

Calcium Chloride

Safety data sheet in the 16-section GHS format · CAS 10043-52-4

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1. Identification of the substance and of the supplier

Product name	Calcium Chloride
Synonyms	calcium dichloride, CaCl ₂ , calcium chloride anhydrous, calcium chloride dihydrate
C.A.S. number	10043-52-4 (anhydrous); 10035-04-8 (dihydrate)
Molecular formula	CaCl ₂ (anhydrous); CaCl ₂ ·2H ₂ O (dihydrate)
Grade supplied	94–97% anhydrous prill · 74–77% flake · 32–35% soln
Product group	Industrial Salts & Inorganics
Identified uses	Oil and gas — drilling and completion fluids, Dust suppression on unpaved roads, haul roads and mine benches, Refrigeration and ice, Liquid desiccant and dehumidification, Latex and rubber processing, Textiles, Drying and desiccation, Effluent treatment, Concrete
Supplier	Velora Chemicals Private Limited
Emergency contact	Medical, fire or spill emergency — call the emergency services first: 112 (all-India), 101 fire, 108 ambulance. Velora Chemicals Private Limited does not at present operate a 24-hour chemical emergency advice line, and this sheet does not pretend otherwise. Every consignment despatched by road carries an emergency information panel under rule 134 of the Central Motor Vehicles Rules 1989 bearing a number from which expert advice on this material can be obtained, and the producer's safety data sheet issued with the consignment carries the producer's own 24-hour number where one is operated. For product, grade and documentation queries in business hours: +91 99255 22674.

2. Hazards identification

GHS signal word	WARNING. There is no EU harmonised (CLP Annex VI) classification for calcium chloride; what exists is supplier self-classification, and it is close to unanimous — Eye Irrit. 2, H319, signal word Warning, on 99.7% of the notified reports in ECHA's inventory (3,493 of 3,505). Work to the classification on the SDS that comes with the lot
Hazard classification	Eye Irrit. 2, H319 — causes serious eye irritation. Several major suppliers also classify Acute Tox. 4 (oral), H302 — harmful if swallowed, so an H302 + H319 label is normal and is not an error. Not classified for skin corrosion or irritation. Over-hazarding this product is as much an error as under-hazarding it, but 'non-hazardous' is wrong too and contradicts the H319 label. No Indian statutory occupational exposure limit is assigned: calcium chloride is not in the Second Schedule to the Factories Act 1948
Precautionary statements	Data not verified — see producer SDS for the lot supplied

3. Composition / information on ingredients

Substance	Calcium Chloride
C.A.S. number	10043-52-4 (anhydrous); 10035-04-8 (dihydrate)
Molecular weight	110.98 g/mol (anhydrous); 147.01 g/mol (dihydrate)

Composition 94–97% anhydrous prill · 74–77% flake · 32–35% soln

4. First-aid measures

Eye contact	Flush immediately with plenty of water for at least 15 minutes, holding the eyelids open; remove contact lenses if present and easy to do; keep rinsing. Get medical attention — see an ophthalmologist — after any eye exposure to the anhydrous solid. A grain in the eye pulls water out of the cornea and heats as it hydrates, and transient corneal injury is a documented effect.
Skin contact	Remove contaminated clothing, gloves and footwear immediately, then flush the skin with plenty of cool water for at least 15 to 20 minutes and wash with soap and water. Get medical attention. Removing the clothing is the load-bearing step — dry solid trapped in a glove, boot or cuff keeps hydrating, heats and abrades. Calcium chloride is not a caustic and is not classified for skin corrosion or irritation.
Inhalation	Move to fresh air; get medical attention if symptoms persist.
Ingestion	Rinse the mouth. Do NOT induce vomiting. Drink plenty of water to dilute, and call a physician or poison control centre immediately. Never give anything by mouth to an unconscious person. Swallowing large amounts of undissolved solid has been reported to cause burns and, rarely, gastric necrosis.

5. Fire-fighting measures

Flash point	Not flammable (inorganic salt, non-combustible)
Suitable extinguishing media	Water fog, foam, dry chemical powder or carbon dioxide, chosen to suit the surrounding fire. The substance itself does not contribute fuel.
Unsuitable extinguishing media	Do not use a high-pressure water jet: it will spread the material and the fire.
Special hazards arising from the substance	Calcium chloride is not flammable (inorganic salt, non-combustible) and does not contribute fuel. Decomposition products in a fire: Data not verified — see producer SDS for the lot supplied.
Advice for fire-fighters	Fire-fighters must wear self-contained breathing apparatus and full protective clothing. Keep unnecessary personnel away and upwind. Prevent firefighting run-off from entering drains, surface water or groundwater.

6. Accidental release measures

Data not verified — see producer SDS for the lot supplied. Brine spills damage reinforced concrete — chloride drives corrosion of embedded steel and calcium chloride forms expansive calcium oxychloride in the hardened paste — so bund and wash down brine handling areas.

7. Handling and storage

- **The exotherm is the thing to get right.** Dissolving calcium chloride releases heat, and the drier the grade the more of it: the heat of solution of the anhydrous salt is about **–737 J/g (–176 cal/g, ≈ –82 kJ/mol)**, against about –305 J/g for the dihydrate. The producer's own figure for making a 30% solution from 83–87% flake is a temperature rise of nearly **47 °C** — from Indian ambient water that lands the batch near 75–80 °C. The grade Velora actually supplies as the high-concentration solid, 94–97% anhydrous, releases materially more heat again per kilogram — scaling the producer's figure puts the rise near **70 °C**, which from 30 °C ambient water brings the batch close to boiling. Violent boiling on contact with water has been recorded. (The 47 °C is the producer's measured figure for 83–87% flake, a grade not in our catalogue; the 70 °C is scaled from it and from the heats of solution above, not measured.) Add solid **slowly, to cool water, with continuous agitation**. Never add it to hot or warm water. If solid is allowed to sit motionless in contact with water it cakes hard, and the cake then dissolves unevenly and spatters hot brine.
- **It is deliquescent, and that changes the assay you receive.** At 25 °C and 70% relative humidity, 94% anhydrous product can take up roughly two and a half times its own mass of water and will eventually run to brine. In most Indian ambient

conditions, exposed material picks up water. Keep bags sealed, palletised off the floor and under cover, and treat the assay on the COA as the assay at despatch in intact packaging. Caking and assay drift, not chemical instability, are what limit shelf life.

- **Do not store calcium chloride brine in ordinary stainless steel.** This is the expensive mistake. Austenitic grades — 304, 304L, 316, 316L — are susceptible to **chloride stress corrosion cracking**, and the producer's guidance is explicit that common stainless steels should not be used for liquid calcium chloride storage, cracking at temperatures **as low as 38 °C**. Full-immersion cracking of austenitics is rare below about 60 °C, but wet-and-dry service drops that threshold a long way, because evaporation concentrates chloride locally: failures have been reported with as little as 10 ppm chloride in the bulk solution. The places it cracks are the places brine dries out — splash zones, tank roofs, flange faces, and under insulation. For bulk liquid storage the producer's preference is **carbon steel with an epoxy-based interior lining**. FRP or plastic works for **smaller tanks at near-ambient temperature** — that size-and-temperature caveat is part of the recommendation, not decoration. **Aluminium 5454 for shells and 6061 for piping is the producer's spec for road tankers, not for static storage**; 6061 pits in chloride in a strongly pH-dependent way and commercial liquor runs alkaline, so do not read it across to a storage tank. Where an austenitic really is required, that means a high-molybdenum grade (904L, alloy 20, a 6-Mo super-austenitic), not 316.

- **On concrete.** Brine spills damage a reinforced slab two ways: chloride drives corrosion of the embedded steel, and calcium chloride reacts with the hardened paste to form **calcium oxychloride**, an expansive phase that causes spalling and scaling, particularly around joints. Bund and wash down brine handling areas.

- **Hazard classification, stated as it actually stands.** There is no EU harmonised classification for calcium chloride; what exists is supplier self-classification, and it is close to unanimous — **Eye Irrit. 2, H319, "causes serious eye irritation"**, signal word Warning, on 99.7% of the notified reports in ECHA's inventory (3,493 of 3,505). Expect one addition on some producers' labels: several major suppliers also classify **Acute Tox. 4 oral, H302, "harmful if swallowed"**, so an H302 + H319 label is normal and is not an error — and the ingestion note below is the reason for it. Work to the classification on the SDS that comes with your lot. **No Indian statutory occupational exposure limit is assigned to it:** the instrument that sets Indian OELs is the Second Schedule to the Factories Act 1948, made under section 41F, and calcium chloride is not in it (the only calcium entry is calcium oxide). Separately — and these are different statutes, not part of the same chain — it is not a listed hazardous chemical under the MSIHC Rules 1989 and not on the Gujarat poisons schedule. Manage dust against the general particulate limits (OSHA PNOR 15 mg/m³ total and 5 mg/m³ respirable; ACGIH PNOC 10 and 3 mg/m³), or against the REACH worker DNELs of 5 mg/m³ (long-term inhalation, local effects) and 10 mg/m³ (acute inhalation, local effects). ECHA derives **no systemic DNEL** — it records no systemic hazard identified for inhalation or dermal exposure. Incompatible with acids, oxidisers and hot water. **And with zinc and galvanised steel:** calcium chloride attacks metals in the presence of moisture and can release hydrogen. Prolonged storage of calcium chloride solution in zinc-coated galvanised iron vessels has caused slow hydrogen evolution that eventually ignited and exploded. Do not store or pipe brine in galvanised or zinc-coated equipment — which matters in India, where galvanised drums and pipework are everywhere. Over-hazarding this product is as much an error as under-hazarding it — but "non-hazardous" is wrong too, and it contradicts the H319 label on the bag.

- **First aid.** Eyes: flush immediately with plenty of water for **at least 15 minutes**, holding the eyelids open; remove contact lenses if present and easy to do; keep rinsing. **Get medical attention — see an ophthalmologist — after any eye exposure to the anhydrous solid.** A grain in the eye pulls water out of the cornea and heats as it hydrates, and transient corneal injury is a documented effect, so this is not an ordinary dust in the eye. Goggles, not spectacles, when handling anhydrous. Skin: **remove contaminated clothing, gloves and footwear immediately**, then flush the skin with plenty of **cool water for at least 15 to 20 minutes** and wash with soap and water. Get medical attention. Taking the clothing off is the load-bearing step — solid held against skin inside a glove or cuff keeps hydrating and keeps heating. Calcium chloride is not a caustic — there is no free alkali, and it is not classified for skin corrosion or irritation — but dry solid trapped in a glove, boot or cuff hydrates, heats and abrades, and the wearer will describe it as a burn. Cool water carries the heat away. Ingestion: rinse the mouth, **do not induce vomiting**, drink plenty of water to dilute, and call a physician or poison control centre immediately. Never give anything by mouth to someone who is unconscious. Swallowing large amounts of undissolved solid has been reported to cause burns and, rarely, gastric necrosis — the same desiccation-and-exotherm mechanism. Inhalation: move to fresh air; medical attention if symptoms persist.

- **Transport.** Calcium chloride **is not a dangerous good** — no UN number, no class, no packing group — as the anhydrous solid, as hydrated flake, or as solution, under the UN Model Regulations, ADR/RID, IMDG, ICAO/IATA and DOT alike. That is a transport status only: the GHS label still goes on the package. Two cautions for freight paperwork. First, if you ship in bulk rather than bagged, check whether the IMSBC Code assigns a schedule — we have not confirmed one either way and will not claim it. Second, **calcium chloride is constantly confused with calcium chlorate**, which is a Class 5.1 oxidiser (UN 1452 solid, UN 2429 solution, PG II). They are different products. Calcium chloride is not an oxidiser.

Storage: Deliquescent: keep bags sealed, palletised off the floor and under cover. At 25 °C and 70% RH, 94% anhydrous product can take up roughly two and a half times its own mass of water and will eventually run to brine; the assay on the COA is the assay at despatch in intact packaging. Caking and assay drift, not chemical instability, limit shelf life. Brine: do not store in ordinary austenitic stainless steel (304/316 — chloride stress corrosion cracking from as low as 38 °C). For bulk liquid storage the producer's preference is carbon steel with an epoxy-based interior lining; FRP or plastic for smaller tanks at near-ambient temperature. Aluminium 5454 shells and 6061 piping are the producer's road-tanker specification, not a storage specification. Never galvanised or zinc-coated vessels or pipework (hydrogen evolution). Bund and wash down brine handling areas.

8. Exposure controls / personal protection

Occupational exposure limits. No Indian statutory occupational exposure limit: the instrument that sets Indian OELs is the Second Schedule to the Factories Act 1948, made under section 41F, and calcium chloride is not in it (the only calcium entry is calcium oxide). Manage dust against the general particulate limits — OSHA PNOR 15 mg/m³ total and 5 mg/m³ respirable; ACGIH PNOC 10 and 3 mg/m³ — or against the REACH worker DNELs of 5 mg/m³ (long-term inhalation, local effects) and 10 mg/m³ (acute inhalation, local effects). ECHA derives no systemic DNEL: no systemic hazard identified for inhalation or dermal exposure.

Personal protection. Goggles, not spectacles, when handling the anhydrous grade — a grain in the eye pulls water out of the cornea and heats as it hydrates. Remove any glove, boot or cuff that has taken in solid. Other PPE: Data not verified — see producer SDS for the lot supplied

Engineering controls. Enclose every transfer, tipping, bag-slitting and sampling point and fit local exhaust extraction at each, and keep airborne concentrations below the limit in force at the place of use. Provide an eyewash within reach of the working position, and a safety shower wherever the material is classified corrosive or irritant or is handled in quantity. Do not eat, drink or smoke in the handling area; wash before breaks. Where no limit is stated above, occupational exposure limits vary by jurisdiction: check the limit in force at the place of use and the producer's sheet for the grade supplied, and record which value your assessment adopted. Select eye, skin and respiratory protection on the strength of a measured or modelled exposure assessment, not on this sheet alone.

9. Physical and chemical properties

Appearance	White to off-white deliquescent prill, flake or powder; the 32–35% solution is a clear, colourless liquid
Physical state	Solid (prill, pellet, granule, flake or powder), deliquescent; also supplied as a 32–35% aqueous solution
Melting / freezing point	772 °C (anhydrous)
Boiling point	Data not verified — see producer SDS for the lot supplied
Relative density	2.15 g/cm ³ (anhydrous)
Solubility in water	Very soluble — about 74.5 g per 100 g water at 20 °C (anhydrous basis). Dissolution is strongly exothermic: see section 7
pH	Not a single number. IS 1314:1984 specified the pH of a 5% solution at 25 °C as 7.0–8.5 for the technical types; IS 1314 was superseded by IS 1314:2024, whose requirement tables have not been read, so treat 7.0–8.5 as the 1984 limit. A dilute solution of pure calcium chloride is essentially neutral to slightly acidic (about pH 6.0–6.5 at 0.1 mol/L); concentrated commercial liquor typically reads alkaline, around 8–10, because the process route often leaves residual lime-derived alkalinity, and pH measurement is unreliable at the ionic strength of a 35% brine. Agree the pH window against the current edition and the lot COA.
Flash point	Not flammable (inorganic salt, non-combustible)
Auto-ignition / ignition temperature	Not applicable — not flammable (inorganic salt, non-combustible)

Explosive / dust-explosion properties	Data not verified — see producer SDS for the lot supplied
Vapour pressure	Data not verified — see producer SDS for the lot supplied
Vapour density	Data not verified — see producer SDS for the lot supplied
Partition coefficient (log Pow)	Data not verified — see producer SDS for the lot supplied
Particle characteristics	Anhydrous grade traded as prill, pellet, granule or powder; hydrated grade as flake. Particle size distribution: Data not verified — see producer SDS for the lot supplied
Molecular weight	110.98 g/mol (anhydrous); 147.01 g/mol (dihydrate)

10. Stability and reactivity

Incompatible materials	Acids, oxidisers and hot water (dissolution is strongly exothermic; violent boiling on contact with water has been recorded). Zinc and galvanised steel: calcium chloride attacks metals in the presence of moisture and can release hydrogen, and prolonged storage of calcium chloride solution in zinc-coated galvanised iron vessels has caused slow hydrogen evolution that eventually ignited and exploded — do not store or pipe brine in galvanised or zinc-coated equipment. Austenitic stainless steels (304, 304L, 316, 316L) in brine service: chloride stress corrosion cracking from as low as 38 °C, worse in wet-and-dry service. Hardened concrete: brine forms expansive calcium oxychloride and drives corrosion of embedded steel
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Conditions to avoid	Deliquescent: keep bags sealed, palletised off the floor and under cover. At 25 °C and 70% RH, 94% anhydrous product can take up roughly two and a half times its own mass of water and will eventually run to brine; the assay on the COA is the assay at despatch in intact packaging. Caking and assay drift, not chemical instability, limit shelf life. Brine: do not store in ordinary austenitic stainless steel (304/316 — chloride stress corrosion cracking from as low as 38 °C). For bulk liquid storage the producer's preference is carbon steel with an epoxy-based interior lining; FRP or plastic for smaller tanks at near-ambient temperature. Aluminium 5454 shells and 6061 piping are the producer's road-tanker specification, not a storage specification. Never galvanised or zinc-coated vessels or pipework (hydrogen evolution). Bund and wash down brine handling areas.
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11. Toxicological information

Eye: Eye Irrit. 2, H319; transient corneal injury from the anhydrous solid is a documented effect. Oral: several major suppliers classify Acute Tox. 4, H302; swallowing large amounts of undissolved solid has been reported to cause burns and, rarely, gastric necrosis (desiccation and exotherm). Skin: not classified for skin corrosion or irritation, but dry solid trapped against skin hydrates, heats and abrades. Systemic: ECHA records no systemic hazard identified for inhalation or dermal exposure and derives no systemic DNEL. Numerical endpoints: Data not verified — see producer SDS for the lot supplied.

12. Ecological information

Data not verified — see producer SDS for the lot supplied

13. Disposal considerations

Dispose of the substance and its container through an authorised facility under the Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016 where the waste is scheduled under those Rules, and otherwise as non-hazardous industrial waste, in each case under the conditions of the State Pollution Control Board consent in force at the site. Whether a particular waste stream is scheduled depends on the substance and on what it has been mixed with, so classify the waste before consigning it. Do not reuse empty containers for any other purpose.

14. Transport information

UN number	Not regulated
Class	Not regulated

Packing group	Not regulated
Proper shipping name	Not regulated — not a dangerous good in packaged form under the UN Model Regulations, ADR/RID, IMDG, ICAO/IATA and DOT; IMSBC position for bulk solid sea shipment not confirmed. Do not confuse with calcium CHLORATE (UN 1452 / UN 2429, Class 5.1)

15. Regulatory information

Supply in India is subject to the Manufacture, Storage and Import of Hazardous Chemical Rules, 1989 where the substance is scheduled, and to any product-specific licensing named on the product page. Classification and labelling follow the GHS as adopted in the jurisdiction of use.

Note: Grades: 94–97% anhydrous prill/granule, 74–77% flake, 32–35% solution, technical grade. The grade figures are CaCl₂ assay, not purity: in the hydrated grades most of the balance is water of crystallisation (pure dihydrate is 75.5% CaCl₂). IS 1314 is written around Type A hydrated, Type B anhydrous (drying agent) and Type C fused; the 1984 edition required 96.0% CaCl₂ minimum for Type B, so a 94–95% anhydrous commercial grade sits below the Type B floor. IS 1314:2024 (published 21 September 2024) superseded IS 1314:1984; its requirement tables have not been read. Not a listed hazardous chemical under the MSIHC Rules 1989; not in the Second Schedule to the Factories Act 1948. Not a specified fertiliser under the Fertiliser (Control) Order 1985 and may not be sold or labelled as one. Transport: not a dangerous good in packaged form; IMSBC Code position for bulk solid sea shipment not confirmed. CALCIUM CHLORIDE IS CONSTANTLY CONFUSED WITH CALCIUM CHLORATE, a Class 5.1 oxidiser (UN 1452 solid, UN 2429 solution, PG II) — a different product. Calcium chloride is not an oxidiser.

16. Other information

Version	1.0
Date of issue	07 October 2026
Supersedes	No previous version
Regulatory basis as at the date of issue	EU CLP Regulation 1272/2008 as amended (noting that there is NO Annex VI harmonised entry for calcium chloride); UN Model Regulations, ADR/RID, the IMDG Code, ICAO/IATA and US DOT (not regulated in packaged form); 29 CFR 1910.1000 Table Z-1; and, in India, the Manufacture, Storage and Import of Hazardous Chemical Rules 1989 (not listed).

How this sheet was compiled and what governs. This sheet was prepared by Velora Chemicals Private Limited as the supplier, from PubChem, the ECHA CLP inventory including Annex VI harmonised classifications, ILO International Chemical Safety Cards and published producer safety data sheets. Values that could not be confirmed from those sources are shown as “Not available” rather than estimated. **The producer's safety data sheet for the specific grade and lot supplied is the governing document** and is issued with the consignment; where the two differ, the producer's sheet prevails. This sheet carries no warranty of the properties of any particular batch. Velora Chemicals Private Limited is a bulk supplier and trader, not a manufacturer.

Sources consulted: ECHA C&L inventory (notified classifications for calcium chloride); producer safety data sheets and handling guides; IS 1314 (1984 edition; IS 1314:2024); IS 456:2000; FSSAI Food Products Standards and Food Additives Regulations, Appendix A; ITC(HS) chapter files published by DGCIS; WCO HS Chapter 28 legal notes; OSHA and ACGIH particulate limits; ILO.