

MADE WITH ALL ISO 9002 APPROVED CHEMICALS

ENVIROSEAL LBS[®]

A SOIL STABILIZER THAT SUPPRESSES DUST AND REDUCES ROAD CONSTRUCTION AND MAINTENANCE COSTS ON CLAY AND LIME BEARING SOILS

ENVIROSEAL LBS[™] is a surfactant (an ionic surface active agent) which changes the hydrophilic nature of clay and lime materials to hydrophobic. Its application not only assists in the expulsion of water from soils, but also aids the lubrication of soil particles and increases the compatibility of many soils in the AASHTO A6 through A8 classifications. The reaction of **LBS** on these materials is particularly effective because of the ion-exchange capacity of clay minerals the property that clay minerals have of absorbing certain ions (such as the **LBS** (inorganic molecule), thereby changing its physical properties. Of special importance is that **LBS** changes the plastic characteristics of these materials due to a reduction in its water absorbing capacity. Unlike most other soil stabilizers, the effect of **LBS** on these materials is permanent.

HOW DOES IT WORK?

ENVIROSEAL LBS[™] was developed to assist engineers with the removal of adsorbed water in materials in order to achieve maximum density with less mechanical effort and to prevent the absorption of water, that results in permanently stabilized construction materials. Most materials are made up of stacks of silica and alumina sheets. The arrangement of these result in different clay minerals such as Kaolinite, Smectite, Illite, etc. A simplified explanation is that these clay minerals have a predominately positive electrical or an ionic charge. This causes clay minerals to have a strong attraction for any cations present. Cations, or negative molecules, are therefore attracted to the positive clay minerals like iron filings to a magnet. In close proximity to the clay molecule or particle, the electrostatic forces are larger and thereby the ions are held very firmly. Nominal temperatures will not remove them. This layer of water is known as the electrostatic diffused double layer. This water is known as the adsorbed water. Moving further away from the clay particle, the water molecules are no longer in an attracted or orientated state, and this water is known as random water and it is also called absorbed water. Certain materials, like Smectite, have spaces between the plates or layers that can adsorb water, causing them to expand. These are known as expansive or swelling materials and are the cause of many failures in foundations or road works. The solution therefore is to obviously expel or prevent the adsorption of water. If some powerful positive molecules can be supplied, the negative charge of the clay minerals can be satisfied and balanced out. At the same time, any weaker cations such as water can be disassociated and replaced, and/or occupation of the vacant ionic sites on the surface of the clay can take place. Large cations, such as sodium or water, cannot easily fit into these sites and is disassociated or replaced. Small cations, on the other hand, fit firmly into these vacated sites and cannot be removed. We therefore have the situation that the clay's negative charge is in balance and positive ions cannot be removed, thereby rendering the clay inert to water. The soil mass is now a permanently stable, **Water Repellent Road Surface**.

This is precisely what ENVIROSEAL LBS[™] does

ENVIROSEAL LBS[™] a cation-reactive synthetic compound that forms a protective coating, on oily clay layers on the surfaces of soil and clay particles. It reduces ion mobility and ion exchange and simultaneously makes the material hydrophobic by eliminating the absorption of water. **The result is a soil material that is much less sensitive to moisture, more workable and it can be compacted to a better particle-interlock state by equipment and traffic forces.** Better particle interlock means higher internal friction and **improved bearing capacity**. It also means greater density and less penetration of water. The active reagent is permanently bonded to the material particles and should any excess reagent be present, **additional** water will facilitate **deeper** penetration into the soil horizon until the entire reagent has been adsorbed.

Streets and roads that have been stabilized with **ENVIROSEAL LBS[™]** and sealed with **Enviroseal 2001** or **Enviroseal LDC** turn from mud surfaces into streets that **Will Maintain Normal Traffic in Wet Weather. CBR Increases from the normal from these types soil of 4.5 to 5.5 can be increased to be in the range of 14 to 16.**

APPLICATIONS.- The Main Applications for **ENVIROSEAL LBS[™]** is as a **Compaction Aid**:

- Increases Soil Workability and Bearing Capacity While Reducing Clay Activity
- Promotes Permanent Stabilization and Prevent Permanent Re-absorption of Water
- Controls Dust
- Minimizes Initial Construction Costs and Maintenance on Gravel Roads
- Maintains Stability under Wet Conditions

ENVIROSEAL LBS[™] is used mostly on:

- **Economical Construction and Upgrading of Gravel Roads**
- **Rehabilitation of Failed Roads**
- **Deviations, Landing Strips, Parking Areas and Nature Reserve Roads**
- **Mass Fills and Earth Dam Walls**

In cases where graded material or gravel has to be transported to a site to surface a road or parking area, the application of **ENVIROSEAL LDC[™]**, which is a **dust control** or **Enviroseal 2001[®]** becomes a very cost-effective solution. **2001** will seal the base surface when mixed to the proper ratios and will provide a highly water-resistant wearing surface.

ENVIROSEAL LBS[™], **ENVIROSEAL 2001[®]** and **ENVIROSEAL LDC[™]** are environmentally friendly and will result in substantial cost savings (up to 80%) over the use of other construction methods. We feel that you may be interested to consider its use in some future projects. More information is supplied in our other brochures:

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