



Drilling Fluids, Inc.

## Commercial Chemical

# CALCIUM CHLORIDE

### Description

CALCIUM CHLORIDE ( $\text{CaCl}_2$ ) forms a neutral salt solution in water. The product is available in powdered, granular, and flaked form and ranges in purity from 73 to 98% by weight. CALCIUM CHLORIDE is also available as a premixed liquid in various concentrations up to saturation.

### Uses

CALCIUM CHLORIDE is used as an inhibitor to control active shale and clay dispersion. CALCIUM CHLORIDE can be used in polymer mud to minimize the formation of gas hydrates. CALCIUM CHLORIDE is used to retard the dissolution of massive salt sections and salt stringers. CALCIUM CHLORIDE can be used to balance the activity of the water phase in oil mud. CALCIUM CHLORIDE can be used as a weighting material up to 11.6 pounds per gallon plus additional weight/density can be obtained by using finely ground CALCIUM CHLORIDE in a saturated solution. In some applications, CALCIUM CHLORIDE is used as a bridging agent for lost circulation in saturated salt systems.

### Benefits

In water-based fluids the high calcium and chloride content of CALCIUM CHLORIDE makes this a very inhibitive fluid. The density range of CALCIUM CHLORIDE makes it possible to use clear like brine up to 11.6 pounds per gallon with a very economical fluid.

In GEO MUL oil-based systems CALCIUM CHLORIDE is an effective means of providing high chloride ion concentration levels in the aqueous phase for balanced-activity mud systems for maximum shale stability.

### Treatment

CALCIUM CHLORIDE is added to water to provide the desired specific gravity or chloride content. Drilling conditions and mud system requirements dictate concentration levels. CALCIUM CHLORIDE is soluble up to a density of 11.6 pounds per gallon in water. See chart on following page.



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## **CALCIUM CHLORIDE (Continued)**

**Function**

CALCIUM CHLORIDE in water-based fluids can provide higher density at saturation than can be attained with either Sodium Chloride (NaCl) or Potassium Chloride (KCl). This product is an inexpensive alternative to the more expensive and environmentally undesirable Bromide Salts or Zinc Chloride.

**Typical Physical Properties**

Physical Appearance ....flaked, granular, powder, or liquid  
Specific Gravity .....2.15  
Bulk Density .....51-60lb/ft<sup>3</sup>  
Hygroscopic: .....yes (extremely)  
Solubility in water: .....192 pounds per barrel at 68°F  
39.4% by weight

**Safe Handling Recommendations**

CALCIUM CHLORIDE is extremely hygroscopic and corrosive. Utilize normal precautions for employee protection when handling chemical products. Use of appropriate respirator, gloves, goggles, and apron is recommended for employee comfort and protection. See Material Safety Data Sheet (MSDS) for this product prior to use.

Protect from moisture.

Transportation of CALCIUM CHLORIDE is not restricted by international or domestic regulatory agencies.

**Packaging**

CALCIUM CHLORIDE is packaged in 80 lb (36.3 kg) and 100 lb (45.4 kg) moisture-proof multi-wall bags. CALCIUM CHLORIDE is also sold as a liquid at a variety of densities.



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Chlorides Chart  
94%-97% CaCl<sub>2</sub>

## Calcium Chloride (Continued)

CaCl <sub>2</sub> Concentration (% by weight)	Density (ppg)	CaCl <sub>2</sub> per finished barrel (ppb)	Percent Volume to Start	Ca+ (mg/l)	Cl- (mg/l)	CaCl <sub>2</sub> (mg/l)
0.90%	8.4	3	99.70%	5,485	3,100	8,585
2.20%	8.54	10.75	99.45%	14,403	8,141	22,544
3.60%	8.6	13	99.20%	23,569	13,322	36,891
4.60%	8.68	18.2	99.07%	30,070	16,996	47,066
5.50%	8.75	22.02	98.93%	36,780	20,789	57,569
6.50%	8.8	24	98.80%	43,487	24,580	68,067
7.40%	8.9	29.86	98.47%	50,132	28,336	78,467
8.30%	8.97	33.85	98.13%	56,770	32,088	88,858
9.30%	9	35	97.80%	63,543	35,916	99,459
11.90%	9.2	46	97.10%	82,352	46,548	128,901
14.70%	9.4	58	96.20%	103,379	58,433	161,812
16.00%	9.5	63.78	95.60%	114,636	64,796	179,431
17.40%	9.6	70	95.00%	126,246	71,358	197,604
19.70%	9.8	81	94.30%	145,589	82,291	227,880
22.40%	10	94	93.10%	168,366	95,166	263,532
24.70%	10.2	106	91.90%	189,294	106,995	296,289
27.00%	10.4	118	91.20%	210,188	118,805	328,993
29.20%	10.6	130	90.00%	231,093	130,621	361,714
30.30%	10.7	134.6	89.65%	243,521	137,646	381,168
31.30%	10.8	142	89.30%	256,342	144,892	401,234
33.30%	11	154	87.80%	277,537	156,873	434,410
35.50%	11.2	167	86.40%	300,724	169,979	470,703
37.60%	11.4	180	85.40%	323,912	183,085	506,998
39.40%	11.6	192	84.30%	345,400	195,231	540,632