

50 Mud Weight Adjustments

Initial Mud Wt (ppg)	DESIRED MUD WEIGHT (PPG)																		
	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0	14.5	15.0	15.5	16.0	16.5	17.0	17.5	18.0	
9.0	29	59	90	123	156	192	229	268	308	350	395	442	490	542	596	653	714	778	
9.5	43	29	60	92	125	160	196	234	273	315	359	405	452	503	557	612	672	735	
10.0	85	30	30	61	93	128	164	201	239	280	323	368	414	464	516	571	630	691	
10.5	128	60	23	31	62	96	131	167	205	245	287	331	376	426	479	531	588	648	
11.0	171	90	46	19	31	64	98	134	171	210	251	294	339	387	437	490	546	605	
11.5	214	120	69	37	16	32	66	101	137	175	215	258	301	348	397	449	504	562	
12.0	256	150	92	56	32	14	33	67	103	140	179	221	263	310	357	408	462	518	
12.5	299	180	115	75	48	27	12	34	68	105	144	184	226	271	318	367	420	475	
13.0	342	210	138	94	63	41	24	11	34	70	108	147	188	232	278	327	378	432	
13.5	385	240	161	112	76	54	36	21	10	35	72	111	150	194	238	286	336	389	
14.0	427	270	185	131	95	68	48	32	19	9	36	74	113	155	199	245	294	345	
14.5	470	300	208	150	110	82	60	43	29	18	8	37	75	116	159	204	252	302	
15.0	513	330	231	169	126	95	72	54	39	26	16	8	37	77	119	163	210	259	
15.5	556	360	254	187	142	109	84	64	48	35	24	15	7	39	79	122	168	216	
16.0	598	390	277	206	158	123	96	75	58	44	32	23	14	40	81	126	172	216	
16.5	641	420	300	225	174	136	108	86	68	53	40	30	21	41	84	129	172	216	
17.0	684	450	323	244	189	150	120	96	77	62	49	38	28	42	86	129	172	216	
17.5	726	480	346	262	205	163	132	107	87	71	57	45	35	43	88	131	173	217	
18.0																			

Dilution or Cut Back: The gray section of the chart shows the number of barrels of water which must be added to 100 bbls of mud to produce the desired weight reduction.

Mud Weight Increase: The yellow section of the chart indicates the number of 100 lb sacks of barite which must be added to 100 bbls of mud to produce desired weight increases.

lb/gal	lb/ft ³	kg/m ³	Specific Gravity	Pressure Gradient (psi/ft)	Pressure Gradient (kPa/m)
8.34	62.38	999.3	1.00	0.434	9.8
8.5	63.58	1018.5	1.02	0.442	10.0
8.6	64.32	1030.5	1.03	0.447	10.1
8.7	65.07	1042.4	1.04	0.452	10.2
8.8	65.82	1054.4	1.05	0.458	10.4
8.9	66.57	1066.4	1.07	0.463	10.5
9.0	67.31	1078.4	1.08	0.468	10.6
9.1	68.06	1090.4	1.09	0.473	10.7
9.2	68.81	1102.3	1.10	0.478	10.8
9.3	69.56	1114.3	1.12	0.484	10.9
9.4	70.31	1126.3	1.13	0.489	11.1
9.5	71.05	1138.3	1.14	0.494	11.2
9.6	71.80	1150.3	1.15	0.499	11.3
9.7	72.55	1162.3	1.16	0.504	11.4
9.8	73.30	1174.2	1.18	0.510	11.5
9.9	74.05	1186.2	1.19	0.515	11.6
10.0	74.79	1198.2	1.20	0.520	11.8
10.1	75.54	1210.2	1.21	0.525	11.9
10.2	76.29	1222.2	1.22	0.530	12.0
10.3	77.04	1234.2	1.24	0.536	12.1
10.4	77.79	1246.1	1.25	0.541	12.2
10.5	78.53	1258.1	1.26	0.546	12.4
10.6	79.28	1270.1	1.27	0.551	12.5
10.7	80.03	1282.1	1.28	0.556	12.6
10.8	80.78	1294.1	1.29	0.562	12.7
10.9	81.53	1306.0	1.31	0.567	12.8
11.0	82.27	1318.0	1.32	0.572	12.9
11.1	83.02	1330.0	1.33	0.577	13.1
11.2	83.77	1342.0	1.34	0.582	13.2
11.3	84.52	1354.0	1.36	0.588	13.3
11.4	85.27	1366.0	1.37	0.593	13.4
11.5	86.01	1377.9	1.38	0.598	13.5
11.6	86.76	1389.9	1.39	0.603	13.6
11.7	87.51	1401.9	1.40	0.608	13.8
11.8	88.26	1413.9	1.41	0.614	13.9
11.9	89.01	1425.9	1.43	0.619	14.0
12.0	89.75	1437.8	1.44	0.624	14.1
12.1	90.50	1449.8	1.45	0.629	14.2
12.2	91.25	1461.8	1.46	0.634	14.4
12.3	92.00	1473.8	1.48	0.640	14.5
12.4	92.74	1485.8	1.49	0.645	14.6
12.5	93.49	1497.8	1.50	0.650	14.7
12.6	94.24	1509.7	1.51	0.655	14.8
12.7	94.99	1521.7	1.52	0.660	14.9
12.8	95.74	1533.7	1.53	0.666	15.1
12.9	96.48	1545.7	1.55	0.671	15.2
13.0	97.23	1557.7	1.56	0.676	15.3
13.1	97.98	1569.6	1.57	0.681	15.4
13.2	98.73	1581.6	1.58	0.686	15.5

lb/gal	lb/ft ³	kg/m ³	Specific Gravity	Pressure Gradient (psi/ft)	Pressure Gradient (kPa/m)
13.3	99.48	1593.6	1.60	0.692	15.6
13.4	100.22	1605.6	1.61	0.697	15.8
13.5	100.97	1617.6	1.62	0.702	15.9
13.6	101.72	1629.6	1.63	0.707	16.0
13.7	102.47	1641.5	1.64	0.712	16.1
13.8	103.22	1653.5	1.65	0.718	16.2
13.9	103.96	1665.5	1.67	0.723	16.4
14.0	104.71	1677.5	1.68	0.728	16.5
14.1	105.46	1689.5	1.69	0.733	16.6
14.2	106.21	1701.5	1.70	0.738	16.7
14.3	106.96	1713.4	1.72	0.744	16.8
14.4	107.70	1725.4	1.73	0.749	16.9
14.5	108.45	1737.4	1.74	0.754	17.1
14.6	109.20	1749.4	1.75	0.759	17.2
14.7	109.95	1761.4	1.76	0.764	17.3
14.8	110.70	1773.3	1.78	0.770	17.4
14.9	111.44	1785.3	1.79	0.775	17.5
15.0	112.19	1797.3	1.80	0.780	17.6
15.1	112.94	1809.3	1.81	0.785	17.8
15.2	113.69	1821.3	1.82	0.790	17.9
15.3	114.44	1833.3	1.84	0.796	18.0
15.4	115.18	1845.2	1.85	0.801	18.1
15.5	115.93	1857.2	1.86	0.806	18.2
15.6	116.68	1869.2	1.87	0.811	18.3
15.7	117.43	1881.2	1.88	0.816	18.5
15.8	118.18	1893.2	1.90	0.822	18.6
15.9	118.92	1905.1	1.91	0.827	18.7
16.0	119.67	1917.1	1.92	0.832	18.8
16.1	120.42	1929.1	1.93	0.837	18.9
16.2	121.17	1941.1	1.94	0.842	19.1
16.3	121.91	1953.1	1.96	0.846	19.2
16.4	122.66	1965.1	1.97	0.853	19.3
16.5	123.41	1977.0	1.98	0.858	19.4
16.6	124.16	1989.0	2.00	0.863	19.5
16.7	124.91	2001.0	2.01	0.868	19.6
16.8	125.65	2013.0	2.02	0.874	19.8
16.9	126.40	2025.0	2.03	0.879	19.9
17.0	127.15	2036.9	2.04	0.884	20.0
17.1	127.90	2048.9	2.05	0.889	20.1
17.2	128.65	2060.9	2.06	0.894	20.2
17.3	129.39	2072.9	2.08	0.900	20.3
17.4	130.14	2084.9	2.09	0.905	20.5
17.5	130.89	2096.9	2.10	0.910	20.6
17.6	131.64	2108.8	2.11	0.915	20.7
17.7	132.39	2120.8	2.12	0.920	20.8
17.8	133.13	2132.8	2.14	0.926	20.9
17.9	133.88	2144.8	2.15	0.931	21.1
18.0	134.63	2156.8	2.16	0.936	21.2
18.1	135.38	2168.8	2.17	0.941	21.3

lb/gal	lb/ft ³	kg/m ³	Specific Gravity	Pressure Gradient (psi/ft)	Pressure Gradient (kPa/m)
18.2	136.13	2180.7	2.18	0.946	21.4
18.3	136.87	2192.7	2.20	0.952	21.5
18.4	137.62	2204.7	2.21	0.957	21.6
18.5	138.37	2216.7	2.22	0.962	21.8
18.6	139.12	2228.7	2.23	0.967	21.9
18.7	139.87	2240.6	2.24	0.972	22.0
18.8	140.61	2252.6	2.26	0.978	22.1
18.9	141.36	2264.6	2.27	0.983	22.2
19.0	142.11	2276.6	2.28	0.988	22.3
19.1	142.86	2288.6	2.29	0.993	22.5
19.2	143.61	2300.6	2.30	0.998	22.6
19.3	144.35	2312.5	2.32	1.004	22.7
19.4	145.10	2324.5	2.33	1.009	22.8
19.5	145.85	2336.5	2.34	1.014	22.9
19.6	146.60	2348.5	2.35	1.019	23.1
19.7	147.34	2360.5	2.36	1.024	23.2
19.8	148.09	2372.4	2.38	1.030	23.3
19.9	148.84	2384.4	2.39	1.035	23.4
20.0	149.59	2396.4	2.40	1.040	23.5

Specifications for BOP Flanges, Ring Gaskets, and Flange Bolts & Nuts

Stack Rating	Approved Flanges	Approved Ring Gaskets	Bolt Spec.	Nut Spec.
2000 psi and 3000 psi	API type 6B with type R flat Bottom Groove	API Type RX	ASTM Grade B-7	ASTM Grade 2-H
5000 psi	API Type 6B with Type R Flat Bottom groove or API Type 6BX with Type BX Groove	API Type RX or API Type BX with Type 6BX Flange	ASTM Grade B-7	ASTM Grade 2-H
10,000 psi	API Type 6BX with Type BX Groove	API Type BX	ASTM Grade B-7	ASTM Grade 2-H

Bolt Size (In.)	Torque (Ft-Lb)
¾ - 10 UNC	200
7/8 - 9 UNC	325
1 - 8 UNC	475
1 1/8 - 8 UN	600
1 1/2 - 8 UN	1400
1 5/8 - 8 UN	1700
1 3/4 - 8 UN	2040
1 7/8 - 8 UN	3220

NOTE: Acceptable flange ring gasket material for sweet oil applications is low-carbon steel and for sour oil or gas is type 316 stainless or type 304 stainless steel. ASTM A-193 Grade B/M with a maximum Rockwell Hardness of 22 may be acceptable but should be derated as per Table 1.4B of API Spec 6A. Specifications as per API Spec 6A "Wellhead Equipment".