TECHNICAL BULLETIN

GRAVEL ROADS – DUST SUPPRESSANTS

PROCESS DESIGN OVERVIEW

1 SCOPE

In many construction, agriculture, mining and secondary or unimproved gravel road operations dust creation and gravel degradation are an ongoing issue that has to be monitored and controlled. The use of specialty products to control dust and bind aggregates together is very common in these industries.

Traffic and weather degrade granular roads causing fugitive dust and stone loss. Fugitive dust can coat nearby vegetation damaging plants, it is a traffic hazard and is abrasive to equipment and engines. By binding the aggregate together and keeping it from rolling and crushing under traffic the life cycle of grading operations can be extended.

1.1 DEFINITIONS

Dust control is an application of a diluted asphalt emulsions, oil based liquids, chloride salts or organic resins sprayed directly onto or mixed into granular road beds. Typically these materials are applied by a vehicle mounted distribution system. The application rates are variable depending on the product of choice and the material it's being applied to.

2 MATERIALS

2.1 Asphalt Emulsions:

Asphalt emulsions are economical, environmentally friendly and can be formulated with a number of additives for enhancing end use properties. Asphalt emulsions can be top sprayed or road mixed into the top few centimeters.

Oil Based Liquids:

Oil based materials come in many forms from clear oils to high viscosity cutbacks. Clear oils have been used when the road requires a wet appearance. The high viscosity cutbacks have excellent binding capabilities and work well blade or pulverize mixed into the top few inches of granular material.

Organic Polymers:

Organic polymers or lignin's derived from plants can be used as a natural dust suppressant measure. It very effectively binds the granular surface together. They tend to be viscous products that are typically diluted with water for application.

Chlorides:

Chlorides have a wide range of applications in construction, de-icing and dust control. Used for many years in the industry chlorides still tend to be an industry work horse when it comes to controlling dust. Typical chlorides used include calcium, magnesium and potassium.

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3 DESIGN CRITERIA

Examining the granular surface for pre-existing conditions, evaluate the aggregate to be used, understand traffic types and volumes, evaluate local environmental conditions, determine wants, needs and budget.

Once the needs assessment is completed an appropriate design can be completed. Designs range from a simple top spray to a complete mix design depending on the assessment.

4 RECOMMENDED PERFORMANCE GUIDELINES

In order to construct a proper well designed dust suppressant the following guidelines should be followed:

- Evaluate the material or commodity, determine wants and needs.
- Based on the assessment choose the appropriate palliative
- Confirm engineering parameters utilizing a certified laboratory
- Develop storage and handling procedures.
- Develop application, QC and QA procedures.