



CHEMICALS PRODUCTS

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TEI EUROPE INDUSTRY OF EPI GROUP oil and gas Division Services Company, focused on completion fluids and associated products and services, water management, frac flow back, production well testing, offshore rig cooling, compression services and equipment, and selected offshore services including well plugging and abandonment, decommissioning, and diving.

EPI GROUP TEI Chemicals



EPI GROUP TEI & Partners continues to be a dominant force in the calcium chloride market as a major, vertically integrated producer, marketer, and distributor. We have set up our supply network of terminals and warehouses in order to adequately meet our customer's need for this versatile product and to be close to where our customers are. **EPI GROUP TEI & Partners** is also the only fluids companies to manufacture bromine-based brines.

- ❖ **Bromides**
- ❖ **Potassium Chloride**
- ❖ **Phosphates**
- ❖ **Calcium Chloride**
- ❖ **Dry Calcium Chloride**
- ❖ **Liquid Calcium Chloride**
- ❖ **Calcium Chloride Applications**
- ❖ **Agricultural Nutrients**
- ❖ **Liquid Calcium Chloride (Technical Grade - Road Grade - Food Grade)**
- ❖ **Solid Calcium Chloride (Technical Grade - Road Grade - Food Grade)**
- ❖ **Oil and Gas Drilling**
- ❖ **Mining Industry**
- ❖ **Gas and Solvent Drying**
- ❖ **Tire Weighting**
- ❖ **Fluoride Removal**
- ❖ **Enzyme Production**
- ❖ **Dehumidification**
- ❖ **Concrete Acceleration**
- ❖ **Chemical Heating**
- ❖ **Dust Binding**
- ❖ **Distilleries**
- ❖ **De-Icing**

EPI GROUP TEI Chemicals



EPI GROUP TEI & Partners is the leading worldwide producer and marketer of calcium chloride. The companies **EPI GROUP TEI & Partners** has seven North American and three European calcium chloride production facilities and a significant global marketing presence. In addition to calcium chloride, **EPI GROUP TEI & Partners** also produces a number of brominated products calcium bromide, sodium bromide, and zinc bromide for use in oilfield and water treatment applications.



Bromides



Bromine & Derivatives

EPI GROUP TEI & Partners manages all aspects of extensive bromide feedstock sourcing and conversion activities. Our calcium bromide, sodium bromide, zinc bromide and bromide based Bio Rid products are available to meet a number of industrial chemical needs, including: microbiological control, flame retardants, bromine donation, and chlorinated solvent replacement.

Drilling and completion fluids are generally blended and sold through **EPI GROUP TEI & Partners** Chemicals. Elemental bromine, chlorinated solvent replacements, biocides and other bromine derivatives are available through the Bromine & Derivatives marketing team.

BioRid 40i BIOCIDES

Product Data Sheet

General Description

BioRid® 40i biocide, a clear brine fluid, is an aqueous sodium bromide solution.

Applications

BioRid 40i biocide is intended for use as a disinfectant, sanitizer, slimicide, bactericide, algicide, fungicide, and molluscicide in the following applications:

- pulp and paper mills;
- waste water treatment systems;
- air wash water systems;
- re-circulating and once-through cooling water systems;
- evaporative condenser systems;
- sewage systems;
- heat exchanger systems;
- industrial processing water;
- industrial scrubbing systems;
- domestic and commercial non-potable water systems;
- influent systems and waste water systems for the control of aquatic environmental bacteria;
- slime forming algae; and
- bacteria, fungi and related odors.

BioRid 40i biocide must be used in combination with an oxidizer such as sodium hypochlorite (12.5%) or chlorine gas (99%) to produce hypobromous acid.

Availability

BioRid 40i biocide is available from West Memphis, AR.

Safety and Handling

BioRid 40i biocide is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. A respirator is not indicated under normal operating conditions. For misty conditions, wear a NIOSH-approved mist respirator. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Clear, colorless solution
Odor	Odorless
Assay	39 to 41% by weight NaBr
Crystallization Temperature	-21°F (-29.4°C)
Flash Point	None
Boiling Point	212°F (100°C) to 233.6°F (112°C)
Turbidity	6 NTU maximum
Density @ 20°C	11.65 lb/gal minimum

CHEMICAL PROPERTIES

Chemical	NaBr
pH (1:10 dilution)	7.0 to 8.0
Iron	10 mg/kg
Hardness	25 mg/kg

BioRid 46i BIOCIDES

Product Data Sheet

General Description

BioRid® 46i biocide, a clear brine fluid, is an aqueous sodium bromide solution.

Applications

BioRid 46i biocide is intended for use as a disinfectant, sanitizer, slimicide, bactericide, algaecide, fungicide, and molluscicide in the following applications:

- pulp and paper mills;
- waste water treatment systems;
- air wash water systems;
- re-circulating and once-through cooling water systems;
- evaporative condenser systems;
- sewage systems;
- heat exchanger systems;
- industrial processing water;
- industrial scrubbing systems;
- domestic and commercial non-potable water systems;
- influent systems and waste water systems for the control of aquatic environmental bacteria;
- slime forming algae; and
- bacteria, fungi and related odors.

BioRid 46i biocide must be used in combination with an oxidizer such as sodium hypochlorite (12.5%) or chlorine gas (99%) to produce hypobromous acid.

Availability

BioRid 46i biocide is available from West Memphis, AR.

Safety and Handling

BioRid 46i biocide is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. A respirator is not indicated under normal operating conditions. For misty conditions, wear a NIOSH-approved mist respirator. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Clear, colorless solution
Odor	Odorless
Assay	44 to 47% by weight NaBr
Crystallization Temperature	27 to 65°F (-3 to 18°C)
Flash Point	None
Boiling Point	212°F (100°C) to 233.6°F (112°C)
Turbidity	6 NTU maximum
Density @ 20°C	12.45 lb/gal minimum

CHEMICAL PROPERTIES

Chemical	NaBr
pH (1:10 dilution)	7.0 to 8.0
Iron	10 mg/kg
Hardness	25 mg/kg

CALCIUM BROMIDE 14.2 CLEAR BRINE FLUID (CBF)

Product Data Sheet

General Description

Calcium bromide is a single salt (CaBr_2) clear brine fluid with a density of 14.2 pounds per gallon. Calcium bromide has the following feature and benefits:

- It is nondamaging to the formation,
- It is thermally and chemically stable,
- It can be blended with other solutions containing bromides and chlorides, and
- It contains a minimum of 52% (by weight) calcium bromide in solution.

Applications

Calcium bromide can be used with calcium chloride brines and dry calcium chloride to formulate nondamaging fluids of densities from 11.7 lb/gal to 15.1 lb/gal.

Availability

Calcium bromide is available from a variety of Gulf Coast plant locations.

Safety and Handling

Calcium bromide is a strong salt solution. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium bromide can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium bromide wastes, consult the appropriate local regulatory authorities.

Storage: Epoxy-lined tanks

PHYSICAL PROPERTIES

Color	30 APHA maximum
Clarity	Clear
Odor	None
Assay	52% by weight CaBr_2
Crystallization Temperature	20°F (-7°C)
Turbidity	6 NTU maximum
Bulk Density	14.2 lb/gal

CHEMICAL PROPERTIES

Chemical	CaBr_2
pH	7.0

SODIUM BROMIDE SOLUTION CLEAR BRINE FLUID (CBF)

Product Data Sheet

General Description

Sodium bromide (NaBr) is a single salt clear brine fluid. It is available in 40% to 46% concentration.

Applications

Being a source of bromine, sodium bromide has various applications.

Some them are as follows:

- Because of its density, sodium bromide is used as a completion, work-over and packer fluid in oilfield applications.
- When used with an oxidizer, such as sodium hypochlorite, sodium bromide is an excellent biocide. It has wide industrial applications, including water treatment and pulp & paper manufacturing.
- Other applications for sodium bromide also include photography and medicines.

Availability

Sodium bromide is available in drums, totes, and bulk quantity from different storage facilities around the United States.

Safety and Handling

Sodium bromide is a strong salt solution. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since sodium bromide can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for sodium bromides wastes, consult the appropriate local regulatory authorities.

PHYSICAL PROPERTIES

Appearance	Colorless Solution
Clarity	Clear
Odor	Slight
Assay	40% to 46% by weight NaBr
Crystallization Temperature	-21°F (-29.4°C) to 50°F (10°C)
Flash Point	None
Boiling Point	212-234°F (100-112°C)
Bulk Density @ 70°F (21°C)	11.6 to 12.6 lb/gal

CHEMICAL PROPERTIES

Chemical	NaBr
pH (1:10 dilution)	6.5 to 7.5

ZINC/CALCIUM BROMIDE 19.2 CLEAR BRINE FLUID (CBF)

Product Data Sheet

General Description

Zinc/calcium bromide is a two salt ($\text{CaBr}_2/\text{ZnBr}_2$) clear, solids-free brine fluid with a density of 19.2 pounds per gallon. It is used in completion fluids and offers the following features and benefits:

- It is non-damaging to the formation,
- It is thermally and chemically stable, and
- It can be blended with other solutions containing bromides and chlorides.

Applications

Zinc/calcium bromide can be used with other bromides and chlorides to prepare non-damaging fluids with densities ranging from 15.1 lb/gal to 19.2 lb/gal.

Availability

Zinc/calcium bromide is available in tank truck quantities from West Memphis, AR and a variety of Gulf Coast plant locations.

Safety and Handling

Zinc/calcium bromide is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. A respirator is not indicated under normal operating conditions. For misty conditions, wear a NIOSH-approved mist respirator. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Color	Straw to clear, transparent
Clarity	Clear
Odor	Odorless
Assay	19.0 to 22.0% by weight CaBr_2
Assay	52.0% to 55.0% by weight ZnBr_2
Crystallization Temperature	16°F (-9°C)
Bulk Density	19.2 pounds per gallon

CHEMICAL PROPERTIES

Chemical	$\text{CaBr}_2/\text{ZnBr}_2$
pH (1:10)	5.0 to 7.0

ZINC BROMIDE 19.2 CLEAR BRINE FLUID (CBF)

Product Data Sheet

General Description

Zinc bromide is a clear, solids-free brine fluid with a minimum density of 19.2 pounds per gallon. It is used in completion fluids and offers the following features and benefits:

- It is non-damaging to the formation,
- It is thermally and chemically stable, and
- It can be blended with other solutions containing bromides and chlorides.

Applications

Zinc bromide can be used with other bromides and chlorides to prepare non-damaging fluids with densities ranging from 15.1 lb/gal to 19.2 lb/gal.

Availability

Zinc bromide is available from West Memphis, AR and a variety of Gulf Coast plant locations.

Safety and Handling

Zinc bromide is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. A respirator is not indicated under normal operating conditions. For misty conditions, wear a NIOSH-approved mist respirator. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Color	Straw to clear, transparent
Clarity	Clear
Odor	Odorless
Assay	72% to 80% by weight ZnBr ₂
Crystallization Temperature	16°F (-9°C)
Bulk Density	19.2 pounds per gallon

CHEMICAL PROPERTIES

Chemical	ZnBr ₂
pH (1:10)	5.0 to 7.0

Potassium Chloride



Many different pharmaceutical applications

- Natural origin
- high-purity
- particularly low content of secondary salts
- complies with the European and US-American pharmacopoeias (Ph. Eur. and USP)

Recommendations of use

KCl 99.7% - 99.9 % Ph. Eur., USP is used for the production of infusion and hemodialysis solutions, as well as standard injections, for enteral and parenteral nutrition, for potassium tablets, dietary salts, sports nutrition and mineral drinks. Our pharmaceutical grade salt is also used for purifying insulin. In biotechnology it is used as a source of the macronutrient potassium for micro-organisms. Beyond that, it is also used as a raw material in the production of cosmetic substances.

Limits for Potassium Chloride in the relevant regulations

Parameter	Ph. Eur.	USP
Content (dried substance)	99.0 – 101.0 %	99.0 – 100.5 %
Appearance	white or almost white, crystalline powder or colourless crystals	-
Solubility	freely soluble in water, practically insoluble in anhydrous ethanol	-
Identification	it gives the characteristic reactions of chlorides and potassium	a solution (1 in 20) responds to the tests for Potassium and for Chloride
Appearance of solution	clear and colourless	-
Acidity or alkalinity	≤ 0.5 ml 0.01 M HCl or 0.01 M NaOH	no pink color with phenolphthalein, pink color after addition of 0.30 ml of 0.020 N NaOH
Bromides	≤ 0.1 %	≤ 0.1 %
Iodides	no blue colour	≤ 50 mg/kg
Sulphates	≤ 300 mg/kg	-
Aluminium	≤ 1 mg/kg haemodialysis solutions	≤ 1 mg/kg haemodialysis solutions
Barium	no opalescence with dilute H ₂ SO ₄	-
Iron	≤ 20 mg/kg	-
Magnesium and alkaline-earth metals as Ca	≤ 200 mg/kg	no turbidity with ammonia, ammonium oxalate and dibasic sodium phosphate
Sodium	≤ 0.1 % parenteral dosage forms, haemodialysis solutions	a solution (1 in 20), tested on a platinum wire, does not impart a pronounced yellow color to a nonluminous flame
Heavy metals	≤ 10 mg/kg	≤ 10 mg/kg
Loss on drying	≤ 1.0 %	≤ 1.0 %
Residual solvents	meets CHMP/ICH/82260/2006	meets test <467>
-: not specified		

Potassium Chloride 99.9 % KCl

Ph. Eur., USP

Purity and properties correspond to the requirements of the a.m. regulations (see enclosed table for values/limits)

Version 11.0

Printing date 2016-05-02

Combined nomenclature: 31,042,090

Nature of Product: white crystals

Chemical Analysis:	w	typical
• KCl, calculated with reference to the dried substance	%	99.9
• Loss on Drying (2 h, 105°C)	%	0.1
• Na	mg/kg	40
• Mg	mg/kg	10
• Ca	mg/kg	5
• SO ₄	mg/kg	20

Granulometry:	typical
• < 0.8 mm	99 %
• d ₅₀	0.35 mm

Physical Properties:	
• Bulk Density	ca. 1,100 kg/m ³
• Bulk Density (packed)	ca. 1,250 kg/m ³
• Angle of Repose	ca. 30 °
• Molecular Weight	74.55 g/mol
• Density	1.989 g/cm ³
• Melting / Solidification Point	770 °C
• Solubility in water	w (KCl) = 25.5 % 20 °C (68 °F)

Upon request:

- Addition of an anti-caking agent (the pure product is prone to caking)
- Special sieving

Shelf life:

- Retest date: 3 years after production

Packaging:

- FFS-PE bags 25 kg
- Big Bags

Application:

In the pharmaceutical industry, especially for dialysis and infusion solutions as well as for standard injections, tablets, enteral and parenteral nutrition.

Phosphates



EPI GROUP TEI & Algerian Partners is one of the largest mining companies in Algeria. In its operations phosphate mining, iron and pozzolan, and uses the latest technologies and processes , research excellence , employs skilled men , honest and motivated.

SPECIFICATIONS PHOSPHATE 63/65% BPL

Elements	Density %
Anhydride Phosphorique (P ₂ O ₅)	29 - 29,70
Anhydride Carbonique (CO ₂)	7,2 - 7,8
Anhydride (SO ₃)	2,50 - 3,00
Oxyde de Calcium (CaO)	48,30 - 49,00
Oxyde de Magnésium (MgO)	1,10 - 1,50
Oxyde de Fer (Fe ₂ O ₃)	0,35 - 0,40
Oxyde d'Aluminium (Al ₂ O ₃)	0,35 - 0,40
Oxyde de Sodium (Na ₂ O)	1,10 - 1,20
Oxyde de Potassium (K ₂ O)	0,09 - 0,10
Oxyde de Silicium (SiO ₂)	2,50 - 3,00
Humidité (H ₂ O)	0,90 - 1,00
Perte au feu (CO ₂ Déduit)	2,80 - 3,20
Fluor (F)	3,50 - 3,60
Chlore (Cl) en ppm	400 - 500
C.Organique	0,10 - 0,20
P ₂ O ₅ Soluble dans l'acide citrique à 2 %	10,00 - 11,00
P ₂ O ₅ Soluble dans l'acide formique à 2 %	18,00 - 21,00

SIZING ANALYSIS

Micron Diameter	%
200	72,83
160	13,77
125	6,58
100	2,21
80	3,11
< 80	1,50
total	100

SPECIFICATIONS PHOSPHATE 66/68 % BPL

Elements	Density %
P ₂ O ₅	30 - 30,2
CO ₂	6,00 - 6,30
SO ₃	2,50 - 3,00
CaO	50,00 - 51,00
MgO	0,75 - 1,00
Fe ₂ O ₃	0,30 - 0,40
Al ₂ O ₃	0,40 - 0,50
Na ₂ O	1,10 - 1,30
K ₂ O	0,07 - 0,10
SiO ₂	2,00 - 2,50
Humidity (H ₂ O)	0,50 - 2,00
Loss of Ignition (LOI)	2,50 - 3,00
Fluor (F)	3,65 - 3,80
Chlore (Cl) ppm	400 - 500
Organic C	0,10 - 0,20
P ₂ O ₅ Soluble in 2 % citric acid	9,00 - 10,00
P ₂ O ₅ Soluble in 2 % formic acid	18,00 - 20,00

SIZING ANALYSIS

Micron Diameter	%
200	60,05
160	18,99
125	13,72
100	4,30
80	1,16
< 80	1,78
Total	100



Calcium Chloride

CALCIUM CHLORIDE



With our proprietary manufacturing process and high quality raw materials, we produce the highest quality calcium chloride products available in North America. By using food grade quality hydrochloric acid and high purity limestone as raw materials, we are able to deliver calcium chloride with very low levels of alkali metals, iron, and other impurities.

Dry Calcium Chloride



With our proprietary manufacturing process and high quality raw materials, we produce the highest quality calcium chloride products available in North America. By using food grade quality hydrochloric acid and high purity limestone as raw materials, we are able to deliver calcium chloride with very low levels of alkali metals, iron, and other impurities.

BRINERS GRADE CALCIUM CHLORIDE

Product Data Sheet

General Description

Briners Grade calcium chloride (CaCl_2) is a white, odorless, high quality granular calcium chloride with 93 to 97 weight percent CaCl_2 .

Applications

Briners Grade calcium chloride is used by canners and processors during the post-harvest treatment of fruits and vegetables to increase firmness and prevent breakup during processing and cooking. When dissolved in potable water and filtered, Briners Grade meets the FCC requirements for aqueous solutions of calcium chloride.

Uses of Briners Grade calcium chloride include:

Pickles. Placing fresh cucumbers in a solution containing .5% calcium chloride and 7.0% sodium chloride reduces softening during fermentation.

Apples. Immersing apples in a solution containing 3.0 to 8.0% calcium chloride reduces cork spotting and bitter-pit problems.

Cherries. Brining sweet cherries in a solution containing 2.5 to 4.0% calcium chloride preserves their firmness.

Olives. Brining black ripe and Greek olives in a solution containing 0.5 to 1.0% calcium chloride maintains their firmness.

Availability

Briners Grade calcium chloride is packaged in 50lb bags, 50 bags per pallet, and is available to ship from facility .

Safety and Handling

Briners Grade calcium chloride generates considerable heat when mixed with water. In solid or solution form, this product may irritate or burn eyes and is a skin, ingestion, and inhalation irritant. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium chloride can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium chloride wastes, consult the appropriate local regulatory authorities.

CHEMICAL PROPERTIES

Chemical	CaCl_2
Appearance	White granule
Odor	None
Assay	Typically 93 to 97% by weight CaCl_2
Bulk Density	Approx. 47-51 lb/cubic foot
pH	7.0 to 10.5 (at 5 to 38% wt solutions)

TYPICAL ANALYSIS*

Calcium Chloride	$\geq 93\%$ by weight
Magnesium and Alkali Salts	$\leq 5\%$ by weight
Fluoride (as F)	≤ 40 mg/kg
Heavy Metals (including Pb)	≤ 20 mg/kg
Lead (Pb)	≤ 5 mg/kg
Arsenic (as As)	≤ 3 mg/kg

*impurities based on 100% CaCl_2 basis

TYPICAL SCREEN ANALYSIS

Screen Number:	Cumulative Wt. %, Retained	
	Minimum	Maximum
6 (3.36mm)	0.0	10.0
16 (1.19mm)	40.0	100.0
20 (0.81mm)	85.0	100.0

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EXPRESS CALCIUM CHLORIDE

Product Data Sheet

General Description

EXPRESS® calcium chloride (CaCl_2) is a white, premium anhydrous, high purity mini-pellet with 93 to 97 weight percent CaCl_2 .

EXPRESS exhibits the following features and benefits:

- It is fast dissolving,
- It is low dusting,
- It is a free flowing pellet, and
- It contains very low levels of impurities.

Applications

EXPRESS calcium chloride is widely used in oilfield applications such as completion and workover fluids to increase density, in cementing as an accelerator, and in the water phase of oil-based drilling muds.

EXPRESS calcium chloride is also suitable for ready mix concrete acceleration, dust stabilization on unpaved roads, tire weighting, brine refrigeration, and non-potable water treatment, and other industrial and commercial applications.

Availability

EXPRESS PACKAGING

Package	Pallet Size	Units/ Pallet	Pallets/ Truckload
50 lb Plastic Bag	40x48	50	17
1000 kg Bulk Bag	44x44	1	19

Safety and Handling

EXPRESS calcium chloride generates considerable heat when mixed with water. In solid or solution form, this product may irritate or burn eyes and is a skin, ingestion, and inhalation irritant. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium chloride can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium chloride wastes, consult the appropriate local regulatory authorities.

CHEMICAL PROPERTIES

Chemical	CaCl_2
Appearance	White mini-pellet
Odor	None
Assay	93 to 97% by weight CaCl_2
Bulk Density	Approx. 47-51 lb/cubic foot
pH	7.0 to 10.5 (at 5 to 38% solution)

TYPICAL ANALYSIS*

Calcium Chloride	93% minimum
Magnesium and Alkali Salts	5% maximum
Moisture	4% maximum
Other Impurities	0.40% maximum

*impurities based on 100% CaCl_2 basis

TYPICAL SCREEN ANALYSIS

Screen Number:	Cumulative Wt. %, Retained	
	Minimum	Maximum
6 (3.36mm)	0.0	10.0
16 (1.19mm)	40.0	100.0
20 (0.81mm)	85.0	100.0

Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED. Further, nothing contained herein shall be taken as a recommendation to manufacture or use any of the herein described materials or processes in violation of existing or future patents.

FLAKE DRY CALCIUM CHLORIDE

Product Data Sheet

General Description

Flake calcium chloride is a white, flaked, dihydrate product with 77 weight percent calcium chloride.

Applications

Chemical Industry. Provides good source of soluble calcium

Oilfield. Can be used as fluid for drilling, cementing, and workover operations

Ready Mix Concrete. Accelerates setting times

Snow and Ice Melting. Facilitates deicing on highways and pavement

Soil Conditioning. Stabilizes roadbeds and facilitates salt remediation

Availability

FLAKE PACKAGING			
Package	Pallet Size	Units/ Pallet	Pallets/ Truckload
50 lb Plastic Bag 1000 kg Bulk Bag	A variety of palletization and stow options are available.		

Flake is made in the USA.

Safety and Handling

Flake dry calcium chloride when in solution forms a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Chemical Formula	CaCl ₂ · 2H ₂ O
Appearance	White flakes
Bulk Density	Approx. 50 lb/cubic foot

CHEMICAL PROPERTIES

Calcium Chloride (CaCl ₂)*	77 wt% minimum
Total Alkali Chlorides as NaCl**	6.0 % maximum
Total Magnesium Chloride (MgCl ₂)**	0.5% maximum

*EDTA titration similar to ASTM E449-08

**Active ingredient basis

PARTICLE SIZE

Screen Number:	Mass % Passing
3/8 (9.5 mm)	100
4 (4.75 mm)	80-100
30 (0.59 mm)	0-5

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Product Data Sheet

General Description

94™ calcium chloride (CaCl_2) is a white, high purity pellet with 94 to 97 weight percent CaCl_2 .

It has the following features when compared to its nearest competitor:

- When sprayed, the faceted shape of pellets makes them more controllable than round pellets that often bounce and roll.
- Higher concentration of calcium chloride gives a higher heat of dissolution, promoting faster melting and higher penetration rate as a deicer.

Applications

94 calcium chloride is the premier deicer for sidewalks, parking lots and driveways. This high energy deicer should be sprinkled lightly and evenly over ice surfaces at an application rate of about 2 pounds per 200 square feet. (Note: a one pound coffee can holds approximately 2 pounds of 94.) Thawing begins immediately. As soon as ice is melted, slush and water should be promptly removed to prevent refreezing. (See warnings below.)

Availability

TETRA 94 PACKAGING

Package	Pallet Size	Units/ Pallet	Pallets/ Truckload
25 lb Plastic Bag	40x48	100	16
50 lb Plastic Bag	40x48	56	15
80 lb Plastic Bag	40x48	35	15
25 kg Plastic Bag	40x48	42	18
100 lb Box	45x45	18	23
2000 lb Bulk Bag	45x45	1	21

Safety and Handling

94 calcium chloride when in solution is a strong salt solution. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium chloride can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium chloride wastes, consult the appropriate local regulatory authorities.

CHEMICAL PROPERTIES

Chemical	CaCl_2
Appearance	White granule
Odor	None
Assay	94 to 97% by weight CaCl_2
Bulk Density	Approx. 55 lb/cubic foot
pH	7.0 to 10.5 (at 5 to 38% wt solutions)

TYPICAL ANALYSIS*

Calcium Chloride	> 94% by weight
Alkali Chlorides (as NaCl)	< 2% by weight
Total Magnesium (as MgCl_2)	< 0.1% by weight
Other Impurities (not H_2O)	< 1% by weight
Iron (Fe)	< 15 mg/kg
Heavy Metal (including Pb)	< 20 mg/kg
Lead (Pb)	< 5 mg/kg

*impurities based on 100% CaCl_2 basis

TYPICAL SCREEN ANALYSIS

Screen Number	
4 (4.76 mm)	100% passing by weight
8 (2.38 mm)	0-40% passing by weight
40 (0.42 mm)	0-4% passing by weight

Warnings: The cycle of refreezing and thawing by natural weather elements can cause damage to concrete. The use of an ice melting agent increases these cycles, a factor over which we have no control. All deicers may be harmful to concrete surfaces. Independent testing shows that these pellets contribute less to concrete scaling than other commonly used deicers. Use this product on properly cured, air-entrained concrete only. Calcium chloride is not recommended on use of concrete that is less than one year old. If this product is used on concrete of questionable quality or in excessive amounts, there may be surface flaking and scaling. When grass and shrubbery are adjacent to icy surfaces, particular care should be taken to avoid excessive application as browning can occur. The use of this ice melting compound must be at the consumer's risk. Store in a dry place and keep tightly closed when not in use.

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Liquid Calcium Chloride



EPI GROUP TEI & Partners is uniquely positioned to provide your liquid calcium chloride requirements from one or more of our five manufacturing plants and 15 terminal locations. In addition, **EPI GROUP TEI & Partners** have an extensive network of barges and railcars to transport calcium chloride to your desired destination. **EPI GROUP TEI & Partner's** liquid calcium chloride is available in a variety of concentrations and grades including food grade and NSF certified products.

FCC FOOD GRADE LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

Chemicals produces FCC food Grade liquid calcium chloride (CaCl_2) under Good Manufacturing Practice (GMP) as an odorless, slightly alkaline, clear, colorless to slightly colored fluid, which is available from 32% to 41%.

- The United Orthodox Synagogues certifies that the production plant is kosher and that the food grade calcium chloride is also kosher for use during Passover.
- The plant quality management system complies with the requirements of BS EN ISO 9002:1994 and has certificate number FM 38434 from the British Standards Institution (BSI).

Applications

FCC Food Grade liquid calcium chloride is used primarily in the food and beverage industry in processing or packaging applications where Food and Drug Administration (FDA) approval for use of a briners grade is not acceptable. It enables apple blossoms to stay on the tree by strengthening the blossom's bond to the tree, resulting in more fruit. Calcium chloride increases the firmness of fruits and vegetables including tomatoes, cherries, olives, and pickles. It also prevents breakup during processing and cooking.

In cheese processing, calcium chloride is added to pasteurized skim milk to help coagulate the curds, increase firmness, and replace calcium lost by heating. Water used to manufacture soft drinks and beer is first demineralized and then remineralized with calcium chloride to assure uniform taste, regardless of the processing location.

Availability

FCC food grade liquid calcium chloride is available from select plant and terminal locations throughout North America.

Safety and Handling

Calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Clear/colorless liquid
Odor	None
Assay	32 to 41% by weight CaCl_2
Crystallization Temperature	-19.5°F (-28.6°C) to 61.5°F (16.39°C)
Specific Gravity @ 68°F (20°C)	1.308 to 1.415
Bulk Density	10.9 to 11.79 lb/gal

CHEMICAL PROPERTIES

Chemical	CaCl_2
pH	Slightly alkaline
Impurities (on 100% CaCl_2 basis)	
Alkali Chlorides	< 0.1% by weight
Magnesium (as MgCl_2)	< 0.1% by weight
Other Impurities (not H_2O)	< 1.0% by weight
Specifications	
Identification	To pass test
Assay	To pass test
Alkalinity (as CaOH_2)	not > 0.03% by weight
Fluoride (as F)	not > 40 mg/kg*
Heavy Metals (as Pb)	not > 20 mg/kg*
Lead (Pb)	not > 4 mg/kg*
Magnesium and Alkali Salts (MgCl_2)	not > 5.0% by weight*

*Calculated on the CaCl_2 determined in the assay %

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NATURAL FOOD GRADE LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

natural food grade liquid calcium chloride is a clear to slightly colored liquid available in concentrations from 32 to 39% CaCl_2 . Natural calcium chloride is produced by solar evaporation of naturally occurring brines. It meets or exceeds FCC specifications for alkalinity, fluoride, heavy metals, and lead. Because it is a natural product, it is not exposed to other chemicals during the production process. Natural calcium chloride contains small amounts of sodium chloride and potassium chloride that are carried over from the natural brine feedstock.

Natural calcium chloride is manufactured under controlled conditions to ensure the purity and safety of the product. Each lot is tested to ensure the purity and quality of the product.

Applications

Calcium chloride has many uses in the food and beverage industry. It increases the firmness of fruits and vegetables including tomatoes, cherries, olives, and pickles. It prevents breakup during processing and cooking. In cheese processing, it is added to pasteurized skim milk to help coagulate the curds, increase firmness, and replace calcium lost by heating. Water used in the soft drink and beer industry is first de-mineralized and is then re-mineralized with calcium chloride in order to assure uniform taste regardless of the processing location. Natural calcium chloride may be used in any application where small amounts of sodium and potassium do not interfere with the intended use of the calcium chloride or the final product. This includes nearly all applications for food grade calcium chloride.

Availability

natural food grade calcium chloride is available in tank trailers

Safety and Handling

Liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Clear, nearly colorless liquid
Odor	None
Crystallization Temperature	-20°F (-29°C) to 45°F (8°C)
Specific Gravity @ 68°F (20°C)	1.33 to 1.43

CHEMICAL PROPERTIES

Chemical Formula	CaCl_2
Concentration	32% to 39% CaCl_2
pH	7.0 to 10.0
Specifications	
Alkalinity (as Ca(OH)_2)	< 0.3% by weight
Potassium	< 1% by weight
Sodium	< 0.5% by weight
Magnesium	< 0.1% by weight
Arsenic	< 3 mg/kg*
Fluoride (as F)	< 40 mg/kg*
Heavy Metals (as Pb)	< 20 mg/kg*
Lead (Pb)	< 4 mg/kg*

*Calculated on the CaCl_2 concentration

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LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

Liquid calcium chloride (CaCl_2) is an odorless, slightly alkaline, colorless fluid. liquid calcium chloride is available in a variety of concentrations and grades, including food grade and NSF certified.

With our proprietary manufacturing process, Chemicals is the only manufacturer that uses food grade quality hydrochloric acid and high purity limestone as raw materials to produce CaCl_2 . This results in CaCl_2 with very low levels of alkali metals, iron, and other impurities when compared to other manufacturers that produce CaCl_2 from brines.

Applications

liquid calcium chloride is used in various applications to retard cold weather hazards, including snow and ice control on roadways (meets or exceeds ASTM D98-95 and AASHTO M 44-86 standards). It is also used as an accelerator for ready-mix concrete curing, and as an anti-freeze for coal storage and transportation.

This product is widely used in oilfield applications as completion and workover fluids, and as a drilling mud additive to increase density and prevent clay hydration.

Liquid CaCl_2 also can be used as:

- A fugitive dust control agent and roadbed stabilizer,
- A weighting fluid for tractor tires to improve traction,
- An inexpensive source of calcium in wastewater treatment to remove fluoride and break oil/water emulsions,
- A low-temperature brine in refrigeration systems, and
- An additive in many other industrial applications.

Availability

Liquid calcium chloride is available from over 20 plant and terminal locations throughout North America. For the location nearest you, refer to the plant and terminal map available

Safety and Handling

Liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Colorless liquid
Odor	None
Assay	28 to 40% by weight CaCl_2
Crystallization Temperature	-38°F (-39°C) to 55.9°F (13.3°C)
Specific Gravity @ 68°F (20°C)	1.264 to 1.403
Bulk Density	10.53 to 11.69 lb/gal

CHEMICAL PROPERTIES

Chemical	CaCl_2
pH	Slightly alkaline
Impurities (on 100% CaCl_2 basis)	
Alkali Chlorides	< 0.1% by weight
Magnesium (as MgCl_2)	< 0.1% by weight
Other impurities (not H_2O)	< 1.0% by weight

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NSF GRADE LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

NSF Grade liquid calcium chloride (CaCl_2) is an odorless, slightly alkaline, colorless fluid with a typical concentration of 28 to 38 percent.

Applications

NSF Grade liquid calcium chloride is used for water treatment and complies with ANSI/NSF 60.

Availability

NSF Grade liquid calcium chloride is available from select plant and terminal locations throughout North America. For the location nearest you, refer to the plant and terminal map available

Safety and Handling

Liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	colorless liquid
Odor	None
Assay	28 to 38% by weight CaCl_2
Crystallization Temperature	-38°F (-39°C) to 42.1°F (5.6°C)
Specific Gravity @ 68°F (20°C)	1.264 to 1.3785
Bulk Density	10.53 to 11.49 lb/gal

CHEMICAL PROPERTIES

Chemical	CaCl_2
pH	Slightly alkaline
Impurities (on 100% CaCl_2 basis)	
Alkali Chlorides	< 0.1% by weight
Magnesium (as MgCl_2)	< 0.1% by weight
Other Impurities (not H_2O)	< 1.0% by weight

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ROADMASTER LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

ROADMASTER™ liquid calcium chloride (CaCl_2) is a concentrated calcium chloride based aqueous solution used for surface dust control and soil stabilization on unpaved roads, road shoulders, embankments, stockpiles and construction sites. ROADMASTER liquid CaCl_2 is also used as a water extender. In highway construction, it is used as an additive to recycled asphalt to reduce voids and improve compaction and stabilization during new construction.

Applications

Calcium chloride is both hygroscopic and deliquescent. These related properties both involve absorption of atmospheric moisture and retention of moisture present in the soil. Unpaved surfaces treated with this product, when cured and compacted, form a hard and smooth riding surface.

ROADMASTER liquid CaCl_2 has exhibited superior performance on roadway construction materials that are typically difficult to treat.

Product longevity will vary with climate, soil type, degree of compaction of the surface, as well as traffic weight and frequency. Generally, a minimum of three to four months is common and, in some cases, up to one year of residual useful life has been experienced.

Availability

ROADMASTER liquid calcium chloride is available from over 20 plant and terminal locations throughout North America. For the location nearest you, refer to the plant and terminal map available

Safety and Handling

ROADMASTER liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Clear/colorless liquid
Odor	None
Assay	28 to 38% by weight CaCl_2
Crystallization Temperature	-38°F (-39°C) to 42.1°F (5.6°C)
Specific Gravity @ 68°F (20°C)	1.264 to 1.378
Bulk Density	10.53 to 11.49 lb/gal

CHEMICAL PROPERTIES

Chemical	CaCl_2
pH	Slightly alkaline
Impurities (on 100% CaCl_2 basis)	
Alkali Chlorides	< 0.1% by weight
Magnesium (as MgCl_2)	< 0.1% by weight
Other Impurities (not H_2O)	< 1.0% by weight

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SUPERSET LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

SuperSet™ liquid calcium chloride (CaCl_2) is an odorless, slightly alkaline, colorless fluid with a typical concentration of 28 to 32 percent CaCl_2 .

Applications

SuperSet liquid calcium chloride is used in concrete to promote an accelerated rate of hydration in cement. Ready-mixed concrete containing SuperSet liquid (CaCl_2) offers significant economic benefits to concrete contractors, through reducing costs and improving performance and profits. SuperSet liquid (CaCl_2) meets ASTM D98-95.

Availability

SuperSet liquid calcium chloride is available from over 20 plant and terminal locations throughout North America. For the location nearest you, refer to the plant and terminal map available

Safety and Handling

SuperSet liquid calcium chloride is a strong salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

PHYSICAL PROPERTIES

Appearance	Clear/colorless liquid
Odor	None
Assay	28 to 32% by weight CaCl_2
Crystallization Temperature	-38°F (-39°C) to -19.5°F (-28.6°C)
Specific Gravity @ 68°F (20°C)	1.264 to 1.308
Bulk Density	10.53 to 10.9 lb/gal

CHEMICAL PROPERTIES

Chemical	CaCl_2
pH	Slightly alkaline
Impurities (on 100% CaCl_2 basis)	
Alkali Chlorides	< 0.1% by weight
Magnesium (as MgCl_2)	< 0.1% by weight
Other Impurities (not H_2O)	< 1.0% by weight

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TECHNICAL GRADE (UNTREATED) LIQUID CALCIUM CHLORIDE

Product Data Sheet

General Description

Technical grade untreated liquid calcium chloride (CaCl_2) is an aqueous solution manufactured by solar concentration of natural brine. It is processed to remove most of the alkali salts and contains no additives.

Applications

Technical grade untreated liquid calcium chloride is intended for use in a variety of applications. It is particularly well suited as a well completion fluid for drilling muds, for the prewetting of deicing salt, to promote roadway stabilization and in adding ballast in tires. It is also used in wastewater treatment to remove fluoride and as a dust control agent.

Technical grade liquid calcium chloride is not approved for use in food processing or as an accelerator in concrete.

Availability

Technical grade untreated liquid calcium chloride is available on the U.S. West Coast.

Safety and Handling

Calcium chloride when in solution is a strong salt solution. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium chloride can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium chloride wastes, consult the appropriate local regulatory authorities.

PHYSICAL PROPERTIES

Appearance	Clear/colorless liquid
Odor	None
Assay	28 to 40% by weight CaCl_2
Crystallization Temperature	-38°F (-39°C) to 42.1°F (5.6°C)
Specific Gravity @ 68°F (20°C)	1.3785
Bulk Density	11.48 lb/gal

CHEMICAL PROPERTIES

CaCl_2	34 to 38% by weight
pH	4.1 to 6.7
Impurities (on 100% CaCl_2 basis)	
Total Alkali Chlorides (as NaCl)	1.0 to 3.5% by weight
Magnesium (as MgCl_2)	0.8 to 3.4% by weight
Degree Baume (@ 60°F)	40 to 43

*Based on CaCl_2 determined in assay

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WINTERTHAW DI LIQUID DEICER

Product Data Sheet

General Description

WinterThaw® DI liquid deicer is calcium chloride (CaCl_2) based. It is specially designed to optimize snow and ice melting. The product contains corrosion inhibiting additives to meet the stringent specifications set for deicing chemicals by the Pacific Northwest States (PNS) and other state departments of transportation (DOTs).

Applications

WinterThaw DI liquid deicer is used in various deicing applications to retard cold weather hazards, including snow and ice control on roadways. The product meets or exceeds ASTM D98-87 and AASHTO M144-86 standards for deicing. It exceeds the PNS DOT requirement that deicers reduce corrosion by at least 70% versus sodium chloride.

The PNS test method is a modified version of the NACE Standard TM 01-69. Based on the information that 3% is the most corrosive concentration of sodium chloride, samples of the deicer materials are also evaluated at this concentration.

WinterThaw DI liquid deicer also meets other key elements of the PNS specifications, being free of precipitates over a wide temperature range and meeting the specification's limits on heavy metals and other impurities.

Availability

WinterThaw DI liquid calcium chloride is available from select plant and terminal locations throughout North America.

Safety and Handling

WinterThaw DI liquid deicer is a strong salt solution. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium chloride can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium chloride wastes, consult the appropriate local regulatory authorities.

PHYSICAL PROPERTIES

Appearance	Clear light yellow to dark amber liquid
Odor	Fresh
Crystallization Temperature	< -20°F (-29°C)
Specific Gravity @ 68°F (20°C)	1.296
Bulk Density	10.80 lb/gal

CHEMICAL PROPERTIES

Chemical	CaCl_2
pH	5.0 to 7.0
Impurities (on 100% CaCl_2 basis)	
Alkali Chlorides	< 0.2% by weight
Magnesium (as MgCl_2)	< 0.2% by weight
Other Impurities (not H_2O)	< 1.0% by weight

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Calcium Chloride Applications



EPI GROUP TEI & Partners provides the highest quality calcium chloride products available in North America. Our calcium chloride, both dry and liquid, is used in a wide variety of applications in numerous industries, from dust control on roadways to food processing. It is also used as an accelerator for ready mix concrete curing and as an anti-freeze for coal storage and transportation.



Agricultural Nutrients



EPI GROUP TEI & Partners, a major producer of calcium chloride, has developed a line of products for use by the agricultural industry. These products are derived from calcium chloride and are based on patented technology purchased from Dr. Lloyd Fenn of Texas A&M University. All of these products contain 100% water-soluble calcium, which gives our customers a tremendous advantage over those using much less soluble calcium sources such as gypsum and limestone. The products are used: As a nutrient to supply calcium for crops, As a soil amendment to reduce sodium levels, improve soil tilth and flocculate the soil, and As a post-harvest dip to increase the shelf life of fruits and vegetables.

Hi-CAL LIQUID CALCIUM

Product Data Sheet

General Description

Hi-Cal™ liquid calcium is a 100% water soluble, clear liquid solution with 12 percent calcium.

As water quality declines due to increasing salinity, crops can experience injury and reduced yields. A cost effective, easy to use solution for dealing with poor water quality is Hi-Cal liquid calcium.

Applications

Hi-Cal liquid calcium is used to solve problems associated with soils and water, especially under irrigated conditions. In addition to being a stand alone water amendment product, Hi-Cal liquid calcium is also used to formulate N-Cal® and Sodex®, fertilizer and turf product lines. Hi-Cal liquid calcium can also be blended with solutions containing nitrogen, potassium, and micronutrients derived from chloride or chelated sources.

Besides providing calcium for plant nutrition and sodium displacement, Hi-Cal liquid calcium is a valuable source of chloride fertilization. Extensive university studies confirm that chloride fertilization helps to suppress many soil-borne and plant tissue diseases on crops such as wheat, barley, corn, potatoes, and rice. Correcting chloride deficiencies can help maximize crop yield and grower profits.

Hi-Cal liquid offers many advantages over other calcium sources such as gypsum as it:

- Is fast acting,
- Is 100% water soluble,
- Is safe and easy to handle,
- Is economical, with low application rates,
- May be mixed with herbicides,
- May be applied through irrigation systems, and
- Is a nonhazardous liquid.

Availability

Hi-Cal liquid calcium is available in bulk only.

Safety and Handling

Hi-Cal liquid calcium is a strong calcium chloride salt solution. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

CHEMICAL PROPERTIES

Chemical	CaCl ₂
Appearance	Clear to straw liquid solution
Odor	None
Assay	Typically 12% by weight Ca
Density	Approx. 11.09 lb/gal
pH	7.0

TYPICAL ANALYSIS*

Guaranteed Analysis Calcium (Ca)	12% by weight
Chloride (Cl)	22 to 26% by weight
Arsenic (As)	< 5 mg/kg
Heavy Metals (including Pb)	< 20 mg/kg
CoBalt (Co)	< 10 mg/kg
Lead (Pb)	< 10 mg/kg

*impurities based on 100% CaCl₂ basis

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HI-CHLOR CHLORIDE NUTRIENT

Product Data Sheet

General Description

Hi-Chlor® chloride nutrient is a clear liquid solution with a minimum of 22% chloride content. Extensive university studies have confirmed that chloride fertilization helps suppress many soil-borne and plant tissue diseases in crops such as wheat, barley, corn, potatoes, onions, and rice. Its role in improving the uptake of cationic nutrients has also been proven. Correcting chloride deficiencies can help maximize crop yield and grower profits. Hi-Chlor nutrient, while being the highest chloride containing fertilizer, also provides calcium nutritional value to crops through its calcium content.

Applications

Hi-Chlor chloride nutrient can be mixed with urea or urea-containing solutions. The mixture is applied in the same manner as the application of nitrogen solutions. Hi-Chlor should be applied according to recommendations based on soil and irrigation water testing and plant analysis. Common Hi-Chlor application rates are 10 to 15 gals/Acre.

Response to chloride in wheat is commonly expected when soil chloride levels are low to medium and potash or other chloride-containing fertilizers are not applied in the crop rotation.

For onion crops, Hi-Chlor should be applied to the soil at 5 gals/Acre at the time of transplanting, followed by multiple applications of 5 gals/Acre at the five-leaf stage and 10 gals/Acre in the mid-season and at the bulbing stage. 20 gals/Acre of Hi-Chlor is recommended 30 days prior to harvesting. This application improves the yield and quality of the produce and the ease of the harvesting of crops.

As chloride can leach out of the soil cross-section with rainfall or irrigation water, its applications need to be split to optimize the chloride input to crops.

Hi-Chlor is recommended to be applied to the soil and not to be sprayed on foliage.

Availability

Hi-Chlor chloride nutrient is available in bulk only.

Safety and Handling

Hi-Chlor chloride nutrient is a strong calcium chloride salt. Wear appropriate protective, impervious clothing. Wear safety glasses with non-flexible side shields or chemical goggles for proper protection of the eyes. Wear appropriate protective non-leather protective gloves and boots. Chemical protective gloves and boots such as PVC or Nitrile are recommended. Leather products do not offer adequate protection and will dehydrate with resultant shrinkage and possible destruction. This product should be handled in areas with proper ventilation. Before using this product, refer to the SDS which is available on the Company's website for complete safety and handling guidelines.

CHEMICAL PROPERTIES

Chemical	CaCl ₂
Appearance	Clear to straw liquid solution
Odor	None
Assay	Typically 12% by weight Ca
Density	Approx. 11.09 lb/gal
pH	7.0

TYPICAL ANALYSIS*

Guaranteed Analysis Calcium (Ca)	12% by weight
Chloride (Cl)	22 to 26% by weight
Arsenic (As)	< 5 mg/kg
Heavy Metals (including Pb)	< 20 mg/kg
CoBalt (Co)	< 10 mg/kg
Lead (Pb)	< 10 mg/kg

*impurities based on 100% CaCl₂ basis

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N-CAL NUTRIENT

Product Data Sheet

General Description

N-Cal® nutrient, a liquid calcium chloride (CaCl_2) supplement, is a specially formulated blend of calcium and nitrogen that provides unique benefits that other fertilizers cannot offer. Based on research conducted at Texas A&M University, N-Cal formulations offer growers the most soluble calcium fertilizer on the market.

Applications

Crop Nutrition. Calcium is an essential element for growing high yielding, high quality crops. The absence of adequate levels of available calcium not only reduces the production capacity of the plant but also lowers its resistance to disease and other environmental pressures. An adequate supply of calcium at the right time is critical.

Amending Sodium Affected Soils. Calcium has long been recognized important for its use in soil amendment. By using a highly soluble source of calcium like N-Cal, the grower is able to quickly remove harmful sodium salts from the root zone, leaving behind valuable calcium and nitrogen nutrients to provide proper nutrition for rapid recovery and vegetative re-growth.

Enhanced Nitrogen Uptake. Studies conducted at Texas A&M have shown that in urea nitrogen will stay in the ammonium form longer when combined with calcium chloride at certain ratios. Plants absorb up to four (4) times more ammonium nitrogen than nitrate nitrogen. The A&M research showed that increased ammonium uptake is associated with higher yields and better quality crops.

Availability

N-Cal nutrient is available as a bulk liquid.

Safety and Handling

N-Cal nutrient is a strong calcium chloride salt solution. Protective clothing, rubber gloves and eye protection are recommended. Rubber safety boots should also be worn in work areas, since calcium chloride can damage leather. This product should be handled in areas with proper ventilation. Before using this product, refer to the MSDS (available on the Company's website) for complete safety and handling guidelines. For proper disposal guidelines for calcium chloride wastes, consult the appropriate local regulatory authorities.

CHEMICAL PROPERTIES

Chemical	N, CaCl_2
Appearance	Clear to straw liquid solution
Odor	None
Assay	Typically 12 to 13% by weight CaCl_2
Density	Approx. 11.1 lb/gal
pH	7.0

TYPICAL ANALYSIS*

Guaranteed Analysis Calcium (Ca)	12%
Guaranteed Analysis Nitrogen (N)	2%
Chloride (Cl)	22-26%
Arsenic (As)	< 5 mg/kg
Cobalt (Co)	< 20 mg/kg
Heavy Metals (including Pb)	< 20 mg/kg
Lead (Pb)	< 5 mg/kg

*impurities based on 100% CaCl_2 basis

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Liquid Calcium Chloride



EPI GROUP TEI & Partners Chemicals Europe produces liquid calcium chloride exclusively by using the limestone-hydrochloric acid process. This enables production of high purity brine with unrivaled consistency.

Our liquid calcium chloride is available in three different grades:

- ❖ Technical Grade which is used in the oil industry as a cooling agent for water treatment and for dehumidification and to decrease the setting time in concrete.
- ❖ Road Grade which is a product specially adapted for customers within the road maintenance industry. It can be utilised for both dust binding on dirt and gravel roads as well as acting as a highly efficient de-icer on most surfaces.
- ❖ Food Grade is used in many areas to provide a pure and safe source of calcium for many different industries. Application examples include cheese manufacturing and controlling the water quality in beer and soft drinks

Technical Grade Liquid Calcium Chloride

Technical grade calcium chloride is produced with special attention to quality and consistency. Our ISO system ensures that our high standards are maintained and improved.

Applications

Technical grade calcium chloride is used in a multitude of applications within a wide variety of industries. It is used as:

- An agent for providing high density clear brine fluids in the oil industry.
- A precipitant for fluorides, sulphates, and phosphates in water purification.
- A safe, secondary cooling agent for hockey rinks and various construction projects.
- An additive in concrete to decrease setting time, especially in cold weather conditions.
- A dehumidifier and a desiccant in domestic and industrial applications.

Availability

Technical grade calcium chloride is produced in Finland, Sweden, and Germany. It is available in several concentrations and delivery forms throughout the world.

Product Information

The following liquid technical grade products are available.

28% Technical Grade Liquid Produced in Finland R

34% Technical Grade Liquid Produced in Sweden

34% Food Grade Liquid Produced in Germany

36% Technical Grade Liquid Produced in Sweden

Road Grade

Liquid Calcium Chloride

Road grade calcium chloride is produced to suit the specific needs of our road maintenance and de-icing customers. Our ISO system ensures that our high standards of production are maintained and improved.

Applications

EPI GROUP TEI & Partners Road grade calcium chloride is used mainly for maintenance of gravel and dirt roads and in de-icing applications on paved and unpaved surfaces.

Calcium chloride is both hygroscopic and deliquescent. These related properties both involve absorption of atmospheric moisture and retention of moisture present in the soil, making it ideal for dust binding on gravel and dirt roads. An unpaved surface treated with this product, when cured and compacted, forms a hard and smooth riding surface, significantly reducing dust displacement.

Calcium chloride is a very effective de-icing agent. Calcium chloride is effective to temperatures as low

As -25°C. The use of calcium chloride to melt snow and ice and to prevent low friction conditions is an efficient tool in any winter road maintenance program.

Availability

Road grade calcium chloride is produced in the Germany, Finland and Sweden. It is available worldwide through our network of distributors as a bulk liquid in vessel or tank truck or in other packaging upon request.

Product Information

The following liquid road grade product is available from **EPI GROUP TEI & Partners**.

32% Road Grade Liquid Produced in Finland

34% Technical Grade Liquid Produced in Germany

34% Technical Grade Liquid Produced in, Sweden

Food Grade

Liquid Calcium Chloride

Food grade calcium chloride is produced under strict supervision to ensure high levels of purity and consistency. The product complies with EC 2012/231, FCC and FAO standards. To ensure that the product meets our stringent demands, comprehensive analysis techniques are employed before the product is shipped. A Certificate of Analysis is provided with this product.

Applications

Food grade calcium chloride is used in various applications within the food and beverage industries. Some examples of common applications are listed below.

In the production of beer and soft drinks, CaCl_2 is used as a source of calcium to regulate the hardness of water.

In the production of cheese, CaCl_2 is used as a source of calcium.

CaCl_2 is also used to increase the firmness of canned fruits and pickled vegetables.

CaCl_2 is also used as a secondary cooling agent in various processes that operate according to food regulations.

Availability

Liquid food grade calcium chloride is produced in Sweden and Germany. It is available worldwide through our network of distributors as a bulk liquid in tank trucks or in 1,000 litre IBCs.

Product Information

The following liquid food grade products are available from **EPI GROUP TEI & Partners**.

34% Food Grade Liquid Produced in Sweden

34% Food Grade Liquid Produced in Germany

36% Food Grade Liquid Produced in Sweden

Solid Calcium Chloride



EPI GROUP TEI & Partners Chemicals Europe produces solid calcium chloride by the limestone-hydrochloric acid process, which ensures high levels of purity and consistency for our products. Solid calcium chloride is a concentrated product that offers logistical advantages over our liquid product, since the transportation costs can be significantly reduced.

Our solid calcium chloride is available in three different grades:

- ❖ **Technical Grade** which is used in the oil industry as a cooling agent for water treatment, for dehumidification and for the reduction of setting time in concrete.
- ❖ **Road Grade** which is specially adapted for customers within the road maintenance industry. It can be utilised for both dust binding on dirt and gravel roads, as well as acting as a highly efficient de-icer on most surfaces.
- ❖ **Food Grade** which is used in many areas to provide a pure and safe source of calcium. Application examples include cheese manufacturing and controlling the water quality in beer and soft drinks

Technical Grade Solid Calcium Chloride

Technical grade calcium chloride is produced with special attention to quality and consistency. Our ISO system ensures that our high standards are maintained and improved.

Applications

Technical grade calcium chloride is used in a multitude of applications within a wide variety of industries. It is used as:

- An agent for providing high density clear brine fluids in the oil industry.
- A precipitant for fluorides, sulphates, and phosphates in water purification.
- A safe, secondary cooling agent for hockey rinks and various construction projects.
- An additive in concrete to decrease setting time, especially in cold weather conditions.
- A dehumidifier and a desiccant in domestic and industrial applications.

Availability

Our solid technical grade calcium chloride flakes are produced in Finland.

Product Information

The following solid technical grade products are available.

77% Technical Grade Flakes Produced in Finland

Road Grade Solid Calcium Chloride

Road grade calcium chloride is produced to suit the specific needs of our road maintenance and de-icing customers. Our ISO system ensures that our high standards of production are maintained and improved.

Applications

EPI GROUP TEI & Partners Road grade calcium chloride is used mainly for maintenance of gravel and dirt roads and in de-icing applications on paved and unpaved surfaces.

Calcium chloride is both hygroscopic and deliquescent. These related properties both involve absorption of atmospheric moisture and retention of moisture present in the soil, making it ideal for dust binding on gravel and dirt roads. An unpaved surface treated with this product, when cured and compacted, forms a hard and smooth riding surface, significantly reducing dust displacement.

Calcium chloride is a very effective de-icing agent. Calcium chloride is effective to temperatures as low

As -25°C. The use of calcium chloride to melt snow and ice and to prevent low friction conditions is an efficient tool in any winter road maintenance program.

Availability

Solid road grade calcium chloride flakes are produced in Finland. Solid road grade calcium chloride is available worldwide through our network of distributors.

Product Information

The following solid road grade products are available from **EPI GROUP TEI & Partners**. 77% Road Grade Flakes Produced in Finland

Food Grade Solid Calcium Chloride

Food grade calcium chloride is produced under strict supervision to ensure high levels of purity and consistency. Our 77% flake products comply with EC 2012/231 and FCC standards. To ensure that the product meets our stringent demands, comprehensive analysis techniques are employed before the product is shipped. A Certificate of Analysis is provided with this product.

Applications

Food grade calcium chloride is used in various applications within the food and beverage industries. Some examples of common applications are listed below.

In the production of beer and soft drinks, CaCl_2 is used as a source of calcium to regulate the hardness of water.

In the production of cheese, CaCl_2 is used as a source of calcium.

CaCl_2 is also used to increase the firmness of canned fruits and pickled vegetables.

CaCl_2 is also used as a secondary cooling agent in various processes that operate according to food regulations.

Availability

Our solid food grade calcium chloride flake product is produced in Finland and is available worldwide through our network of distributors.

Product Information

The following solid food grade products are available.

77% Food Grade Flakes Produced in, Finland

Oil and Gas Drilling



EPI GROUP TEI & Partners offers calcium chloride products that are used in:

- ❖ Completion and workover fluids,
- ❖ Basic drilling fluids,
- ❖ Oil based mud/inverted drilling fluids, drill-in fluids, and horizontal drilling fluids,
- ❖ Clear water flocculation applications, and Cementing applications.

Calcium chloride is used as a clear brine single salt fluid in densities ranging from 1006 kg/m³ to 1390 kg/m³ (8.4 to 11.6 lb/gal). The divalent calcium ion (Ca⁺²) inhibits clay swelling, dispersion and migration. Calcium chloride brines are one of the most economical brines used in oilfield completion and workover operations.

EPI GROUP TEI & Partners has been developing and delivering high quality, innovative clear brine fluids (CBFs) and related products and services to the oil and gas industry for well over two decades.

With seven North American and three European calcium chloride production facilities and a significant global marketing presence, **EPI GROUP TEI & Partners** is the leading worldwide supplier of calcium chloride.

For more information on our clear brine fluids and additives designed for use in the oil and gas industry.

Mining Industry



Freeze Conditioning of Minerals:

Minerals, particularly coal, as they are normally transported and handled, contain substantial amounts of moisture. If shipped or stored in cold Miningweather of sufficient duration and intensity, moist minerals tend to freeze. Frozen minerals create severe handling problems during the winter months. For example, bottom-dumped railcars that unload in a few minutes in the summer months may take hours to unload when frozen. The use of freeze conditioning agents (FCA) to ease unloading and handling of minerals during the winter months has become an accepted practice by the mineral industry.

FCAs have two main benefits. They function as a freeze point depressant, and also weaken the crystal structure of the ice formed, making the ice more friable. Calcium chloride, being an excellent additive to weaken the crystal structure of the ice and superior as a freeze point depressant, is widely used in the mineral industry as a freeze conditioning agent.

The amount of calcium chloride required depends on the expected weather condition and the moisture content of the minerals. For coal, with the moisture content of coal being about 10 wt%, the amount required could be 1-2 litres per ton of coal.

Dust Control in Mining Operations:

Both underground and open cut mining operations are regulated for the level of dust emission in the working environment. Since April 2, 1998, according to the Mine Safety and Health Administration (MSHA) in the U.S.A. a noncompliance determination is based on the results of single full-shift dust samples taken by the inspectors. MSHA requires mine operators to take corrective action to lower the concentration of respirable dust whenever a full-shift measurement by an MSHA inspector indicates non-compliance.

Calcium chloride, being hygroscopic and deliquescent, when spread on the haulage roads minimizes the dust emission. It is also very cost effective.

Calcium chloride is also used in mining operations for the stabilization of the unpaved haulage roads, as its application improves the strength of the road surface. Apart from keeping the dust level down, its use also substantially reduces the overall road maintenance cost.

PRODUCT INFORMATION

32% Road Grade Liquid Produced in Finland

34% Technical Grade Liquid Produced in Germany

34% Technical Grade Liquid Produced in Sweden

36% Technical Grade Liquid Produced in Sweden

77% Road Grade Flakes Produced in Finland

Gas and Solvent Drying



Refineries and petrochemical plants requiring a method to remove dissolved and free water from hydrocarbon streams can utilize calcium chloride pellets that significantly outperform other means of moisture removal.

EPI GROUP TEI & Partners supplies calcium chloride pellets that are effective in drying the following and similar products:

REFINERIES

- Diesel/LCO
- Kerosene/Jet Fuel
- Propane
- Butane
- Ethane
- LPG

PETROCHEMICAL

- Mixed C4s
- Chlorinated hydrocarbon
- Aromatic hydrocarbon
- Acetylene

Solid calcium chloride can, due to its affinity for water, also be used for removing water from certain oils and organic solvents.

Tire Weighting



Calcium chloride, when dissolved and used as a liquid for tire ballast, will provide a number of benefits. It will increase traction, drawbar pull, tire and tractor life, and will also help you conserve fuel.

Your local implement or tire dealer will assist with tire hydraflation. A 28% solution of calcium chloride will give a freezing point of below -35°C .

Mixing Guidelines

There are a number of ways you can prepare 100 kg of 28% calcium chloride solution:

- Mix 64 litres of cold tap water and 36 kg 77% flakes, or
- Mix 70 litres of cold tap water and 30 kg 94% granules, or
- Mix 22 litres of cold tap water and 58 litres (77 kg) of 36% solution.

34% Technical Grade Liquid Produced in Germany

34% Technical Grade Liquid Produced in Sweden

36% Technical Grade Liquid Produced in Sweden

77% Technical Grade Flakes Produced in Finland

Fluoride Removal



The treatment of fluoride bearing effluents is an area of increasing concern, as fluoride content in drinking water has become a part of the public and regulatory agenda. Industrial operations, such as petroleum refineries, aluminum smelters, and semi-conductor production facilities, generate effluents that are high in fluoride content and require treatment prior to their discharge into public streams. Calcium chloride can be used effectively in the removal of fluoride.

Calcium chloride can also be used to remove other undesired organisms from industrial wastewaters, e.g., soluble phosphates can be precipitated as calcium phosphate and sulphate as calcium sulphate (gypsum).

34% Technical Grade Liquid Produced in, Germany
34% Technical Grade Liquid Produced in Sweden
34% Technical Grade Liquid Produced in Finland
36% Technical Grade Liquid Produced in Sweden
77% Technical Grade Flakes Produced in Finland

Enzyme Production



Enzymes are protein structures that act as extremely efficient catalysts. Enzymes are used in many industrial and pharmaceutical applications. Industrial applications include, e.g., using enzymes for detergents. Calcium chloride can be utilised in different applications within the enzyme industry, e.g., as a method to facilitate separation of the enzyme from other cell structures after fermentation. Some enzymes also require a calcium ion, Ca^{2+} , as co-factor that will retain the three-dimensional structure of the protein. In some cases, a highly soluble source of calcium is required as a nutrient in fermentation processes.

34% Food Grade Liquid Produced in, Sweden
34% Food Grade Liquid Produced in Germany
36% Food Grade Liquid Produced in Sweden
77% Food Grade Flakes Produced in Finland

Dehumidification



Dehumidification of air is an important process in both industrial and domestic applications.

Domestic applications of calcium chloride are as dehumidifiers for closets, cupboards, cars, boats and mobile homes. In many cases, the humidity in these types of enclosed spaces is too high, leading to accelerated micro-biological activity. This growth of mold and bacteria often leads to unwanted odors and may also degrade materials such as textiles, wood, paper and leather. If the air humidity is very high, condensation of water can occur, which can damage many materials and goods by staining or initiating corrosion. By using a calcium chloride dehumidifier, these problems can often be mitigated or completely solved.

In industrial applications, the aim is the same as given above—to reduce humidity in order to protect goods, machinery and electronics. For example, absorption of moisture in transport containers during sea transport requires EPI GROUP TEI & Partner's solid calcium chloride as a cost effective and efficient moisture absorbing chemical.

77% Technical Grade Flakes
Produced in, Finland

Concrete Acceleration



The primary benefit of calcium chloride in concrete is an accelerated rate of hydration for cement. This significantly reduces setting time to facilitate Hands in Concrete rapid attainment of early strength and easier protection of freshly placed concrete in cold weather.

Manufacturers of ready mixed concrete have used calcium chloride for over 50 years to give their contracting customers the performance they want and the durable product they require.

Ready mixed concrete containing calcium chloride offers significant economic benefits to concrete contractors by reducing costs and improving their overall performance and profits.

Cool Weather

Anytime the temperature drops below 20°C, the setting of ready mixed concrete slows down. This effect is most significant in the 0°C to 10°C temperature range. The rapid setting offered by the addition of calcium chloride to ready mixed concrete allows concrete contractors to continue to work effectively into the fall and winter months.

In cool and cold weather concreting applications, calcium chloride can be used to reduce setting times by as much as two-thirds. A two percent admixture of calcium chloride at 10°C will improve setting times to that attainable at 20°C without calcium chloride.

This rapid setting can be critical when there is a chance that temperatures may drop below freezing. Calcium chloride accelerates the rate of hydration of freshly placed concrete and lowers its free water content faster.

This allows concrete to escape potential freeze damage in a matter of days, as opposed to the weeks it can take normally. It also minimizes the costly precautions required to protect freshly placed concrete from serious freeze damage.

High Early Strength

In applications where time is of the essence such as foundations and emergency patching of pavement, the addition of calcium chloride to ready mixed concrete can reduce the waiting period before surfaces can bear loads.

Chemical Heating



One effective and creative use of the energy in calcium chloride is in self heating containers. Water and anhydrous calcium chloride can be incorporated in an advanced container and then brought into contact with each other by pressing a button, which causes the seal between the two materials to rupture. The heat evolved in the dissolution of the calcium chloride can then be used to heat a beverage such as coffee or tea.

When calcium chloride is dissolved in water, heat is evolved since calcium chloride has a negative heat of solution. The amount of energy available depends on the concentration of crystal water; a completely water free (anhydrous) calcium chloride contains the most energy. The table below gives the theoretical maximum energy that is available from one gram of product with varying concentrations of calcium chloride.

% CaCl_2	% anhydrate CaCl_2	% monohydrate $\text{CaCl}_2 \cdot \text{H}_2\text{O}$	$\Delta H_{\text{solution}}$ J/g
87	6.9	93.1	-428
88	14.1	85.9	-452
89	21.3	78.7	-476
90	28.4	71.6	-499
91	35.6	64.4	-523
92	42.7	57.3	-547
93	49.9	50.1	-571
94	57.1	42.9	-594
95	64.2	35.8	-618
96	71.4	28.6	-642
97	78.5	21.5	-666
98	85.7	14.3	-689
99	92.8	7.2	-713
100	100	0	-737

The reason for the rapid drop in available energy as the concentration of calcium chloride decreases can be found in the heat of solution for pure anhydrous CaCl_2 and the monohydrate as shown below.

$\Delta H_{\text{solution}}$ CaCl_2	-737 J/g	(to infinite dilution)
$\Delta H_{\text{solution}}$ $\text{CaCl}_2 \cdot \text{H}_2\text{O}$	-405 J/g	(to infinite dilution)

Dust Binding



Calcium chloride has unique properties that make it ideal for maintaining unpaved roads and fortifying road bases for new construction. Calcium chloride is both hygroscopic (draws moisture from the air) and deliquescent (resists evaporation and stays in solution). Calcium chloride's ability to regulate moisture on road surfaces is the key to building and maintaining roads that last.

Utilizing calcium chloride will heavily decrease the loss of material from the road surface from the effects of traffic and wind. This decrease will provide economical as well as environmental and health benefits. Maintenance costs will be reduced, and the displacement of small airborne particles will be minimized, helping to alleviate this recognized health issue.

Both liquid and solid calcium chloride can be used for dust binding. The selection of a product will depend on the distribution equipment available and other local factors.

32% Road Grade Liquid Produced in, Finland

34% Technical Grade Liquid Produced in Germany

34% Technical Grade Liquid Produced in Sweden

77% Road Grade Flakes Produced in Finland

Distilleries



Tartaric acid is naturally occurring in grapes and other fruits and plants. In the wine and grappa industries, it can be found in the solid residues that remain after the grape juice has been produced.

Crude tartaric acid can be recovered from the following sources:

- The press cakes from grape juice [i.e., unfermented (marcs) or partly fermented (pomace)] are boiled with water, and any alcohol that is present is distilled off. The hot mash is settled, decanted and the clear liquor is cooled to crystallize. The recovered high-test crude cream of tartar (vinaccia) has an 85-90% tartaric acid content.
- Lees, which are the dried sediments in the wine fermentation vats, consist of yeast cells, pectinous substances, and tartars. Their content of tartaric acid equivalents ranges from 16% to 40%.
- The crystalline crust (argols) formed in the vats in the secondary fermentation period contains more than 40% tartaric acid.

Calcium tartrate is a sparingly soluble salt that can be precipitated by adding calcium chloride to these residues.

34% Food Grade Liquid Produced in, Germany

34% Technical Grade Liquid Produced in Sweden

36% Food Grade Liquid Produced in Sweden

De-Icing



Calcium chloride is the most powerful of all common de-icers used for melting ice and snow on sidewalks, driveways, parking lots, and streets. The exothermic (heat releasing) reaction when solid calcium chloride goes into solution makes it the de-icer of choice. No other product melts more ice, and melts ice faster, than calcium chloride.

Calcium chloride has the lowest freezing point of all the typical de-icers including sodium chloride, magnesium chloride, potassium chloride, and urea.

Calcium chloride is an essential part of any winter road maintenance program and will provide a safe surface for both traffic and pedestrians.

Both liquid and solid calcium chloride can be used for de-icing. The selection of a product will depend on the local conditions and available equipment.

32% Road Grade Liquid Produced in Finland
34% Technical Grade Liquid Produced in Germany
34% Technical Grade Liquid Produced in Sweden
77% Road Grade Flakes Produced in Finland

OUR VOCATION

-Meet and complete the requirements of our international clients.

-Satisfy your three major expectations: save time, simplify your work and ensure your safety.

-Remain leader and constantly adapt our materials to the needs of the market.

To do that:

*We represent only the worldwide leaders in the manufacturing sector.

*We have a strong worldwide global network of distribution and after-sale support.

*We conduct continuous upgrading of our products

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