



Road Dust Suppression using DustMag[®]

Accepted worldwide as the best dust suppressant on the market, available since 1983 in Canada and since 1990 in Australia. DustMag[®] is a proven solution that is easily applied.

Benefits of DustMag[®]

Depending on the situation, benefits include:

- ✓ Road dust suppression, compaction and stabilization
- ✓ Smoother, harder roads permit faster 'safe' driving speeds
- ✓ Greater road productivity (eg haulage)
- ✓ Decreased vehicle fuel consumption and lower maintenance costs
- ✓ Longer lasting roads, lower road repair and maintenance costs
- ✓ Rapid application (40,000-80,000 square metres per day) keeps roads open
- ✓ Lower replacement cost of road gravel and road fines
- ✓ Minimal operational disruptions
- ✓ Reduced watering costs, reallocation of watercarts
- ✓ Happier surrounding community
- ✓ Less crop damage to road surrounds
- ✓ Reduced evaporation (can be a watering supplement)
- ✓ Preserves surrounding flora and fauna
- ✓ Conserves valuable water supplies

Uses of DustMag[®]

Principally applied to trafficked areas such as roadways, DustMag[®] acts as a compaction agent, stabilizer and dust suppressant. It can also aid in sealed road construction.

What is DustMag[®]?

A 100% Australian made, environmentally benign, hygroscopic solution based on 'Magnesium' Chloride (MgCl₂). Hence the name DustMag[®].

The solution is delivered to the job site as a bulk liquid, ready to use. No mixing or special preparation is required.

How is DustMag[®] applied?

Usually by a pressurized, monitor-equipped spray truck (commonly referred to as a 'watercart' or 'dustcart') which dispenses the solution top down onto the prepared surface at a usual rate of 1.8 litres per square metre.

It can also be repeatedly applied as a 'shandy' mixed with water, or it can be graded into the surface material if stabilization and compaction are the main aims, rather than dust suppression.

A combination of these application methods, or others, may be determined in consultation with your local Rainstorm representative who can advise you on the method best suited to your particular requirements and conditions.

Rainstorm can arrange the application of DustMag[®] using their own specialized equipment and trained workforce, or simply supply the product for application by the purchaser or their contractor.

How does DustMag[®] work?

DustMag[®] is 'hygroscopic' meaning it attracts and retains moisture from the air. This expedites compaction by slowing the rate of evaporation during the compaction process. Furthermore, by aiding moisture retention the treated surface continues to compact under future traffic.

Combined with better water retention, other chemical characteristics of the Magnesium Chloride component of the product increase attraction between soil particles. As the binding ability of road fines increases, so does road stability. The finer particles are retained in the road surface and lock coarser aggregates in place.

In summary, retaining moisture retains the dust which better compacts and stabilizes the road surface, which is now smoother, harder, safer and longer lasting.

How long will it last?

This depends on many factors such as the characteristics of the gravel to be treated, climate patterns, and surface traffic. Heavier traffic volumes can actually increase the lifespan of a DustMag[®] treated surface. Most situations will require application only once a year, typically before the dry season. Low rate 'top ups' may be applied 'as needed' either by Rainstorm or by clients/contractors adding small volumes to watercarts out of product held in storage at client premises.

Pricing

Since it is supplied as a bulk liquid, DustMag[®] is priced differently around Australia to allow for the freight component. It is priced by the litre as a delivered product, or by the square metre with full service application by Rainstorm. Contact your nearest Rainstorm representative (see below) for a quick price estimate based on the size and location of your intended application.



Rainstorm Truck Applying DustMag on Local Government Roads In Australia



Rainstorm Lays the Dust from Canada to Australia Under Different Conditions

Who else uses DustMag[®]?

In Australia our clients include:

- ✓ City of Cranbourne
- ✓ Shire of Yarra Ranges
- ✓ Transfield Resources
- ✓ Alcoa
- ✓ Worsley Alumina
- ✓ BHP Billiton
- ✓ Rio Tinto
- ✓ FMG
- ✓ Iluka Resources
- ✓ Main Roads WA

Independent research shows

1. "... substantial reduction in fugitive dust emission with application of chemical dust suppressants (50-70% reduction)."

2. Magnesium Chloride is the most effective chemical dust suppressant when compared to Nalco, Lignosulfonate, and Coherex.

3. Magnesium Chloride "... proved to be the accepted best performer. This was the standard and its general use is reflected in the 'first' rating due to its excellent dust abatement properties and longevity. This material is easy

to work and maintain.” Nine months after application: “The surface is still hard packed with very little loose gravel on the riding portion. The ride is good. There are a few small potholes and some washboard in the corners only. Light traffic is producing very little dust.”

4. “... the trial section performed extremely effectively. Virtually no dust was generated and loss of surface material was limited, with no maintenance grading required. During this period, the road was subject to an unusually high volume of construction traffic which, under normal circumstances, would have created maintenance problems. ... it can confidently be concluded from this trial that DustMag[®] is an effective short term treatment which may result in significantly reduced maintenance requirements for heavy traffic volume unsealed roads.”

5. For every vehicle travelling down an unsealed road once a day, for a year, over 500kg's of aggregates are stripped from the road and are deposited along a corridor extending 150m to either side. For example, a road with average traffic flow of only 5 vehicles per hour loses over 66 tonnes of aggregates, per kilometre, every year.

6. Cost analysis shows “... 30-46% reduction in total annual maintenance costs for treated test sections over the untreated section.”

7. Estimated “61% reduction in total aggregate loss when unpaved roads are treated” with DustMag[®].

References:

- 1,6,7. Colorado State University, Relative Effectiveness of Road Dust Suppressants, 1993/4.
2. US Mines Department, Comparative Evaluation of Chemical Stabilizers.
3. British Columbian Ministry of Transportation, Highways Dust Abatement Test Program, 1991/2.
4. Shire of Ashburton, Trial of Road Stabilizers, 1993.
5. Roberts, 1973 and Hoover, 1971.

Why DustMag[®] works so well

Because it is based on Magnesium Chloride. The small levels of moisture retained by DustMag[®] achieve such high levels of compaction and dust suppression in three ways.

DustMag[®] simply binds itself and water molecules to the surface fines making them heavier and less prone to lifting from the road by wind or traffic action.

As the Magnesium Chloride component of DustMag[®] penetrates the road it reduces any negative charge on the particles. This in turn, reduces the particles tendency to repel each other and reduces the thickness of water coating the particles. This allows the particles to move closer together.

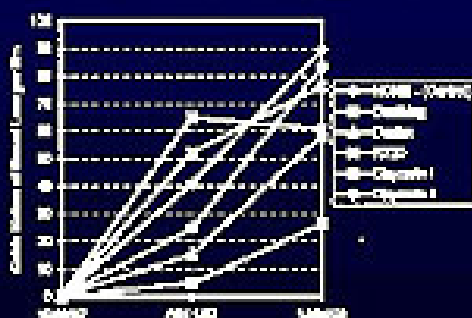
The surface tension of Magnesium Chloride is far greater than that of water. The higher surface tension reduces evaporation and, combined with the thinner film coating the particles, substantially increases the attraction between the soil particles.

WHO'S GOT THE BEST DUST SUPPRESSANTS?



Main Roads Study shows DustMag Number One in all categories
 DustMag knocks back gravel loss by 70%!

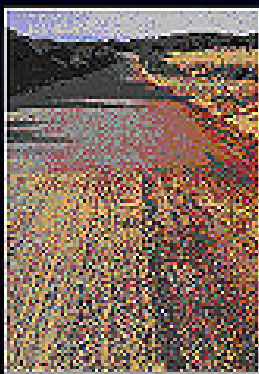
Gravel Retention of 8 Products plus Control



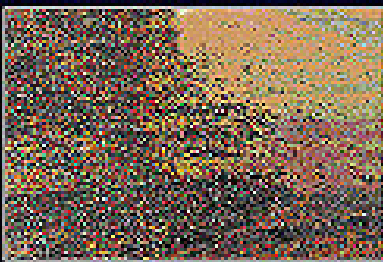
PRODUCT USED	PRODUCT SCORINGS OVER 3 ASSESSMENT PERIODS (1 - 6 with 6 being the highest)								
	27/06/97 - Time of Construction			01/07/97 - before Wet Season			14/09/97 - After Wet Season		
	Dust Generation	Surface Finish	Pavement Condition	Dust Generation	Surface Finish	Pavement Condition	Dust Generation	Surface Finish	Pavement Condition
NONE - (Control)	6	6	6	4	4	4	1	2.5	3.0
DustMag	6	6	6	6	4.5	4.5	4	4	4.5
DurMag	6	6	6	4	4	4	3	3.5	4
Reynolds RT20	6	6	6	2	3.5	3.5	1	3	3.5
Claycrete I	5	5	6	2	3	3.5	2	2.5	3.5
Claycrete II	5	5	6	3	2.5	4	2	3	3.5

PRODUCT RANKINGS AFTER 6 MONTHS - GRAVEL LOSS

GRAVEL RETENTION AND SAVING (at 100000 km) OF 8 PRODUCTS vs CONTROL					
Gravel Lost (M ³ /km ²)	PRODUCT USED	Score Ranking	Gravel Save ¹ per 6000	Value per 6000M ²	Retention Ratio (%)
-2,876	DurMag	1	63.3	\$2,182	71%



Compaction results of normal traffic flow. Results may vary according to local traffic, soil type and climate.



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