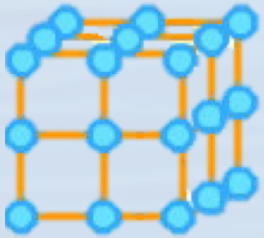
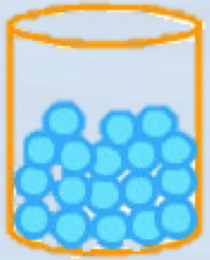
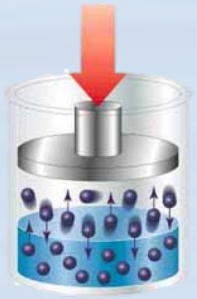
Physics Recap

Available Gas







Physics Recap Available Gas

- What is the available gas of a super-quad (64 x 50 L) pressurized to 200 bar ?

Free Gas Volume (FGV) = Floodable Volume (FV) x pressure (gauge)

Floodable Volume. = 64 x 50 L = 3200 L

Free Gas Volume = 3200 x 200 = 640,000 L

We express FGV in M^3 so ÷ by 1000

640,000 ÷ 1000 = **640m^3**

It is very. Important to remember that you will not actually have 640 m^3 available to pressurize. In reality if you are providing this gas to 200m of depth (20bar) you would have to compensate for the depth and the working pressure to deliver it. Therefore may only have 160 bar actually available.

Physics Recap Available Gas

- A chamber has a floodable volume of 26m^3. How much gas is required to pressurise it to 120m?

Remember to calculate Chamber FGV in GAUGE, not ABSOLUTE pressure.

Gauge pressure = 120 ÷ 10 = 12 $bar_{(g)}$

FGV = FV x $P_{(g)}$

= 26 m^3 x 12 $bar_{(g)}$

= 312 m^3

Physics Recap Available Gas

- How much gas is required to pressurise a 140 ft^3 bell to 492 feet?

140 x 492 ÷ 33

= 2087 ft^3

Physics Recap Available Gas

- Calculate the volume of gas used to pressurise a 32m^3 DDC to a depth of 170 msw.

  FGV = FV *x* P (P = msw ÷ 10)

  32m^3 x (170 ÷ 10)

  = 32m^3 x 17bar(g)

  = **544 m^3**

- If the 544m^3 came from a 64 cylinder (50L) super quad which had a pressure of 220 bar, what will the final pressure be?

  FGV = FV *x* P

  So FV = 64 x 50 ÷ 1000 = 3.2 m^3

  therefore

  FGV = 3.2m^3 x 220 bar(g) = **704 m^3**

  704m^3 - 544 m^3 = **160 m^3**

  FGV ÷ FV = P so

  160m^3 ÷ 3.2 m^3

  = 50 bar(g)

Physics Recap Available Gas

- A gas quad has 9 50L cylinders. If the quad is filled to 183 bar, how much gas would it contain?

$9 \times 50L = 450L$

$450 \div 1000 = 0.45m^3$

$0.45m^3 \times 183bar(g)$

$= 82\ m^3$.

Physics Recap Available Gas

- Calculate the volume of gas used to pressurise a 24m^3 DDC and a 4.2m^3 bell to a depth of 106msw.

FGV = FV *x* P

FV = 24m^3 + 4.2m^3 = 28.2m^3

so FGV = 28.2m^3 x 10.6 bar(g)

= **299m^3**

Daily Recap

1. How much pressure will be left in a superquad (64 x 50 litre) used to pressurise a complex with a total volume of 55 m^3 to a depth of 75 msw if the initial pressure is 200 bar?

Pressure (gauge) x F.V.	So	7.5b(g) x 55 m^3	=	**412.5 m^3**
F.V. of Superquad	=	64 x 50Litres ÷ 1000	=	**3.2 m^3**
Pressure drop	=	412.5m^3 used ÷ 3.2m^3	=	**128.9 bar(g)**
Pressure remaining	=	200b(g) - 128.9b(g)	=	**71.1 bar(g)**