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**BIBS Masks (Built-In Breathing Systems)** are used in dry hyperbaric environments to breath oxygen during decompression of divers and are used to administer oxygen to patients in hyperbaric medical chambers. If a chamber atmosphere becomes contaminated the **Ultralite 2 BIBS Mask** can be donned in such an emergency and supply non-contaminated breathing gas from an independent source.

**Overboard Dump:** The exhaled gas is 'dumped' or discharged outside of the chamber. This helps prevent unacceptable build up of oxygen within the hyperbaric environment. Pressure/depth increase of the chamber, which would otherwise occur using single hose BIBS is also reduced.

**Breathing Standards:** The Ultralite 2 BIBS Mask is designed to perform to the high standards set by the HSE/NPD (Health & Safety Executive/Norwegian Petroleum Directorate) in their 1991 requirements - "Evaluation of Breathing Apparatus for use in Manned Underwater Operations in the North Sea".

These guidelines have become the standard worldwide when considering performance requirements for diving and diving related breathing apparatus.



## Ultralite 2 BIBS Mask

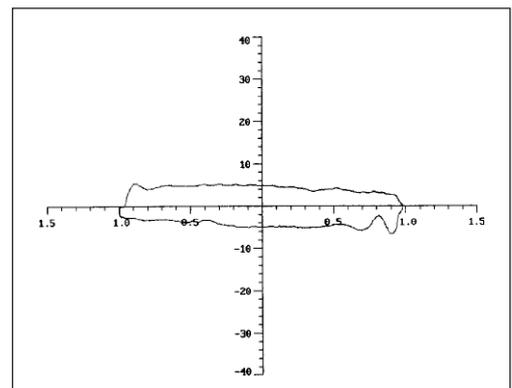
**Development:** In 1993, using knowledge gained from the previous manufacturer of a shallow BIBS Mask, and enhancing the performance of other BIBS Masks, Divex designed a totally new, high performing quality product.

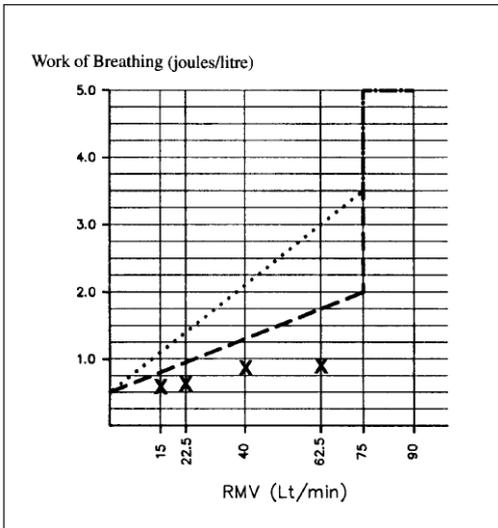
**Breathing Trials:** Using the Divex in-house Life Support Laboratory, which houses a computer- controlled breathing test simulator, an extensive programme of trial and development was undertaken.

The result was a BIBS Mask of outstanding performance, simplicity of design and robustness to suit the environments in which it would be used.

**Performance:** The breathing loop below shows the ideal low work of breathing and benign smoothness of inhalation and exhalation of the Ultralite 2 at 40 ltr RMV at a depth of 20 msw (66 feet). The total area of such a loop is computer calculated to give the work of breathing and the result, along with other rates of RMV (Respiratory Minute Volume), plotted on the graph.

Work of Breathing Loop





Performance at 20 msw / 66 fsw at various ventilation rates.

The dashed line indicates the maximum WOB permitted within the HSE/NPD Guidelines at >180 msw, the dotted line showing WOB maximum <180 msw.

**Advantages of Low WOB:** 'Work of Breathing' is the effort required to overcome the mechanical, frictional and drag within a piece of breathing apparatus and/or breathing system. The less effort required by the user the less fatigued they become and more comfortable and 'natural' they feel.

The Ultralite 2 mask reduces significantly the WOB. The ergonomically designed soft silicone oral nasal offers an exceptional fit without the need for over tightening of the headstraps.

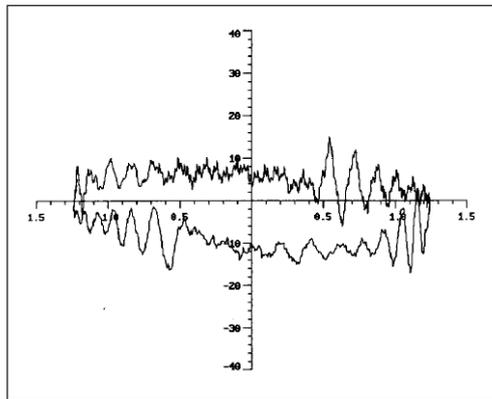
**Decompression and Safety Warning:**

Trials conducted by Aberdeen's National Hyperbaric Centre have indicated decompression and related problems may arise if leakage of chamber gas occurs into the oral nasal mask upon inhalation. This leakage occurs if the oral nasal is a poor fit when using a BIBS Mask with a high WOB and/or the related pipework, valving and regulator system is inadequately designed.

Similarly, if exhaled gas leaks out of the oral nasal into the chamber due to high exhalation resistance potentially high levels of oxygen can accumulate within the chamber leading to safety concerns such as fire hazard etc.

A trial report is available from Divex.

**Heliox Breathing:** The outstanding performance of the Ultralite 2 continues when breathing helium-oxygen mixtures. At 62.5 RMV at a depth of 300 msw (940 feet seawater) the mask has a work of breathing of 1.653 joules/litre. The WOB 'loop' below illustrates performance even at 450 msw..



Performance at 20 msw / 66 fsw at various ventilation rates.

**Function:** Ultralite 2 has a balanced regulator on both the inlet and outlet. Careful design enables gas pressures to be supplied and exhausted over a wide range without compromising performance.

It works by allowing a very small proportion of the gas at both inlet and outlet points to be ported through tiny orifices to create near equal pressures on the valve sealing surfaces. The valve is kept closed by only the lightest spring pressure so the wearer does not have to overcome the high spring tension required to seal an unbalanced regulator.



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### Safety Feature

**Anti-suction Valves:** To protect the user from excessive suction in the event of the malfunction of the exhaust valve or system, two inward relieving mushroom valves are located in the base of the body. These are designed to relieve between 25 to 30 cms of water gauge.

**Communications:** A push-to-talk microphone system is available as an additional feature. The picture above shows a typical multi-occupancy chamber and Ultralite 2 masks - the push button handpiece mounted on the inlet hose just below the mask. A chamber two-way speaker is shown (below) on the chamber wall with the microphone junction-box nearby.

The ancillary equipment such as manifold block, microphone boxes etc. are all available as easy to install Divex products.

### Specification

Standard Hose Length	2m (shorter and longer hoses to order)
Inlet Pressure	6-10 Bar
Outlet Pressure	Self-protecting 3m - 20 msw

Recommended to be vacuum assisted from 0 - 3m to comply fully with guidelines. For safety, protect with Divex BPR beyond 20 msw

Weight (excl. hoses)	361g
Weight (incl. hoses)	884

#### Ultralite 2 BIBS Mask

Order Code E12380

#### Ultralite 2 BIBS Mask with Microphone/ Banana Plug

Order Code E15000

#### Soft Seal Kit

Order Code E13884

#### Tool Kit

Order Code E13319

#### Head Harness

Order Code E12366