

Unpaved Road “Dust Control”

What is dust control? On unpaved roads, it means applying something to retain the fines (dust) in the road surface with a goal of forming a binder around the larger particles and allowing precipitation to drain off of the road surface.

Materials that “seal” the surface, such as lignin, diluted asphalt emulsions and any other material (short of actual paving with chip seals or asphaltic concrete) are sometimes used. These materials can work for short periods; however, after rain, freezing and thawing, and traffic, the surface will disintegrate and will have to be regraded for a smooth riding surface. Upon regrading, the sealing material will be lost and/or need to be replaced.

On the other hand, CaCl_2 can be regraded as necessary when sufficient moisture is available to allow the top inch or two of surface to be cut and mixed by the grader. The CaCl_2 coated fine particles are smoothed back and will continue to provide dust control. The effectiveness of the CaCl_2 depends on moisture from rain, humidity, and dew. CaCl_2 is deliquescent and hygroscopic (draws moisture and resists evaporation). Starting with 100% effectiveness at initial application, rain cycles and larger aggregate particles abraded creates more dust. Blading and mixing with uncoated particles will eventually require a “booster shot” to restore the maximum dust control. AASHO tests on the Ottawa Test Road showed that at an ADT (average daily traffic) of 100 vehicles per day on an 18’ wide road would lose 300 tons of aggregate per mile per year. After 2 pounds per square yard of flake CaCl_2 was applied, the road lost only 30 tons per mile per year.

A newly treated CaCl_2 road will start at 100% dust control and may go down to 70 to 80% by the following spring. After maintaining the surface and adding any new aggregate, a booster shot of at least 1 pound of flake CaCl_2 or equivalent as Liquidow® will restore the 100%

control. As years go by, less CaCl_2 per mile will be required as a “reservoir” will build up in the road. Each booster shot will do better and last longer. The 18’ width will usually only be boosted on the middle two-thirds to three-fourths of the road as most traffic will be driving in the middle of the road. The greater the ADT and softer the aggregate, the more CaCl_2 may be required. The harder the aggregate and/or lower the ADT, the less CaCl_2 booster shots may be required. The road will let you know when it needs some maintenance.

The ability to achieve a hard, dust-controlled surface that can save more money per mile per year than it costs is dependent on the ADT, cost of replacement aggregate and blading expenses.

Please call Sicalco to discuss the potential costs and benefits for your highway department.