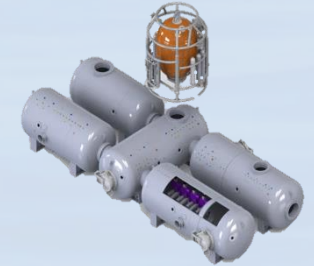
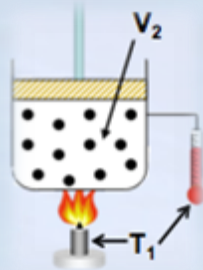


Establishing A ppO_2



Establishing A ppO_2

- To ensure that the acceptable upper limits of ppO_2 are not exceeded it is common to use a range of O_2 percentages to comply with the safety legislation.
- Oxygen is routinely mixed with helium to provide a breathing mix.
 - Helium has a reduced chance of causing Decompression Illness.
 - Helium is a lighter gas, and easier to breath at depth.
- The mix of helium is is blended to give the desired $O_2\%$, for example:
 - 21/79 Heliox.
 - 16/84 Heliox.
 - 12/88 Heliox.
 - 8/92 Heliox.
 - 2/98 Heliox.

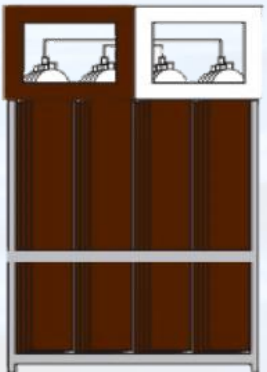
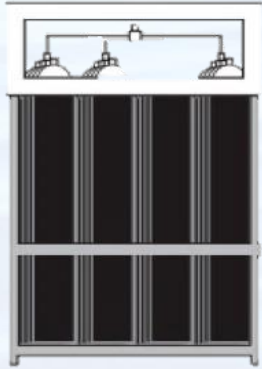
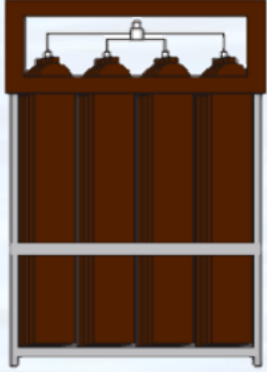


Danger
Compressed gas



Establishing A ppO_2

- You normally compress using two HeO_2 mixes - a mix high in O_2 , and a mix low in O_2 .
- The choice of which blend to use is dependant upon the desired ppO_2 .
- The desired ppO_2 is routinely an integral part of a companies
- S.O.P's and legislated by governing bodies:
 - Saturation lockout gas 0.5 to 0.9 bar
 - Bounce Dive lockout gas 1.2 to 1.6 bar
 - Bailout 1.2 to 2.8 bar
 - Saturation Storage 0.35 to 0.45 bar
 - Saturation Decompression 0.5 to 0.6 bar
 - Chamber emergency gas BIBS 0.2 to 0.8 bar
 - Therapeutic treatment BIBS 1.5 to 2.8 bar

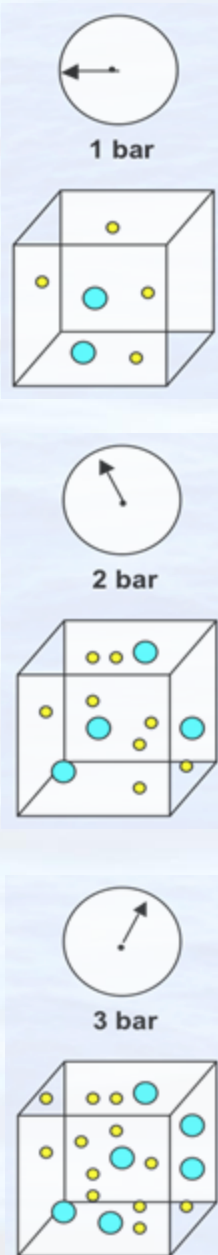


Establishing A ppO_2 The Formula

- Partial pressure is an integral part of Daltons law.
- Establishing an appropriate ppO_2 is possible by applying the formula:

$$\frac{(pO_2 \text{ required} - pO_2 \text{ initial})}{(\%O_2 \text{ high mix} - \%O_2 \text{ low mix})} = \text{msw}$$

- Important....
 - Final pO_2 is in millibar.
 - The initial pO_2 is almost always 210 milibars (21% O_2 in atmosphere).
 - Depth is always in MSW.
 - High mix is the HeO_2 with the highest oxygen.
 - Low mix is the lowest % of O_2 .
- The use of this formula is always in conjunction with gas mixing methods and Dalton's law.



Establishing A ppO₂ The Formula: Example

- Pressurise to 80msw using 10 % and 2 % HeO₂.
 - Maintain a pO₂ of no more than 420 mbar.
- Initial blowdown using the 10% until a desired depth to switch to the low mix.

$$\frac{(420^{\text{required PPO}_2} - 210^{\text{current PPO}_2}) - (80^{\text{msw}} \times 2\%)}{(10\% - 2\%)}$$

$$= \frac{210 - 160}{8}$$

$$= \frac{50}{8}$$

$$= 6.25 \text{ msw on } 10 \%$$