

APPLICATION METHODS

CALCIUM CHLORIDE AS A DUST SUPPRESSANT



General Information

Calcium chloride is classified as a salt.

Calcium chloride is non-toxic

Key Properties:

Hygroscopic – which means it can absorb moisture from the air and/or from the road.

Deliquescent – which means it can dissolve into the moisture it absorbs forming a clear liquid that does not evaporate easily.

These two key properties make Calcium Chloride an excellent dust suppressant; this ability to pull moisture from seemingly dry air maintains the road at a fairly uniform level of moisture. The result is a binding effect on the fines in the gravel road, thereby stabilizing the base and preventing dust.

The Calcium Chloride sucks up moisture keeping it in the road thus reducing dust, that's why the road looks darker.



Three Forms of Calcium Chloride:

FLAKE – comes in 20-25 kg bags or 1000 kg tote bag, with a 77% to 80% calcium chloride content and water of crystallization.

PELLET- comes in 20-25 kg bags or 1000 kg tote bag, with a 94% to 97% calcium chloride content and less than 1% of water of crystallization.

LIQUID – comes in tanker loads with the chemical in 32, 35, 38% concentrations.

Recommend ordering the FLAKE in 20-25 kg bags makes it easier to handle and store.

**STORE IN A DRY WELL VENTILATED ROOM WITH GRAVEL OR
WOODEN FLOOR AVOID STORING ON A CONCRETE FLOOR**

SAFETY PRECAUTIONS

Calcium Chloride is **EXOTHERMIC** – which means it releases heat as it dissolves.
(Good de-icer for snow or ice)

Heat Reaction can raise the temperature when mixing with water in a tank **making the water hot enough to burn** so all workers should be made aware of this.

Calcium Chloride is **CORROSIVE**

All workers should wear **dust respirators (masks)** to avoid inhaling the chemical.

All workers should wear **goggles** to protect eyes.

All workers should wear **rubber boots, rubber gloves and coveralls** when handling Calcium Chloride.

Potential Health Effects

Inhalation:

Granular material does not pose a significant inhalation hazard, but inhalation of dust may cause irritation to the respiratory tract, with symptoms of coughing and shortness of breath.

FIRST AID – Remove to fresh air, keep patient warm and at rest, obtain medical attention

Ingestion:

Low toxicity material but ingestion may cause serious irritation of the mucous membrane due to heat of hydrolysis. Large amounts can cause gastrointestinal upset, vomiting, abdominal pain.

FIRST AID – Induce vomiting immediately as directed by medical personnel.

Skin Contact:

Solid may cause mild irritation on dry skin, strong solutions or solid in contact with moist skin may cause severe irritation, even burns.

FIRST AID – Wipe off excess material from skin then immediately flush skin with plenty of water for at least 15 minutes. Remove contaminated clothing and shoes. Obtain medical attention.

Eye Contact:

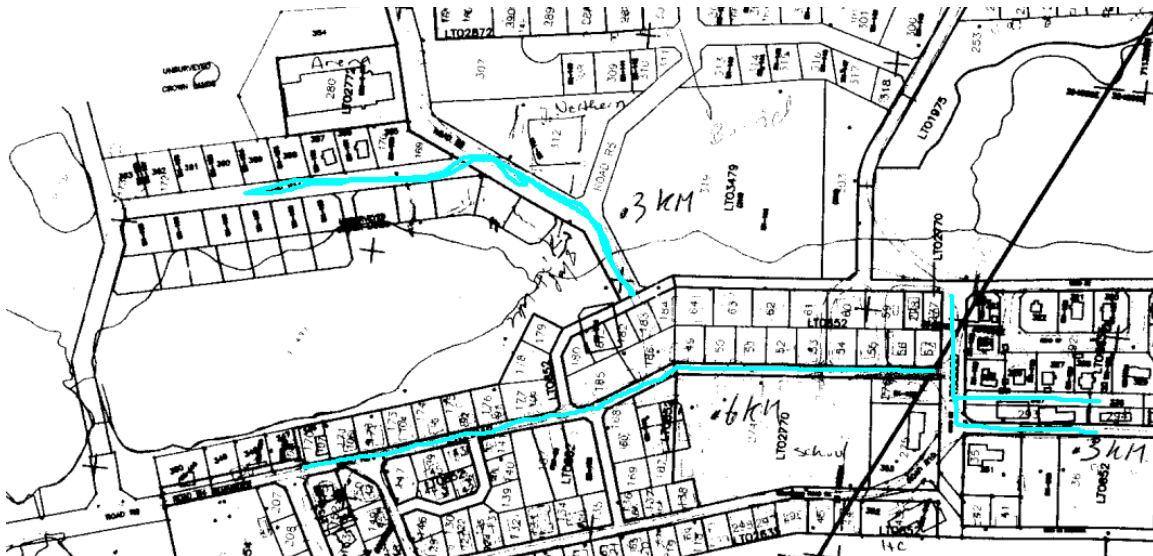
Hazard may be either mechanical abrasion or, more serious, burns from heat hydrolysis and chloride irritation.

FIRST AID – Immediately flush eyes with plenty of water for at least 15 minutes, lifting lower and upper eyelids occasionally. Obtain medical attention immediately.

Obtain medical attention immediately for any of the above conditions.

ROAD PREPARATION AND APPLICATION

Select all roads to be treated and measure width and length.



Determine how much you need.

Manufactures' recommended application rates for flake calcium chloride:

1 to 1.5 pounds of flake per square yard for newly treated roads.

.5 to 1 pound of flake per square yard for roads treated the previous year.

Width (ft) x Length (ft) divided by 9 ft = Square Yard

Example: Road measures 300 meters = 900 feet long x 30 feet wide,

$30 \times 900 = 27000$ divided by 9 = 3000 square yards

3000 square yards x 1 pound = 3000 lbs for a newly treated road.

3000 square yards x .5 pound = 1500 lbs for a previously treated road.

MOBILE EQUIPMENT

Material Spreader - to distribute the calcium chloride



Water Truck with spreader - bar to water the roads



Grader with scarifier blades – for road base preparations and mixing



Compactor – use for road compaction



Liquid sprayer – used for mixing flake with water and spraying as a liquid brine solution.



Eliminates the use of a material spreader and water truck.

PUBLIC AWARENESS

Prior to commencing the application of calcium chloride the public should be advised that the Municipality will be applying the product.

Make announcements on the radio, stating where and when dust control will be taking place; that the roads will be slippery when wet for a short period of time, and that the general public should stay away from the area until the work is complete. The public should avoid walking or driving on the wet surface.

Ensure the Health Centre knows what is going on and provide them with a 'Material Safety Data Sheet' (M.S.D.S) on Calcium Chloride.

M.S.D.S. is provided to the Hamlet by the Calcium Chloride supplier.

APPLICATION METHODS

Three application methods are available. Method 1 & 2 is to be used in all situations depending equipment available. Method 3 (surface application only) is to be used only if the road is in poor condition and no gravel is available for top dressing.

Prior to commencing any of this work the roads should be well graded and in good condition adding new gravel if necessary. A straight-line crown of $\frac{1}{2}$ " per foot has been found to be most satisfactory.

Method #1

1. Barricades and signs should be erected at each end of the roadway being treated to advise public that a dust control project is underway. Flag persons may be required to redirect traffic.
2. Water the road until it is lightly saturated.



3. Blade windrows to the sides of the road using the top 2 to 3 inches of road.



4. The chemical should be loaded into the spreader hopper using safety precautions.



5. Apply the calcium chloride to the full road width evenly. Remember to calculate how much is required per length of road and spread that amount evenly.



6. Spread water until calcium chloride is dissolved.



7. Blade windrowed material back over the road several times (3 full times/nine passes) to blend in the calcium chloride solution.



8. Shape and compact the treated road
Additional water may be required if white patches are present. Careful not to over wet the road as it will take longer to cure.
9. Wash all equipment thoroughly at the end of each days work to remove all traces of calcium chloride.



Method #2

1. Barricades and signs should be erected at each end of the roadway being treated to advise public that a dust control project is underway. Flag persons may be required to redirect traffic.
2. Fill Liquid Sprayer half full with cold water and add calcium chloride flake using safety precautions.



Top up tank after the flake is added. (No more then 18 bags (22 kg) should be added to the 500 gallon tank.)



3. Apply the calcium chloride to the full road width evenly. Remember to calculate how much is required per length of road and spread that amount evenly.



4. Blade windrowed material back over the road several times (3 full times/nine passes) to blend in the calcium chloride solution.



5. Shape and compact the treated road
6. Wash all equipment thoroughly at the end of each days work to remove all traces of calcium chloride.

Method #3

Surface application only is to be used only if the road is in poor condition and no gravel is available for top dressing.

1. Barricades and signs should be erected at each end of the roadway being treated to advise public that a dust control project is underway. Flag persons may be required to redirect traffic.
2. Water the road until it is slightly saturated.
3. Blade and compact the road.
4. The chemical should be loaded into the spreader or sprayer using the same safety precautions used in method #1 and #2
5. Apply the calcium to the full width evenly. (Measure the amount required for length of road) .5 or 1 pound per square yard.
6. If using the spreader, water the road until all the calcium chloride is dissolved. It's better to water lightly and gently so you don't wash away the chemical into the ditch.
7. If using the sprayer no additional watering is required.
8. Wash all equipment thoroughly at the end of each days work to remove all traces of calcium chloride.

Method # 4 Not recommended



Conclusions:

Method #1 or #2 is the best; applying and blending calcium chloride into the top 3" of road surface, then compacting it thoroughly will leave you with a nice hard road that should give you a dust free season.

If the road begins to become dusty late in the summer rewatering will activate the calcium chloride and enable the road surface to remain hard and dust free.





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