



KEYS TO SUCCESSFUL CHLORIDE DUST CONTROL/STABILIZATION

Magnesium chloride, calcium chloride, and sodium chloride (road salt – very short term dust control only) have all been used successfully for stabilizing and dust control on South Dakota's gravel roads. When chloride treatments are working well, they not only control dust which makes local residents happy, but the gravel surface remains tightly bound which reduces gravel loss and reduces blading frequency. In some cases, depending on traffic, chloride treatments will actually pay for themselves by reducing the need to regravel and blade the road frequently. However, we have also seen poor performance and even failures with chloride treatments as well. Here are three major points to consider:

Good subgrade and gravel are essential

If the road has a weak subgrade, the surface will constantly deflect under traffic and the surface gravel will never have a chance to form a crust. Subgrade improvement will need to be done before treatment in very weak conditions. Thereafter, quality of the existing surface gravel is critical. If the gravel does not have a good natural "binding" characteristic the chloride cannot do its job. Chloride is not a binder; but it will draw moisture from the air and keep the gravel surface damp and tightly bound when natural binder is present.

Gravel that has a good blend of stone, sand and fines is essential. Ideally, the gravel should have 8 to 15% of its total weight passing a #200 sieve. In addition to this, a minimum PI (plasticity index) of 5 is ideal with 12 as a maximum. The top size of stone should not exceed three quarters of an inch.

Proper surface preparation

The road surface needs to be properly prepared before treatment. When stabilizing, loosen the top one to two inches of gravel. An ideal way to do this is to use a "bit type" cutting edge on the grader. These bits will have a shallow scarifying effect on the gravel and do a nice job of loosening the surface and blending the stone, sand and fines.



Make sure the surface is crowned properly and shaped uniformly. Crown should be at or near 4%. Never exceed 6%. If the material is dry, it is best to pre-wet the road to near optimum moisture prior to chloride treatment. An ideal time to treat a road is right after fresh gravel is hauled and spread. Do not attempt to treat dry gravel.



Excellent example of application of liquid chloride shown here.

Proper Application

Liquid chloride should be applied through a pressurized spray bar that gives a uniform application across the road surface. Also the truck's travel speed in feet per minute and the output of the spray bar in gallons per minute should be carefully calibrated so that a uniform application rate is made on the entire length and width of the road. Unless the rate of application is less than .3 gal per square yard, the product should be applied in two shots with ample time for absorption in between.

Flake or pelleted chloride should be applied through a ground driven spreader (such as a broadcast fertilizer spreader) that can be precisely calibrated. Sand spreaders are often used, but they are not ideal.

One final point – don't be stingy on the application rate itself. A liquid treatment of less than .5 gal. per sq yd is seldom effective for the season. A flake treatment of under 1.5 pounds per sq yd is seldom enough. Follow these simple rules and chloride treatments will perform very well.

Ken Skorseth, SDLTAP Program Manager