PELADOW DG Calcium Chloride

General Description

PELADOW* DG calcium chloride is an almond shaped, briquetted, 91% (min.) calcium chloride product.

Applications

PELADOW DG calcium chloride is a specially designed product for the dehydration of both gas and liquid hydrocarbons such as natural gas, LPG, kerosene, and diesel fuel.
In addition to hydrocarbons, PELADOW DG has been used to dry chlorinated solvents and air.

How It Works

Typically, PELADOW DG calcium chloride dryers operate in an upflow configuration. Wet hydrocarbon flows upward through the bed. As water is removed, calcium chloride becomes increasingly hydrated until a liquid brine forms. The brine is heavier than most hydrocarbons and therefore, flows downward through the bed. Brine accumulates in the bottom of the dryer and is removed for disposal as needed. PELADOW DG is consumed from the bottom up. Ideally, the bed settles as this occurs, diminishing the bed depth over time. Typically, operation can continue until about 80% of the bed is depleted. At this time, the dryer must be recharged by topping off with fresh product. For more information on the properties of calcium chloride, refer to the back of this page.

Availability

PELADOW DG calcium chloride is available in 400 pound drums and 2,100 pound sacks.

Typical Physical Properties

Appearance	White almond shaped briquettes
Odor	None
Sieve Analysis	89% min. > 1/2 inch 3% max. < 1/4 inch
Bulk Density	60-68 lbs. / cu. ft.
Briquette Density	1.86-1.88 g/cc
Briquette Porosity	15-20%
Bed Void Space (Loose Fill)	45-50%
Briquette Size	Approx. 0.7” thick at thickest point, 1.1” length
Angle of Repose	28°

Safety and Handling

For brief contact, no precautions other than clean body-covering clothing should be needed. Selection of specific items such as goggles, gloves, and apron will depend on the operation. Eye/face protection is recommended for dusty operations or when handling solutions.

Appropriate ventilation should be in place to keep atmospheric levels below industrial hygiene guidelines (Dow IHG for calcium chloride is 10 mg/cu. meter).

Rubber boots and gloves are recommended, due to the adverse effect of calcium chloride on leather.

Consult authorities for proper disposal information.

For full safety and handling details, contact The Dow Chemical Company for a current copy of the Material Safety Data Sheet for this product.

For more information contact The Dow Chemical Company Customer Information Center at 1-800-447-4369.

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Different Phases of Calcium Chloride

The phase diagram for pure calcium chloride shows that different levels of hydration exist in the solid phase, depending on temperature and total water content. These levels of hydration can be represented by four chemical formulas:

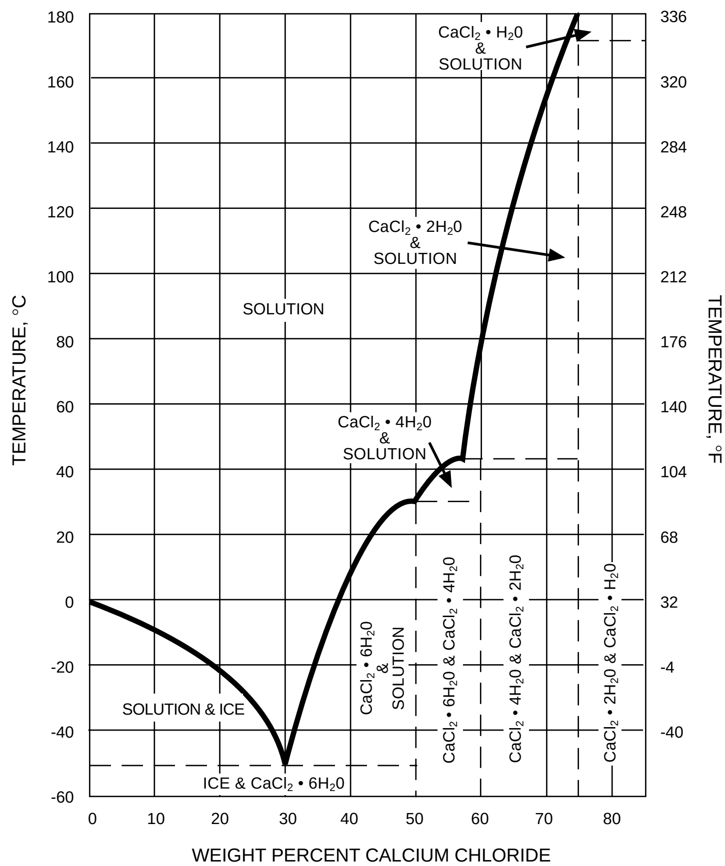
- Calcium chloride hexahydrate, ($CaCl_2 \bullet 6H_2O$)
- Calcium chloride tetrahydrate, ($CaCl_2 \bullet 4H_2O$)
- Calcium chloride dihydrate, ($CaCl_2 \bullet 2H_2O$)
- Calcium chloride monohydrate, ($CaCl_2 \bullet H_2O$)

A phase diagram is helpful in understanding the chemical changes that take place as composition and temperature vary.

Properties of Calcium Chloride Hydrates

The table below provides physical property information for calcium chloride and its hydrates. With the exception of the hexahydrate salt, note that heat is released when calcium chloride comes in contact with water, (Heat of Solution data). In most dehydration applications, the quantity of water being absorbed at any given time is not large enough for this heat effect to be observable. However, if water is used to wash out equipment containing partially hydrated calcium chloride, care should be taken to make sure that the resulting brine temperature does not increase high enough to create a hazard.

Phase Diagram of the $CaCl_2$ and Water System



Property	$CaCl_2 \bullet 6H_20$	$CaCl_2 \bullet 4H_20$	$CaCl_2 \bullet 2H_20$	$CaCl_2 \bullet H_20$	$CaCl_2$
Composition (% $CaCl_2$)	50.66	60.63	75.49	86.03	100
Molecular Weight	219.09	183.05	147.02	129	110.99
Melting Point[1] (°C) (°F)	29.9 85.8	45.3 113.5	176 349	187 369	773 1424
Boiling Point[2] (°C) (°F)	– –	– –	174 345	183 361	1935 3515
Density at 25°C (77°F), g/cm[3]	1.71	1.83	1.85	2.24	2.16
Heat of Fusion (cal/g) (Btu/lb)	50 90	39 70	21 38	32 58	61.5 110.6
Heat of Solution[3] in H_20 (cal/g) (to infinite dilution) (Btu/lb)	17.2 31.0	-14.2 -25.6	-72.8 -131.1	-96.8 -174.3	-176.2 -317.2
Heat of Formation[3] at 25°C (77°F), kcal/mole	-623.3	-480.3	-335.58	-265.49	-190.10
Heat Capacity at 25°C (77°F), cal/g °C, or Btu/lb °F	0.34	0.32	0.28	0.20	0.16

1 Incongruent melting point for hydrates.
2 Temperature where dissociation pressure reaches one atmosphere for hydrates.
3 Negative sign means that heat is evolved (process exothermic).

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