

Information about longer sodalime usage periods for Dolphin and DrägerRay August 2003

DOLPHIN

The filling quantity of the CO₂ cartridge is designed for a usage period of 3 hours when filled correctly. This 3-hour usage period is only reached when the apparatus is used within the specified operating temperature range of 0°C to +30°C (water temperatures) and when using Dive Sorb[®]. However, the 3-hour usage period is only reached under the specified operating conditions. If water enters the CO₂ cartridge and the sodalime gets wet, the usage period will certainly be reduced.

The maximum usage period of a sodalime filling must never be exceeded. This 180 minute usage period may be split into one or several dives provided that the dives are made within one day (24 hours). Between the dives the sodalime filling must be checked (entry of water, packing density) and the CO₂ cartridge be stored in sealed condition. The CO₂ cartridge must be refilled before every dive / diving day. It must be filled / the filling be checked directly before the dive. Non-compliance with these instructions might lead to a CO₂ intoxication during the dive.

A partial filling component which can be used to reduce the filling quantity of the CO₂ cartridge such that the CO₂-absorption period is limited to one hour is offered as accessory. Thus the sodalime consumption can be reduced if the apparatus is used seldom.

When using the apparatus in waters with temperatures below 4°C Dräger lays down to proceed as follows:

Store the sodalime for at least 12 hours at a room temperature of 15°C - 25°C until directly before the dive and fill the cartridge directly before starting the dive.

The above mentioned 3-hour CO₂ absorption period was determined under the following conditions:

- water bath temperature : 4 (-2)°C
- breathing rate : 20 strokes/min. x 2 L/stroke = 40 L/min BTPS*
- simulated oxygen consumption : 1.78 L/min. STPD**
- interruption criterion : 0.5 % by vol. CO₂ in the inhaled gas
- CO₂ supply : 1.6 L/min. STPD**

During this test a – for divers – relatively high average physical work is assumed. If the physical work is reduced to the following test criteria:

- water bath temperature : 4 (-2)°C
- breathing rate : 20 strokes/min. x 1.5 L/stroke = 30 L/min. BTPS*
- simulated oxygen consumption : 1.33 L/min. STPD**
- interruption criterion : 0.5 % by vol. CO₂ in the inhaled gas
- CO₂ supply : 1.2 L/min. STPD**

the CO₂ absorption **increases from 3 hours to 250 minutes.**

RAY

The filling quantity of the CO₂ cartridge is designed for a usage period of 70 minutes when filled correctly. This 70-minute usage period is only reached when the apparatus is used within the specified operating temperature range of 0°C to +30°C (water temperatures) and when using Dive Sorb®. However, the 70-minute usage period is only reached under the specified operating conditions. If water enters the CO₂ cartridge and the sodalime gets wet, the usage period will certainly be reduced.

The maximum usage period of a sodalime filling must never be exceeded. This 70 minute usage period may be split into one or several dives provided that the dives are made within one day (24 hours). Between the dives the sodalime filling must be checked (entry of water, packing density) and the CO₂ cartridge be stored in sealed condition. The CO₂ cartridge must be refilled before every dive / diving day. It must be filled / the filling be checked directly before the dive. Non-compliance with these instructions might lead to a CO₂ intoxication during the dive.

When using the apparatus in waters with temperatures below 4°C Dräger lays down to proceed as follows:

Store the sodalime for at least 12 hours at a room temperature of 15°C - 25°C until directly before the dive and fill the cartridge directly before starting the dive.

The above mentioned 70 minute CO₂ absorption period was determined under the following conditions:

- water bath temperature : 4 (-2)°C
- breathing rate : 20 strokes/min. x 2 L/stroke = 40 L/min BTPS*
- simulated oxygen consumption : 1.78 L/min. STPD**
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- CO₂ supply : 1.6 L/min. STPD**

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- water bath temperature : 4 (-2)°C
- breathing rate : 20 strokes/min. x 1.5 L/stroke = 30 L/min. BTPS*
- simulated oxygen consumption : 1.33 L/min. STPD**
- interruption criterion : 0.5 % by vol. CO₂ in the inhaled gas
- CO₂ supply : 1.2 L/min. STPD**

the CO₂ absorption **increases from 70 minutes to 110 minutes.**

For both apparatuses

According to the US Navy Diving Manual (revision 4, 20. January, 1999) an oxygen consumption of 1.70 L/min. is regarded as heavy work, while an oxygen consumption of 2.50 L/min. corresponds to extreme physical work under water.

As per this Diving Manual an oxygen consumption between 0.8 and 1.40 L/min. corresponds to average physical work under water.

Hence, testing of the apparatuses with a permanent oxygen consumption of 1.78 L/min. and the respective CO₂-load means a worst case scenario. Thus it is ensured that during the operating period the apparatus has been approved for, there is always sufficient CO₂ absorption provided that the apparatus works properly and is operated as described in the instructions for use.

If the test conditions are reduced to an oxygen consumption of 1.33 L/min. as described above, the average physical work the diver has to produce permanently under water is simulated.

* BTPS: **B**ody **T**emperature and **P**ressure **S**aturated
** STPD: **S**tandard **T**emperature and **P**ressure **D**ry **G**as

Also observe "Information about sodalime in the DrägerRay sodalime cartridge => usage periods!!!!!!