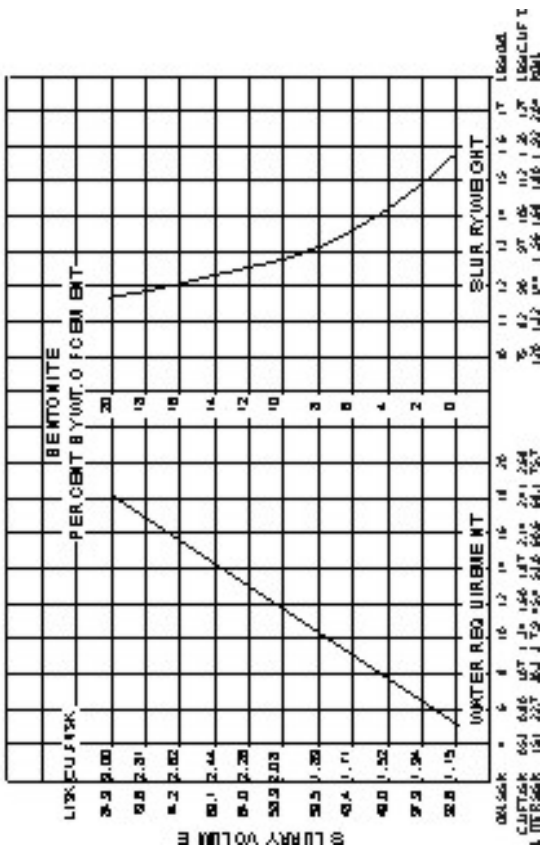


**SECTION IV**  
**TABLE OF CONTENTS**  
**CLASS G CEMENT**

	English Units	Metric Units
With Bentonite .....	3	4
Gilsonite .....	3	4
Silica Flour .....	3	4
Sand .....	3	4
Salt .....	5	6
Salt Table .....	7	8
Densified .....	7	8
Perlite .....	9	10

## ENGLISH / METRIC UNITS

## APIC LASS G CEMENT



## ENGLISH UNITS

API CLASS G CEMENT  
SLURRY PROPERTIES

Per Cent Bentonite	Water Requirement		Slurry Weight		Slurry Volume
	Gal./Sk.	Cu. Ft./Sk.	Lbs./Gal.	Lbs./Cu. Ft.	Cu. Ft./Sk.
0	5.0	0.67	15.8	118	1.15
2	6.3	0.84	14.8	111	1.34
4	7.6	1.02	14.2	106	1.52
6	8.9	1.19	13.6	102	1.71
8	10.2	1.37	13.2	99	1.89
10	11.5	1.54	12.8	96	2.08
12	12.8	1.71	12.6	94	2.26

Gilsonite Lbs./Sk.	Per Cent Bentonite	Water Requirement		Slurry Weight		Slurry Volume
		Gal./Sk.	Cu.Ft./Sk.	Lbs./Gal.	Lbs./Cu. Ft.	Cu. Ft./Sk.
10	0	5.4	0.72	14.7	110	1.36
15	0	5.6	0.75	14.3	107	1.46
25	0	6.0	0.80	13.6	102	1.66
50	0	7.0	0.94	12.4	93	2.17
10	2	6.7	0.90	14.0	105	1.54
15	2	6.9	0.92	13.8	103	1.64
25	2	7.3	0.98	13.2	99	1.85
50	2	8.3	1.11	12.3	92	2.36
10	4	8.0	1.07	13.5	101	1.73
15	4	8.2	1.10	13.2	99	1.83
25	4	8.6	1.15	12.8	96	2.03
50	4	9.6	1.29	12.0	90	2.54

Per Cent Silica Flour	Water Requirement		Slurry Weight		Slurry Volume
	Gal./Sk.	Cu. Ft./Sk.	Lbs./Gal.	Lbs./Cu. Ft.	Cu. Ft./Sk.
30	6.4	0.85	15.6	117	1.50
40	6.8	0.91	15.5	116	1.62
50	7.3	0.97	15.5	116	1.74

Sand Lbs./Sk.	Water Requirement		Slurry Weight		Slurry Volume
	Gal./Sk.	Cu. Ft./Sk.	Lbs./Gal.	Lbs./Cu. Ft.	Cu. Ft./Sk.
20	5.0	0.67	16.3	122	1.27
25	5.0	0.67	16.4	123	1.30
30	5.0	0.67	16.6	124	1.33
35	5.0	0.67	16.7	125	1.36
40	5.0	0.67	16.8	126	1.39
50	5.0	0.67	17.1	128	1.46

**METRIC UNITS**

**API CLASS G CEMENT**

**SLURRY PROPERTIES**

<b>Per Cent Bentonite</b>	<b>Water Requirement L/Sk</b>	<b>Slurry Weight Kg/L</b>	<b>Slurry Volume L/Sk</b>
0	18.9	1.89	32.56
2	23.8	1.77	37.94
4	28.8	1.70	43.03
6	33.7	1.63	48.41
8	38.6	1.58	53.51
10	43.5	1.53	58.89
12	48.4	1.51	63.99

<b>Gilsonite Kg/Sk</b>	<b>Per Cent Bentonite</b>	<b>Water Requirement L/Sk</b>	<b>Slurry Weight Kg/L</b>	<b>Slurry Volume L/Sk</b>
4.5	0	20.4	1.76	38.50
6.8	0	21.2	1.71	41.43
11.3	0	22.7	1.63	47.00
22.7	0	26.5	1.49	61.44
4.5	2	25.4	1.68	43.60
6.8	2	26.1	1.65	46.43
11.3	2	27.6	1.58	52.38
22.7	2	31.4	1.47	68.81
4.5	4	30.3	1.62	48.98
6.8	4	31.0	1.58	51.81
11.3	4	32.5	1.53	57.47
22.7	4	36.3	1.44	71.91

<b>Per Cent Silica Flour</b>	<b>Water Requirement L/Sk</b>	<b>Slurry Weight Kg/L</b>	<b>Slurry Volume L/Sk</b>
30	24.2	1.87	42.47
40	25.7	1.86	45.87
50	27.6	1.86	49.26

<b>Sand Kg/Sk</b>	<b>Water Requirement L/Sk</b>	<b>Slurry Weight Kg/L</b>	<b>Slurry Volume L/Sk</b>
9.1	18.9	1.95	35.96
11.3	18.9	1.96	36.81
13.6	18.9	1.99	37.65
15.9	18.9	2.00	38.50
18.1	18.9	2.01	39.35
22.7	18.9	2.05	41.34

## ENGLISH UNITS

## API CLASS G CEM WITH SALT

Per Cent*	Salt Lbs./Sk.	Per Cent Silica Flour	Water		Slurry Weight		Slurry Volume Cu. Ft./Sk.
			Requirement Gal./Sk.	Cu. Ft./Sk.	Lbs./Gal	Lbs./ Cu. Ft.	
10	4.18	0	5.0	0.67	15.9	119	1.18
18	7.52	0	5.0	0.67	16.0	120	1.20
Sat.	15.54	0	5.0	0.67	16.3	122	1.24
10	5.30	30	6.4	0.85	15.8	118	1.54
18	9.55	30	6.4	0.85	15.8	118	1.56
Sat.	19.72	30	6.4	0.85	16.0	120	1.62
10	5.68	40	6.8	0.91	15.6	117	1.65
18	10.12	40	6.8	0.91	15.8	118	1.68
Sat.	21.10	40	6.8	0.91	16.0	120	1.75

\*By weight of water.

### THICKENING TIME - HOURS : MINUTES

(Pressure - Temperature Thickening - Time Test)

Salt Per Cent	API CASING TESTS	
	6,000'	12,000'
0	1:45	3:33 (0.4)*
18	1:42	1:10 (0.4)*
Sat.	6:03	2:45 (0.4)*

\*Percent Retarder.

### COMPRESSIVE STRENGTH - PSI

(API Curing Pressures)

Salt Per Cent	110° F	24 Hours			72 Hours
		140° F	170° F	170° F	170° F
0	2,915	3,425	3,735	5,685	
18	2,960	3,225	3,375	4,000	
Sat.	1,465	2,550	2,660	3,200	

Salt Per Cent	170° F	24 Hours		72 Hours		
		230° F	260° F	170° F	230° F	260° F
0	4,250	5,700	6,350	5,450	6,275	6,850
18	3,100	4,710	5,100	4,650	3,860	4,710
Sat.	2,410	2,860	3,050	2,750	3,100	3,885

## METRIC UNITS

## API CLASS G CEMENT WITH SALT

Per Cent*	Salt	Per Cent Silica Flour	Water	Slurry Weight Kg/L	Slurry Volume L/Sk
	Kg/Sk		Requirement l/Sk		
10	1.90	0	18.9	1.90	33.41
18	3.41	0	18.9	1.92	33.97
Sat**	7.05	0	18.9	1.95	35.11
10	2.40	30	24.2	1.89	43.60
18	4.33	30	24.2	1.89	44.17
Sat.	8.94	30	24.2	1.92	45.87
10	2.58	40	25.7	1.87	46.71
18	4.59	40	25.7	1.89	47.56
Sat**	9.57	40	25.7	1.92	49.55

\*By weight of water.

### THICKENING TIME - HOURS : MINUTES

(Pressure - Temperature Thickening - Time Test)

Salt Per Cent	API CASING TESTS	
	1 830m	3 660m
0	1:45	3:33 (0.4)*
18	1:42	1:10 (0.4)*
Sat**	6:03	2:45 (0.4)*

\*Percent Retarder.

### COMPRESSIVE STRENGTH - MEGAPASCALS

(API Curing Pressures)

Salt Per Cent	43° C 11.03 MPa***	24 Hours		72 Hours	
		60° C 20.68 MPa***	77° C 20.68 MPa***	77° C 20.68 MPa***	77° C 20.68 MPa***
0	20.09	23.61	25.75		39.19
18	20.40	22.23	23.27		27.57
Sat**	10.10	17.58	18.34		22.06

Salt Per Cent	77° C 20.68 MPa***	24 Hours			72 Hours	
		110° C 20.68 MPa***	127° C 20.68 MPa***	77° C 20.68 MPa***	110° c 20.68 MPa***	127° C 20.68 MPa***
0	29.30	39.30	43.78	37.57	43.26	47.22
18	21.37	32.47	35.16	32.06	26.61	32.47
Sat**	16.61	19.71	20.71	18.96	21.37	26.78

\*\* At 60° C

\*\*\* Curing Pressure

**ENGLISH UNITS**

On all salt water slurries, the amount of salt to use per sack of cement can be calculated by using the following figures per Cu. Ft. of water:

SALT Per Cent by Wt. of Water	SALT Lbs./Cu. Ft. of Water
10	6.24
14	8.74
18	11.23
24	15.00
Sat.	23.20

Salt should be dry blended with the cement, where possible.

**API CLASS G CEMENT**

**With Dispersant (Densified)**

Per Cent Dispersant	Water Requirement		Slurry Weight		Slurry Volume
	Gal./Sk.	Cu. Ft./Sk.	Lbs./Gal.	Lbs./Cu. Ft.	C. Ft./Sk.
0.75	4.00	0.54	16.7	125	1.02
0.75	3.78	0.51	17.0	127	0.99
0.75	3.38	0.45	17.5	131	0.93

**COMPRESSIVE STRENGTH - PSI**

Atmospheric Pressure

Per Cent Dispersant	Per Cent Salt	Slurry Weight Lbs./Cu. Ft.	8 Hours		24 Hours	
			80° F	100° F	80° F	100° F
0.75	0	125	470	.990	3.225	4.225
0.75	3	125	805	1.350	4.390	5.785

**METRIC UNITS**

On all salt water slurries, the amount of salt to use per sack of cement can be calculated by using the following figures per Litre of water:

SALT Per Cent by Wt. of Water	SALT Kg/m <sup>3</sup> of Water
10	99.96
14	140.01
18	179.90
24	240.03
Sat. (60° C)	371.66

Salt should be dry blended with the cement, where possible.

**API CLASS G CEMENT**  
With Dispersant (Densified)

Per Cent Dispersant	Water Requirement L/Sk.	Slurry Weight Kg/L	Slurry Volume L/Sk.
0.75	15.14	2.00	28.88
0.75	14.31	2.04	28.03
0.75	12.79	2.10	26.33

**COMPRESSIVE STRENGTH - MEGAPASCALS**

Atmospheric Pressure

Per Cent Dispersant	Per Cent Salt	Slurry Weight KG/L	8 Hours		24 Hours	
			27° C	38° C	27° C	38° C
0.75	0	2.00	3.24	6.82	22.23	29.13
0.75	3	2.00	5.55	9.30	30.26	39.88



## ENGLISH UNITS

## API CLASS G CEMENT

## 1:1 PERLITE CEMENT\*

(PERLITE 8-10 Lbs./Cu. Ft.)

Per Cent Bentonite	Per Cent Silica Flour	Water Requirement		Slurry Weight**		Slurry Volume
		Gal./ Sk.	Cu. Ft./Sk.	Lbs./Gal.	Lbs./Cu. Ft.	Cu. Ft./Sk.**
0	0	7.9	1.05	12.4 (13.9)	92.7 (104.0)	1.83 (1.63)
2	0	9.1	1.22	12.1 (13.4)	90.6 (100.4)	2.01 (1.81)
4	0	10.4	1.40	11.9 (13.0)	88.8 ( 97.6)	2.20 (2.00)
0	30	10.4	1.39	12.5 (13.6)	93.6 (102.0)	2.34 (2.14)
0	40	10.8	1.45	12.6 (13.7)	94.3 (102.5)	2.46 (2.26)
2	30	11.7	1.56	12.1 (13.2)	90.8 ( 99.0)	2.55 (2.35)
2	40	12.1	1.62	12.3 (13.4)	92.3 (100.0)	2.65 (2.45)
0	30	9.7†	1.30	12.8 (14.0)	95.7 (105.0)	2.31 (2.10)
2	30	11.0†	1.47	12.5 (13.4)	93.5 (100.0)	2.51 (2.31)

## 2:1 PERLITE CEMENT\*

0	30	14.4	1.93	11.1 (12.6)	82.7 ( 94.5)	3.18 (2.78)
0	40	14.9	1.99	11.2 (12.7)	83.5 ( 95.0)	3.30 (2.90)
2	30	15.8	2.11	10.9 (12.4)	81.8 ( 93.0)	3.37 (2.97)
2	40	16.2	2.16	11.0 (12.5)	82.6 ( 93.5)	3.49 (3.09)

\* – California.

\*\* – Values in parentheses are for 3,000 psi pressure.

† – 10 per cent salt water.

**METRIC UNITS**

**API CLASS G CEMENT**

**1:1 PERLITE CEMENT\***

---

Per Cent Bentonite	Per Cent Silica Flour	Water Requirement L/Sk	Slurry Weight** Kg/L	Slurry Volume L/Sk**
0	0	29.9	1.49 (1.67)	51.8 (46.1)
2	0	34.4	1.45 (1.61)	56.9 (51.2)
4	0	39.4	1.43 (1.56)	62.3 (56.6)
0	30	39.4	1.50 (1.63)	66.2 (60.6)
0	40	40.9	1.51 (1.64)	66.3 (64.0)
2	30	44.3	1.45 (1.58)	72.2 (66.5)
2	40	45.8	1.47 (1.61)	75.0 (69.4)
0	30	36.7†	1.53 (1.68)	65.4 (59.5)
2	30	41.6†	1.50 (1.61)	71.1 (65.4)

**2:1 PERLITE CEMENT\***

0	30	54.5	1.33 (1.51)	90.0 (78.7)
0	40	56.4	1.34 (1.52)	93.4 (82.1)
2	30	59.8	1.31 (1.49)	95.4 (84.1)
2	40	61.3	1.32 (1.50)	98.8 (87.5)

---

\* – California.

\*\* – Values in parentheses are for 20.68 MPa pressure.

† – 10 per cent salt water.