 79 | 111 | |

Air surface $O_2$ decompression tables DCIEM / Imperial

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) – In-Water Stops – Air 80 | 70 | 60 | 50 | 40 | 30 | Surface Interval | RCC $O_2$ 40 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 120 | 10 | - | - | - | - | - | - | | - | 2 | C |
| | 20 | - | - | - | - | - | - | | 7 | 15 | F |
| | 25 | - | - | - | - | - | 2 | 7 min | 13 | 23 | G |
| | 30 | - | - | - | - | - | 5 | | 21 | 34 | G |
| | 35 | - | - | - | - | - | 6 | | 27 | 41 | H |
| | Maximum operational limit UK-HSE | | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | | 30* | 51 | I |
| | 45 | - | - | - | - | 3 | 7 | | 36* | 59 | J |
| | 50 | - | - | - | - | 4 | 7 | | 42* | 66 | K |
| | 55 | - | - | - | - | 5 | 7 | | 48* | 73 | |
| | 60 | - | - | - | - | 6 | 8 | | 53* | 80 | |
| | 65 | - | - | - | - | 7 | 8 | | 58* | 86 | |
| | 70 | - | - | - | - | 7 | 9 | 7 min | 60** | 94 | |
| | 75 | - | - | - | 2 | 6 | 9 | | 70** | 105 | |
| | 80 | - | - | - | 3 | 6 | 9 | | 77** | 113 | |
| | 85 | - | - | - | 3 | 7 | 10 | | 83** | 121 | |
| | 90 | - | - | - | 3 | 7 | 14 | | 87** | 129 | |
| | 95 | - | - | - | 4 | 7 | 16 | | 90** | 135 | |
| | 100 | - | - | - | 4 | 7 | 20 | | 100*** | 154 | |

Note: asterisk (*) indicates number of 5 minute air breaks required.

### *2.3.2.2 - Loss of oxygen supply*

Switch on air, and recommence O2 at the point of interruption if the O2 can be quickly reestablished. Or switch to the standard Air table and resume the decompression using this table. Or switch to surface O2 decompression procedure.

Note:

The procedures to move from "in water O2 decompression procedure" to "in-water air procedure" or from "in water O2 decompression procedure" to "surface O2 decompression" are those explained for acute oxygen poisoning.

### 2.3.3 - Table air, with in water oxygen decompression at 20 ft - Imperial

#### *2.3.3.1 - Table 2S: Short in water oxygen decompression - Imperial*

This table has to be used for information, and to calculate multilevel diving. It is not to be used to manage the dives.

| Depth (fsw) | No-Decompression Bottom Times (min) | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|
| 50 | 30 C | 50 E | 75 G | 115 J | 125 J | 140 K | 160 |
| 60 | 20 B | 30 D | 50 F | 75 H | 85 I | 95 J | 110 K |
| 70 | 15 B | 25 D | 35 F | 45 F | 65 H | 72 I | 82 J |
| 80 | 10 A | 20 D | 25 E | 30 F | 50 H | 57 H | 64 I |
| 90 | 9 A | 15 C | 20 D | 25 E | 40 G | 46 H | 52 I |
| 100 | 7 A | 10 B | 15 D | 20 E | 33 G | 39 H | 43 I |
| 110 | 6 A | 10 B | 12 C | 17 D | 28 G | 34 H | 37 H |
| 120 | | 6 A | 10 C | 14 D | 23 G | 30 H | 32 H |
| 130 | | 5 A | 8 B | 13 D | 20 G | 26 G | 29 H |
| 140 | | 5 A | 7 B | 11 D | 17 F | 24 G | 26 H |
| 150 | | | 6 B | 10 D | 15 F | 21 G | 23 H |
| 160 | | | 6 B | 9 D | 14 F | 19 G | 21 H |
| 170 | | | 5 B | 8 C | 12 E | 18 G | 19 H |
| 180 | | | 5 B | 7 C | 11 E | 16 G | 18 G |
| Decompression Time (min) Oxygen at 30 fsw | | | | 5 | 10 | 15 | 20 |

Note: Decompression stop times do not include ascent time to 30 fsw.

*2.3.3.2 - Table 2M: In-water oxygen decompression 20 fsw - Imperial*

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 50 | 75 | - | - | - | - | - | - | - | 1 | G |
| | 115 | - | - | - | - | - | - | **5** | 6 | J |
| | 130 | - | - | - | - | - | - | **12** | 13 | J |
| | 140 | - | - | - | - | - | - | **15** | 16 | K |
| | 160 | - | - | - | - | - | - | **20** | 21 | |
| | 180 | - | - | - | - | - | - | **24** | 25 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 200 | - | - | - | - | - | - | **28** | 29 | |
| | 220 | - | - | - | - | - | - | **32** | 33 | |
| | 240 | - | - | - | - | - | - | **36** | 37 | |
| | 260 | - | - | - | - | - | - | **39** | 40 | |
| | 280 | - | - | - | - | - | - | **43** | 44 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 60 | 50 | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | **5** | 6 | H |
| | 90 | - | - | - | - | - | - | **12** | 13 | J |
| | 100 | - | - | - | - | - | - | **16** | 17 | J |
| | 110 | - | - | - | - | - | - | **20** | 21 | K |
| | 120 | - | - | - | - | - | - | **23** | 24 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 140 | - | - | - | - | - | - | **29** | 30 | |
| | 160 | - | - | - | - | - | - | **35** | 36 | |
| | 180 | - | - | - | - | - | - | **40** | 41 | |
| | 200 | - | - | - | - | - | - | **45** | 46 | |
| | 220 | - | - | - | - | - | - | **50** | 51 | |
| | 240 | - | - | - | - | - | - | **55** | 56 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

Table of contents

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 70 | 35 | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | **6** | 8 | G |
| | 70 | - | - | - | - | - | - | **14** | 16 | I |
| | 80 | - | - | - | - | - | - | **19** | 21 | J |
| | 90 | - | - | - | - | - | - | **24** | 26 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 100 | - | - | - | - | - | - | **28** | 30 | K |
| | 110 | - | - | - | - | - | - | **32** | 34 | |
| | 120 | - | - | - | - | - | - | **35** | 37 | |
| | 130 | - | - | - | - | - | - | **39** | 41 | |
| | 140 | - | - | - | - | - | - | **42** | 44 | |
| | 150 | - | - | - | - | - | - | **45** | 47 | |
| | 160 | - | - | - | - | - | - | **49** | 51 | |
| | 170 | - | - | - | - | - | - | **52** | 54 | |
| | 180 | - | - | - | - | - | - | **56** | 58 | |
| | 190 | - | - | - | - | - | - | **59** | 61 | |
| | 200 | - | - | - | - | - | 2 | **62** | 65 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 80 | 25 | - | - | - | - | - | - | - | 2 | E |
| | 30 | - | - | - | - | - | - | **5** | 7 | F |
| | 50 | - | - | - | - | - | - | **9** | 11 | H |
| | 55 | - | - | - | - | - | - | **14** | 16 | H |
| | 60 | - | - | - | - | - | - | **18** | 20 | I |
| | 70 | - | - | - | - | - | - | **24** | 26 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 80 | - | - | - | - | - | - | **29** | 31 | K |
| | 90 | - | - | - | - | - | - | **34** | 36 | |
| | 100 | - | - | - | - | - | 2 | **38** | 41 | |
| | 110 | - | - | - | - | - | 3 | **42** | 46 | |
| | 120 | - | - | - | - | - | 3 | **47** | 51 | |
| | 130 | - | - | - | - | - | 4 | **51** | 56 | |
| | 140 | - | - | - | - | - | 5 | **55** | 61 | |
| | 150 | - | - | - | - | - | 5 | **60** | 66 | |
| | 160 | - | - | - | - | - | 6 | **64** | 71 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) Air 80 | 70 | 60 | 50 | 40 | 30 | O2 20 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| 90 | 20 | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | **5** | 7 | E |
| | 40 | - | - | - | - | - | - | **10** | 12 | G |
| | 45 | - | - | - | - | - | - | **13** | 15 | H |
| | 50 | - | - | - | - | - | - | **19** | 21 | H |
| | 55 | - | - | - | - | - | - | **23** | 25 | I |
| | 60 | - | - | - | - | - | 2 | **26** | 29 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 70 | - | - | - | - | - | 4 | **32** | 37 | |
| | 80 | - | - | - | - | - | 5 | **38** | 44 | |
| | 90 | - | - | - | - | - | 6 | **43** | 50 | |
| | 100 | - | - | - | - | - | 7 | **48** | 56 | |
| | 110 | - | - | - | - | - | 8 | **53** | 62 | |
| | 120 | - | - | - | - | - | 8 | **59** | 68 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) Air 80 | 70 | 60 | 50 | 40 | 30 | O2 20 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| 100 | 15 | - | - | - | - | - | - | - | 2 | D |
| | 20 | - | - | - | - | - | - | **5** | 7 | E |
| | 30 | - | - | - | - | - | - | **9** | 11 | F |
| | 35 | - | - | - | - | - | - | **11** | 13 | G |
| | 40 | - | - | - | - | - | - | **16** | 18 | H |
| | 45 | - | - | - | - | - | 3 | **22** | 26 | I |
| | 50 | - | - | - | - | - | 4 | **26** | 31 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 55 | - | - | - | - | - | 5 | **30** | 36 | J |
| | 60 | - | - | - | - | - | 6 | **34** | 41 | |
| | 70 | - | - | - | - | - | 8 | **40** | 49 | |
| | 80 | - | - | - | - | - | 9 | **46** | 56 | |
| | 90 | - | - | - | - | 2 | 8 | **52** | 63 | |
| | 100 | - | - | - | - | 3 | 9 | **58** | 71 | |
| | 110 | - | - | - | - | 4 | 9 | **64** | 78 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 110 | 12 | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | **7** | 9 | E |
| | 25 | - | - | - | - | - | - | **9** | 11 | F |
| | 30 | - | - | - | - | - | - | **11** | 13 | G |
| | 35 | - | - | - | - | - | 4 | **17** | 22 | H |
| | 40 | - | - | - | - | - | 5 | **23** | 29 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 45 | - | - | - | - | - | 6 | **28** | 35 | J |
| | 50 | - | - | - | - | - | 8 | **33** | 42 | K |
| | 55 | - | - | - | - | - | 9 | **37** | 47 | K |
| | 60 | - | - | - | - | 3 | 7 | **40** | 51 | |
| | 65 | - | - | - | - | 3 | 8 | **44** | 56 | |
| | 70 | - | - | - | - | 4 | 8 | **47** | 60 | |
| | 75 | - | - | - | - | 5 | 8 | **50** | 64 | |
| | 80 | - | - | - | - | 5 | 8 | **54** | 68 | |
| | 85 | - | - | - | - | 6 | 8 | **57** | 72 | |
| | 90 | - | - | - | - | 6 | 9 | **61** | 77 | |
| | 95 | - | - | - | - | 7 | 9 | **64** | 81 | |
| | 100 | - | - | - | - | 7 | 10 | **68** | 86 | |
| | 105 | - | - | - | - | 8 | 13 | **71** | 93 | |
| | 110 | - | - | - | - | 8 | 16 | **75** | 100 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | **20** | | |
| 120 | 10 | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | **6** | 8 | E |
| | 20 | - | - | - | - | - | - | **9** | 11 | F |
| | 25 | - | - | - | - | - | - | **11** | 13 | G |
| | 30 | - | - | - | - | - | 5 | **15** | 21 | H |
| | 35 | - | - | - | - | - | 6 | **24** | 31 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | **29** | 38 | I |
| | 45 | - | - | - | - | 3 | 7 | **34** | 45 | J |
| | 50 | - | - | - | - | 4 | 7 | **38** | 50 | K |
| | 55 | - | - | - | - | 5 | 7 | **42** | 55 | |
| | 60 | - | - | - | - | 6 | 8 | **46** | 61 | |
| | 65 | - | - | - | - | 7 | 8 | **50** | 66 | |
| | 70 | - | - | - | - | 7 | 9 | **54** | 71 | |
| | 75 | - | - | - | 2 | 6 | 9 | **58** | 76 | |
| | 80 | - | - | - | 3 | 6 | 9 | **62** | 81 | |
| | 85 | - | - | - | 3 | 7 | 10 | **66** | 87 | |
| | 90 | - | - | - | 3 | 7 | 14 | **70** | 95 | |
| | 95 | - | - | - | 4 | 7 | 16 | **74** | 102 | |
| | 100 | - | - | - | 4 | 7 | 20 | **79** | 111 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 130 | 8 | - | - | - | - | - | - | - | 2 | B |
| | 15 | - | - | - | - | - | - | **7** | 10 | E |
| | 20 | - | - | - | - | - | - | **10** | 13 | G |
| | 25 | - | - | - | - | - | 5 | **13** | 19 | G |
| | 30 | - | - | - | - | - | 7 | **22** | 30 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 35 | - | - | - | - | 3 | 6 | **29** | 39 | I |
| | 40 | - | - | - | - | 5 | 6 | **34** | 46 | J |
| | 45 | - | - | - | - | 6 | 7 | **39** | 53 | L |
| | 50 | - | - | - | - | 7 | 8 | **43** | 59 | |
| | 55 | - | - | - | 2 | 6 | 8 | **48** | 65 | |
| | 60 | - | - | - | 3 | 6 | 8 | **52** | 70 | |
| | 65 | - | - | - | 4 | 6 | 9 | **56** | 76 | |
| | 70 | - | - | - | 5 | 6 | 9 | **61** | 82 | |
| | 75 | - | - | - | 5 | 7 | 11 | **65** | 89 | |
| | 80 | - | - | - | 6 | 7 | 15 | **70** | 99 | |
| | 85 | - | - | - | 6 | 7 | 18 | **75** | 107 | |
| | 90 | - | - | - | 7 | 7 | 22 | **80** | 117 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 140 | 7 | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | **4** | 7 | D |
| | 15 | - | - | - | - | - | - | **9** | 12 | D |
| | 20 | - | - | - | - | - | 4 | **12** | 17 | G |
| | 25 | - | - | - | - | - | 7 | **18** | 26 | H |
| | 30 | - | - | - | - | 4 | 6 | **27** | 38 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 35 | - | - | - | - | 6 | 6 | **33** | 46 | J |
| | 40 | - | - | - | - | 7 | 7 | **39** | 54 | K |
| | 45 | - | - | - | 3 | 6 | 7 | **44** | 61 | M |
| | 50 | - | - | - | 4 | 6 | 8 | **49** | 68 | |
| | 55 | - | - | - | 5 | 6 | 9 | **53** | 74 | |
| | 60 | - | - | - | 6 | 6 | 9 | **58** | 80 | |
| | 65 | - | - | - | 7 | 6 | 11 | **64** | 89 | |
| | 70 | - | - | 2 | 5 | 7 | 15 | **69** | 99 | |
| | 75 | - | - | 3 | 5 | 8 | 18 | **74** | 109 | |
| | 80 | - | - | 3 | 6 | 8 | 21 | **80** | 119 | |
| | 85 | - | - | 4 | 6 | 8 | 25 | **85** | 129 | |
| | 90 | - | - | 4 | 6 | 8 | 30 | **91** | 140 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 150 | 6 | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | **5** | 8 | D |
| | 15 | - | - | - | - | - | - | **10** | 13 | F |
| | 20 | - | - | - | - | - | 6 | **14** | 21 | G |
| | 25 | - | - | - | - | 4 | 6 | **24** | 35 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 7 | **31** | 45 | I |
| | 35 | - | - | - | 3 | 5 | 7 | **37** | 53 | K |
| | 40 | - | - | - | 4 | 6 | 8 | **43** | 62 | M |
| | 45 | - | - | - | 6 | 6 | 8 | **48** | 69 | |
| | 50 | - | - | - | 7 | 6 | 9 | **54** | 77 | |
| | 55 | - | - | 3 | 5 | 6 | 10 | **60** | 85 | |
| | 60 | - | - | 4 | 5 | 7 | 13 | **65** | 95 | |
| | 65 | - | - | 4 | 6 | 7 | 17 | **71** | 106 | |
| | 70 | - | - | 5 | 6 | 7 | 21 | **77** | 117 | |
| | 75 | - | - | 6 | 5 | 8 | 25 | **84** | 129 | |
| | 80 | - | - | 6 | 6 | 8 | 29 | **90** | 140 | |

**Warning:** Oxygen stop times at 20 fsw do not include the ascent time to surface

In-water oxygen decompression 20 fsw

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 160 | 6 | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | **6** | 9 | E |
| | 15 | - | - | - | - | - | 4 | **11** | 16 | F |
| | 20 | - | - | - | - | 3 | 5 | **16** | 25 | G |
| | 25 | - | - | - | - | 6 | 6 | **28** | 41 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 30 | - | - | - | 4 | 5 | 6 | **35** | 51 | J |
| | 35 | - | - | - | 5 | 6 | 7 | **41** | 60 | L |
| | 40 | - | - | - | 7 | 6 | 8 | **47** | 69 | |
| | 45 | - | - | 3 | 5 | 6 | 9 | **54** | 78 | |
| | 50 | - | - | 4 | 5 | 7 | 9 | **60** | 86 | |
| | 55 | - | - | 5 | 6 | 7 | 14 | **66** | 99 | |
| | 60 | - | - | 6 | 6 | 7 | 18 | **73** | 111 | |
| | 65 | - | 3 | 4 | 6 | 8 | 22 | **80** | 124 | |
| | 70 | - | 3 | 5 | 6 | 8 | 27 | **87** | 137 | |

**Warning:** Oxygen stop times at 20 fsw do not include the ascent time to surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 170 | 5 | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 7 | 10 | E |
| | 15 | - | - | - | - | - | 6 | 13 | 20 | G |
| | 20 | - | - | - | - | 5 | 6 | 21 | 33 | H |
| | 25 | - | - | - | 3 | 5 | 6 | 31 | 46 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 30 | - | - | - | 6 | 5 | 7 | 39 | 58 | K |
| | 35 | - | - | 3 | 4 | 6 | 8 | 46 | 68 | M |
| | 40 | - | - | 4 | 5 | 6 | 9 | 52 | 77 | |
| | 45 | - | - | 6 | 5 | 6 | 10 | 59 | 87 | |
| | 50 | - | 3 | 4 | 5 | 7 | 14 | 66 | 100 | |
| | 55 | - | 3 | 5 | 5 | 8 | 19 | 73 | 114 | |
| | 60 | - | 4 | 5 | 6 | 8 | 23 | 81 | 128 | |
| | 65 | - | 5 | 5 | 6 | 8 | 29 | 89 | 143 | |
| | 70 | - | 5 | 5 | 7 | 12 | 31 | 96 | 157 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 80 | 70 | 60 | 50 | 40 | 30 | 20 | | |
| 180 | 5 | - | - | - | - | - | - | - | 3 | B |
| | 10 | - | - | - | - | - | - | 9 | 12 | E |
| | 15 | - | - | - | - | - | 8 | 14 | 23 | G |
| | 20 | - | - | - | - | 7 | 6 | 25 | 39 | H |
| | 25 | - | - | - | 5 | 5 | 7 | 35 | 53 | J |
| | 30 | - | - | 3 | 5 | 5 | 8 | 42 | 64 | M |
| | 35 | - | - | 5 | 5 | 6 | 8 | 50 | 75 | |
| | 40 | - | 3 | 4 | 5 | 6 | 9 | 57 | 85 | |
| | 45 | - | 4 | 4 | 5 | 7 | 14 | 65 | 100 | |
| | 50 | - | 5 | 4 | 6 | 7 | 19 | 73 | 115 | |
| | 55 | - | 5 | 5 | 6 | 8 | 24 | 81 | 130 | |
| | 60 | 3 | 3 | 5 | 7 | 9 | 29 | 89 | 146 | |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | **20** | |
| **190** | 5 | - | - | - | - | - | - | - | - | - | 3 |
| | 10 | - | - | - | - | - | - | - | - | **10** | 14 |
| | 15 | - | - | - | - | - | - | 4 | 5 | **15** | 25 |
| | 20 | - | - | - | - | - | 4 | 5 | 6 | **29** | 45 |
| | 25 | - | - | - | - | 3 | 4 | 5 | 7 | **38** | 58 |
| | 30 | - | - | - | - | 5 | 5 | 5 | 8 | **46** | 70 |
| | 35 | - | - | - | 3 | 4 | 5 | 6 | 9 | **54** | 82 |
| | 40 | - | - | - | 5 | 4 | 5 | 7 | 12 | **62** | 96 |
| | 45 | - | - | - | 6 | 4 | 6 | 7 | 18 | **71** | 113 |
| | 50 | - | - | 3 | 4 | 4 | 6 | 8 | 24 | **80** | 130 |
| | 55 | - | - | 4 | 4 | 5 | 6 | 10 | 28 | **89** | 147 |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | **20** | |
| **200** | 10 | - | - | - | - | - | - | - | 4 | **11** | 16 |
| | 15 | - | - | - | - | - | - | 6 | 5 | **18** | 30 |
| | 20 | - | - | - | - | - | 6 | 4 | 7 | **32** | 50 |
| | 25 | - | - | - | - | 5 | 4 | 5 | 8 | **41** | 64 |
| | 30 | - | - | - | 3 | 4 | 5 | 6 | 8 | **50** | 77 |
| | 35 | - | - | - | 5 | 4 | 5 | 7 | 9 | **58** | 89 |
| | 40 | - | - | 3 | 3 | 5 | 5 | 8 | 16 | **67** | 108 |
| | 45 | - | - | 4 | 4 | 4 | 6 | 8 | 22 | **77** | 126 |
| | 50 | - | - | 5 | 4 | 5 | 6 | 10 | 27 | **87** | 145 |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | **20** | |
| **210** | 10 | - | - | - | - | - | - | - | 5 | **12** | 18 |
| | 15 | - | - | - | - | - | - | 7 | 6 | **22** | 36 |
| | 20 | - | - | - | - | 4 | 3 | 5 | 7 | **35** | 55 |
| | 25 | - | - | - | - | 6 | 5 | 5 | 8 | **45** | 70 |
| | 30 | - | - | - | 5 | 4 | 5 | 6 | 9 | **54** | 84 |
| | 35 | - | - | 3 | 4 | 4 | 5 | 7 | 14 | **63** | 101 |
| | 40 | - | - | 5 | 3 | 5 | 6 | 8 | 19 | **73** | 120 |
| | 45 | - | - | 6 | 4 | 4 | 7 | 8 | 27 | **84** | 141 |
| | 50 | - | 3 | 4 | 4 | 5 | 7 | 13 | 31 | **95** | 163 |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | **20** | |
| **220** | 10 | - | - | - | - | - | - | - | 7 | **13** | 21 |
| | 15 | - | - | - | - | - | 5 | 4 | 6 | **25** | 41 |
| | 20 | - | - | - | - | 5 | 4 | 5 | 7 | **38** | 60 |
| | 25 | - | - | - | 4 | 4 | 4 | 6 | 9 | **48** | 76 |
| | 30 | - | - | 3 | 4 | 4 | 5 | 7 | 9 | **58** | 91 |
| | 35 | - | - | 5 | 3 | 5 | 5 | 8 | 17 | **68** | 112 |
| | 40 | - | 3 | 3 | 4 | 5 | 6 | 8 | 24 | **80** | 134 |
| | 45 | - | 4 | 3 | 4 | 6 | 6 | 12 | 29 | **91** | 156 |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

In-water oxygen decompression 20 fsw

**Warning: The maximum operational depth UK-HSE is 164 fsw**

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 100 | 90 | 80 | 70 | 60 | 50 | 40 | 30 | **20** | |
| **230** | 10 | - | - | - | - | - | - | - | 8 | **14** | 23 |
| | 15 | - | - | - | - | - | 6 | 4 | 7 | **28** | 46 |
| | 20 | - | - | - | - | 6 | 4 | 6 | 7 | **40** | 64 |
| | 25 | - | - | - | 6 | 4 | 4 | 7 | 8 | **51** | 81 |
| | 30 | - | - | 5 | 3 | 4 | 6 | 7 | 12 | **62** | 100 |
| | 35 | - | 4 | 3 | 3 | 5 | 6 | 8 | 20 | **74** | 124 |
| | 40 | - | 5 | 3 | 4 | 5 | 6 | 10 | 27 | **86** | 147 |

**Warning:** The 20 fsw stop does not include the ascent time to the surface

*2.3.3.3 - Tables A and B for repetitive dive calculation - Imperial*

| A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 → 11:59 | 12:00 → 14:59 | 15:00 → 18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

| B. NO-DECOMPRESSION REPETITIVE DIVING TABLE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (fsw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 30 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 40 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 50 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 60 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 70 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 80 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 90 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 100 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 110 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 120 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 130 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 140 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 150 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

***2.3.3.4 - Table #5 - Depth correction for diving at altitude - Imperial***

| Actual Depth (feet) | Depth Correction at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| 30 | +0 | +10 | +10 | +10 | +10 | +10 | +10 | +20 | +20 |
| 40 | +0 | +10 | +10 | +10 | +10 | +10 | +20 | +20 | +20 |
| 50 | +0 | +10 | +10 | +10 | +10 | +20 | +20 | +20 | +20 |
| 60 | +0 | +10 | +10 | +10 | +20 | +20 | +20 | +20 | +30 |
| 70 | +0 | +10 | +10 | +10 | +20 | +20 | +20 | +30 | +30 |
| 80 | +0 | +10 | +10 | +20 | +20 | +20 | +30 | +30 | +40 |
| 90 | +0 | +10 | +10 | +20 | +20 | +20 | +30 | +30 | +40 |
| 100 | +0 | +10 | +10 | +20 | +20 | +30 | +30 | +30 | +40 |
| 110 | +0 | +10 | +20 | +20 | +20 | +30 | +30 | +40 | +50 |
| 120 | +0 | +10 | +20 | +20 | +30 | +30 | +30 | +40 | +50 |
| 130 | +0 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +50 |
| 140 | +0 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +60 |
| 150 | +10 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | +60 |
| 160 | +10 | +20 | +20 | +30 | +30 | +40 | +40 | +50 | +60 |
| 170 | +10 | +20 | +20 | +30 | +30 | +40 | +50 | +50 | +70 |
| 180 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | +50 | |
| 190 | +10 | +20 | +20 | +30 | +40 | +40 | +50 | | |
| 200 | +10 | +20 | +20 | +30 | +40 | +40 | | | |
| 210 | +10 | +20 | +20 | +30 | | | | | |
| 220 | +10 | +20 | | | | | | | |
| 230 | +10 | | | | | | | | |

| Sea Level Stop Depth (feet) | Actual Decompression Stop Depth at Altitude (feet) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 300 → 999 | 1000 → 1999 | 2000 → 2999 | 3000 → 3999 | 4000 → 4999 | 5000 → 5999 | 6000 → 6999 | 7000 → 7999 | 8000 → 10000 |
| 10 | 10 | 10 | 10 | 9 | 9 | 9 | 8 | 8 | 8 |
| 20 | 20 | 20 | 19 | 18 | 18 | 17 | 16 | 16 | 15 |
| 30 | 30 | 29 | 28 | 27 | 26 | 25 | 24 | 24 | 23 |
| 40 | 40 | 39 | 38 | 36 | 35 | 34 | 32 | 31 | 30 |
| 50 | 50 | 49 | 47 | 45 | 44 | 42 | 40 | 39 | 38 |
| 60 | 59 | 58 | 56 | 54 | 52 | 50 | 48 | 47 | 45 |
| 70 | 69 | 68 | 66 | 63 | 61 | 59 | 56 | 54 | 52 |
| 80 | 79 | 77 | 75 | 72 | 70 | 67 | 64 | 62 | 60 |
| 90 | 89 | 87 | 84 | 81 | 78 | 75 | 72 | 70 | 67 |

### 2.3.4 - Table air, with in water oxygen decompression at 20 ft - Metric

#### *2.3.4.1 - Table 2S: Short in water oxygen decompression - Metric*

This table has to be used for information, and to calculate multilevel diving. It is not to be used to manage the dives.

| Depth (msw) | No-Decompression Bottom Times (min) | | | Decompression Required Bottom Times (min) | | | |
|---|---|---|---|---|---|---|---|
| 15 | 30 C | 50 E | 75 G | 120 J | 130 J | 145 | 165 |
| 18 | 20 B | 30 D | 50 F | 80 H | 90 J | 100 J | 115 K |
| 21 | 15 B | 25 D | 35 E | 47 F | 67 H | 74 I | 84 J |
| 24 | 10 A | 20 D | 25 E | 34 F | 53 H | 58 H | 65 I |
| 27 | 9 A | 15 C | 20 D | 26 E | 42 G | 48 H | 53 I |
| 30 | 7 A | 10 B | 15 D | 21 E | 35 G | 40 H | 45 I |
| 33 | 6 A | 10 B | 12 C | 17 D | 29 G | 35 H | 38 H |
| 36 | | 6 A | 10 C | 15 D | 24 G | 30 H | 33 H |
| 39 | | 5 A | 8 B | 13 D | 20 G | 27 G | 29 H |
| 42 | | 5 A | 7 B | 11 D | 18 F | 24 G | 26 H |
| 45 | | | 7 B | 10 D | 16 F | 22 G | 24 H |
| 48 | | | 6 B | 9 D | 14 F | 20 G | 21 H |
| 51 | | | 6 B | 8 C | 13 E | 18 G | 20 H |
| 54 | | | 5 B | 8 C | 11 E | 16 G | 18 G |
| Decompression Time (min) Oxygen at 9 msw | | | | 5 | 10 | 15 | 20 |

Note: Decompression stop times do not include ascent time to 9 msw.

*2.3.4.2 - Table 2M: In-water oxygen decompression 20 fsw - Metric*

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 15 | 75 | - | - | - | - | - | - | - | 1 | G |
| | 120 | - | - | - | - | - | - | **5** | 6 | J |
| | 130 | - | - | - | - | - | - | **10** | 11 | J |
| | 140 | - | - | - | - | - | - | **14** | 15 | K |
| | 160 | - | - | - | - | - | - | **19** | 20 | |
| | 180 | - | - | - | - | - | - | **23** | 24 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 200 | - | - | - | - | - | - | **27** | 28 | |
| | 220 | - | - | - | - | - | - | **31** | 32 | |
| | 240 | - | - | - | - | - | - | **35** | 36 | |
| | 260 | - | - | - | - | - | - | **38** | 39 | |
| | 280 | - | - | - | - | - | - | **41** | 42 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 18 | 50 | - | - | - | - | - | - | - | 1 | F |
| | 80 | - | - | - | - | - | - | **5** | 7 | H |
| | 90 | - | - | - | - | - | - | **10** | 12 | J |
| | 100 | - | - | - | - | - | - | **15** | 17 | J |
| | 110 | - | - | - | - | - | - | **19** | 21 | K |
| | 120 | - | - | - | - | - | - | **22** | 24 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 140 | - | - | - | - | - | - | **28** | 30 | |
| | 160 | - | - | - | - | - | - | **33** | 35 | |
| | 180 | - | - | - | - | - | - | **38** | 40 | |
| | 200 | - | - | - | - | - | - | **43** | 45 | |
| | 220 | - | - | - | - | - | - | **48** | 50 | |
| | 240 | - | - | - | - | - | - | **53** | 55 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 21 | 35 | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | 6 | 8 | G |
| | 70 | - | - | - | - | - | - | 12 | 14 | I |
| | 80 | - | - | - | - | - | - | 18 | 20 | J |
| | 90 | - | - | - | - | - | - | 23 | 25 | K |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 100 | - | - | - | - | - | - | 27 | 29 | K |
| | 110 | - | - | - | - | - | - | 30 | 32 | |
| | 120 | - | - | - | - | - | - | 34 | 36 | |
| | 130 | - | - | - | - | - | - | 37 | 39 | |
| | 140 | - | - | - | - | - | - | 41 | 43 | |
| | 150 | - | - | - | - | - | - | 44 | 46 | |
| | 160 | - | - | - | - | - | - | 47 | 49 | |
| | 170 | - | - | - | - | - | - | 51 | 53 | |
| | 180 | - | - | - | - | - | - | 54 | 56 | |
| | 190 | - | - | - | - | - | - | 57 | 59 | |
| | 200 | - | - | - | - | - | - | 60 | 62 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 24 | 25 | - | - | - | - | - | - | - | 2 | E |
| | 35 | - | - | - | - | - | - | 6 | 8 | G |
| | 50 | - | - | - | - | - | - | 8 | 10 | H |
| | 55 | - | - | - | - | - | - | 12 | 14 | H |
| | 60 | - | - | - | - | - | - | 16 | 18 | I |
| | 70 | - | - | - | - | - | - | 23 | 25 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 80 | - | - | - | - | - | - | 28 | 30 | K |
| | 90 | - | - | - | - | - | - | 32 | 34 | |
| | 100 | - | - | - | - | - | - | 37 | 39 | |
| | 110 | - | - | - | - | - | 2 | 41 | 44 | |
| | 120 | - | - | - | - | - | 3 | 45 | 49 | |
| | 130 | - | - | - | - | - | 4 | 49 | 54 | |
| | 140 | - | - | - | - | - | 4 | 53 | 58 | |
| | 150 | - | - | - | - | - | 5 | 58 | 64 | |
| | 160 | - | - | - | - | - | 5 | 62 | 68 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | O2 | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 27 | 20 | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | **5** | 7 | E |
| | 40 | - | - | - | - | - | - | **9** | 11 | G |
| | 45 | - | - | - | - | - | - | **11** | 13 | H |
| | 50 | - | - | - | - | - | - | **17** | 19 | H |
| | 55 | - | - | - | - | - | - | **22** | 24 | I |
| | 60 | - | - | - | - | - | 2 | **25** | 28 | J |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 70 | - | - | - | - | - | 3 | **31** | 35 | |
| | 80 | - | - | - | - | - | 4 | **36** | 41 | |
| | 90 | - | - | - | - | - | 5 | **42** | 48 | |
| | 100 | - | - | - | - | - | 6 | **47** | 54 | |
| | 110 | - | - | - | - | - | 7 | **52** | 60 | |
| | 120 | - | - | - | - | - | 8 | **57** | 66 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | O2 | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 30 | 15 | - | - | - | - | - | - | - | 2 | D |
| | 20 | - | - | - | - | - | - | **5** | 7 | E |
| | 30 | - | - | - | - | - | - | **9** | 11 | F |
| | 35 | - | - | - | - | - | - | **10** | 12 | G |
| | 40 | - | - | - | - | - | - | **14** | 16 | H |
| | 45 | - | - | - | - | - | 3 | **20** | 24 | I |
| | 50 | - | - | - | - | - | 4 | **25** | 30 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 55 | - | - | - | - | - | 5 | **29** | 35 | J |
| | 60 | - | - | - | - | - | 6 | **32** | 39 | |
| | 70 | - | - | - | - | - | 7 | **39** | 47 | |
| | 80 | - | - | - | - | - | 8 | **45** | 54 | |
| | 90 | - | - | - | - | 2 | 8 | **51** | 62 | |
| | 100 | - | - | - | - | 3 | 8 | **56** | 68 | |
| | 110 | - | - | - | - | 4 | 8 | **62** | 75 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 33 | 12 | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | 7 | 9 | E |
| | 25 | - | - | - | - | - | - | 9 | 11 | F |
| | 30 | - | - | - | - | - | - | 11 | 13 | G |
| | 35 | - | - | - | - | - | 3 | 15 | 19 | H |
| | 40 | - | - | - | - | - | 5 | 22 | 28 | I |
| | Maximum operational limit UK-HSE | | | | | | | | | |
| | 45 | - | - | - | - | - | 6 | 27 | 34 | J |
| | 50 | - | - | - | - | - | 7 | 32 | 40 | K |
| | 55 | - | - | - | - | - | 8 | 36 | 45 | K |
| | 60 | - | - | - | - | 2 | 7 | 39 | 49 | |
| | 65 | - | - | - | - | 3 | 7 | 42 | 53 | |
| | 70 | - | - | - | - | 4 | 7 | 46 | 58 | |
| | 75 | - | - | - | - | 4 | 8 | 49 | 62 | |
| | 80 | - | - | - | - | 5 | 8 | 52 | 66 | |
| | 85 | - | - | - | - | 5 | 9 | 56 | 71 | |
| | 90 | - | - | - | - | 6 | 9 | 59 | 75 | |
| | 95 | - | - | - | - | 6 | 9 | 62 | 78 | |
| | 100 | - | - | - | - | 7 | 9 | 66 | 83 | |
| | 105 | - | - | - | - | 7 | 12 | 69 | 89 | |
| | 110 | - | - | - | - | 8 | 15 | 73 | 97 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | **6** | | |
| 36 | 10 | - | - | - | - | - | - | - | 2 | C |
| | 15 | - | - | - | - | - | - | **5** | 7 | E |
| | 20 | - | - | - | - | - | - | **8** | 10 | F |
| | 25 | - | - | - | - | - | - | **11** | 13 | G |
| | 30 | - | - | - | - | - | 4 | **13** | 18 | H |
| | 35 | - | - | - | - | - | 6 | **22** | 29 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 40 | - | - | - | - | - | 8 | **28** | 37 | I |
| | 45 | - | - | - | - | 3 | 6 | **33** | 43 | J |
| | 50 | - | - | - | - | 4 | 7 | **37** | 49 | K |
| | 55 | - | - | - | - | 5 | 7 | **41** | 54 | |
| | 60 | - | - | - | - | 6 | 7 | **45** | 59 | |
| | 65 | - | - | - | - | 6 | 8 | **49** | 64 | |
| | 70 | - | - | - | - | 7 | 8 | **52** | 68 | |
| | 75 | - | - | - | - | 8 | 8 | **56** | 73 | |
| | 80 | - | - | - | 2 | 6 | 9 | **60** | 78 | |
| | 85 | - | - | - | 3 | 6 | 10 | **64** | 84 | |
| | 90 | - | - | - | 3 | 7 | 13 | **68** | 92 | |
| | 95 | - | - | - | 4 | 6 | 16 | **72** | 99 | |
| | 100 | - | - | - | 4 | 7 | 19 | **76** | 107 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

Hyperlink Table of contents

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 39 | 8 | - | - | - | - | - | - | **-** | 2 | B |
| | 15 | - | - | - | - | - | - | **7** | 10 | E |
| | 20 | - | - | - | - | - | - | **10** | 13 | G |
| | 25 | - | - | - | - | - | 5 | **13** | 19 | G |
| | 30 | - | - | - | - | - | 7 | **21** | 29 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 35 | - | - | - | - | 3 | 6 | **28** | 38 | I |
| | 40 | - | - | - | - | 4 | 7 | **33** | 45 | J |
| | 45 | - | - | - | - | 6 | 7 | **38** | 52 | L |
| | 50 | - | - | - | - | 7 | 7 | **42** | 57 | |
| | 55 | - | - | - | 2 | 6 | 8 | **46** | 63 | |
| | 60 | - | - | - | 3 | 6 | 8 | **51** | 69 | |
| | 65 | - | - | - | 4 | 6 | 8 | **55** | 74 | |
| | 70 | - | - | - | 4 | 7 | 9 | **59** | 80 | |
| | 75 | - | - | - | 5 | 6 | 11 | **64** | 87 | |
| | 80 | - | - | - | 5 | 7 | 14 | **68** | 95 | |
| | 85 | - | - | - | 6 | 7 | 17 | **73** | 104 | |
| | 90 | - | - | - | 6 | 8 | 20 | **78** | 113 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | **6** | | |
| **42** | 7 | - | - | - | - | - | - | **-** | 3 | B |
| | 10 | - | - | - | - | - | - | **4** | 7 | D |
| | 15 | - | - | - | - | - | - | **8** | 11 | D |
| | 20 | - | - | - | - | - | 4 | **12** | 17 | G |
| | 25 | - | - | - | - | - | 7 | **17** | 25 | H |
| | 30 | - | - | - | - | 4 | 6 | **26** | 37 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 35 | - | - | - | - | 5 | 7 | **32** | 45 | J |
| | 40 | - | - | - | - | 7 | 7 | **37** | 52 | K |
| | 45 | - | - | - | 3 | 5 | 8 | **43** | 60 | M |
| | 50 | - | - | - | 4 | 6 | 8 | **47** | 66 | |
| | 55 | - | - | - | 5 | 6 | 8 | **52** | 72 | |
| | 60 | - | - | - | 6 | 6 | 9 | **57** | 79 | |
| | 65 | - | - | - | 6 | 7 | 10 | **62** | 86 | |
| | 70 | - | - | - | 7 | 7 | 14 | **67** | 96 | |
| | 75 | - | - | 3 | 5 | 7 | 18 | **72** | 106 | |
| | 80 | - | - | 3 | 6 | 7 | 21 | **77** | 115 | |
| | 85 | - | - | 4 | 5 | 8 | 25 | **83** | 126 | |
| | 90 | - | - | 4 | 6 | 8 | 28 | **89** | 136 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 45 | 7 | - | - | - | - | - | - | **-** | 3 | B |
| | 10 | - | - | - | - | - | - | **5** | 8 | D |
| | 15 | - | - | - | - | - | - | **10** | 13 | F |
| | 20 | - | - | - | - | - | 6 | **13** | 20 | G |
| | 25 | - | - | - | - | 4 | 5 | **22** | 32 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 30 | - | - | - | - | 6 | 6 | **30** | 43 | I |
| | 35 | - | - | - | 3 | 5 | 7 | **36** | 52 | K |
| | 40 | - | - | - | 4 | 6 | 7 | **42** | 60 | M |
| | 45 | - | - | - | 5 | 6 | 8 | **47** | 67 | |
| | 50 | - | - | - | 6 | 7 | 8 | **52** | 74 | |
| | 55 | - | - | 3 | 5 | 6 | 9 | **58** | 82 | |
| | 60 | - | - | 3 | 5 | 7 | 12 | **63** | 91 | |
| | 65 | - | - | 4 | 5 | 8 | 16 | **69** | 103 | |
| | 70 | - | - | 5 | 5 | 8 | 20 | **75** | 114 | |
| | 75 | - | - | 5 | 6 | 8 | 24 | **81** | 125 | |
| | 80 | - | - | 6 | 6 | 8 | 28 | **87** | 136 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 48 | 6 | - | - | - | - | - | - | **-** | 3 | B |
| | 10 | - | - | - | - | - | - | **6** | 9 | E |
| | 15 | - | - | - | - | - | 4 | **11** | 16 | F |
| | 20 | - | - | - | - | - | 8 | **15** | 24 | G |
| | 25 | - | - | - | - | 6 | 6 | **26** | 39 | I |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 30 | - | - | - | 3 | 5 | 7 | **34** | 50 | J |
| | 35 | - | - | - | 5 | 5 | 8 | **40** | 59 | L |
| | 40 | - | - | - | 6 | 6 | 8 | **46** | 67 | |
| | 45 | - | - | 3 | 5 | 6 | 9 | **52** | 76 | |
| | 50 | - | - | 4 | 5 | 7 | 9 | **58** | 84 | |
| | 55 | - | - | 5 | 5 | 7 | 13 | **64** | 95 | |
| | 60 | - | - | 6 | 5 | 8 | 17 | **70** | 107 | |
| | 65 | - | - | 7 | 5 | 8 | 22 | **77** | 120 | |
| | 70 | - | 3 | 4 | 6 | 8 | 26 | **84** | 132 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 51 | 6 | - | - | - | - | - | - | **-** | 3 | B |
| | 10 | - | - | - | - | - | - | **7** | 10 | E |
| | 15 | - | - | - | - | - | 5 | **12** | 18 | G |
| | 20 | - | - | - | - | 5 | 5 | **20** | 31 | H |
| | **Maximum operational limit UK-HSE** | | | | | | | | | |
| | 25 | - | - | - | 3 | 5 | 6 | **30** | 45 | J |
| | 30 | - | - | - | 5 | 5 | 7 | **38** | 56 | K |
| | 35 | - | - | 3 | 4 | 6 | 8 | **44** | 66 | M |
| | 40 | - | - | 4 | 5 | 6 | 8 | **51** | 75 | |
| | 45 | - | - | 5 | 5 | 7 | 9 | **57** | 84 | |
| | 50 | - | - | 6 | 6 | 7 | 13 | **64** | 97 | |
| | 55 | - | 3 | 4 | 6 | 7 | 18 | **71** | 110 | |
| | 60 | - | 4 | 4 | 6 | 8 | 23 | **78** | 124 | |
| | 65 | - | 5 | 4 | 6 | 9 | 27 | **86** | 138 | |
| | 70 | - | 5 | 5 | 6 | 12 | 30 | **93** | 152 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | $O_2$ | | |
| | | 24 | 21 | 18 | 15 | 12 | 9 | 6 | | |
| 54 | 5 | - | - | - | - | - | - | **-** | 3 | B |
| | 10 | - | - | - | - | - | - | **8** | 11 | E |
| | 15 | - | - | - | - | - | 7 | **14** | 22 | G |
| | 20 | - | - | - | - | 6 | 6 | **24** | 37 | H |
| | 25 | - | - | - | 5 | 5 | 7 | **34** | 52 | J |
| | 30 | - | - | 3 | 4 | 6 | 7 | **41** | 62 | M |
| | 35 | - | - | 5 | 4 | 6 | 8 | **48** | 72 | |
| | 40 | - | - | 6 | 5 | 7 | 9 | **55** | 83 | |
| | 45 | - | 4 | 4 | 5 | 7 | 13 | **63** | 97 | |
| | 50 | - | 4 | 5 | 5 | 8 | 18 | **70** | 111 | |
| | 55 | - | 5 | 5 | 6 | 8 | 23 | **78** | 126 | |
| | 60 | - | 6 | 5 | 6 | 9 | 28 | **86** | 141 | |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | |
| 57 | 5 | - | - | - | - | - | - | - | - | - | 3 |
| | 10 | - | - | - | - | - | - | - | - | **9** | 13 |
| | 15 | - | - | - | - | - | - | 4 | 5 | **14** | 24 |
| | 20 | - | - | - | - | - | 4 | 4 | 6 | **28** | 43 |
| | 25 | - | - | - | - | - | 7 | 5 | 7 | **37** | 57 |
| | 30 | - | - | - | - | 5 | 4 | 6 | 8 | **45** | 69 |
| | 35 | - | - | - | 3 | 4 | 5 | 6 | 9 | **52** | 80 |
| | 40 | - | - | - | 4 | 4 | 5 | 7 | 11 | **60** | 92 |
| | 45 | - | - | - | 5 | 5 | 5 | 8 | 17 | **68** | 109 |
| | 50 | - | - | 3 | 3 | 5 | 6 | 8 | 22 | **77** | 125 |
| | 55 | - | - | 4 | 3 | 5 | 7 | 9 | 27 | **86** | 142 |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | |
| 60 | 5 | - | - | - | - | - | - | - | - | - | 4 |
| | 10 | - | - | - | - | - | - | - | - | **10** | 14 |
| | 15 | - | - | - | - | - | - | 5 | 6 | **16** | 28 |
| | 20 | - | - | - | - | - | 5 | 5 | 6 | **31** | 48 |
| | 25 | - | - | - | - | 5 | 4 | 5 | 7 | **40** | 62 |
| | 30 | - | - | - | 3 | 4 | 4 | 6 | 9 | **49** | 76 |
| | 35 | - | - | - | 5 | 4 | 5 | 6 | 10 | **57** | 88 |
| | 40 | - | - | - | 6 | 4 | 6 | 7 | 15 | **65** | 104 |
| | 45 | - | - | 4 | 3 | 5 | 6 | 8 | 21 | **75** | 123 |
| | 50 | - | - | 5 | 4 | 4 | 7 | 9 | 27 | **84** | 141 |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | |
| 63 | 10 | - | - | - | - | - | - | - | 5 | **11** | 17 |
| | 15 | - | - | - | - | - | - | 7 | 6 | **21** | 35 |
| | 20 | - | - | - | - | - | 7 | 5 | 7 | **33** | 53 |
| | 25 | - | - | - | - | 6 | 4 | 6 | 8 | **43** | 68 |
| | 30 | - | - | - | 5 | 4 | 4 | 7 | 8 | **52** | 81 |
| | 35 | - | - | 3 | 3 | 4 | 6 | 7 | 12 | **61** | 97 |
| | 40 | - | - | 4 | 4 | 4 | 6 | 8 | 19 | **71** | 117 |
| | 45 | - | - | 5 | 4 | 5 | 6 | 9 | 25 | **81** | 136 |
| | 50 | - | 3 | 3 | 4 | 6 | 6 | 13 | 29 | **91** | 156 |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | |
| 66 | 10 | - | - | - | - | - | - | - | 7 | **12** | 20 |
| | 15 | - | - | - | - | - | 4 | 5 | 5 | **24** | 39 |
| | 20 | - | - | - | - | 5 | 4 | 5 | 7 | **36** | 58 |
| | 25 | - | - | - | 4 | 4 | 4 | 6 | 8 | **47** | 74 |
| | 30 | - | - | 3 | 3 | 4 | 5 | 7 | 9 | **56** | 88 |
| | 35 | - | - | 5 | 3 | 4 | 6 | 7 | 16 | **66** | 108 |
| | 40 | - | 3 | 3 | 4 | 4 | 7 | 8 | 23 | **77** | 130 |
| | 45 | - | 4 | 3 | 4 | 5 | 7 | 11 | 28 | **88** | 151 |

**Warning:** The 6 msw stop does not include the ascent time to the surface

In-water oxygen decompression 6 msw

**Warning: The maximum operational depth UK-HSE is 50 msw**

| Depth (msw) | Bottom Time (min) | Stop Times (min) at Different Depths (msw) | | | | | | | | | Decom. Time (min) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Air | | | | | | | | $O_2$ | |
| | | 30 | 27 | 24 | 21 | 18 | 15 | 12 | 9 | 6 | |
| 69 | 10 | - | - | - | - | - | - | - | 8 | **14** | 23 |
| | 15 | - | - | - | - | - | 6 | 4 | 6 | **27** | 44 |
| | 20 | - | - | - | - | 6 | 4 | 6 | 7 | **39** | 63 |
| | 25 | - | - | - | 6 | 3 | 5 | 6 | 9 | **50** | 80 |
| | 30 | - | - | 5 | 3 | 4 | 5 | 7 | 12 | **60** | 97 |
| | 35 | - | 3 | 3 | 4 | 4 | 6 | 8 | 19 | **72** | 120 |
| | 40 | - | 5 | 3 | 4 | 5 | 6 | 9 | 27 | **84** | 144 |

**Warning:** The 6 msw stop does not include the ascent time to the surface

*2.3.4.3 - Tables A and B for repetitive dive calculation - Metric*

| A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

| B. NO-DECOMPRESSION REPETITIVE DIVING TABLE | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Depth (msw) | Allowable No-D Limits (min) for Repetitive Factors (RF) | | | | | | | | | |
| | 1.1 | 1.2 | 1.3 | 1.4 | 1.5 | 1.6 | 1.7 | 1.8 | 1.9 | 2.0 |
| 9 | 272 | 250 | 230 | 214 | 200 | 187 | 176 | 166 | 157 | 150 |
| 12 | 136 | 125 | 115 | 107 | 100 | 93 | 88 | 83 | 78 | 75 |
| 15 | 60 | 55 | 50 | 45 | 41 | 38 | 36 | 34 | 32 | 31 |
| 18 | 40 | 35 | 31 | 29 | 27 | 26 | 24 | 23 | 22 | 21 |
| 21 | 30 | 25 | 21 | 19 | 18 | 17 | 16 | 15 | 14 | 13 |
| 24 | 20 | 18 | 16 | 15 | 14 | 13 | 12 | 12 | 11 | 11 |
| 27 | 16 | 14 | 12 | 11 | 11 | 10 | 9 | 9 | 8 | 8 |
| 30 | 13 | 11 | 10 | 9 | 9 | 8 | 8 | 7 | 7 | 7 |
| 33 | 10 | 9 | 8 | 8 | 7 | 7 | 6 | 6 | 6 | 6 |
| 36 | 8 | 7 | 7 | 6 | 6 | 6 | 5 | 5 | 5 | 5 |
| 39 | 7 | 6 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 4 |
| 42 | 6 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 |
| 45 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 | 3 |

***2.3.5.4 - Table #5 - Depth correction for diving at altitude - Metric***

| Actual Depth (metres) | Depth Correction at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 → 299 | 300 → 599 | 600 → 899 | 900 → 1199 | 1200 → 1499 | 1500 → 1799 | 1800 → 2099 | 2100 → 2399 | 2400 → 3000 |
| 9 | +0 | +3 | +3 | +3 | +3 | +3 | +3 | +6 | +6 |
| 12 | +0 | +3 | +3 | +3 | +3 | +3 | +6 | +6 | +6 |
| 15 | +0 | +3 | +3 | +3 | +3 | +6 | +6 | +6 | +6 |
| 18 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +6 | +9 |
| 21 | +0 | +3 | +3 | +3 | +6 | +6 | +6 | +9 | +9 |
| 24 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 27 | +0 | +3 | +3 | +6 | +6 | +6 | +9 | +9 | +12 |
| 30 | +0 | +3 | +3 | +6 | +6 | +9 | +9 | +9 | +12 |
| 33 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 36 | +0 | +3 | +6 | +6 | +6 | +9 | +9 | +12 | +15 |
| 39 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 |
| 42 | +0 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +18 |
| 45 | +3 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +18 |
| 48 | +3 | +6 | +6 | +9 | +9 | +12 | +12 | +15 | +18 |
| 51 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | +21 |
| 54 | +3 | +6 | +6 | +9 | +9 | +12 | +15 | +15 | |
| 57 | +3 | +6 | +6 | +9 | +12 | +12 | +15 | | |
| 60 | +3 | +6 | +6 | +9 | +12 | +12 | | | |
| 63 | +3 | +6 | +6 | +9 | | | | | |
| 66 | +3 | +6 | | | | | | | |
| 69 | +3 | | | | | | | | |

| Sea Level Stop Depth (metres) | Actual Decompression Stop Depth at Altitude (metres) | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 100 → 299 | 300 → 599 | 600 → 899 | 900 → 1199 | 1200 → 1499 | 1500 → 1799 | 1800 → 2099 | 2100 → 2399 | 2400 → 3000 |
| 3 | 3.0 | 3.0 | 3.0 | 3.0 | 3.0 | 2.5 | 2.5 | 2.5 | 2.5 |
| 6 | 6.0 | 6.0 | 6.0 | 5.5 | 5.5 | 5.0 | 5.0 | 5.0 | 4.5 |
| 9 | 9.0 | 9.0 | 8.5 | 8.5 | 8.0 | 7.5 | 7.5 | 7.0 | 7.0 |
| 12 | 12.0 | 12.0 | 11.5 | 11.0 | 10.5 | 10.0 | 10.0 | 9.5 | 9.0 |
| 15 | 15.0 | 14.5 | 14.0 | 13.5 | 13.0 | 12.5 | 12.0 | 12.0 | 11.5 |
| 18 | 18.0 | 17.5 | 17.0 | 16.5 | 16.0 | 15.0 | 14.5 | 14.0 | 13.5 |
| 21 | 21.0 | 20.5 | 20.0 | 19.0 | 18.5 | 17.5 | 17.0 | 16.5 | 16.0 |
| 24 | 24.0 | 23.5 | 22.5 | 21.5 | 21.0 | 20.0 | 19.5 | 19.0 | 18.0 |
| 27 | 27.0 | 26.0 | 25.5 | 24.5 | 23.5 | 22.5 | 22.0 | 21.0 | 20.0 |

## 2.4 - Nitrox diving procedure

### 2.4.1 - Equivalent air depth table for nitrogen/oxygen breathing mixture *(Table 1(N) DCIEM)*

Decompression for nitrogen-oxygen breathing mixtures is based on the air diving table according to the "Equivalent Air Depth (EAD)" for the nitrogen-oxygen mixture used and the depth of the dive.
The partial pressure of nitrogen in the breathing mixture at the actual depth of the dive is used to determine the depth of a dive on air (i.e., the EAD) with the same partial pressure of nitrogen. The decompression requirement for the dive using the Nitrox (nitrogen-oxygen) mixture is then determined from an air diving table for that EAD. Thus, a dive on 60% nitrogen/40% oxygen at 50 fsw has approximately the same partial pressure of nitrogen *[0.6 x (50 + 33)/33 = 1.5 ATA (atmospheres absolute)]* than a dive to 30 fsw on air with 79% nitrogen *[0.79 x (30 + 33)/33 = 1.5 ATA]*.
The "equivalent air depth" EAD for 50 fsw on 60% $N_2$/40% $O_2$ is therefore 30 fsw. Because the EAD is shallower than the actual dive depth, the decompression required for the nitrogen-oxygen dive is less than would be required for an air dive to the same actual depth.

DCIEM promotes three nitrogen-oxygen mixtures:

- 60% $N_2$ / 40% $O_2$
- 64% $N_2$ / 36% $O_2$
- 68% $N_2$ / 32% $O_2$

The table 1(N) DCIEM shows the Equivalent Air Depths (EAD) adjusted to the appropriate decompression schedule depth, and the partial pressure of oxygen ($PPO_2$) for these mixtures *(see on the next page)*.

Note that:

- Oxygen percentage in the breathing gas is to be within ±0.5% of the specified nominal concentrations listed in the Table.
- EAD is computed for the worst case value (i.e., % nitrogen +0.5%), and is rounded up to the next greater 10 fsw or 3 msw (e.g., 11 fsw rounded up to 20 fsw).
- $PO_2$ is computed for the worst case value (i.e., % oxygen +0.5%) and is rounded up to the next greater first decimal value (e.g., 1.32 to 1.4, 1.45 to 1.5).
- A maximum depth cut-off of 110 fsw/34 msw (actual depth) has been applied by DCIEM, because of physiological and engineering factors involving nitrogen-oxygen open-circuit diving. These include:
  - Greater gas density with increasing depth which can negatively affect gas flow dynamics in open-circuit systems and respiratory ventilatory functions.
  - Increased diver workloads at critical depths, that can place supply demands beyond the capabilities of open-circuit systems and reduce lung ventilation efficiency.
  - Individual diver physiological and respiratory variations.
  - A wide variation in breathing resistance/performance of regulators.

Although some may react independently, these factors have an inter-dependent relationship; all can react in a compounding manner, thereby significantly increasing arterial carbon dioxide levels. It is well-documented that an increase in CO2 levels significantly increases a diver's susceptibility to Central Nervous System (CNS) oxygen toxicity.
In addition, the operational limit of 1.4 ATA recommended by IMCA has been introduced. As a result, this table can be used by those who desire to implement this guideline.

### 2.4.2 - Recommended bottom time limit *(Table 2(N) DCIEM)*

Table 2(N) DCIEM gives the nominal single dive partial pressure oxygen exposure limits and the maximum bottom time limits for the various $PO_2$ values in Table 1(N).
These guidelines have been established by DCIEM after a review of US Navy, NOAA, and Canadian Forces oxygen exposure guidelines applicable to pure oxygen closed-circuit rebreathers, nitrogen-oxygen, and helium-oxygen diving and a review of the pertinent open literature.

- The nominal $PO_2$ single dive exposure limits are independent of depth and address central nervous system (CNS) oxygen toxicity and concurrent concerns for the effective control of Units of Pulmonary Toxicity Dose (UPTD) in single and repetitive dives.
- The corresponding maximum bottom time limits given for nominal single dive $PO_2$ exposure limits are depth dependent and are based on diving to the "normal air diving limit" in the DCIEM air diving tables.

### 2.4.2 - Use tables 1(N) and 2(N) DCIEM

a. Establish the actual depth of the dive.
b. Determine the Equivalent Air Depths (EAD) and the $PO_2$ for the nitrogen-oxygen (Nitrox) mixture using Table 1(N)).
c. Use the EAD to determine the depth of the air decompression schedule to use and to calculate the Repetitive Group (RG).
d. Use the $PO_2$ to determine the maximum bottom time allowed from the Table 2(N) guidelines.

Example #1: What is the bottom time allowed for a dive to 75 fsw on a 60% $N_2$/40% $O_2$ mixture?

From Table 1(N), the EAD for 75 fsw actual depth is 50 fsw and the $PO_2$ is 1.4 ATA.

Operational limit IMCA

***Table 1(N) DCIEM: Equivalent air depth for nitrox***

| Actual Depth (fsw) | Mixture | | | | | |
|---|---|---|---|---|---|---|
| | 60% $N_2$/40% $O_2$ | | 64% $N_2$/36% $O_2$ | | 68% $N_2$/32% $O_2$ | |
| | EAD (fsw) | $PO_2$ (ATA) | EAD (fsw) | $PO_2$ (ATA) | EAD (fsw) | $PO_2$ (ATA) |
| 30 | 20 | 0.8 | 20 | 0.7 | 30 | 0.7 |
| 35 | 20 | 0.9 | 30 | 0.8 | 30 | 0.7 |
| 40 | 30 | 0.9 | 30 | 0.8 | 40 | 0.8 |
| 45 | 30 | 1.0 | 40 | 0.9 | 40 | 0.8 |
| 50 | 40 | 1.1 | 40 | 1.0 | 40 | 0.8 |
| 55 | 40 | 1.1 | 40 | 1.0 | 50 | 0.9 |
| 60 | 40 | 1.2 | 50 | 1.1 | 50 | 0.9 |
| 65 | 50 | 1.2 | 50 | 1.1 | 60 | 1.0 |
| 70 | 50 | 1.3 | 60 | 1.2 | 60 | 1.0 |
| 75 | 50 | 1.4 | 60 | 1.2 | 70 | 1.1 |
| 80 | 60 | 1.4 | 60 | 1.3 | 70 | 1.1 |
| 85 | 60 | 1.5 | 70 | 1.3 | 70 | 1.2 |
| 90 | 70 | 1.5 | 70 | 1.4 | 80 | 1.2 |
| 95 | **70** | **1.6** | 80 | 1.5 | 80 | 1.3 |
| 100 | | | 80 | 1.5 | 90 | 1.3 |
| 105 | | | **80** | **1.6** | 90 | 1.4 |
| 110 | | | **90** | **1.6** | 100 | 1.5 |
| 115 | Depth cut-off DCIEM | | | | **100** | **1.5** |
| 120 | | | | | **100** | **1.6** |
| 125 | | | | | **110** | **1.6** |

The nominal single dive $PO_2$ exposure limit from Table 2(N) is 150 minutes, with the maximum bottom time allowing diving to the Normal Air Diving Limit.

***Table 2(N) DCIEM: Recommended bottom time limits***

| $PO_2$ (ATA) | Nominal single dive PO2 exposure limits (in minutes) | Maximum bottom time (in minutes) |
|---|---|---|
| up to 1.100 | > 240 | Normal air diving limit |
| 1.101 - 1.200 | 210 | |
| 1.201 - 1.300 | 180 | |
| 1.301 - 1.400 | 150 | |
| **1.401 - 1.500** | **120** | Normal air diving limit |
| **1.501 - 1.600** | **45** | **45** |

Limit IMCA

The Normal Air Diving Limit for 50 fsw is 140 minutes.

***Table air standard DCIEM***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 50 | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | C |
| | 40 | - | - | - | - | - | - | - | - | 1 | D |
| | 50 | - | - | - | - | - | - | - | - | 1 | E |
| | 60 | - | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | - | - | 1 | G |
| | 100 | - | - | - | - | - | - | - | 6 | 6 | I |
| | 120 | - | - | - | - | - | - | - | 12 | 12 | K |
| | 130 | - | - | - | - | - | - | - | 18 | 18 | L |
| | 140 | - | - | - | - | - | - | - | 24 | 24 | M |
| | 150 | - | - | - | - | - | - | - | 29 | 29 | |
| | 160 | - | - | - | - | - | - | - | 33 | 33 | |
| | 170 | - | - | - | - | - | - | - | 38 | 38 | |
| | 180 | - | - | - | - | - | - | - | 43 | 43 | |
| | **Maximum operational limit OGP/ HSE** | | | | | | | | | | |
| | 200 | - | - | - | - | - | - | - | 53 | 53 | |
| | 220 | - | - | - | - | - | - | - | 63 | 63 | |
| | 240 | - | - | - | - | - | - | - | 74 | 74 | |
| | 260 | - | - | - | - | - | - | - | 86 | 86 | |
| | 280 | - | - | - | - | - | - | - | 97 | 97 | |

Thus, the maximum dive allowed is 75 fsw (actual depth)/140 min.

Table of contents

Example #2: What bottom time is allowed for a dive to 102 fsw on a 64% N2/36% $0_2$ mixture?

***Table 1(N) DCIEM: Equivalent air depth for nitrox***

| Actual Depth (fsw) | Mixture | | | | | |
|---|---|---|---|---|---|---|
| | 60% $N_2$/40% $O_2$ | | 64% $N_2$/36% $O_2$ | | 68% $N_2$/32% $O_2$ | |
| | EAD (fsw) | $PO_2$ (ATA) | EAD (fsw) | $PO_2$ (ATA) | EAD (fsw) | $PO_2$ (ATA) |
| 30 | 20 | 0.8 | 20 | 0.7 | 30 | 0.7 |
| 35 | 20 | 0.9 | 30 | 0.8 | 30 | 0.7 |
| 40 | 30 | 0.9 | 30 | 0.8 | 40 | 0.8 |
| 45 | 30 | 1.0 | 40 | 0.9 | 40 | 0.8 |
| 50 | 40 | 1.1 | 40 | 1.0 | 40 | 0.8 |
| 55 | 40 | 1.1 | 40 | 1.0 | 50 | 0.9 |
| 60 | 40 | 1.2 | 50 | 1.1 | 50 | 0.9 |
| 65 | 50 | 1.2 | 50 | 1.1 | 60 | 1.0 |
| 70 | 50 | 1.3 | 60 | 1.2 | 60 | 1.0 |
| 75 | 50 | 1.4 | 60 | 1.2 | 70 | 1.1 |
| 80 | 60 | 1.4 | 60 | 1.3 | 70 | 1.1 |
| 85 | 60 | 1.5 | 70 | 1.3 | 70 | 1.2 |
| 90 | 70 | 1.5 | 70 | 1.4 | 80 | 1.2 |
| 95 | 70 | 1.6 | 80 | 1.5 | 80 | 1.3 |
| 100 | | | 80 | 1.5 | 90 | 1.3 |
| 105 | | | 80 | 1.6 | 90 | 1.4 |
| 110 | | | 90 | 1.6 | 100 | 1.5 |
| 115 | Depth cut-off DCIEM | | | | 100 | 1.5 |
| 120 | | | | | 100 | 1.6 |
| 125 | | | | | 110 | 1.6 |

*Operational limit IMCA*

The EAD is 80 fsw and the $PO_2$ is 1.6

***Table 2(N) DCIEM: Recommended bottom time limits***

| $PO_2$ (ATA) | Nominal single dive PO2 exposure limits (in minutes) | Maximum bottom time (in minutes) |
|---|---|---|
| up to 1.100 | > 240 | Normal air diving limit |
| 1.101 - 1.200 | 210 | |
| 1.201 - 1.300 | 180 | |
| 1.301 - 1.400 | 150 | |
| **1.401 - 1.500** | **120** | Normal air diving limit |
| **1.501 - 1.600** | **45** | **45** |

*Limit IMCA*

The $PO_2$ is the controlling factor, resulting in the bottom time being restricted to 45 minutes

***Table air standard DCIEM***

| Depth (fsw) | Bottom Time (min) | 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Stop Times (min) at Different Depths (fsw) | | | | | | | | | |
| | 10 | - | - | - | - | - | - | - | - | 2 | A |
| | 15 | - | - | - | - | - | - | - | - | 2 | C |
| | 20 | - | - | - | - | - | - | - | - | 2 | D |
| | 25 | - | - | - | - | - | - | - | - | 2 | E |
| | 30 | - | - | - | - | - | - | - | 6 | 6 | F |
| | 40 | - | - | - | - | - | - | 2 | 10 | 12 | G |
| | 50 | - | - | - | - | - | - | 4 | 12 | 16 | H |
| | 55 | - | - | - | - | - | - | 5 | 17 | 22 | I |
| | 60 | - | - | - | - | - | - | 6 | 22 | 28 | J |
| | 65 | - | - | - | - | - | - | 7 | 27 | 34 | J |
| | 70 | - | - | - | - | - | - | 8 | 31 | 39 | K |
| | **Maximum operational limit OGP/ HSE** | | | | | | | | | | |
| **80** | 75 | - | - | - | - | - | - | 9 | 35 | 44 | L |
| | 80 | - | - | - | - | - | - | 9 | 40 | 49 | M |
| | 85 | - | - | - | - | - | - | 10 | 44 | 54 | |
| | 90 | - | - | - | - | - | - | 11 | 48 | 59 | |
| | 95 | - | - | - | - | - | - | 11 | 53 | 64 | |
| | 100 | - | - | - | - | - | 2 | 10 | 58 | 70 | |
| | 110 | - | - | - | - | - | 3 | 14 | 66 | 83 | |
| | 120 | - | - | - | - | - | 3 | 20 | 76 | 99 | |
| | 130 | - | - | - | - | - | 4 | 24 | 87 | 115 | |

Thus, the maximum dive allowed is 102 fsw (actual depth)/45 minutes. (EAD = 80 fsw/45 min.).

### 2.4.3 - Tables 1(N) and 2(N) DCIEM - Imperial

*Table 1(N) DCIEM: Equivalent air depth for nitrox (Imperial)*

| Actual Depth (fsw) | Mixture: 60% $N_2$/40% $O_2$ EAD (fsw) | 60% $N_2$/40% $O_2$ $PO_2$ (ATA) | 64% $N_2$/36% $O_2$ EAD (fsw) | 64% $N_2$/36% $O_2$ $PO_2$ (ATA) | 68% $N_2$/32% $O_2$ EAD (fsw) | 68% $N_2$/32% $O_2$ $PO_2$ (ATA) |
|---|---|---|---|---|---|---|
| 30 | 20 | 0.8 | 20 | 0.7 | 30 | 0.7 |
| 35 | 20 | 0.9 | 30 | 0.8 | 30 | 0.7 |
| 40 | 30 | 0.9 | 30 | 0.8 | 40 | 0.8 |
| 45 | 30 | 1.0 | 40 | 0.9 | 40 | 0.8 |
| 50 | 40 | 1.1 | 40 | 1.0 | 40 | 0.8 |
| 55 | 40 | 1.1 | 40 | 1.0 | 50 | 0.9 |
| 60 | 40 | 1.2 | 50 | 1.1 | 50 | 0.9 |
| 65 | 50 | 1.2 | 50 | 1.1 | 60 | 1.0 |
| 70 | 50 | 1.3 | 60 | 1.2 | 60 | 1.0 |
| 75 | 50 | 1.4 | 60 | 1.2 | 70 | 1.1 |
| 80 | 60 | 1.4 | 60 | 1.3 | 70 | 1.1 |
| 85 | 60 | 1.5 | 70 | 1.3 | 70 | 1.2 |
| 90 | 70 | 1.5 | 70 | 1.4 | 80 | 1.2 |
| 95 | **70** | **1.6** | 80 | 1.5 | 80 | 1.3 |
| 100 | | | 80 | 1.5 | 90 | 1.3 |
| 105 | | | **80** | **1.6** | 90 | 1.4 |
| 110 | | | **90** | **1.6** | 100 | 1.5 |
| 115 | Depth cut-off DCIEM | | | | **100** | **1.5** |
| 120 | | | | | **100** | **1.6** |
| 125 | | | | | **110** | **1.6** |

*Operational limit IMCA*

*Table 2(N) DCIEM: Recommended bottom time limits*

| $PO_2$ (ATA) | Nominal single dive PO2 exposure limits (in minutes) | Maximum bottom time (in minutes) |
|---|---|---|
| up to 1.100 | > 240 | Normal air diving limit |
| 1.101 - 1.200 | 210 | |
| 1.201 - 1.300 | 180 | |
| 1.301 - 1.400 | 150 | |
| **1.401 - 1.500** | **120** | Normal air diving limit |
| **1.501 - 1.600** | **45** | **45** |

*Operational limit IMCA*

Hyperlink Table of contents

**2.4.4 - Tables 1(N) and 2(N) DCIEM - Metric**

*Table 1(N) DCIEM: Equivalent air depth for nitrox (Metric)*

| Actual Depth (msw) | Mixture | | | | | |
|---|---|---|---|---|---|---|
| | 60% $N_2$/40% $O_2$ | | 64% $N_2$/36% $O_2$ | | 68% $N_2$/32% $O_2$ | |
| | EAD (msw) | $PO_2$ (ATA) | EAD (msw) | $PO_2$ (ATA) | EAD (msw) | $PO_2$ (ATA) |
| 9 | 6 | 0.8 | 6 | 0.7 | 9 | 0.7 |
| 10 | 6 | 0.8 | 9 | 0.8 | 9 | 0.7 |
| 11 | 9 | 0.9 | 9 | 0.8 | 9 | 0.7 |
| 12 | 9 | 0.9 | 9 | 0.8 | 12 | 0.7 |
| 13 | 9 | 1.0 | 9 | 0.9 | 12 | 0.8 |
| 14 | 9 | 1.0 | 12 | 0.9 | 12 | 0.8 |
| 15 | 12 | 1.0 | 12 | 0.9 | 12 | 0.8 |
| 16 | 12 | 1.1 | 12 | 1.0 | 15 | 0.9 |
| 17 | 12 | 1.1 | 12 | 1.0 | 15 | 0.9 |
| 18 | 12 | 1.2 | 15 | 1.1 | 15 | 0.9 |
| 19 | 15 | 1.2 | 15 | 1.1 | 18 | 1.0 |
| 20 | 15 | 1.3 | 15 | 1.1 | 18 | 1.0 |
| 21 | 15 | 1.3 | 18 | 1.2 | 18 | 1.0 |
| 22 | 15 | 1.3 | 18 | 1.2 | 18 | 1.1 |
| 23 | 18 | 1.4 | 18 | 1.2 | 21 | 1.1 |
| 24 | 18 | 1.4 | 18 | 1.3 | 21 | 1.1 |
| 25 | 18 | 1.5 | 21 | 1.3 | 21 | 1.2 |
| 26 | 18 | 1.5 | 21 | 1.4 | 24 | 1.2 |
| 27 | 21 | 1.5 | 21 | 1.4 | 24 | 1.2 |
| 28 | **21** | **1.6** | 21 | 1.4 | 24 | 1.3 |
| 29 | **21** | **1.6** | 24 | 1.5 | 24 | 1.3 |
| 30 | **21** | **1.6** | 24 | 1.5 | 27 | 1.3 |
| 31 | | | 24 | 1.5 | 27 | 1.4 |
| 32 | | | **27** | **1.6** | 27 | 1.4 |
| 33 | | | **27** | **1.6** | 30 | 1.4 |
| 34 | | | **27** | **1.6** | 30 | 1.5 |
| 35 | Depth cut-off DCIEM | | | | **30** | **1.5** |
| 36 | | | | | **30** | **1.5** |
| 37 | | | | | **33** | **1.6** |
| 38 | | | | | **33** | **1.6** |
| 39 | | | | | **33** | **1.6** |

*Operational limit IMCA*

*Table 2(N) DCIEM: Recommended bottom time limits*

| $PO_2$ (ATA) | Nominal single dive PO2 exposure limits (in minutes) | Maximum bottom time (in minutes) |
|---|---|---|
| up to 1.100 | > 240 | Normal air diving limit |
| 1.101 - 1.200 | 210 | |
| 1.201 - 1.300 | 180 | |
| 1.301 - 1.400 | 150 | |
| **1.401 - 1.500** | **120** | Normal air diving limit |
| **1.501 - 1.600** | **45** | **45** |

*Operational limit IMCA*

### 2.4.5 - Calculate the "Equivalent Air Depth" (EAD)

As explained previously, the decompression table to use for a nitrox dive is found by calculating the "Equivalent Air Depth" (EAD).
DCIEM promotes three mixes with 32%; 36% and 40% oxygen to cover efficiently the range between 9 m (30 ft) and 33 m (110 ft), and table 1(N) is based on these three percentages. Nevertheless it can happen that the "ideal mixes" recommended by DCIEM are not available, and other mixes are proposed. In this case the equivalent air depth can be calculated.

#### *2.4.5.1 - Using the metric system, the formula is:*

$$EAD = \frac{(\text{nitrogen \% x absolute depth})}{(79)} - 10 \text{ msw}$$

Example: Equivalent air depth (EAD) of a mix 40% oxygen + 60% nitrogen at 25 metres depth

- Nitrogen = 60%
- Absolute depth = 25 msw + 10 msw = 35 msw *(**Note:** 10 msw is the depth for a pressure of 1 bar, which is the pressure of the atmosphere)*
- Equivalent air depth = 60 x 35 / 79 - 10 = 26.6 - 10 = 16.6 msw

#### *2.4.5.2 - Using the imperial system, the formula is:*

$$EAD = \frac{(\text{nitrogen \% x absolute depth})}{(79)} - 33 \text{ fsw}$$

Example: Equivalent air depth (EAD) of a mix 30% oxygen + 70% nitrogen at 100 feet depth

- Nitrogen = 70%
- Absolute depth = 100 fsw + 33 fsw = 133 fsw *(**Note:** 33 fsw is the depth for a pressure of 1 ATA, which is the pressure of the atmosphere)*
- Equivalent air depth = 70 x 133 / 79 - 33 = 117.8 - 33 = 84.8 fsw

#### *2.4.5.3 - Make the calculation more stringent*

DCIEM recommends to compute the EAD for the worst case value (i.e., % nitrogen +0.5%), and to round it up to the next greater 10 fsw or 3 msw (e.g., 11 fsw rounded up to 20 fsw).

**2.4.6 - Calculate the "Partial Pressure"** (PP)

According to IMCA (and the US Navy), 1.4 ATA is the maximum partial pressure agreed underwater with Nitrox mixes. In addition, the partial pressure is used to calculate the maximum time of exposure using the table 2(N) DCIEM .

The basic formula to calculate the partial pressure is: abs pressure x % = PP

Partial pressure can be also calculated using "absolute depth" value, which is sometime more convenient.

***2.4.6.1 - For calculation is metric, the formula is:***

Absolute depth /10 x % = Partial Pressure (bar)

Example: What is the oxygen partial pressure of a mix 20/80 at 10 msw?

- Absolute depth: 10 msw + 10 msw = 20 msw
- Partial pressure: (20 /10) x 20% = 2 x 20% = 0.4 bar

***2.4.6.2 - For calculation in "imperial", the formula is:***

Absolute depth /33 x % = Partial pressure (atmosphere)

Example: What is the oxygen partial pressure of a mix 20/80 at 33 msw?

- Absolute depth: 33 fsw + 33 fsw = 66 fsw
- Partial pressure: (66 /33) x 20% = 2 x 20% = 0.4 atmosphere

***2.4.6.3 - Make the calculation more stringent***

DCIEM recommends to compute the $PPO_2$ for the worst case value (i.e., % oxygen +0.5%) and to round it up to the next greater first decimal value (e.g., 1.32 to 1.4, 1.45 to 1.5).

## 2.4.7 - Successive dives (repetitive dives), UK-HSE maximum operating limits, Breathing mix during the stops, & Reinforcement of the decompression procedures

### *2.4.7.1 - Successive dives (repetitive dives)*

The procedure is exactly the same as the one used for the standard air and explained in Section 1.1.2 of this chapter.

### *2.4.7.2 - UK-HSE maximum operating limits*

The limit to apply should be the most stringent of DCIEM 2N and UK-HSE.
The methods of calculation of the EAD and recommended bottom time limits DCIEM are described in the previous points of this chapter:

### *2.4.7.3 - Breathing mix during the stops*

The bottom mix can be used during the stops and gives the advantage to be richer in oxygen than air. Thus, breathing the bottom mix reinforce the decompression and avoids switching from one mix to another.
Nevertheless, based on the fact that the equivalent air depth is corresponding to the depth the diver is supposed have reached during the dive using air, the stops can be performed using air.

### *2.4.7.4 - Reinforcement of the decompression procedures*

The procedure for selecting the depth is exactly the same as the one used for the standard air and explained in point 1.1.5 of Section 1.1 “Standard air decompression” in this chapter.
Nevertheless, the bottom time will have to be adjusted according to the table “DCIEM 2N”.
The example 1.4.2 “Use tables 1(N) and 2(N) DCIEM” of this chapter can be used to explain how to reinforce the decompression procedure of a dive at 75 fsw with a 60% $N_2$/40% $O_2$ mixture by an additional depth or bottom time.

From Table 1(N), the EAD for 75 fsw actual depth is 50 fsw and the $PO_2$ is 1.4 ATA.

Operational limit IMCA

***Table 1(N) DCIEM: Equivalent air depth for nitrox***

| Actual Depth (fsw) | Mixture | | | | | |
|---|---|---|---|---|---|---|
| | 60% $N_2$/40% $O_2$ | | 64% $N_2$/36% $O_2$ | | 68% $N_2$/32% $O_2$ | |
| | EAD (fsw) | $PO_2$ (ATA) | EAD (fsw) | $PO_2$ (ATA) | EAD (fsw) | $PO_2$ (ATA) |
| 30 | 20 | 0.8 | 20 | 0.7 | 30 | 0.7 |
| 35 | 20 | 0.9 | 30 | 0.8 | 30 | 0.7 |
| 40 | 30 | 0.9 | 30 | 0.8 | 40 | 0.8 |
| 45 | 30 | 1.0 | 40 | 0.9 | 40 | 0.8 |
| 50 | 40 | 1.1 | 40 | 1.0 | 40 | 0.8 |
| 55 | 40 | 1.1 | 40 | 1.0 | 50 | 0.9 |
| 60 | 40 | 1.2 | 50 | 1.1 | 50 | 0.9 |
| 65 | 50 | 1.2 | 50 | 1.1 | 60 | 1.0 |
| 70 | 50 | 1.3 | 60 | 1.2 | 60 | 1.0 |
| 75 | 50 | 1.4 | 60 | 1.2 | 70 | 1.1 |
| 80 | 60 | 1.4 | 60 | 1.3 | 70 | 1.1 |
| 85 | 60 | 1.5 | 70 | 1.3 | 70 | 1.2 |
| 90 | 70 | 1.5 | 70 | 1.4 | 80 | 1.2 |
| 95 | **70** | **1.6** | 80 | 1.5 | 80 | 1.3 |
| 100 | | | 80 | 1.5 | 90 | 1.3 |
| 105 | | | **80** | **1.6** | 90 | 1.4 |
| 110 | | | **90** | **1.6** | 100 | 1.5 |
| 115 | Depth cut-off DCIEM | | | | **100** | **1.5** |
| 120 | | | | | **100** | **1.6** |
| 125 | | | | | **110** | **1.6** |

The nominal single dive $PO_2$ exposure limit from Table 2(N) is 150 minutes, with the maximum bottom time allowing diving to the Normal Air Diving Limit.

***Table 2(N) DCIEM: Recommended bottom time limits***

| $PO_2$ (ATA) | Nominal single dive PO2 exposure limits (in minutes) | Maximum bottom time (in minutes) |
|---|---|---|
| up to 1.100 | > 240 | Normal air diving limit |
| 1.101 - 1.200 | 210 | |
| 1.201 - 1.300 | 180 | |
| 1.301 - 1.400 | 150 | |
| **1.401 - 1.500** | **120** | Normal air diving limit |
| **1.501 - 1.600** | **45** | **45** |

Limit IMCA

The Normal Air Diving Limit for 50 fsw is 140 minutes.

Thus, the maximum dive allowed is 75 fsw (actual depth)/140 min.

This is the dive allowed without reinforcement procedure

***Table air standard DCIEM***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | C |
| | 40 | - | - | - | - | - | - | - | - | 1 | D |
| | 50 | - | - | - | - | - | - | - | - | 1 | E |
| | 60 | - | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | - | - | 1 | G |
| | 100 | - | - | - | - | - | - | - | 6 | 6 | I |
| | 120 | - | - | - | - | - | - | - | 12 | 12 | K |
| | 130 | - | - | - | - | - | - | - | 18 | 18 | L |
| 50 | 140 | - | - | - | - | - | - | - | 24 | 24 | M |
| | 150 | - | - | - | - | - | - | - | 29 | 29 | |
| | 160 | - | - | - | - | - | - | - | 33 | 33 | |
| | 170 | - | - | - | - | - | - | - | 38 | 38 | |
| | 180 | - | - | - | - | - | - | - | 43 | 43 | |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| | 200 | - | - | - | - | - | - | - | 53 | 53 | |
| | 220 | - | - | - | - | - | - | - | 63 | 63 | |
| | 240 | - | - | - | - | - | - | - | 74 | 74 | |
| | 260 | - | - | - | - | - | - | - | 86 | 86 | |
| | 280 | - | - | - | - | - | - | - | 97 | 97 | |

*Repetitive dives limit*

**Solution #1:**
Decision to apply a reinforcement procedure of 1 additional depth

The Normal Air Diving Limit for 60 fsw is then 120 minutes, because the maximum bottom time limit accounts for UPTD considerations in repetitive dives.

Thus, the maximum dive allowed is 75 fsw (actual depth)/120 min with a decompression using the table 60 fsw instead 50 fsw, if using this reiforcement procedure.

***Table air standard DCIEM***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | D |
| | 40 | - | - | - | - | - | - | - | - | 1 | E |
| | 50 | - | - | - | - | - | - | - | - | 1 | F |
| | 60 | - | - | - | - | - | - | - | 5 | 5 | G |
| | 80 | - | - | - | - | - | - | - | 10 | 10 | I |
| | 90 | - | - | - | - | - | - | - | 19 | 19 | J |
| | 100 | - | - | - | - | - | - | - | 26 | 26 | K |
| | 110 | - | - | - | - | - | - | - | 32 | 32 | L |
| | 120 | - | - | - | - | - | - | 2 | 37 | 39 | M |
| | **Maximum operational limit UK-HSE** | | | | | | | | | | |
| 60 | 130 | - | - | - | - | - | - | 2 | 43 | 45 | |
| | 140 | - | - | - | - | - | - | 3 | 49 | 52 | |
| | 150 | - | - | - | - | - | - | 3 | 55 | 58 | |

*Repetitive dives limit*

**Solution #2:**
Decision to apply a reinforcement procedure using the bottom time

The Normal Air Diving Limit for 50 fsw is 140 minutes. (The maximum bottom time limit accounts for UPTD considerations in repetitive dives). In this case longer decompression time is not acceptable. Thus the bottom time is to be limited to 130 minutes and the decompression applied as for 140 minutes.

Thus, the maximum dive allowed is 75 fsw (actual depth)/130 min, with a decompression time calculated for 140 minutes at 50 fsw, If using this safety procedure.

***Table air standard DCIEM***

| Depth (fsw) | Bottom Time (min) | Stop Times (min) at Different Depths (fsw) 80 | 70 | 60 | 50 | 40 | 30 | 20 | 10 | Decom. Time (min) | Repet. Group |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 10 | - | - | - | - | - | - | - | - | 1 | A |
| | 20 | - | - | - | - | - | - | - | - | 1 | B |
| | 30 | - | - | - | - | - | - | - | - | 1 | C |
| | 40 | - | - | - | - | - | - | - | - | 1 | D |
| | 50 | - | - | - | - | - | - | - | - | 1 | E |
| | 60 | - | - | - | - | - | - | - | - | 1 | F |
| | 75 | - | - | - | - | - | - | - | - | 1 | G |
| | 100 | - | - | - | - | - | - | - | 6 | 6 | I |
| | 120 | - | - | - | - | - | - | - | 12 | 12 | K |
| | 130 | - | - | - | - | - | - | - | 18 | 18 | L |
| 50 | 140 | - | - | - | - | - | - | - | 24 | 24 | M |
| | 150 | - | - | - | - | - | - | - | 29 | 29 | |
| | 160 | - | - | - | - | - | - | - | 33 | 33 | |
| | 170 | - | - | - | - | - | - | - | 38 | 38 | |
| | 180 | - | - | - | - | - | - | - | 43 | 43 | |
| | **Maximum operational limit OGP/ HSE** | | | | | | | | | | |
| | 200 | - | - | - | - | - | - | - | 53 | 53 | |
| | 220 | - | - | - | - | - | - | - | 63 | 63 | |
| | 240 | - | - | - | - | - | - | - | 74 | 74 | |
| | 260 | - | - | - | - | - | - | - | 86 | 86 | |
| | 280 | - | - | - | - | - | - | - | 97 | 97 | |

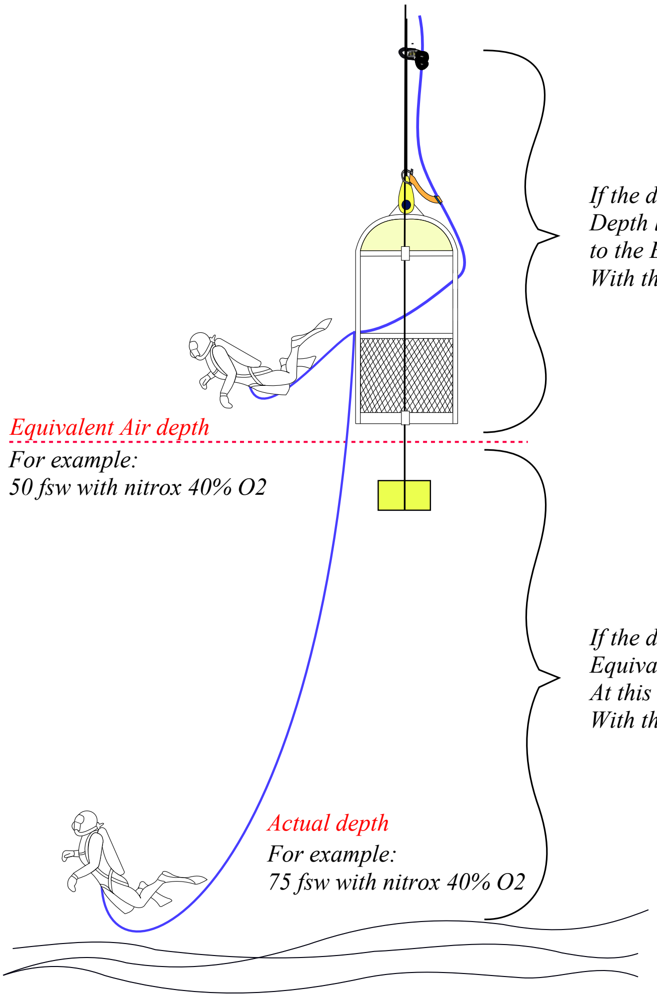
*Repetitive dives limit*

### 2.4.8 - Control of acute oxygen poisoning

The contingencies for "air standard in-water decompression" and "Nitrox diving" are the same except for the problems linked to using elevated partial pressures of oxygen. For this reason, and as for the use of oxygen for the stops, this point focuses only on those related to this gas, as acute oxygen poisoning may affect people sensitive to oxygen despite the limited partial pressures and times of exposure.
The procedure is the one to apply for every acute oxygen poisoning case and consists of removing the diver from the elevated oxygen partial pressure and controlling the side effects.

Minor symptoms during the dive:

- The nitrox supply must be stopped, and the helmet flushed with air.
- The divers ascent to the basket (which should be stored above him) that should reduce the partial pressure of O2. Example: At 25 msw with a mix 40% $O_2$ the $PPO_2$ is 1.4 bar. If the diver ascent to 17 msw, the $PPO_2$ is 1.08 bar
- The stand by diver must be sent to assist the diver.
- The decompression table to apply is the air decompression table for the actual depth of the diver, if the diver has been passed on air when at depth.
- If the diver has been passed on air when the "equivalent air dive" level has been reached or passed, the decompression to apply is the one corresponding to the equivalent air dive level .




In Case of serious symptoms during the dive:

- If the symptoms are too severe, but the epileptic crisis not yet started, the diver must be passed on air, removed from water and surface decompression procedure should be applied.
  Surface decompression must be considered even for trivial cases, and must be organized for all cases that could become more serious. The advantage of decompression in chamber is that the casualty can be easily controlled, which is not the case if the casualty is wearing his helmet and is underwater.
- The selection of the decompression table is to be done according to what is explained in the point above.
- If the epileptic crisis is started, the diver cannot be ascended as he is not able to exhale, ascent him could trigger a pulmonary barotrauma. In this case the solution is to wait the end of the crisis and ascent later on. However, during such a crisis, the diver can swallow his tongue or vomit in his helmet, which may result in suffocation or vomit swallowed by the lungs. In both case the final result can be a fatality.
  For these reasons, an epileptic crisis in the water must be avoided, and the diver must inform the diving supervisor of any symptom/bad feeling instead of waiting for the start of the crisis: Prudence must be the rule!

# 3 - After the dive

## 3.1 - Proximity of chamber and activities following a dive

***DMAC 022 says:***

A distinction between different types of diving is reasonable:

1. On completion of oxy-helium or other saturation decompression; after surface-orientated dives requiring decompression stops; and after dives within the no-stop limits but with multiple ascents (‘yo-yo’ diving) the divers should remain in the vicinity (within 20 minutes) of a suitable chamber for 4 hours. They should then remain within two hours travelling time of a two-compartment chamber until 12 hours post-surfacing.
2. Shallower than 10 m and for one or two dives within accepted no-stop limits, the divers should remain in the vicinity of a suitable chamber (within 20 minutes) for one hour. The diving contractor's diving rules should make provision for any subsequent emergency procedures after these intervals.

It should be emphasised to all divers that:

- Any symptom should be reported before departure from a dive location.
- Treatment begun soon after the onset of symptoms is often relatively straightforward but treatment which has been delayed for a while after the onset of symptoms may be difficult because the condition has become less responsive.

During the two hours following decompression, it is recommended that divers limit their activities to tasks which do not involve sustained physical effort, and in particular, it is recommended that they avoid running, climbing stairs or participating in intense sports exercises.

***Remember the following rules regarding successive (repetitive) dives:***

- IMCA D 022 chapter 10 “general diving procedures” says “The divers and standby diver must all be medically fit to dive and clear of any decompression penalties.”
- In chapter 6 / point A “repetitive diving procedures” of the DCIEM manual it is said: *In table 4A, repetitive factor (RF) letter from A to O at selected surface supplied intervals (SI) from 15 min. to 18 hrs. As the SI increases, the RF decreases until it becomes ‘1.0’. A dive is considered a repetitive dive if it is conducted while the RF from the previous dive is greater than ‘1.0’. For example, any dive within 18 hours after surfacing from group H or higher dive would be considered a repetitive dive.*

## 3.3 - Flying after diving

### 3.3.1 - Select the best procedure

***DCIEM says:***

1. After a no decompression dive, enough surface interval time must be allowed to elapse for the repetitive factor to diminish to 1.0 before flying.

**A. REPETITIVE FACTORS/SURFACE INTERVALS TABLE**

| Repet. Group (RG) | Repetitive Factors (RF) for Surface Intervals (SI) in hr:min | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0:15 → 0:29 | 0:30 → 0:59 | 1:00 → 1:29 | 1:30 → 1:59 | 2:00 → 2:59 | 3:00 → 3:59 | 4:00 → 5:59 | 6:00 → 8:59 | 9:00 →11:59 | 12:00 →14:59 | 15:00 →18:00 |
| A | 1.4 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 | 1.0 |
| B | 1.5 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| C | 1.6 | 1.4 | 1.3 | 1.2 | 1.2 | 1.2 | 1.1 | 1.1 | 1.1 | 1.0 | 1.0 |
| D | 1.8 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 | 1.0 |
| E | 1.9 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.2 | 1.1 | 1.1 | 1.0 |
| F | 2.0 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| G | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.2 | 1.1 | 1.1 | 1.0 |
| H | - | - | 1.9 | 1.7 | 1.6 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| I | - | - | 2.0 | 1.8 | 1.7 | 1.5 | 1.4 | 1.3 | 1.1 | 1.1 | 1.1 |
| J | - | - | - | 1.9 | 1.8 | 1.6 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| K | - | - | - | 2.0 | 1.9 | 1.7 | 1.5 | 1.3 | 1.2 | 1.1 | 1.1 |
| L | - | - | - | - | 2.0 | 1.7 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| M | - | - | - | - | - | 1.8 | 1.6 | 1.4 | 1.2 | 1.1 | 1.1 |
| N | - | - | - | - | - | 1.9 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |
| O | - | - | - | - | - | 2.0 | 1.7 | 1.4 | 1.2 | 1.1 | 1.1 |

2. After a decompression dive, a minimum of 24 hrs is required before flying.

***Comparison with DMAC 7 and procedures to apply:***

The last revision of DMAC 7, displayed below and published in November 2017, provides substantial reinforcements to the previous guideline. As a result, it should be applied for flights with a cabin altitude above 2000 feet, as the procedure proposed is more stringent than the DCIEM. Note that the carbine altitude of pressurized passenger aircraft is usually 8000 ft (2440 metres).

Flights with a cabin altitude below 600 m are usually short flights and helicopter transfers. The cabins of these aircraft are often not pressurized. It is preferable to apply at least the DCIEM procedures for non-stop dives less than 60 minutes and decompression dives less than 4 hours as they are more stringent than those of DMAC in this segment. However, unless the pilot is instructed not to fly above this limit, he may decide to position the aircraft above it for safety reasons or because he has been asked to proceed this way. Thus, except for specific flights where the pilot is instructed not to expose his passengers to an altitude above 600 m, the procedure DMAC 7 for all flights should be applied.

| ***Table 1:*** ***Diving without decompression illness problems or any symptoms*** | ***Minimum times before flying at cabin altitude*** | |
|---|---|---|
| | ***2000 feet (600 m)*** | ***All other flights*** |
| 1.1 - No stop dives. Total time under pressure less than 60 minutes within the last 12 hours | 2 hours | 18 hours (24 hours)* |
| 1.2 - All other air and nitrox diving, heliox and mixed gas bounce diving *(less than 4 hours under pressure)* | 12 hours | 24 hours |
| 1.3 - Heliox saturation *(more than 4 hours under pressure)* | | |
| 1.4 - Air, nitrox or trimix saturation *(more than 4 hours under pressure)* | 24 hours | 48 hours |

** 18 hour time applies to short flights (less than 3 hours). For longer flights the time is extended to 24 hours*

### 3.3.2 - Consequences of a diver developing a decompression accident during a flight

When the diver arrives at the sea's surface at the end of a dive, the table allows him to stay at this level, but not above. Still, immediate transfer to a higher altitude is prohibited without applying a relevant stand-by procedure because exposure to a diminished atmospheric pressure than at the sea's surface may trigger uncontrolled off-gassing. As the cabin altitude of a pressurized passenger aircraft is usually 8000 ft (2440 metres), The diver traveling home after diving operations may be subject to a decompression accident if the precautions described in the next points are not implemented. The following potential consequences of such a scenario should be taken into consideration:

- Most divers returning home after diving operations are alone during the entire flight or a part of their journey. For this reason, the victim may not be able to explain he has a decompression accident for several reasons, such as loss of consciousness, the inability to speak clearly, or the inability of the people surrounding him to understand what he says. Thus, the cabin attendants, unaware of decompression problems, may not treat him appropriately.
- Note that even though the diver is conscious and can explain he is affected by decompression sickness, the medical kit of the plane cabin is not designed to treat such accidents. According to specialized websites, these kits have been thought to treat the following health problems that are the most encountered:
    - Gastrointestinal/Nausea
    - Neurological, such as fainting or seizures
    - Respiratory
    - Cardiovascular
    - Dermatological

  Also, basic emergency kits such as those required by the US Federal Aviation Administration are not provided with an oxygen breathing kit. Some companies include it in addition to defibrillators and medical communication headsets, but it is not the case for all transporters.
- As a result of the conditions above, the pilots may be obliged to reorganize their flight, so lower the altitude to increase the cabin's pressure and look for an airfield where the plane can land to transfer the victim to an adequate facility. In addition to the numerous reports resulting from such a decision, the expenses resulting from such an emergency landing may be charged to the person or the company responsible if appropriate post-dive precautions have not been applied. This point applies, of course, to diving companies, but also the divers, as they are not supposed to ignore this.