

Tank Factors

- Cubic Footage Per 100psi in a set of doubles/sidemount
- Used to convert between volume and pressure in Imperial
- Unnecessary in Metric

Key	
TF	Tank Factor
V	Volume
P	Pressure

Rated Volume / Rated Pressure X 100 X 2 = Tank Factor

Rated Volume/Rated Pressure — Gives us the number of cubic feet per single psi
X100 — Because our gauges don't read single psi, they read in 100s
X2 — Because we have two tanks in our unified gas supply

$(RV/RP) \times 100 \times 2 = TF$

EXAMPLE: Aluminium 80s

$77.5cf / 3000psi = .025cf$ per single psi
 $.025 \times 100 = 2.5cf$ per 100psi in a single tank
 $2.5 \times 2 = 5cf$ per 100psi in doubles

$77.5/3000 \times 100 \times 2 = 5$
 $(RV/RP) \times 100 \times 2 = TF$

Common Tank Factors	
AL80	5
LP85/HP100	6
LP95/HP120	7
LP104/HP130	8

Applying Tank Factors

- Converting Pressure to Volume
- Converting Volume to Pressure
- 100 is used as a conversion figure (for hundreds of psi)
- "Divide the other then multiply"

$V =$	$P/100 \times TF$
$P =$	$V/TF \times 100$

Volume from Pressure

$$V = P/100 \times TF$$

EXAMPLE: We have used 700psi in a set of double 80s; how much volume is this?

$700psi / 100 = 7$
 $7 \times 5 (TF) = 35cf$

$700/100 \times 5 = V = 35$

Pressure from Volume

$$P = V/TF \times 100$$

EXAMPLE: To gas match we need to determine the pressure of 40cf in a set of AL80s

$40cf / 5 (TF) = 8$
 $8 \times 100 = 800psi$

$40/5 \times 100 = P = 800$

Breathing Intervals

- 5 minute blocks of gas consumption
- Practical way of gas planning / estimating usage
- Measured in PSI/BAR
- Dependant on
 - Personal SAC rate
 - Tanks being used
- SAC rate should be known (can default to .75cf/m - 20L/m)
- Can be written down or memorised and applied to any dive (using applicable tanks)

Depth in ATA	
33' / 10M	2
66' / 20M	3
99' / 30M	4

EXAMPLE: Diver with a SAC rate of .5cf/m uses double AL80s. What are their Intervals?

1: Calculate RMV adjusted for depth
Multiply SAC by depth in ATA

Depth (In ATA)	RMV
1 (Surface)	.5cf/m (SAC)
2	1
3	1.5
4	2

2: Convert cf/m to psi/min using tank factor

$$P = V/TF \times 100$$

$$P = 1 \text{ (cf/m at 2ATA)} / 5 \text{ (TF)} = .2$$

$$2 \times 100 = 20\text{psi/min}$$

Complete the rest of the table

Depth (In ATA)	RMV	PSI/min
1 (Surface)	.5cf/m (SAC)	10
2	1	20
3	1.5	30
4	2	40

3: Multiply PSI/min by 5

20psi is a useless measurement and no one checks pressure every minute

Depth (In ATA)	RMV	PSI/min	PSI/5 minutes
1 (Surface)	.5cf/m (SAC)	10	50
2	1	20	100
3	1.5	30	150
4	2	40	200

4: Eliminate extraneous information from table

Ignore surface row and middle columns

Change "Depth" header to local units

Change "PSI/5 minutes" header to "Interval"

5: Write this down in wetnotes

6: Remember this is personal and for specific tank size

Depth	Interval
33	100
66	150
99	200

Applying Intervals

- Estimate gas usage for a given dive
- Multiply depth-dependent 5 minute blocks to determine how much is needed or estimate how much has been used
- Pressure gauges are not ultra-accurate, reasonable rounding is expected

EXAMPLE A: Diver with the above intervals has been in 60 foot passage for 25 minutes. How much gas has been consumed?

25 minutes / 5 minute intervals = 5 intervals
 $150 \times 5 = 750$

25 minutes is 5 intervals
150 is the interval for 66' (the closest to our target depth)
Diver has likely consumed around 700psi since they're a little shallower

EXAMPLE B: Same diver plans to spend 40 minutes at 40 feet. How much gas will be consumed?

40 minutes / 5 minute intervals = 8 intervals
 $100 \times 8 = 800$

40 minutes is 8 intervals
100psi is the interval for 33'
Diver can expect to need a bit more than 800psi. Call it ~900psi.

Swim Speed / Distance

Sort of obvious

Multiply time by feet/minute

- 20fpm is barely moving
- 30fpm is pretty slow
- **40fpm is pretty average**
- 50fpm is pretty fast
- 60fpm is a likely-unsustainable sprint

EXAMPLE: Team has been swimming for 40 minutes at 30fpm. How far into the cave are they?

$40 \times 30 = 1200$ feet