

Calcium Chloride in Dust Control Applications

Still the Most Effective Dust Control Agent

Contents

Why control dust?	1
Why use calcium chloride for dust control?	2
How can road managers with tight budgets justify expenditures for dust control with calcium chloride?	2
Guidelines for Using Calcium Chloride in Dust Control	2
Frequently asked questions	3
Additional Information	3

WHY CONTROL DUST?

Dust produced by traffic on unpaved roads is an unpleasant nuisance, affecting the quality of life for everyone who uses those roads and those who live or work nearby. Road users face the serious safety issue of reduced visibility, and residents suffer from dust drifting into their living environment, increasing their chances of developing respiratory health problems.

Dust is more than a nuisance: it is a warning sign of costly road damage. A dusty road is a deteriorating road. Dust is made of fine, airborne particles from the road surface. When the particles become airborne, they no longer can serve as binding agents to hold the road surface together. This results in ruts, potholes and washboards that require costly spot repairs and frequent blading to keep the road in acceptable condition.

WHY USE CALCIUM CHLORIDE FOR DUST CONTROL?

Calcium chloride attracts moisture from the air, keeping the road damp even under hot, dry conditions. This constant dampness binds aggregate particles together, resulting in a hard and compact surface. As calcium chloride is applied annually, it becomes established deeper in the road base, giving improved stability and preventing frost damage.

HOW CAN ROAD MANAGERS WITH TIGHT BUDGETS JUSTIFY EXPENDITURES FOR DUST CONTROL WITH CALCIUM CHLORIDE?

Several years ago, road managers in South Africa asked this question and subsequently launched a series of field trials to collect the necessary data to develop an answer.¹ They found:

- Blading frequency of roads treated with calcium chloride decreased by about 50% and the expected interval between gravel applications increased from 7 to 14 years.
- Annual application of calcium chloride with a 90-day blading cycle maximized the economic benefits for road managers and road users.

Therefore, a dust control program with calcium chloride is an investment with a good rate of return, improving the quality of life for road users and neighbors.

GUIDELINES FOR USING CALCIUM CHLORIDE IN DUST CONTROL

- Blade in the spring while the road moisture content and humidity are high. Water road surface prior to blading unless rain has fallen within the last two days. Remove ruts, washboards, potholes and mix in loose aggregate.
- For best performance, aggregate should meet the criteria shown in Table 1 (below).
- Good drainage is essential for superior performance. Shape roads to a 4% or greater crown. Ditches, shoulders, and culverts should be shaped and cleaned as needed.
- Recommended application rates are shown in Table 2 (below). When applying product in solid form like flake or pellet, it is usually preferable to water the surface prior to spreading the product. If the road is kept open to traffic while solid product remains on the surface, signs should be posted directing motorists to take appropriate precautions.
- Avoid applications during heavy rainfall or if rain is threatening.
- During unusually long periods of hot, dry weather, water the road surface during early morning hours as needed to reconstitute the treatment. Re-apply in late summer or early fall as needed.

FREQUENTLY ASKED QUESTIONS

Will an unpaved road treated with calcium chloride corrode my vehicle?

Noticeable corrosion is unlikely to occur on vehicles driven on unpaved surfaces treated with calcium chloride. Calcium chloride used for dust suppression is present in small amounts and tends to stay bound in the soil of the road, so there is little chance for significant contact with metal on a passing vehicle. Calcium chloride is readily soluble in water and vehicles can be easily cleaned after exposure. As a preventative measure, dust control application equipment should be thoroughly cleaned of calcium chloride residue after use.

Are dust control treatments with calcium chloride safe for the environment?

Controlling dust with calcium chloride reduces airborne particulate matter, which improves regional air quality and reduces sediment load on waterways. When following proper, current application practices, ground and surface waters are not likely to be impacted, and injury to trees from over-exposure to chloride rarely occurs. For more information, visit our “Use Responsibly” section of our website www.OxyChemCalciumChloride.com.

ADDITIONAL INFORMATION

To ensure the safe and effective use of OxyChem calcium chloride, please review the product's Safety Data Sheet (SDS) prior to use. To obtain an SDS, please visit our website at www.OxyChemCalciumChloride.com.

Table 1. Recommended Aggregate Characteristics

Characteristic	Preferred	Acceptable
Maximum Size	¾ inch	1 inch
Grading Description	Well graded – not uniform or skip graded	
Percent Pass #4	55 to 70	50 to 75
Percent Pass #200 (Non-plastic)	14 to 17	12 to 17
Percent Pass #200 (Plastic)	12 to 15	8 to 15
Plasticity Index	2 to 9	Non-plastic
Los Angeles Abrasion	Less than 30	Less than 40
Percent Fracture, one face	Greater than 85%	Greater than 75%

Table 2. Dust Control Application Rates (US and Metric Units)

Product	Unpaved Roads	Truck Terminals & Parking Lots	Mine Hauling & Logging Roads
LIQUIDOW® 35%	0.30 gal/yd ² 2117 gal/lane-mi	0.33 gal/yd ² 2352 gal/lane-mi	0.39 gal/yd ² 2744 gal/lane-mi
	1.36 litre/m ² 5027 litre/lane-km	1.51 litre/m ² 5604 litre/lane-km	1.76 litre/m ² 6511 litre/lane-km
LIQUIDOW® 38%	0.27 gal/yd ² 1901 gal/lane-mi	0.30 gal/yd ² 2112 gal/lane-mi	0.35 gal/yd ² 2464 gal/lane-mi
	1.22 litre/m ² 4514 litre/lane-km	1.36 litre/m ² 5032 litre/lane-km	1.58 litre/m ² 5846 litre/lane-km
LIQUIDOW® 42%	0.24 gal/yd ² 1664 gal/lane-mi	0.26 gal/yd ² 1849 gal/lane-mi	0.31 gal/yd ² 2157 gal/lane-mi
	1.07 litre/m ² 3951 litre/lane-km	1.19 litre/m ² 4404 litre/lane-km	1.38 litre/m ² 5116 litre/lane-km
DOWFLAKE® Xtra 83-87%	1.38 lb/yd ² 4.84 ton/lane-mi	1.56 lb/yd ² 5.49 ton/lane-mi	1.83 lb/yd ² 6.45 ton/lane-mi
	0.75 kg/m ² 2.76 tonne/lane-km	0.85 kg/m ² 3.13 tonne/lane-km	0.99 kg/m ² 3.68 tonne/lane-km
ANHYDROUS 94-97%	1.23 lb/yd ² 4.33 ton/lane-mi	1.39 lb/yd ² 4.90 ton/lane-mi	1.64 lb/yd ² 5.77 ton/lane-mi
	0.67 kg/m ² 2.47 tonne/lane-km	0.76 kg/m ² 2.80 tonne/lane-km	0.89 kg/m ² 3.29 tonne/lane-km

*lane-mi equals 4 yards wide by 1760 yards long

lane-km equals 3.7 meters wide by 1000 meters long

1 “The Incorporation of Dust Palliatives as a Maintenance Option in Unsealed Road Management System.” D. Jones, E. Sadzik, and I. Wolmarans; paper from 20th ARRB Conference, 19-21 March 2001.

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