

Formulas Imperial

$$MG = CAT$$

$$p_{GAS} = ATA \times f_{GAS}$$

$$SCR = \frac{\text{Vol Consumed}}{\text{Time} \times ATA}$$

$$DCR = SCR \times ATA$$

$$ATA = \text{depth} \div 33 + 1$$

$$\text{Volume of Gas} = SCR \times ATA \times \text{TIME}$$

$$TF = (\text{Gas Vol} \div \text{Serv Press}) \times 100$$

$$MOD = 33 \times ((p_{O_2} 1.2 \div f_{O_2}) - 1)$$

$$END = (\text{depth} + 33) \times (1 - f_{He}) - 33$$

$$CNS\% = (BT + N_{x50} \text{TIME}) \div 2$$

$$CNS\% = (BT \div 2) + (O_{2\text{TIME}} \times 2)$$

$$EADD = \left((\text{depth} + 33) \times \left(\frac{p_{GAS MIX}}{1.29} \right) \right) - 33$$

$$\rho_{O_2} = 1.43 \text{ g/l}$$

$$\rho_{N_2} = 1.25 \text{ g/l}$$

$$\rho_{He} = 0.18 \text{ g/l}$$

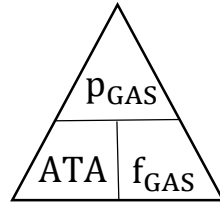
$$\rho_{Air} = 1.29 \text{ g/l}$$

$$\rho_{32} = 1.31 \text{ g/l}$$

$$\rho_{30/30} = 0.98 \text{ g/l}$$

$$\rho_{21/35} = 0.91 \text{ g/l}$$

$$\rho_{18/45} = 0.80 \text{ g/l}$$



GUE T1 Notes METRIC

Standard Bottom Gases

Range	Gas Mix	Max pO ₂	EADD	END	MOD
0-30 m	Nx32	1.28	30 m	30 m	30 m
0-30 m	30/30	1.20	20 m	18 m	30 m
0-45 m	21/35	1.15	29 m	26 m	45 m
0-60 m	18/45	1.26	33 m	29 m	60 m

Deco Gas Loss

- Maintain schedule from 21 to 9 m
- Alternate diver on Nx50 at each stop
- Double 6m stop duration
- Alternate diver on Nx50 every 5 min

Omitted Deco

- Re-enter deco 1 stop deeper
- Double the 6 m stop duration

Four-Point Dive Plan

1. GOAL, SEQUENCE & ENVIRONMENT

GOAL:

DEPTH:

BT:

ENVIRO:

COND:

SEQ:

2. GAS STRATEGIES & MANAGEMENT

Waypoints	Pressure	Time (min)
BG		
Avg Depth		
Segments		
MG and max BT		
BT		
TP		
Nx50		
Segments		
Max DT		

Shallow Ratio Deco

BG: Nx32, valid from 40 ft to 100 ft

Unlimited time from 30 ft and above

- MDL = 130 – Average Depth

Ascent

- 30 ft/min to 50% of max depth
- 10 ft/min to 20 ft

Deco @ 20ft

- DT on 32% = BT – MDL
- DT/2 on O₂
- 6 min from 20 ft to surface

Surface interval

- 1 to 2 hours: 50% of MDL
- More than 2 hours: 75% of MDL

Pragmatic Deco

- Plan in Deco Planner, GF:20/85
- Keep 20 ft stop time as is
- Linearize from 70 ft to 30 ft: total-stops/5 and round up

Ratio 170 Deco

Depth range: 130-170 ft
21/35 or 18/45, max 30 min with Nx50

- Ratio 1:1 @ 150 ft
- TDT = BT
- 20 ft = $BT \div 2$
- 70-30 ft = $BT \div 2$
- +/- 10 ft = +/- 5 min TDT

Depth	Stop Times		
	5	10	15
20'	5	10	15
30'	1	2	3
40'	1	2	3
50'	1	2	3
60'	1	2	3
70'	1	2	3
Total Deco	10	20	30

Four-Point Dive Plan

3. ANALYSIS RESULT & LIMITATIONS

Worst Gas:

CHANGE@MOD

pO₂:

END:

EADD:

4. DECO STRATEGIES & MANAGEMENT

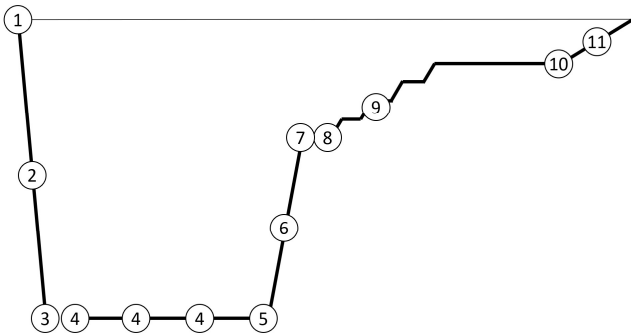
Depth	Time

CNS%:

+/- 1 min BT = +/- min DT

+/- 3 m = +/- min DT

Dive Execution



1. GUE EDGE
2. 14 m/min descent rate
3. Reset average depth
4. 5-minute Situational Checks:
Equipment (depth, pressure, bar/5min,
flow check), Environment, Team
5. Confirm: Avg depth, BT, Total Deco
and first stop
6. 9 m/min ascent rate
7. Team switches to deco gas
8. Reset timer and initiate deco
9. Deco stops with 30 sec slide
10. 6 m deco completed
11. 1 m/min slide to surface

T1 Tank Factors

$$TF = (\text{Gas Vol} / \text{Serv Press}) \times 100$$

Tank	TF (ft ³ /100psi)	Metric Equiv
AL40	2	6
AL80	3	11
D80	5	D11
DLP85/ DHP100	6	D12
DLP95/ DHP120	7	D15
DLP104/ DHP130	8	D16
DLP121	9	D19

Minimum Gas & psi/5min

DHP130/DLP104

TF= 8

Depth feet	MG-0 psi	MG-20 psi	MG-70 psi	PSI/5min
100'	600	600	▼	200
110'	600	700	500	300
120'	700	800	600	300
130'	800	800	700	300
140'	900	900	800	300
150'	1000	1100	900	300
160'	1100	1200	1000	300
170'	1300	1300	1100	300

DLP121

TF= 9

Depth feet	MG-0 psi	MG-20 psi	MG-70 psi	PSI/5min
100'	500	500	↓	200
110'	600	600	▼	200
120'	700	700	500	200
130'	700	800	600	300
140'	800	800	700	300
150'	900	900	800	300
160'	1000	1000	900	300
170'	1100	1100	1000	300

Deco psi/5min AL80: 300 AL40: 600

Min Gas Calculation (500 psi minimum):

C: 0.75 ft³/min x 2 divers

A: average depth of ascent to 70 ft or 20 ft in ATA

T: 1 min emergency + 1 min per 10 ft + 1 min switch

Minimum Gas & bars/5min

D 11

Depth	MG-0 bar	MG-6 bar	MG-21 bar	bar/5min
30 m	50	60	40	20
33 m	60	60	50	20
36 m	70	70	50	25
39 m	80	80	60	25
42 m	90	90	70	25
45 m	100	100	80	25
48 m	110	110	90	30
51 m	120	120	110	30

D 12

Depth	MG-0 bar	MG-6 bar	MG-21 bar	bar/5min
30 m	50	50	▼	20
33 m	60	60	40	20
36 m	70	70	50	20
39 m	70	80	60	25
42 m	80	80	70	25
45 m	90	90	80	25
48 m	100	100	90	25
51 m	110	110	100	30

D 13

Depth	MG-0 bar	MG-6 bar	MG-21 bar	bar/5min
30 m	50	50	▼	20
33 m	50	50	40	20
36 m	60	60	50	20
39 m	70	70	50	20
42 m	80	80	60	20
45 m	80	90	70	25
48 m	90	100	80	25
51 m	100	110	90	25

Minimum Gas & bars/5min

D 15

Depth	MG-0 bar	MG-6 bar	MG-21 bar	bar/5min
30 m	40	40	↓	15
33 m	50	50	↓	15
36 m	50	50	40	20
39 m	60	60	50	20
42 m	70	70	50	20
45 m	70	80	60	20
48 m	80	80	70	20
51 m	90	90	80	25

D 16

Depth	MG-0 bar	MG-6 bar	MG-21 bar	bar/5min
30 m	↓	40	↓	15
33 m	40	50	↓	15
36 m	50	50	↓	15
39 m	60	60	40	20
42 m	60	60	50	20
45 m	70	70	60	20
48 m	80	80	70	20
51 m	80	90	70	20

D 19

Depth	MG-0 bar	MG-6 bar	MG-21 bar	bar/5min
36 m	40	40	↓	15
39 m	50	50	↓	15
42 m	50	60	40	15
45 m	60	60	50	15
48 m	70	70	60	20
51 m	70	70	60	20

Deco bars/5 min 11l: 20 7l: 30 5.5l: 40

Minimum Gas & psi/5min

D80

TF= 5

Depth feet	MG-0 psi	MG-20 psi	MG-70 psi	PSI/5min
100'	900	900	600	400
110'	1000	1000	700	400
120'	1100	1200	900	400
130'	1300	1300	1000	400
140'	1500	1500	1200	400
150'	1600	1700	1300	500
160'	1800	1800	1500	500
170'	2000	2000	1700	500

DLP85/DHP100

TF= 6

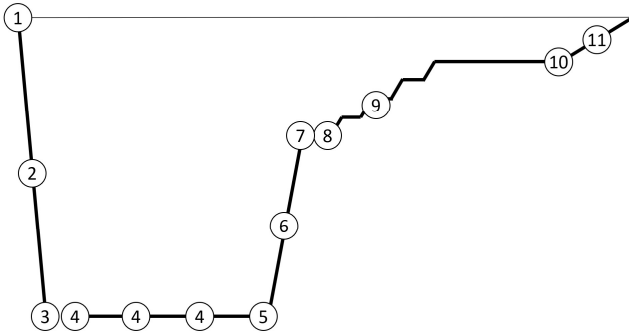
Depth feet	MG-0 psi	MG-20 psi	MG-70 psi	PSI/5min
100'	700	800	500	300
110'	800	900	600	300
120'	1000	1000	700	300
130'	1100	1100	900	400
140'	1200	1200	1000	400
150'	1400	1400	1100	400
160'	1500	1500	1300	400
170'	1700	1700	1400	400

DLP95/DHP120

TF= 7

Depth feet	MG-0 psi	MG-20 psi	MG-70 psi	PSI/5min
100'	600	700	↓	300
110'	700	700	500	300
120'	800	900	600	300
130'	900	1000	700	300
140'	1100	1100	900	300
150'	1200	1200	1000	300
160'	1300	1300	1100	400
170'	1400	1500	1200	400

Dive Execution



1. GUE EDGE
2. 50 ft/min descent rate
3. Reset average depth
4. 5-minute Situational Checks:
Equipment (depth, pressure, PSI/5 min, flow check), Environment, Team
5. Confirm: Avg depth, BT, Total Deco and first stop
6. 30 ft/min ascent rate
7. Team switches to deco gas
8. Reset timer and initiate deco
9. Deco stops with 30 sec slide
10. 20 ft deco completed
11. 6 min slide to surface

Minimum Gas Calculation

Min Gas (40 bars minimum):

C: 20 l/min x 2 divers

A: average depth of ascent to 21 m or 6 m in ATA

T: 1 min emergency + 1 min per 3 m + 1 min switch

Tank Factors &

Metric Equivalents

$$TF = (\text{Gas Vol} / \text{Serv Press}) \times 100$$

Imperial Tank	TF (ft ³ /100psi)	Metric Equiv
AL40	2	6
AL80	3	11
D80	5	D11
DLP85/ DHP100	6	D12
DLP95/ DHP120	7	D15
DLP104/ DHP130	8	D16
DLP121	9	D19

Pragmatic Deco

- Plan in Deco Planner, GF:20/85
- Keep 6m stop time as is
- Linearize from 21m to 9m: total-stops/5 and round up

Ratio 51 Deco

Depth range: 39-51 m, 21/35 or 18/45, max 30 min with Nx50

- Ratio 1:1 @ 45 m
- TDT = BT
- 6 m = $BT \div 2$
- 21-9 m = $BT \div 2$
- +/- 3 m = +/- 5 min TDT

Depth	Stop Times		
	5	10	15
6 m	5	10	15
9 m	1	2	3
12 m	1	2	3
15 m	1	2	3
18 m	1	2	3
21 m	1	2	3
Total Deco	10	20	30

Four-Point Dive Plan

3. ANALYSIS RESULT & LIMITATIONS

Worst Gas:

CHANGE@MOD

pO₂:

END:

EADD:

4. DECO STRATEGIES & MANAGEMENT

Depth	Time

CNS%:

+/- 1 min BT = +/- min DT

+/- 10 ft = +/- min DT

Four-Point Dive Plan

1. GOAL, SEQUENCE & ENVIRONMENT

GOAL:

DEPTH:

BT:

ENVIRO:

COND:

SEQ:

2. GAS STRATEGIES & MANAGEMENT

Waypoints	Pressure	Time (min)
BG		
Avg Depth		
Segments		
MG and max BT		
BT		
TP		
Nx50		
Segments		
Max DT		

Shallow Ratio Deco

BG: Nx32, valid from 13 m to 30 m

Unlimited from 10 m and above

- MDL = 30 min at 30 m average depth
- MDL = 30 min +10 min for each 3 m shallower
- MDL = 30 + 10 x (30 – average depth)/3

Ascent

- 9 m/min to 50% of max depth
- 3 m/min to 6 m

Deco @ 6 m

- DT on 32% = BT – MDL
- DT/2 on O₂
- 6 min from 6m to surface

Surface interval

- 1 to 2 hours: 50% of MDL
- More than 2 hours: 75% of MDL

Formulas

Metric

$$MG = CAT$$

$$p_{GAS} = ATA \times f_{GAS}$$

$$SCR = \frac{\text{Vol Consumed}}{\text{Time} \times ATA}$$

$$DCR = SCR \times ATA$$

$$ATA = \text{depth} \div 10 + 1$$

$$\text{Volume of Gas} = SCR \times ATA \times \text{TIME}$$

$$MOD = 10 \times ((pO_2 \cdot 1.2 \div fO_2) - 1)$$

$$END = (\text{depth} + 10) \times (1 - f_{He}) - 10$$

$$CNS\% = (BT + N \times 50_{\text{TIME}}) \div 2$$

$$CNS\% = (BT \div 2) + (O_{2\text{TIME}} \times 2)$$

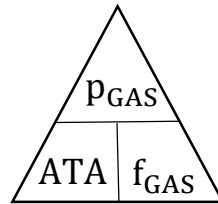
$$EADD = \left((\text{depth} + 10) \times \left(\frac{\rho_{GAS\ MIX}}{1.29} \right) \right) - 10$$

$$\rho_{O_2} = 1.43 \text{ g/l}$$

$$\rho_{N_2} = 1.25 \text{ g/l}$$

$$\rho_{He} = 0.18 \text{ g/l}$$

$$\rho_{Air} = 1.29 \text{ g/l}$$



$$\rho_{32} = 1.31 \text{ g/l}$$

$$\rho_{30/30} = 0.98 \text{ g/l}$$

$$\rho_{21/35} = 0.91 \text{ g/l}$$

$$\rho_{18/45} = 0.80 \text{ g/l}$$

GUE T1 Notes

IMPERIAL

Standard Bottom Gases

Range	Gas Mix	Max pO ₂	EADD	END	MOD
0-100 ft	Nx32	1.28	100 ft	100 ft	100 ft
0-100 ft	30/30	1.20	66 ft	60 ft	100 ft
0-150 ft	21/35	1.15	97 ft	85 ft	150 ft
0-200 ft	18/45	1.26	110 ft	95 ft	200 ft

Deco Gas Loss

- Maintain schedule from 70 to 30 ft
- Alternate diver on Nx50 at each stop
- Double 20 ft stop duration
- Alternate diver on Nx50 every 5 minutes

Omitted Deco

- Re-enter deco 1 stop deeper
- Double the 20 ft stop duration