

Dust-Tech



DUST-TECH

Nano- Technology

Dust-Tech, essentially is a liquid plastic. The polymer has been developed with a particle size of 1 µm (one micron). That is one-thousandth of a millimeter (0.001mm).

The minute size of the particles allows greater penetration into the soil. The very sticky Dust-Tech liquid polymer is surrounded with stabilizing agents to keep the product from sticking together while in its packaging. Once the product is mixed with water and applied over the ground an evaporation process of the stabilizing agents takes place, leaving the Dust-Tech polymer to bind with the soil particles.

Application

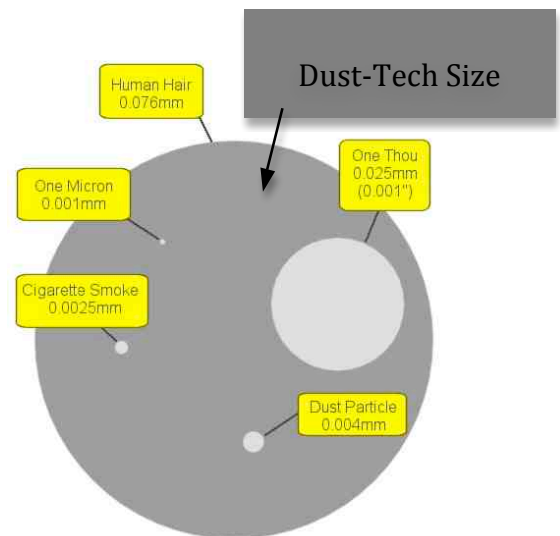
It is important to test the materials that the product will be applied on. Typically, when treating tailing dam materials for dust stabilization, one would mix Dust-Tech 1:9 parts water and apply the diluted ration at 1 litre per square meter.

The less diluted the application of Dust-Tech polymer, the stronger and longer lasting the solution will be. Dust-Tech, being a liquid plastic will bind the top 5 to 10mm of the tailing material. It is recommended that the product be applied in a fairly diluted format and then subjected to the environmental challenges facing the mine. One can easily apply a second or third mix of Dust-Tech to strengthen the bond, until the right economical / performance criteria are met.

Performance Warranty

Warranty is subject to:

- i. The mine's environmental requirements
- ii. Longevity requirements
- iii. Testing of the materials to be treated with Dust-Tech polymer
- iv. Determining the application rates in accordance
- v. Performance warranty can be guaranteed from 3 months to 30 years , subject to customer requirements and budgets



Skin Formation (colourant used)



TYPICAL DUST-TECH APPLICATIONS

- **Mine Haul Roads** - Stabilization and dust suppression of mine haul roads. Mines have a variety of roads. Some are haul roads, some are pit roads and some are general roads. Not all roads are treated the same. The heavier duty roads and roads that are critical to product, need to be stabilized to allow operations to continue in rainy weather.
- **Water Consumption Reduction** - dramatically reduce the water consumption for road maintenance. Dust-Tech is an elastomer and binds the top 10 – 15mm of the base-layer. As regular Dust-Tech applications are applied, the soil eventually becomes saturated and applications become more infrequently
- **Tailings** – stabilize loose materials on tailings. Prevent wind and water erosion. The top 10-15mm of the tailing is bound and forms a strong crust (see pics on next page)
- **Solar Panel Farms** – bind loose materials under the solar panels and minimize dust deposits on the panels
- **Heli-Pads** – stabilize the landing area of helicopters



TAILINGS - WATER REDUCTION

Mines are wasting millions of litres of water per annum with continuous water spraying of tailings to reduce dust.

Reduction in operation maintenance expenditure is always of high importance for mining operations.

Dust-Tech polymer concentrate from Polymer Pavements, is mixed with up to 20 parts water and is applied at approximately one litre of diluted mix per m². This solution is cost effective and semi-permanent. Normally, Dust-Tech is clear in colour. However a colourant may be added to the product for several reasons:

- i. to easily mark and monitor tailing areas that have been treated with Dust-Tech
- ii. to create a green environmentally friendly looking tailing
- iii. to easily identify areas that may have been damaged. These areas will show the natural colours of the tailing material

Benefits of Dust-Tech, Dust Palliative

- i. One application lasts up to two years
- ii. A strong "skin" of two to three millimeters will be formed
- iii. No more daily water spraying is required
- iv. Environmentally friendly
- v. Cost Effective



Note green tinted Dust-Tech polymer skin being cut out of mine tailing materials. Tailings are tinted green in order to allow for easy identification of treated areas and to expose any damaged areas, which will display lighter coloured material, which has not been treated.



DUST AND NOISE POLLUTION

Dust at mining operations can be caused by trucks being driven on unsealed roads, crushing operations, drilling operations and wind blowing over areas disturbed by mining.

Dust levels can be controlled by spraying water on roads, stockpiles and conveyors. Other steps can also be taken, including fitting drills with dust collection systems and purchasing additional land surrounding the mine to act as a buffer zone. Trees planted in these buffer zones can also minimise the visual impact of mining operations on local communities.

Dust-Tech - The Solution

Simply spray Dust-Tech over the loose material and allow to settle. Within an hour, a thin plastic type film will be formed over the soil, penetrating at least 4mm deep into the soil. Dust-Tech is environmental friendly and will allow seedlings and grass to grow through the film.

One litre of Dust-Tech is mixed with twenty litres of water and sprayed on the area to be treated – making it extremely cost effective. Approximately 50ml of Dust-Tech is sprayed per m². Frequency of application is subject to the road material and traffic conditions.

Before

After





Unlike some opposition products, Dust-Tech is environmentally friendly and skid-proof when wet.

How Dust-Tech Works

Dust-Tech is a scientifically advanced copolymer specifically formulated to control dust emissions. The nano-polymer particles penetrate the top five mm of so, of the road (subject to the road density). It works by saturating, penetrating and bonding dust and aggregate particles together, creating a durable surface that acts as an excellent dust suppressant.

The product will be diluted and applied as per user requirements.

The Problem with Many Dust Control Alternatives

- * Water can be an effective short term solution, but when the moisture dries, it leaves the soil more fragile creating even more dust
- * Oil-based emulsions continually percolate and leach through the soil, never binding with the road bed particles to stabilise the surface.
- * Most asphaltic materials create a thin top layer which is easily picked up and tracked by heavy equipment, leading to surface deterioration in the form of ruts, washboards and potholes





BENEFITS OF DUST-TECH

1. Control Dust – keep employees healthy
2. Open road to traffic immediately after applying Dust-Tech
3. Stabilize dirt/sand roads and prevent them from becoming slippery when wet
4. Improve productivity through better roads
5. Cost effective
6. Environmentally friendly
7. Easy application
8. Long life storage
9. Non-flammable



Dust-Tech – Environmentally Friendly

Department of Labour

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NORTHERN CAPE



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Sunningdale Suites
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January 6, 2014

Re: Alternative Dust Depression Method

Dear Mr. Olivier

This letter serves to convey to you the safe use of Dust Tech as an alternative to control dust pollution on the Gestamp Solar PV site in Copperton, Prieska.

It is our endeavor to ensure that the Occupational Health and Safety Act be applied and complied with as well as the Compensation for Occupational Injuries & Diseases Act by all employers and/or contractors.

We therefore conclude that the method you envisage using, be utilized in order to minimize the risk of all employees' health.

Hope everything is in order.

Regards,



P. Fillies
Deputy Director: Labour Centre Operations
Labour Centre De Aar



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MINISTRY OF HEALTH
DEPARTMENT OF PUBLIC
HEALTH
PRIVATE BAG 00269,
GABORONE

DPH 19/24 II ()

19 December 2013

To whom it may concern

Dear Sir/Madam

CHEMICAL CLEARANCE LETTER: TERAFORM, BOTSWANA (PTY) LTD

This office has found that the information provided in the material safety data sheet of these chemicals/products is adequate therefore clearance is granted for the following chemicals/products manufactured/supplied by **POLYMER PAVEMENTS, SOUTH AFRICA (PTY) LTD** on the conditions listed below:

1. SOIL- TECH POLYMER
2. DUST- TECH POLYMER

The company shall abide by the following;

- ♦ The company shall ensure there is adequate storage facility for chemicals and they are stored according to their type and intrinsic properties to avoid any reactions that may result in explosions. Effective and adequate ventilation Systems (e.g. Exhaust or Natural ventilation) shall be installed and regularly monitored to avoid accumulation of gaseous material inside warehouses. The ventilation system should be designed such that workers are not exposed to fumes.
- ♦ Administration controls should be in place and this includes amongst others adequate storage facility, ablution, laundry lockers, medical tests. In addition to this, storage should be well separated for example, away from the offices and eating areas. Employees shall also be advised on appropriate practices when handling chemicals.

