Regulations for health and safety at work issued by the German Employers' Liability Insurance Association

BGV C23

(formerly VBG 39)

Regulations issued by the German Employers' Liability Insurance Association

Accident Prevention Regulations on

Diving

of 1 October 1979,
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HVBG
Association of commercial and industrial workers' compensation insurance carriers

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I. General

§ 1

Scope of application

(1) These accident prevention regulations apply to diving work.

(2) These accident prevention regulations do not apply to

- compressed air work,
- diving activities of research divers.

§ 2

Definitions

For the purpose of this accident prevention regulation the following terms are defined:

1. Diving work is underwater work, during which the divers are provided with compressed air using diving equipment.
2. Helmet diving equipment combines a hard helmet with a dry suit. The enclosed air volume is constantly refreshed with compressed air.
3. Lightweight diving equipment enables direct breathing of compressed air.
4. Dive depth pressure is the over pressure in the respective diving depth.
5. Signal ropes are ropes that serve to protect the diver and ensure communication between signal transmitter and diver.
6. Telephone lines are signalling lines which are braided strain-relieved into telephone cables.
7. Operating lines are ropes helping the diver to orientate and are mainly used for searching tasks.
8. Basic ropes are ropes, which enable the diver to orientate between water surface and underwater work place.
9. Ascent describes the ascent from deeper waters to a water depth close to the surface.
10. Decompression describes the return to the water surface.
11. Dive is a temporary, one-time underwater stay.
12. Dive Assignment equals the total number of dives under similar conditions and at the same location to carry out underwater work.
13. Dive location is the area including the divers' workplace, the location where he enters and leaves the water as well as the underwater work place.
14. Hyperbaric treatment chambers (transport chambers or treatment chambers) are pressure chambers used for transportation or to treat sick divers.

II. Equipment and Design

§ 3

Diving equipment

Diving equipment must be designed to supply the diver with the correct amount of compressed air depending on the diving depth and without causing a harmful pressure difference to the dive depth pressure.

§ 4

Air supply systems

(1) Air supply systems must be designed to supply all pipe supplied divers and standby divers with compressed air in adequate quantity and quality according to the diving depth.

(2) Compressed air in adequate quantity as per article (1) is given under the condition that the air supply system provides each diver (including standby divers) for the planned dive and measured at dive depth pressure the following air amount:

60 l/min for helmet diving equipment and
30 l/min for lightweight diving equipment

Furthermore, the air supply system must be able to increase the supply for a duration of 15 minutes to

100 l/min for each helmet diving equipment and
50 l/min for lightweight diving equipment

In addition, an air reserve according to the list in appendix 2 must be available for emergency cases. The air reserve carried by the diver is not to be included in this calculation.

(3) In order to compensate pressure differences a pressure tank must be connected in case a compressor is used for the air supply.

(4) Separate air supply connections must be available for all underwater divers and standby divers.

§ 5

Hyperbaric treatment chambers

(1) Hyperbaric treatment chambers must be designed to

1. allow over pressure of 5 bar at minimum,
2. reach over pressure of 5 bar within 6 minutes,
3. allow viewing and speaking with persons inside the chamber,
4. allow oxygen breathing in the chamber
   and
5. the independent admission of an accompanying person and the treatment of a sick diver.

(2) Treatment chambers must additionally be designed to allow the admission of an accompanying person, treatment of a sick diver and oxygen breathing.

(3) Oxygen breathing is not allowed in transport chambers.

§ 6

Electrical facilities for diving works

Electrical facilities and equipment must comply with safety requirements and be suitable for underwater use. In particular, they must meet the following requirements:

1. All electrical facilities and equipment must have clearly visible main switches which enable to shutt off all poles.
2. Rubber hoses or equivalent types are to be used.
3. The electrical facilities and equipment must be equipped with one of the following safety measures in case of an increased touch voltage.
   – protective insulation with insulation monitoring,
   – safety extra-low voltage or
   – residual current operated device (residual current JFN = 30 mA).
4. All electrical equipment must be waterproof.

§ 7

Ropes

(1) Signal ropes must be braided, have a diameter of 10-14 mm and a maximum tensile load of 2000 N at minimum. A length of 80 m may not be exceeded. They must be floatable.

(2) Notwithstanding article 1, telephone lines are not required to be floatable.

(3) Operating lines must have a diameter of at least 8 mm and a maximum tensile load of 2000 N at minimum. A length of 40 m may not be exceeded.

(4) Basic ropes must have a diameter of 24-28 mm.

III. Operation

A. General provisions

§ 8

Management and supervision

Each dive must be directed by a supervisor. The diving supervisor must be able to evaluate operating conditions, to ensure safe diving operations and to initiate required actions in case of accidents or disturbances. In case the diving operation is not directed by the owner of the company, the supervisor must be appointed in writing. In case a diver of the diving group is appointed as diving supervisor, he may only dive after a qualified deputy has been appointed in writing.

§ 9

Diver group

(1) Diving operations may only be carried out by a group of divers.

(2) Each group of divers consists of two divers, a signal transmitter and a diving assistent.

(3) Notwithstanding article 2, the diving assistent is not required if autonomous diving equipment is used or in case the complete control system of the diving equipment is located in reaching area of the signal transmitter. However, the signal transmitter may not operate a compressor or bottles of compressed air.

§ 10

Demands on the diver

(1) The diving company may only employ persons as divers, who

1. are at least 21 years old,
2. have passed officially recognized diving exams and can present corresponding certificates,
3. provide evidence for 6 hours of diving in 6 months following the above mentioned exam (article 2)
4. not applicable; replaced by
   - Accident prevention regulation on preventive occupational health examinations (BGV A 4, formerly VBG 100).

(2) In case a diver is not able to provide evidence with regards to paragraph 1, article 3, he may only dive under supervision if special difficulties are encountered.

(3) not applicable; replaced by
Accident prevention regulation on preventive occupational health examinations (BGV A 4, formerly VBG 100).

§ 11

Requirements for companies training apprentices

(not applicable)

§ 12

Demands on the signal transmitter

Only trustworthy persons in good physical condition may be employed as signal transmitters. In addition, they must

1. be at least 18 years old,
2. have been adequately trained by a diving company and have the required knowledge and skills,
3. have passed relevant exams complete with a certificate.

§ 13

Demands on the diving assistent

Only trustworthy persons in good physical condition may be employed as diving assistents. In addition, they must

1. be at least 18 years old,
2. be trained in operating and maintaining air supply systems and provide proof for their qualification.

§ 14

Provision of equipment

(1) The company must provide each diver (including standby divers) with the following equipment at a minimum:

- pipe supplied diving equipment with air supply system or autonomous diving equipment,
- signal ropes or telephone lines complete with voice communication
- dive knife,
- protective clothing.

(2) Each group of divers is to be equipped with a watch and a dive table according to appendix 1.

(3) An appropriate and safely secured ladder must be available to enter the water. The ladder must reach at least 1,80 m deep into the water and reach over deck at least 1 m with one rail.

(4) Notwithstanding article 3, a ladder is not required when using lightweight diving equipment, provided the freeboard above water measures at least 0,5 m and no obstacles exist up to 2 m under water. However, some facility to safely enter the water is required in all cases.

(5) Facilities are required to ensure that divers may safely reach their work place under water and return to the surface keeping to the required dive levels.

(6) In cases where diving is performed from land or from safely secured ships or platforms a boat with adequate stability and load capacity must be available. If the horizontal distance between the signal transmitter and the workplace under water is greater than 50 m this boat is required to be motor-driven. Propellers must have contact protection.

(7) An oxygen breathing apparatus (respirator) must be available on site enabling the breathing of pure oxygen for a duration of at least 3 hours.

(8) A hyperbaric treatment chamber is required on site

1. for dives with ascent times of more than 35 min

   or

2. in case of diving depths of more than 10 m, if a transport to the nearest hyperbaric treatment chamber would take longer than 3 hours.

An air reserve is required in order to reach over pressure of 5 bar and for proper flushing during the required operating time.

(9) A heatable locker room must be made available on site.

(10) Postings are required on site giving information about

- first-aid,
- next available doctor
- next available pressure chamber.

§ 15

Safeguarding the dive

(1) Before each diving operation the diving supervisor must give information about work conditions as well as special dangers and difficulties within the diving area.

(2) The diving supervisor must initiate all necessary actions required to adequately safeguard the dive. In particular, he is responsible for marking the diving area in waters with shipping traffic and for eliminating dangers. In addition, he must decide on who to inform by telephone in case of decompression illnesses and how the sick diver will be transported to the next available treatment chamber.

(3) Before each dive the diving supervisor must instruct employees about

1. specific work conditions on site and utilized equipment,
2. special dangers and difficulties on site
3. behavior in case of accidents and disturbances.

§ 16

Documentation

(1) Before each dive going deeper than 10 m and regarding work with special difficulties (article 23) the diving supervisor must prepare a diving plan stating start and end of the dive, depth of the dive, calculation of required amount of air as well as dive levels including decompression stops. This information must be made available to the signal transmitter.

(2) The diver must make daily entries on each dive into his diver's logbook. The following details must be recorded:

- date,
- diving area,
- diving depth,
- start, end and total duration of the dive,
- dive levels,
- carried out work,
- used diving equipment,
- special incidents or difficulties as well as
- name of the diving supervisor and respective signature.

(3) The diving supervisor must take notes in his logbook about special incidents during dives, in particular concerning

- emergency decompression (state reason),
- break-off of a dive (state reason),
- treatment of sick divers.

§ 17

Work place of diver group

(1) It is absolutely necessary that the work place of the diver group has enough room to store all required equipment and that all work may be carried out without disturbances. It must be located as close as possible to the place of water entry and exit.

(2) Multiple groups of divers may only work in the same area if they do not interfere with each other/hinder each other.

(3) In case the work place is located on a water craft, this has to be of adequate stability and have enough load capacity.

(4) In case the signal transmitter uses a boat in order to have a better connection to the diver, this boat must be suitable to take the diver on board, if necessary.

§ 18

Communication

(1) Communication between signal transmitter and diver must be ensured by using voice communication and signal ropes.

(2) A one-time pull on the signal rope is understood as distress signal. Other signals can be chosen freely, but must be discussed before each dive. The agreed signals must be communicated to all members of the dive group. Pulling signals are to be confirmed as “understood” by replying with the same signal.

(3) Communication between the signal transmitter and the other members of the diver group must be ensured if the signal transmitter keeps connection to the diver from a boat.

§ 19

Preparation of the dive

(1) Diving may only be started after the diving supervisor has assured himself that all divers and standby divers are fit and ready to dive. He is required to ask each diver if they feel well or if they have a cold and if they are capable of ear clearing.

(2) The diver must wear the minimum equipment according to § 14 Art. 1 as well as the additional equipment according to § 29 if using light weight diving equipment.

(3) Air supply hose, signal rope or telephone line and dive knife must be fastened in such a way that the diver is able to reach them under water at all times.

(4) It is to be ensured that signal ropes or telephone lines at all times safely transfer the maximum tensile load of 2000 N. It must be ensured that ropes do not tighten (Bowline).

(5) The signal transmitter is responsible to check the equipment one more time before the diver descends into the water.

§ 20

Operation of the air supply system

(1) It must be ensured that compressors do not draw in harmful gas.

(2) Compressed air bottles must be protected against falling, rolling and sun light.

(3) Controls and hose couplings above water must be protected against icing if the air temperature drops to freezing point and below.

§ 21

Descent of the diver

(1) Before starting to descend the diver must recite the agreed signals (as per § 18 Abs. 2), even if he is equipped with a telephone.

(2) With exception to circumstances regarding § 14 Abs. 4 the diver may only enter the water using a ladder. Jumping into the water is not allowed.

(3) Before descending the signal transmitter must carry out a check on the diver in the water to see if the diving suit and equipment is tight.

(4) The diver may only descend to the work place under water by using the equipment required in § 14 Abs. 5.

(5) The signal transmitter must ensure that the signal rope (telephone line) and air supply hose run without loops and not over sharp edges.

(6) The signal transmitter supervises the complete dive. In particular, he watches the descent, keeps a constant connection with the diver under water und supervises the ascent. He may not carry out any additional work during the dive. However, he may adjust the air supply and switch a welding machine if this does not imply a leaving of his stand and does not distract from his supervising job.

§ 22

Dive

(1) In case compressed air is used for breathing the dive may not exceed a depth of 50 m. The employers' liability insurance association must approve beforehand if gas of other composition is to be used.

(2) Only one diver is allowed under water at a time. The second diver (standby diver) must keep himself ready at the dive site.

(3) The allowed diving time is stated in the dive table (Appendix 1). The critical time is marked in the dive table with a horizontal red line and may at no time be exceeded. Subsequent dives must be included in the calculation.

(4) The dive table is binding framework, but the duration is always subject to the physical condition of the diver.

(5) The diving supervisor must ensure that other work, which could endanger the diver, is not started before the diver has left the danger zone.

(6) The diving supervisor must initiate the ascent of the diver in case the signal rope or air hose could possibly be entangled with moving loads, other ropes or chains.

(7) The diving supervisor must ensure that all operated machines are turned off, which could endanger the diver. The diver is to be informed before ships, anchors, propellers or rudders are operated.

(8) It is not allowed to dump objects into the water at the starting point while a dive is carried out.

(9) For the duration of the dive no other disturbing work may be carried out at the dive site.

§ 23

Work under special difficulties

(1) Mutual voice communication between diver and signal transmitter is required in addition to the equipment as per §14 art. 1 with regards to work under special difficulties. In particular, this applies to:

1. underwater blasting,
2. diving in currents stronger than 1,5 m/s,
3. work inside or underneath wrecks or structures (pipes, pile foundations, tight passages)
4. diving works with the danger of entanglement or
5. diving deeper than 30 m.

(2) Regarding works described in article 1, the standby diver must be ready to intervene immediately in case of an emergency.

(3) When working in currents stronger than 1,5 m/s, the diver is to be protected by appropriate measures.

§ 24

Breaking off a dive

The diving supervisor must break off the dive

1. on request of the diver,
2. if the diver does not respond to signals,
3. if the diver group is no longer complete,
4. if the telephone breaks down during work under special difficulties (as per § 23 Abs. 1),
5. in case important equipment is damaged or
6. in case of changes on site which could endanger the diver.

§ 25

Ascent, decompression

(1) The diver is required to ascend according to the dive table (appendix 1) and to use the equipment as per § 14 Abs. 5.

(2) If the diver has performed hard physical work, the required total ascent time is to be taken from the next highest dive level.

(3) A surfacing speed of 10 m/min may not be exceeded. This applies to ascending without decompression stops as well as to ascending from one dive level to the next.

(4) If the diver surfaces according to decompression tables it must be kept in mind that the ascent time to the first dive level is included in the first decompression stop and so on from one level to the next (dive table column 3).

(5) During decompression stops the diver may not do any physical exercise, but instead keep calm.

(6) The dive level may not be determined with the help of the bathometer.

(7) In case a diver has by accident not observed decompression stops, he must immediately after reaching the surface descend back to the first dive level he has left too early. The deco stops will then have to be recalculated on the basis of the sum out of the total diving time plus the additional time necessary to go back to the required dive level.

(8) Notwithstanding article 7, divers with symptoms of sickness must be treated in a hyperbaric treatment chamber in accordance with § 32.

§ 26

Emergency decompression

(1) Deviations from the dive tables in appendix 1 are only allowed if this is inevitable to protect the diver from acute danger. In this case the diver must be transported to the next available treatment chamber, even if he shows no symptoms of decompression sickness. During transport the diver is to breathe oxygen under atmospheric pressure.

(2) Notwithstanding article 1, an emergency decompression as per article 3 is acceptable if an operable decompression chamber is available on site along with a person instructed on first-aid for diving accidents and if the diver is not showing any symptoms of decompression sickness. In addition, the following provisions apply:

- The total ascent time of the dive may not exceed 35 min.
- The surfacing speed may not exceed 10 m/min.
- The decompression stops were observed until the 9 m mark.

(3) In case of an emergency decompression the diving supervisor must ensure that the following requirements are observed:

1. The recompression pressure must be 1,2 bar over pressure = 12 m WS,
2. From the start of the ascent until recompression to the recompression pressure inside the hyperbaric treatment chamber the indicated time periods (table 4, appendix 1) may not be exceeded.
3. The diver must be kept under recompression pressure breathing oxygen (according to table 4, appendix 1).
4. The subsequent decompression must be effected according to table 4 of appendix 1 with a surfacing speed of 2 m /min.

(4) After an emergency decompression the relevant diver has to be examined by a doctor before the next dive. Required breaks from diving must be taken.

§ 27

Necessary actions after the dive

(1) The diver must be safely secured when taking off the diving equipment to prevent him from falling into the water.

(2) Divers must refrain from flying for a minimum of 12 hours after a performed dive. Only a doctor familiar with hyperbaric medicine can give permission to reduce this waiting time.

B. Additional regulations for helmet diving equipment

§ 28

Safety at work under water

(1) Divers using with helmet diving equipment must be careful not to be suddenly buoyed up.

(2) Divers using with helmet diving equipment must be additionally secured under water if there is a danger of falling.

C. Additional regulations for lightweight diving equipment

§ 29

Equipment for lightweight diving

In addition to the minimum equipment (§ 14 Abs. 1) divers with lightweight diving equipment must receive additional equipment able to take the diver back to the surface and ensuring a safe recovery in case of an emergency.

§ 30

Diving conditions

(1) Regarding dives with surface supplied lightweight diving equipment, the diving supervisor is responsible to see that duration and depth of a dive corresponds with the carried air reserve. Required decompression stops must be included in the calculation.

(2) Regarding dives with autonomous lightweight diving equipment the duration and depth must remain within the limit to ensure that decompression stops are not required. This also applies to subsequent dives.

(3) Regarding work under special difficulties § 23 art. 1 No. 1-4 autonomous lightweight diving equipment are not permitted.

IV. Equipment check

§ 31

(1) Before each dive the equipment is to be carefully checked by the diver with regards to operability, completeness and readiness.

(2) The diving supervisor is responsible to check tools, facilities and other additional equipment before each dive.

(3) The employer is required to have the complete diving equipment professionally checked as often as necessary, but at least once a year. The results of the examination is to be recorded in writing.

(4) Damaged and inoperable equipment is to be marked as such and must be withdrawn.

V. What to do in case of diving accidents

§ 32

What to do in case of diving accidents

(1) The diving supervisor must ensure that divers showing symptoms of decompression sickness receive oxygen and are transported immediately to a treatment center.

(2) If a hyperbaric treatment chamber is available on site the recompression treatment is to be started immediately. The diving supervisor is to call in a doctor at once.

(3) In case a diver’s life can only be saved by not following the decompression tables, then immediately after first aid measures the diver must receive recompression treatment (if first aid is not possible inside a hyperbaric treatment chamber).

VI. Misdemeanor

§ 33

Misdemeanor

Those who contravene the regulations of § 209 art. 1 No. 1 Seventh Book of the Social Security Code (SGB VII) commit misdemeanor

- §§ 3 - 6,
- § 8,
- § 9 art. 1 or 2,
- § 10,
- §§ 12, 13,
- § 14 art. 1 - 3, 5 - 8 or 10,
- § 15 art. 2 or 3,
- § 16,
- § 18 art. 1 or 3,
- § 19 art. 2 - 5,
- § 20 art. 1 or 2,
- § 21 art. 2 - 6,
- § 22 art. 1 - 4, 6 or 7,
- §§ 23, 24, 25 art. 1, 3, 7, 8,
- §§ 26, art. 1, 3 or 4,
- §§ 27, 28 art. 1,
- §§ 29 - 31 or 32 art. 1

VII. Coming into effect

§ 34

Coming into effect

These accident prevention regulations come into effect as of 1 October 1979*. At the same time the accident prevention regulation “Diving works” (VBG 39) dated 1 May 1954, as amended on 1 April 1971, is overridden.

* A German Employers’ Liability Insurance Association has issued these accident prevention regulations for the first time on this date.

Appendix 1

Explanations regarding the decompression tables

1 General

All tables regarding surfacing are summarized in this appendix as follows:

Table 1: Maximum under water stay regarding depths up to 10,5 m

Table 2: Surfacing with compressed air in depths greater than 10,5m

Table 3: Surfacing with oxygen as of the 6 m-decompression stop for depths greater than 10,5 m

Table 4: Emergency decompression table

Table 5: Adjustment of water depth in case the diving area is located higher than 300 m above sea level

Table 6: Additional time required for surfacing after repeat dives

Surfacing is permitted according to

- Table 2: Compressed air

or alternatively according to

- Table 3: Oxygen / 6 m

However, table 3 should be preferred due to the medical advantages of oxygen breathing.

2 Restrictions regarding scope of tables 2 and 3

2.1 Total duration of a dive

The total duration of a dive may not exceed the values given in table 1 for dives up to 10,5 m and those given in table 2 and 3 for dives deeper than 10,5 m. The values below the red horizontal line are only intended for emergencies and may not be exceeded under normal circumstances.

2.2 Diving depth

The tables are valid for depths up to 50 m. The values given for depths up to 60 m are only for emergencies. They may not be reached under normal circumstances.

2.3 Air pressure at diving site

The given values are based on an air pressure of 1000 hPa (= 1 bar) at the diving site. In case the air pressure drops below 970 hPa due to the higher altitude of the diving site (=300 m above sea level) or if weather dependent differences in air pressure occur, adjustments according to table 5 will have to be made (please see section 8).

2.4 Repeat dives

Repeat dives are dives performed less than 12 hours after the preceding dive. Tables 2 and 3 are only valid for one-time dives. Please see section 9 in order to determine ascent times for repeat dives.

3 General instructions

3.1 In case it is necessary to perform work in different water depths, the dive is to be started at the deepest point und then move upward step by step.

3.2 In the course of his work the diver may not ascend above the first decompression stop.

3.3 Even if work is carried out in depths less than 7 m repeated descending and ascending must be avoided as this clearly increases the risk of decompression.

3.4 When ascending without decompression stops the maximum surfacing speed of 10 m/min may not be exceeded. When ascending with decompression stops the provisions given in the tables are to be observed.

3.5 In case a diver has by accident not observed decompression stops, he must immediately after reaching the surface descend back to the first dive level he has left too early. The decompression stops of the repeated ascent are determined by adding the time needed to reach the relevant dive level which had been left too early.

3.6 As a rule, a diver who will be employed as standby diver immediately after his own dive, may not dive the maximum permitted time. In addition, a repeat dive must be permitted after the regular performed dive (please see last column of decompression table).

4 Handling of the decompression table

4.1 The decompression table is valid for surfacing after medium-difficult work. If the diver has performed hard physical work the required ascent time is to be taken from the next highest dive level.

4.2 If the length of the under water stay or the reached dive level does not correspond to the value given in the table, the next highest value is to be used to determine the ascent time.

4.3 The decompression stops indicated in the table includes the time needed for the ascent to the next highest dive level or to the surface. This means, that the last minute of the respective stop may be used for the ascent to the next highest level.

5 Ascending using oxygen

If the oxygen unit is inoperable the ascent must follow the pressure air table (table 2).

When ascending with oxygen the nitrogen desaturation of the body tissues is clearly accelerated in comparison to surfacing with compressed air. Therefore, the rate between ascent time and decompression is better when using table 3 („Surfacing with oxygen“ as of the 6 m decompression stop for depths greater than 10,5 m) in comparison to table 2 („Surfacing with compressed air for depths greater than 10,5 mm“).

6 Behavior of diver after dive

6.1 The diver may not perform hard physical work within two hours after the completed dive.

6.2 After decompression the diver must remain within a three-hour driving distance to an operable Taucherdruckkammer.

7 Emergency decompression

Emergency decompression is only permitted in acute emergencies due to the possible health risks. Please refer to the provisions of § 26 of these accident prevention regulations.

8 Diving in altitudes higher than 300 m above sea level or air pressure below < 970 hPa at the diving site

8.1 If the atmospheric pressure drops below 970 hPa at the diving site, the ascent time must be increased according to the values given in table 5. This is normally the case if the diving site is located more than 300 m above sea level. Depending on variations in air pressure due to weather conditions, an adjustment may be necessary at an earlier or later point in time.

8.2 The calculatory depth is determined by means of the below described method:

1. Determination of the actual diving depth
2. Determination of the altitude of the dive site in meters above sea level or determination of the air pressure
3. Determination of calculatory diving depth with table 5;

   The intersection point of the columns „actual diving depth“ and „altitude/air pressure“ indicates the calculatory diving depth.

Example:

Actual diving depth:	30 m
Altitude of diving site:	850 m
Calculatory diving depth:	36 m

The calulatory diving depth must be determined in order to be able to correctly read the ascent times given in table 2 and 3.

9 Repeat dives

9.1 Dives marked with „yes“ in tables 2 and 3 allow repeat dives within 12 hours of the preceding dive.

Repeat dives are not allowed in case marked with “no”.

Ascent times and decompression stops after a repeat dive are determined as described in sections 9.2 and 9.3.

A three-minute decompression stop is recommended at the 3 m level also for repeat dives not deeper than 7 meters.

9.2 Ascent times and decompression stops after a repeat dive are determined by adding a certain period of time given in table 6 to the actual duration of the dive. The intersection point of the columns „surface interval“ and „diving depth of the repeat dive“ indicates the time addition. The time addition is only based on the key data of the relevant repeat dive, key data of the preceding dive is taken into account in the last column of table 2 and 3.

Sample calculation:

1. Dive:		(33 m diving depth) (35 min duration of dive)
	=	repeat dive possible
Repeat dive:		30 m diving depth 30 min duration of dive 90 min surface interval
taken from table 6:		25 min time addition
	=	calculatory duration of dive: 55 min
taken from table 2:		ascent time 54:45 min

Note: The values given in brackets are not relevant for the calculation. They only serve as comparative figures for the calculation in section 9.3.

9.3 As an alternative to section 9.2 ascent times may also be determined by using the following method:

Both dives are combined by adding up the individual diving times and by assessing the greatest depth being reached during the dives. Ascent times are then determined by using tables 2 or 3.

Sample calculation:

1. dive:	(33 m diving depth) (35 min duration of dive)
	= repeat dive possible
	taken from table 2: ascent time: 22:15 min
Repeat dive:	30 m diving depth 30 min duration of dive (90 min surface interval)
	= calculatory duration of dive: 65 min
	= calculatory diving depth 33 m
taken from table 2:	ascent time 91:45 min

Note: The values given in brackets are not relevant for the calculation. They only serve as comparative figures for the calculation in section 9.3.

Table 1: Maximum underwater stay in water depths less than 12 m (in minutes) (refer to § 16)

Diving depth (m)	Surface interval*) (in hours)		
	12	6	4
7,5	360	360	360
9,0	360	330	300
10,5	270	250	240

*) Surface interval means the period of time between the end of decompression of the first dive and start of the second dive.

Table 2: Pressure air table

Diving depth 12 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
165	1:00	-	-	-	-	-	-	1:00	Yes
170	0:45	-	-	-	-	-	3	3:45	Yes
180	0:45	-	-	-	-	-	5	5:45	Yes
210	0:45	-	-	-	-	-	10	10:45	No
240	0:45	-	-	-	-	-	15	15:45	No
270	0:45	-	-	-	-	-	25	25:45	No
300	0:45	-	-	-	-	-	30	30:45	No
330	0:45	-	-	-	-	-	35	35:45	No
360	0:45	-	-	-	-	-	40	40:45	No

Diving depth 15 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
80	1:15	-	-	-	-	-	-	1:15	Yes
90	1:00	-	-	-	-	-	3	4:00	Yes
100	1:00	-	-	-	-	-	5	6:00	Yes
110	1:00	-	-	-	-	-	7	8:00	Yes
120	1:00	-	-	-	-	-	12	13:00	Yes
130	1:00	-	-	-	-	-	15	16:00	Yes
140	1:00	-	-	-	-	-	20	21:00	Yes
150	1:00	-	-	-	-	-	25	26:00	Yes
160	1:00	-	-	-	-	-	25	26:00	No
170	1:00	-	-	-	-	-	30	31:00	No
180	1:00	-	-	-	-	-	35	36:00	No
210	1:00	-	-	-	-	-	45	46:00	No
240	1:00	-	-	-	-	-	60	61:00	No
270	1:00	-	-	-	-	-	70	71:00	No

Diving depth 18 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
50	1:30	-	-	-	-	-	-	1:30	Yes
55	1:15	-	-	-	-	-	3	4:15	Yes
60	1:15	-	-	-	-	-	5	6:15	Yes
70	1:15	-	-	-	-	-	7	8:15	Yes
80	1:15	-	-	-	-	-	15	16:15	Yes
90	1:15	-	-	-	-	-	20	21:15	Yes
100	1:15	-	-	-	-	-	25	26:15	Yes
110	1:15	-	-	-	-	-	30	31:15	Yes
120	1:15	-	-	-	-	-	35	36:15	Yes
130	1:00	-	-	-	-	3	40	44:00	Yes
140	1:00	-	-	-	-	5	45	51:00	Yes
150	1:00	-	-	-	-	7	50	58:00	Yes
160	1:00	-	-	-	-	10	50	61:00	Yes
170	1:00	-	-	-	-	12	55	68:00	Yes
180	1:00	-	-	-	-	15	60	76:00	No
210	1:00	-	-	-	-	20	70	91:00	No

Diving depth 21 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
35	1:45	-	-	-	-	-	-	1:45	Yes
40	1:30	-	-	-	-	-	3	4:30	Yes
45	1:30	-	-	-	-	-	5	6:30	Yes
50	1:30	-	-	-	-	-	7	8:30	Yes
60	1:30	-	-	-	-	-	15	16:30	Yes
70	1:30	-	-	-	-	-	20	21:30	Yes
80	1:15	-	-	-	-	3	25	29:15	Yes
90	1:15	-	-	-	-	5	30	36:15	Yes
100	1:15	-	-	-	-	7	35	43:15	Yes
110	1:15	-	-	-	-	10	40	51:15	Yes
120	1:15	-	-	-	-	15	45	61:15	Yes
130	1:15	-	-	-	-	20	50	71:15	Yes
140	1:15	-	-	-	-	25	55	81:15	Yes
150	1:00	-	-	-	3	25	60	89:00	No
180	1:00	-	-	-	5	40	75	121:00	No

Diving depth 24 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
25	2:00	-	-	-	-	-	-	2:00	Yes
30	1:45	-	-	-	-	-	3	4:45	Yes
35	1:45	-	-	-	-	-	5	6:45	Yes
40	1:45	-	-	-	-	-	7	8:45	Yes
45	1:45	-	-	-	-	-	10	11:45	Yes
50	1:45	-	-	-	-	-	15	16:45	Yes
60	1:30	-	-	-	-	3	20	24:30	Yes
70	1:30	-	-	-	-	5	30	36:30	Yes
80	1:30	-	-	-	-	10	35	46:30	Yes
90	1:30	-	-	-	-	15	40	56:30	Yes
100	1:15	-	-	-	3	20	45	69:15	Yes
110	1:15	-	-	-	3	25	50	79:15	Yes
120	1:15	-	-	-	3	30	60	94:15	Yes
130	1:15	-	-	-	5	30	65	101:15	Yes
140	1:15	-	-	-	10	35	70	116:15	No
150	1:15				10	40	75	126:15	No

Diving depth 27 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
20	2:15	-	-	-	-	-	-	2:15	Yes
25	2:00	-	-	-	-	-	3	5:00	Yes
30	2:00	-	-	-	-	-	5	7:00	Yes
35	2:00	-	-	-	-	-	10	12:00	Yes
40	1:45	-	-	-	-	3	12	16:45	Yes
45	1:45	-	-	-	-	3	15	19:45	Yes
50	1:45	-	-	-	-	5	20	26:45	Yes
60	1:45	-	-	-	-	7	30	38:45	Yes
70	1:45	-	-	-	3	12	35	51:45	Yes
80	1:30	-	-	-	3	17	40	61:30	Yes
90	1:30	-	-	-	5	25	50	81:30	Yes
100	1:30	-	-	-	10	30	55	96:30	Yes
110	1:30	-	-	-	12	30	65	108:30	Yes
120	1:30	-	-	-	15	35	70	121:30	Yes
130	1:15	-	-	3	20	40	75	139:15	No

Diving depth 30 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
15	2:30	-	-	-	-	-	-	2:30	Yes
20	2:15	-	-	-	-	-	3	5:15	Yes
25	2:15	-	-	-	-	-	5	7:15	Yes
30	2:15	-	-	-	-	-	10	12:15	Yes
35	2:00	-	-	-	-	3	12	17:00	Yes
40	2:00	-	-	-	-	5	17	24:00	Yes
45	2:00	-	-	-	-	7	20	29:00	Yes
50	2:00	-	-	-	-	10	25	37:00	Yes
60	1:45	-	-	-	3	15	35	54:45	Yes
70	1:45	-	-	-	5	20	40	66:45	Yes
80	1:45	-	-	-	10	25	50	86:45	Yes
90	1:30	-	-	3	12	30	60	106:30	Yes
100	1:30	-	-	3	17	35	65	121:30	Yes
110	1:30	-	-	3	20	40	75	139:30	No

Diving depth 33 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
12	2:45	-	-	-	-	-	-	2:45	Yes
15	2:30	-	-	-	-	-	3	5:30	Yes
20	2:30	-	-	-	-	-	5	7:30	Yes
25	2:15	-	-	-	-	3	7	12:15	Yes
30	2:15	-	-	-	-	3	12	17:15	Yes
35	2:15	-	-	-	-	5	15	22:15	Yes
40	2:00	-	-	-	3	7	20	32:00	Yes
45	2:00	-	-	-	3	10	25	40:00	Yes
50	2:00	-	-	-	5	15	30	52:00	Yes
60	2:00	-	-	-	10	20	40	72:00	Yes
70	1:45	-	-	3	12	25	50	91:45	Yes
80	1:45	-	-	3	15	30	60	109:45	Yes
90	1:45	-	-	5	20	35	65	126:45	Yes
100	1:45	-	-	10	25	40	75	151:45	No

Diving depth 36 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
10	3:00	-	-	-	-	-	-	3:00	Yes
15	2:45	-	-	-	-	-	3	5:45	Yes
20	2:45	-	-	-	-	-	7	9:45	Yes
25	2:30	-	-	-	-	3	12	17:30	Yes
30	2:30	-	-	-	-	5	17	24:30	Yes
35	2:15	-	-	-	3	10	20	35:15	Yes
40	2:15	-	-	-	3	12	25	42:15	Yes
45	2:15	-	-	-	5	15	30	52:15	Yes
50	2:00	-	-	3	7	20	35	67:00	Yes
60	2:00	-	-	3	12	25	45	87:00	Yes
70	2:00	-	-	5	15	30	55	107:00	Yes
80	2:00	-	-	7	20	35	65	129:00	Yes
90	1:45	-	3	12	25	40	75	156:45	No

Diving depth 39 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
8	3:15	-	-	-	-	-	-	3:15	Yes
10	3:00	-	-	-	-	-	3	6:00	Yes
15	3:00	-	-	-	-	-	5	8:00	Yes
20	2:45	-	-	-	-	3	7	12:45	Yes
25	2:45	-	-	-	-	5	15	22:45	Yes
30	2:30	-	-	-	3	7	20	32:30	Yes
35	2:30	-	-	-	5	10	25	42:30	Yes
40	2:15	-	-	3	7	15	30	57:15	Yes
45	2:15	-	-	3	10	20	35	70:15	Yes
50	2:15	-	-	3	10	25	45	85:15	Yes
60	2:15	-	-	5	15	30	55	107:15	Yes
70	2:00	-	3	10	20	35	65	135:00	Yes
80	2:00	-	3	12	25	40	75	157:00	No

Diving depth 42 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
7	3:30	-	-	-	-	-	-	3:30	Yes
10	3:15	-	-	-	-	-	3	6:15	Yes
15	3:00	-	-	-	-	3	5	11:00	Yes
20	3:00	-	-	-	-	3	12	18:00	Yes
25	2:45	-	-	-	3	7	17	29:45	Yes
30	2:45	-	-	-	5	10	25	42:45	Yes
35	2:30	-	-	3	7	15	30	57:30	Yes
40	2:30	-	-	3	10	20	35	70:30	Yes
45	2:30	-	-	5	12	25	40	84:30	Yes
50	2:30	-	-	5	15	25	45	92:30	Yes
60	2:15	-	3	10	17	30	60	122:15	Yes
70	2:15	-	5	12	25	40	75	159:15	No

Diving depth 45 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
6	3:45	-	-	-	-	-	-	3:45	Yes
10	3:30	-	-	-	-	-	3	6:30	Yes
15	3:15	-	-	-	-	3	7	13:15	Yes
20	3:00	-	-	-	3	5	12	23:00	Yes
25	3:00	-	-	-	3	7	20	33:00	Yes
30	2:45	-	-	3	5	12	25	47:45	Yes
35	2:45	-	-	3	7	15	30	57:45	Yes
40	2:45	-	-	5	10	20	40	77:45	Yes
45	2:30	-	3	5	12	25	45	92:30	Yes
50	2:30	-	3	7	15	30	55	112:30	Yes
60	2:15	3	5	12	20	35	65	142:15	No

Diving depth 48 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
5	4:00	-	-	-	-	-	-	4:00	Yes
10	3:45	-	-	-	-	-	5	8:45	Yes
15	3:30	-	-	-	-	3	7	13:30	Yes
20	3:15	-	-	-	3	7	15	28:15	Yes
25	3:15	-	-	-	5	10	20	38:15	Yes
30	3:00	-	-	3	7	15	30	58:00	Yes
35	3:00	-	-	5	10	20	35	73:00	Yes
40	2:45	-	3	7	15	25	45	97:45	Yes
45	2:45	-	5	10	17	30	50	114:45	Yes
50	2:30	3	5	10	20	30	60	130:30	Yes
60	2:30	3	7	15	25	40	75	167:30	No

Diving depth 50 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
5	4:15	-	-	-	-	-	-	4:15	Yes
10	3:45	-	-	-	-	3	5	11:45	Yes
15	3:30	-	-	-	3	5	12	23:30	Yes
20	3:30	-	-	-	5	7	17	32:30	Yes
25	3:15	-	-	3	5	12	25	48:15	Yes
30	3:15	-	-	5	7	15	35	65:15	Yes
35	3:00	-	3	5	10	20	40	81:00	Yes
40	3:00	-	5	7	15	25	50	105:00	Yes
45	2:45	3	5	10	17	30	55	122:45	Yes
50	2:45	3	7	12	20	35	65	144:45	Nein

Diving depth 54 m (ascent times are marked red in original)

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
5	4:15	-	-	-	-	-	3	7:15	No
10	4:00	-	-	-	-	3	7	14:00	No
15	3:45	-	-	-	3	5	12	23:45	No
20	3:30	-	-	3	5	10	17	38:30	No
25	3:30	-	-	5	7	15	30	60:30	No
30	3:15	-	3	5	10	20	35	76:15	No
35	3:15	-	5	7	12	25	45	97:15	No
40	3:00	3	5	10	15	30	55	121:00	No
45	3:00	5	7	12	20	35	60	142:00	No

Diving depth 57 m (ascent times are marked red in original)

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
5	4:30	-	-	-	-	-	3	7:15	No
10	4:15	-	-	-	-	3	7	14:15	No
15	4:00	-	-	-	3	7	15	29:00	No
20	3:45	-	-	3	5	10	20	41:45	No
25	3:30	-	3	5	7	15	30	63:30	No
30	3:30	-	5	7	10	20	40	83:30	No
35	3:15	3	5	7	15	25	50	108:15	No
40	3:15	3	7	10	20	30	60	133:15	No

Diving depth 60 m (ascent times are marked red in original

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		18 m	15 m	12 m	9 m	6 m	3 m		
5	4:45	-	-	-	-	-	5	9:45	No
10	4:15	-	-	-	3	5	7	19:15	No
15	4:00	-	-	3	5	7	15	34:00	No
20	4:00	-	-	5	7	12	25	53:00	No
25	3:45	-	3	5	10	20	35	76:45	No
30	3:30	3	5	7	12	25	45	100:30	No
35	3:30	3	5	10	15	30	55	121:30	No

Table 3: Oxygen table (oxygen breathing while surfacing)

Diving depth 12 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
180	0:30	-	-	-	-	-	3	3:30	Yes
210	0:30	-	-	-	-	-	5	5:30	No
240	0:30	-	-	-	-	-	10	10:30	No
270	0:30	-	-	-	-	-	15	15:30	No
300	0:30	-	-	-	-	-	20	20:30	No
330	0:30	-	-	-	-	-	20	20:30	No
360	0:30	-	-	-	-	-	25	25:30	No

Diving depth 15 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
90	0:45	-	-	-	-	-	3	3:45	Yes
100	0:45	-	-	-	-	-	3	3:45	Yes
110	0:45	-	-	-	-	-	5	5:45	Yes
120	0:45	-	-	-	-	-	7	7:45	Yes
130	0:45	-	-	-	-	-	7	7:45	Yes
140	0:45	-	-	-	-	-	10	10:45	Yes
150	0:45	-	-	-	-	-	15	15:45	Yes
180	0:45	-	-	-	-	-	20	20:45	No
210	0:45	-	-	-	-	-	25	25:45	No
240	0:45	-	-	-	-	-	30	30:45	No
270	0:45	-	-	-	-	-	35	35:45	No
300	0:45	-	-	-	-	-	45	45:45	No

Diving depth 18 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
60	1:00	-	-	-	-	-	3	4:00	Yes
70	1:00	-	-	-	-	-	5	6:00	Yes
80	1:00	-	-	-	-	-	7	8:00	Yes
90	1:00	-	-	-	-	-	10	11:00	Yes
100	1:00	-	-	-	-	-	15	16:00	Yes
110	1:00	-	-	-	-	-	15	16:00	Yes
120	1:00	-	-	-	-	-	20	21:00	Yes
130	1:00	-	-	-	-	-	25	26:00	Yes
140	1:00	-	-	-	-	-	30	31:00	Yes
150	1:00	-	-	-	-	-	35	36:00	Yes
180	1:00	-	-	-	-	-	40	41:00	No
210	1:00	-	-	-	-	-	50	51:00	No
240	1:00	-	-	-	-	-	60	61:00	No

Diving depth 21 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
40	1:15	-	-	-	-	-	3	4:15	Yes
45	1:15	-	-	-	-	-	3	4:15	Yes
50	1:15	-	-	-	-	-	5	6:15	Yes
60	1:15	-	-	-	-	-	7	8:15	Yes
70	1:15	-	-	-	-	-	10	11:15	Yes
80	1:15	-	-	-	-	-	15	16:15	Yes
90	1:15	-	-	-	-	-	20	21:15	Yes
100	1:15	-	-	-	-	-	25	26:15	Yes
110	1:15	-	-	-	-	-	25	26:15	Yes
120	1:15	-	-	-	-	-	30	31:15	Yes
130	1:15	-	-	-	-	-	35	36:15	Yes
140	1:15	-	-	-	-	-	40	41:15	Yes
150	1:00	-	-	-	-	3	45	49:00	No
180	1:00	-	-	-	-	5	60	66:00	No
210	1:00	-	-	-	-	5	70	76:00	No

Diving depth 24 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
30	1:30	-	-	-	-	-	3	4:30	Yes
35	1:30	-	-	-	-	-	3	4:30	Yes
40	1:30	-	-	-	-	-	5	6:30	Yes
45	1:30	-	-	-	-	-	5	6:30	Yes
50	1:30	-	-	-	-	-	7	8:30	Yes
60	1:30	-	-	-	-	-	15	16:30	Yes
70	1:30	-	-	-	-	-	20	21:30	Yes
80	1:30	-	-	-	-	-	25	26:30	Yes
90	1:30	-	-	-	-	-	30	31:30	Yes
100	1:15	-	-	-	-	3	35	39:15	Yes
110	1:15	-	-	-	-	3	40	44:15	Yes
120	1:15	-	-	-	-	3	45	49:15	Yes
130	1:15	-	-	-	-	5	50	56:15	Yes
140	1:15	-	-	-	-	10	55	66:15	No
150	1:15	-	-	-	-	10	60	71:15	No
180	1:00				3	20	75	99:00	No

Diving depth 27 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
25	1:45	-	-	-	-	-	3	4:45	Yes
30	1:45	-	-	-	-	-	3	4:45	Yes
35	1:45	-	-	-	-	-	5	6:45	Yes
40	1:45	-	-	-	-	-	7	8:45	Yes
45	1:45	-	-	-	-	-	10	11:45	Yes
50	1:45	-	-	-	-	-	15	16:45	Yes
60	1:45	-	-	-	-	-	20	21:45	Yes
70	1:30	-	-	-	-	3	25	29:30	Yes
80	1:30	-	-	-	-	3	30	34:30	Yes
90	1:30	-	-	-	-	5	40	46:30	Yes
100	1:30	-	-	-	-	10	45	56:30	Yes
110	1:30	-	-	-	-	12	50	63:30	Yes
120	1:30	-	-	-	-	15	55	71:30	Yes
130	1:00	-	-	-	3	20	60	84:00	No
140	1:00	-	-	-	3	25	65	94:00	No
150	1:00	-	-	-	3	25	70	99:00	No

Diving depth 30 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
20	2:00	-	-	-	-	-	3	5:00	Yes
25	2:00	-	-	-	-	-	3	5:00	Yes
30	2:00	-	-	-	-	-	5	7:00	Yes
35	2:00	-	-	-	-	-	7	9:00	Yes
40	2:00	-	-	-	-	-	15	17:00	Yes
45	2:00	-	-	-	-	-	15	17:00	Yes
50	2:00	-	-	-	-	-	20	22:00	Yes
60	1:45	-	-	-	-	3	30	34:45	Yes
70	1:45	-	-	-	-	5	35	41:45	Yes
80	1:45	-	-	-	-	10	40	51:45	Yes
90	1:30	-	-	-	3	12	45	61:30	Yes
100	1:30	-	-	-	3	17	50	71:30	Yes
110	1:30	-	-	-	3	20	60	84:30	No
120	1:30	-	-	-	5	25	65	96:30	No
130	1:30	-	-	-	7	30	70	108:30	No
140	1:15	-	-	3	10	30	80	124:15	No

Diving depth 33 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
15	2:15	-	-	-	-	-	3	5:15	Yes
20	2:15	-	-	-	-	-	3	5:15	Yes
25	2:15	-	-	-	-	-	5	7:15	Yes
30	2:15	-	-	-	-	-	7	9:15	Yes
35	2:15	-	-	-	-	-	10	12:15	Yes
40	2:00	-	-	-	-	3	15	20:00	Yes
45	2:00	-	-	-	-	3	20	25:00	Yes
50	2:00	-	-	-	-	5	30	37:00	Yes
60	2:00	-	-	-	-	10	35	47:00	Yes
70	1:45	-	-	-	3	12	40	56:45	Yes
80	1:45	-	-	-	3	15	45	64:45	Yes
90	1:45	-	-	-	5	20	50	76:45	Yes
100	1:45	-	-	-	10	25	60	96:45	No
110	1:30	-	-	3	12	25	65	106:30	No
120	1:30	-	-	3	15	30	75	124:30	No

Diving depth 36 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
15	2:30	-	-	-	-	-	3	5:30	Yes
20	2:30	-	-	-	-	-	5	7:30	Yes
25	2:30	-	-	-	-	-	7	9:30	Yes
30	2:30	-	-	-	-	-	15	17:30	Yes
35	2:15	-	-	-	-	3	15	20:15	Yes
40	2:15	-	-	-	-	3	20	25:15	Yes
45	2:15	-	-	-	-	5	30	37:15	Yes
50	2:15	-	-	-	3	5	35	45:15	Yes
60	2:00	-	-	-	3	12	40	57:00	Yes
70	2:00	-	-	-	5	15	45	67:00	Yes
80	2:00	-	-	-	7	20	55	84:00	Yes
90	1:45	-	-	3	12	25	60	101:45	No
100	1:45	-	-	3	15	30	70	119:45	No
110	1:45	-	-	5	20	30	80	136:45	No

Diving depth 39 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
10	2:45	-	-	-	-	-	3	5:45	Yes
15	2:45	-	-	-	-	-	3	5:45	Yes
20	2:45	-	-	-	-	-	7	9:45	Yes
25	2:45	-	-	-	-	-	10	12:45	Yes
30	2:30	-	-	-	-	3	15	20:30	Yes
35	2:30	-	-	-	-	5	20	27:30	Yes
40	2:15	-	-	-	3	7	25	37:15	Yes
45	2:15	-	-	-	3	10	30	45:15	Yes
50	2:15	-	-	-	3	10	35	50:15	Yes
60	2:15	-	-	-	5	15	45	67:15	Yes
70	2:00	-	-	3	10	20	50	85:00	Yes
80	2:00	-	-	3	12	25	60	102:00	No
90	2:00	-	-	5	15	30	70	122:00	No
100	1:45	-	3	7	20	30	80	141:45	No

Diving depth 42 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
10	3:00	-	-	-	-	-	3	6:00	Yes
15	3:00	-	-	-	-	-	5	8:00	Yes
20	3:00	-	-	-	-	-	10	13:00	Yes
25	2:45	-	-	-	-	3	15	20:45	Yes
30	2:45	-	-	-	-	5	20	27:45	Yes
35	2:30	-	-	-	3	7	25	37:30	Yes
40	2:30	-	-	-	3	10	30	45:30	Yes
45	2:30	-	-	-	3	12	35	52:30	Yes
50	2:15	-	-	-	5	15	40	62:15	Yes
60	2:15	-	-	3	10	17	50	82:15	Yes
70	2:15	-	-	5	12	25	60	104:15	No
80	2:00	-	3	7	15	25	70	122:00	No
90	2:00	-	3	12	20	30	80	147:00	No

Diving depth 45 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
10	3:15	-	-	-	-	-	3	6:15	Yes
15	3:15	-	-	-	-	-	7	10:15	Yes
20	3: 00	-	-	-	-	3	10	16:00	Yes
25	3:00	-	-	-	-	3	15	21:00	Yes
30	2:45	-	-	-	3	5	20	30:45	Yes
35	2:45	-	-	-	3	7	25	37:45	Yes
40	2:45	-	-	-	5	10	35	52:45	Yes
45	2:30	-	-	3	5	12	45	67:30	Yes
50	2:30	-	-	3	7	15	50	77:30	Yes
60	2:15	-	3	5	12	20	55	97:15	No
70	2:15	-	3	7	15	25	65	117:15	No
80	2:15	-	3	12	20	30	75	142:15	No

Diving depth 48 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air 21 m	Air 18 m	Air 15 m	Air 12 m	Air 9 m	Oxygen 6 m		
10	3:30	-	-	-	-	-	3	6:30	Yes
15	3:30	-	-	-	-	-	7	10:30	Yes
20	3:15	-	-	-	-	3	15	21:15	Yes
25	3:15	-	-	-	-	5	20	28:15	Yes
30	3:00	-	-	-	3	7	25	38:00	Yes
35	3:00	-	-	-	5	10	30	48:00	Yes
40	2:45	-	-	3	7	15	35	62:45	Yes
45	2:45	-	-	5	10	17	40	74:45	Yes
50	2:30	-	3	5	10	20	50	90:30	Yes
60	2:30	-	3	7	15	25	60	112:30	No
70	2:30	-	5	10	20	30	70	137:30	No

Diving depth 50 m

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
10	3:45	-	-	-	-	-	5	8:45	Yes
15	3:30	-	-	-	-	3	10	16:30	Yes
20	3:30	-	-	-	-	3	15	21:30	Yes
25	3:15	-	-	-	3	5	20	31:15	Yes
30	3:15	-	-	-	5	7	25	40:15	Yes
35	3:00	-	-	3	5	10	30	51:00	Yes
40	3:00	-	-	5	7	15	40	70:00	Yes
45	2:45	-	3	5	10	20	45	85:45	Yes
50	2:45	-	3	7	15	20	50	97:45	No
60	2:45	-	5	10	15	25	65	122:45	No
70	2:30	3	7	12	20	35	80	159:30	No

Diving depth 54 m (ascent times are marked red in original)

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
5	4:00						3	7:00	No
10	4:00	-	-	-	-	-	7	11:00	No
15	3:45	-	-	-	-	3	10	16:45	No
20	3:30	-	-	-	3	5	15	26:30	No
25	3:30	-	-	-	5	7	25	40:30	No
30	3:15	-	-	3	5	10	35	56:15	No
35	3:15	-	-	3	7	12	40	65:15	No
40	3:00	-	3	5	10	15	50	86:00	No
45	3:00	-	3	7	12	20	55	100:00	No
50	3:00	-	5	10	15	25	65	123:00	No
60	2:45	3	7	10	20	30	75	147:45	No

Diving depth 57 m (ascent times are marked red in original)

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
5	4:15						3	7:15	No
10	4:15	-	-	-	-	-	7	11:15	No
15	4:00	-	-	-	-	3	15	22:00	No
20	3:45	-	-	-	3	5	20	31:45	No
25	3:30	-	-	3	5	7	25	43:30	No
30	3:30	-	-	3	7	10	35	58:30	No
35	3:15	-	3	5	7	15	45	78:15	No
40	3:15	-	3	7	10	20	50	93:15	No
45	3:00	3	5	7	12	25	55	110:00	No
50	3:00	3	5	10	15	25	65	126:00	No

Diving depth 60 m (ascent times are marked red in original)

Diving time (min)	Ascent to first dive level (min:sec)	Decompression time at the dive levels during surfacing (min)						Overall time of decompression (min:sec)	Repeat dive possible
		Air	Air	Air	Air	Air	Oxygen		
		21 m	18 m	15 m	12 m	9 m	6 m		
5	4:30						3	7:30	No
10	4:15	-	-	-	-	3	7	14:15	No
15	4:00	-	-	-	3	5	15	27:00	No
20	4:00	-	-	-	5	7	20	36:00	No
25	3:30	-	-	3	5	10	30	51:45	No
30	3:30	-	3	5	7	12	40	70:30	No
35	3:30	-	3	5	10	15	45	81:30	No
40	3:15	3	5	7	15	20	55	108:15	No

Table 4: Emergency decompression

Diving depth 12 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
180	1:00	-	-	-	3	10	6	20:00
210	1:00	-	-	-	3	10	6	20:00
240	1:00	-	-	-	3	10	6	20:00
270	1:00	-	-	-	3	20	6	30:00
300	1:00	-	-	-	3	25	6	35:00
330	1:00	-	-	-	3	25	6	35:00
360	1:00	-	-	-	3	30	6	40:00

Diving depth 15 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
90	1:15	-	-	-	3	10	6	20:15
100	1:15	-	-	-	3	10	6	20:15
110	1:15	-	-	-	3	10	6	20:15
120	1:15	-	-	-	3	10	6	20:15
130	1:15	-	-	-	3	10	6	20:15
140	1:15	-	-	-	3	15	6	25:15
150	1:15	-	-	-	3	20	6	30:15
180	1:15	-	-	-	3	25	6	35:15

Diving depth 18 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
60	1:30	-	-	-	3	10	6	20:30
70	1:30	-	-	-	3	10	6	20:30
80	1:30	-	-	-	3	10	6	20:30
90	1:30	-	-	-	3	15	6	25:30
100	1:30	-	-	-	3	20	6	30:30
110	1:30	-	-	-	3	25	6	35:30
120	1:30	-	-	-	3	25	6	35:30
130	1:30	-	-	-	3	30	6	40:30
140	1:30	-	-	-	3	40	6	50:30
150	1:30	-	-	-	3	40	6	50:30

Diving depth 21 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
40	1:45	-	-	-	3	10	6	20:45
45	1:45	-	-	-	3	10	6	20:45
50	1:45	-	-	-	3	10	6	20:45
60	1:45	-	-	-	3	10	6	20:45
70	1:45	-	-	-	3	15	6	25:45
80	1:45	-	-	-	3	20	6	30:45
90	1:45	-	-	-	3	25	6	35:45
100	1:45	-	-	-	3	35	6	45:45
110	1:45	-	-	-	3	40	6	50:45
120	1:45	-	-	-	3	45	6	55:45

Diving depth 24 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time (min)	Ascent to dive level Total time of decompression (min:sec)	Air 15 m	Air 12 m	Air 9 m	Time period < than (min)	Oxygen 12 m	Oxygen 12-0 m	(min:sec)
30	2:00	-	-	-	3	10	6	21:00
35	2:00	-	-	-	3	10	6	21:00
40	2:00	-	-	-	3	10	6	21:00
45	2:00	-	-	-	3	10	6	21:00
50	2:00	-	-	-	3	10	6	21:00
60	2:00	-	-	-	3	15	6	26:00
70	2:00	-	-	-	3	25	6	36:00
80	2:00	-	-	-	3	35	6	46:00
90	2:00	-	-	-	3	40	6	51:00

Diving depth 27 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time (min)	Ascent to dive level Total time of decompression (min:sec)	Air 15 m	Air 12 m	Air 9 m	Time period < than (min)	Oxygen 12 m	Oxygen 12-0 m	(min:sec)
25	2:15	-	-	-	3	10	6	21:15
30	2:15	-	-	-	3	10	6	21:15
35	2:15	-	-	-	3	10	6	21:15
40	2:15	-	-	-	3	10	6	21:15
45	2:15	-	-	-	3	15	6	26:15
50	2:15	-	-	-	3	20	6	31:15
60	2:15	-	-	-	3	30	6	41:15
70	1:30	-	-	3	3	40	6	53:30

Diving depth 30 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
20	2:30	-	-	-	3	10	6	21:30
25	2:30	-	-	-	3	10	6	21:30
30	2:30	-	-	-	3	10	6	21:30
35	2:30	-	-	-	3	15	6	26:30
40	2:30	-	-	-	3	20	6	31:30
45	2:30	-	-	-	3	20	6	31:30
50	2:30	-	-	-	3	25	6	36:30
60	1:45	-	-	3	3	40	6	53:45

Diving depth 33 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
15	2:45	-	-	-	3	10	6	21:45
20	2:45	-	-	-	3	10	6	21:45
25	2:45	-	-	-	3	10	6	21:45
30	2:45	-	-	-	3	15	6	26:45
35	2:45	-	-	-	3	20	6	31:45
40	2:45	-	-	-	3	25	6	36:45
45	2:00	-	-	3	3	30	6	44:45
50	2:00	-	-	5	3	35	6	51:00
60	2:00	-	-	10	3	45	6	66:00

Diving depth 36 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
15	3:00	-	-	-	3	10	6	22:00
20	3:00	-	-	-	3	10	6	22:00
25	3:00	-	-	-	3	15	6	27:00
30	3:00	-	-	-	3	20	6	32:00
35	2:15	-	-	3	3	25	6	39:15
40	2:15	-	-	3	3	30	6	44:15
45	2:10	-	-	5	3	35	6	51:15
50	2:00	-	3	7	3	40	6	61:15

Diving depth 39 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
10	3:15	-	-	-	3	10	6	22:15
15	3:15	-	-	-	3	10	6	22:15
20	3:15	-	-	-	3	10	6	22:15
25	3:15	-	-	-	3	15	6	27:15
30	2:30	-	-	3	3	25	6	39:30
35	2:30	-	-	5	3	30	6	46:30
40	2:15	-	3	7	3	35	6	56:15

Diving depth 42 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
10	3:30	-	-	-	3	10	6	22:30
15	3:30	-	-	-	3	10	6	22:30
20	3:30	-	-	-	3	15	6	27:30
25	2:45	-	-	3	3	25	6	39:45
30	2:45	-	-	5	3	30	6	46:45
35	2:30	-	3	7	3	35	6	56:30
40	2:30	-	3	10	3	40	6	64:30

Diving depth 45 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
10	3:45	-	-	-	3	10	6	22:45
15	3:45	-	-	-	3	10	6	22:45
20	3:00	-	-	3	3	15	6	30:00
25	3:00	-	-	3	3	25	6	40:00
30	3:15	-	3	5	3	30	6	50:15

Diving depth 48 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
10	4:00	-	-	-	3	10	6	23:00
15	4:00	-	-	-	3	10	6	23:00
20	3:15	-	-	3	3	20	6	35:15
25	3:15	-	-	5	3	25	6	42:15
30	3:00	-	3	7	3	35	6	57:00

Diving depth 51 m

		Decompression time at the dive levels during surfacing (min)						
		Pressure						
		In the water			At the surface	In the chamber		
Diving time	Ascent to dive level Total time of decompression	Air	Air	Air	Time period < than	Oxygen	Oxygen	
(min)	(min:sec)	15 m	12 m	9 m	(min)	12 m	12-0 m	(min:sec)
10	4:15	-	-	-	3	10	6	23:15
15	3:30	-	-	3	3	15	6	30:30
20	3:30	-	-	5	3	25	6	42:30
25	3:15	-	3	5	3	30	6	50:15
30	3:15	-	5	7	3	40	6	64:15

Table 5: Adjustment table for diving in heights of more than 300 m ("calculative diving depth") (refer to section 8 of explanations)

Diving depth	Actual altitude/atmospheric pressure					
	300 - 500 m 950 mbar	500 - 1 000 m 900 mbar	1 000 - 1 500 m 850 mbar	1 500 - 2 000 m 800 mbar	2 000 - 2 500 m 750 mbar	2 500 - 3 000 m 700 mbar
5 m	9 m	9 m	9 m	9 m	12 m	12 m
6 m	9 m	9 m	9 m	12 m	12 m	15 m
7 m	9 m	9 m	12 m	12 m	15 m	15 m
8 m	9 m	12 m	12 m	15 m	15 m	18 m
9 m	12 m	12 m	15 m	15 m	18 m	18 m
10 m	12 m	15 m	15 m	15 m	18 m	21 m
11 m	15 m	15 m	15 m	18 m	18 m	21 m
12 m	15 m	15 m	18 m	18 m	21 m	24 m
13 m	15 m	18 m	18 m	21 m	21 m	24 m
14 m	18 m	18 m	21 m	21 m	24 m	27 m
15 m	18 m	18 m	21 m	24 m	24 m	27 m
16 m	18 m	21 m	21 m	24 m	27 m	30 m
17 m	21 m	21 m	24 m	24 m	27 m	30 m
18 m	21 m	24 m	24 m	27 m	30 m	30 m
19 m	21 m	24 m	27 m	27 m	30 m	33 m
20 m	24 m	24 m	27 m	30 m	30 m	33 m
21 m	24 m	27 m	27 m	30 m	33 m	36 m
22 m	24 m	27 m	30 m	30 m	33 m	36 m
23 m	27 m	27 m	30 m	33 m	36 m	39 m
24 m	27 m	30 m	30 m	33 m	36 m	39 m
25 m	27 m	30 m	33 m	36 m	39 m	42 m
26 m	30 m	30 m	33 m	36 m	39 m	42 m
27 m	30 m	33 m	36 m	39 m	42 m	45 m
28 m	30 m	33 m	36 m	39 m	42 m	45 m
29 m	33 m	36 m	36 m	39 m	45 m	48 m
30 m	33 m	36 m	39 m	42 m	45 m	48 m
31 m	36 m	36 m	39 m	42 m	45 m	51 m
32 m	36 m	39 m	42 m	45 m	48 m	51 m
33 m	36 m	39 m	42 m	45 m	48 m	54 m
34 m	39 m	39 m	42 m	45 m	51 m	54 m
35 m	39 m	42 m	45 m	48 m	51 m	57 m
36 m	39 m	42 m	45 m	48 m	54 m	57 m
37 m	42 m	45 m	48 m	51 m	54 m	60 m
38 m	42 m	45 m	48 m	51 m	54 m	60 m
39 m	42 m	45 m	48 m	54 m	57 m	60 m
40 m	45 m	48 m	51 m	54 m	57 m	
41 m	45 m	48 m	51 m	54 m	60 m	
42 m	45 m	48 m	54 m	57 m	60 m	
43 m	48 m	51 m	54 m	57 m		
44 m	48 m	51 m	54 m	60 m		
45 m	48 m	54 m	57 m	60 m		
46 m	51 m	54 m	57 m	60 m		
47 m	51 m	54 m	60 m			
48 m	54 m	57 m	60 m			
49 m	54 m	57 m	60 m			
50 m	54 m	57 m				

Table 6: Time addition to ascents of repeat dives
(refer to section 9 of explanations)

Diving depth of repeat dives	Surface interval (in min)*)									
	- 30	- 45	- 60	- 90	- 120	- 180	- 240	- 300	- 360	- 720
- 15 m	110	90	80	70	60	50	40	30	20	15
- 18 m	85	70	60	55	50	40	30	20	10	10
- 20 m	65	55	50	45	40	30	25	15	10	10
- 23 m	55	45	45	40	35	25	20	15	10	5
- 26 m	50	40	35	35	25	25	15	15	10	5
- 29 m	45	35	35	30	25	20	15	10	10	5
- 32 m	40	30	30	25	25	20	15	10	10	5
- 35 m	35	30	25	25	20	20	15	10	5	5
- 38 m	30	25	25	20	20	15	15	10	5	5
- 41 m	30	25	25	20	20	15	10	10	5	5
- 44 m	25	25	20	20	15	15	10	10	5	5
- 47 m	25	20	20	20	15	15	10	10	5	5
- 50 m	25	20	20	15	15	15	10	10	5	5

*) Surface interval is the period of time between the end of decompression of the first dive and the start of a repeat dive (given in minutes).

Appendix 2

Calculation of the amount of reserve air as per § 4 Abs. 2

When using surface supplied diving equipment a reserve air amount must be provided on site in case of an emergency.

The following cases are to be differentiated:

1. Supply by compressors

   Break-down of the compressor near the end of the planned diving time

   The amount of air necessary for the ascent to the surface must be provided in bottles at the diving site.

2. Supply by bottles

   Near the end of the planned diving time the diver is prevented from surfacing for a duration of 20 minutes.

   The diver must be provided with enough air

   – for the dive prolonged by 20 minutes

     as well as

   – for the resulting longer ascent times.

   In any case – independent from the type of air supply – an additional reserve amount of air must be provided to enable the reserve diver to dive if the submerged diver needs help.

   (refer to example 3)

Explanations regarding the sample calculations

(1) = Time for the ascent to the first decompression stop or duration of decompression stop in minutes

(2) = Air consumption of a diver (lightweight/helmet) at normal pressure in liter per minute

(3) = Coefficient to account for changed air consumption due to dive depth pressure (equivalent to the absolute pressure in bar)

(4) = Required amount of air at the respective dive level/diving depth

(5) = Prolongation of ground time or decompression stops compared to original plan by the 20 minute diving overtime.

Example for no. 1.:

Diving depth 36 m

Planned duration of underwater stay 40 min

Required amount of reserve air:

(1)		(2)		(3)		(4)	Explanation
min		l/min		bar		l	
3	*	60/30	*	4,6 [a]	=	828/ 414	(Air 36 until 9 m)
3	*	60/30	*	1,9	=	342/ 171	(Air 9 until 6 m)
12	*	60/30	*	1,6	=	1152/ 576	(Air 6 until 3 m)
25	*	60/30	*	1,3	=	1950/ 975	(Air 3 until 0 m)
						4272/2136	

[a] = The maximum planned dive depth pressure + 1 bar is to be considered for the ascent to the first decompression stop

Example for no. 2:
Diving depth
Planned duration of underwater stay 40 min
Calculated duration of underwater stay 60 (= 40 + 20) min
Required amount of reserve air

(5) min		(2) l/min		(3) bar		(4) l	Explanation
20	*	60/30	*	4,6	=	5520/2760	(Air at 36 m)
3	*	60/30	*	4,6 [a]	=	828/ 414	(Air 36 until 9 m)
9	*	60/30	*	1,9	=	1026/ 513	(Air 9 until 6 m)
13	*	60/30	*	1,6	=	1248/ 624	(Air 6 until 3 m)
20	*	60/30	*	1,3	=	1560/ 780	(Air 3 until 0 m)
						10182/5091	

[a] = The maximum planned dive depth pressure + 1 bar is to be considered for the ascent to the first decompression stop

Example: (calculation of required air for reserve divers)

Diving depth 36 m
Duration of dive 20 min
Required amount of reserve air

(1) min		(2) l/min		(3) bar		(4) l	Explanations
20	*	60/30	*	4,6	=	5520/2760	(Air at 36 m)
3	*	60/30	*	4,6 [a]	=	828/ 414	(Air 36 until 3 m)
7	*	60/30	*	1,3	=	546/ 273	(Air 3 until 0 m)
						6894/3447	

[a] = The maximum planned dive depth pressure + 1 bar is to be considered for the ascent to the first decompression stop

Appendix 3

Required knowledge and skills of the signal transmitter as per § 12 no. 2

1 Theoretical knowledge

1.1 Knowledge of machinery

1.1.1 Basic knowledge of build-up and operation of lightweight and helmet diving equipment

1.1.2 Basic knowledge of operating welding and cutting equipment

1.1.3 Basic knowledge of operating pressure chambers

1.2 Basic working skills

1.2.1 Knowledge of signalling

1.2.2 Basic knowledge of the different underwater works (e. g. searching, crane works, recovery works, underwater cutting)

1.3 Basic medical knowledge

1.3.1 Basic knowledge of dangers for divers during descent, underwater stay and ascent

1.3.2 Identification of divers' illnesses and initiation of treatment

1.4 Provisions of law
Knowledge of Accident Prevention Regulations „Diving" (BGV C23)

2 Practical knowledge

2.1 Dressing of diver (lightweight/helmet) including equipment check for completeness.

2.2 Securing divers during descent

2.3 Guiding divers during underwater stay

2.4 Guide/assist divers during ascent including decompression stops

2.5 Use decompression tables correctly

Compared with the former version of 1 January 1997, the following regulations were changed:

- § 1 clause 2
- § 4 clause 2 section 3
- § 5
- § 14 clause 1
- § 18
- § 22
- § 25
- § 26
- § 29
- § 32
- § 33

- The following regulations were added:
- Attachment 1
- Attachment 2
- Attachment 3

- The following regulations were deleted:
- § 11
- Appendix 1
- Appendix 2
- Appendix 3
- Appendix 4
- Appendix 5.

Notice:
As of April 1999 all new releases of the German Employers' Liability Insurance Association have a new name and order number.

All existing publications listed under a VBG or ZH1 number will be revised and receive new names and order numbers.

Until this process has been completed (within 3-5 years) all publications may also be ordered under their old order numbers.

As soon as publications have received new names and numbers these will be entered in a so-called transfer-list and made available.