

## Lignex — dust control (soil stabilisation) on unsealed roads

Lignosulphonate is an effective **dust suppressant** and **surface stabiliser** of unsealed roads.

Sappi Biotech markets **Lignex 101**, a high lignin content **liquid** product and **Lignex 201**, a high lignin content **powder** product aimed primarily at **road dust management** and **soil stabilisation** applications.



### What is Lignosulphonate?

Lignin, a major component of wood, is one of the most abundant natural polymers. Lignosulphonate is a sulphonated technical lignin which is a by-product from the chemical pulping process during the papermaking process when cellulose and lignin are separated.

Learn more about lignosulphonates: [FAQ Lignosulphonates](#).

### How does Lignex work?

Lignex acts as surfactant, polymeric binder and disperser/plasticiser.

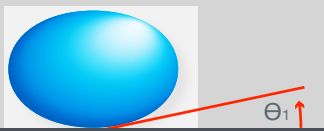
**Surfactants** lower the surface tension between liquid and solid particles, acting as a wetting agent. Effective wetting of dust particles suppress the tendency for very fine particles to become airborne.

### How surfactants work

Surface tension — which describes a fluid's surface elasticity — makes a liquid shape itself to the smallest surface area possible — a sphere — the smallest possible surface area to volume ratio.

#### High surface tension

Results in low dispersion and low adhesion to surrounding surfaces.



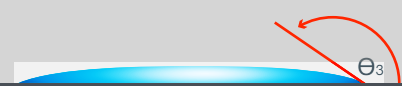
#### Reduced surface tension

Improved dispersion with some adhesion to surrounding surfaces.



#### Low surface tension

High, effective dispersion and adhesion properties.



Surfactants decrease surface tension

Lignosulphonate acts as a surfactant, to reduce surface tension, which makes it easier to mix insoluble particles (and molecules of insoluble fluids) in water. It also acts as a dispersant, that is, distributing fine particles evenly throughout a mixture.

**Lignex** could offer **savings** through **reduced water usage** and **road maintenance, improved vehicle tyre lifespan** and **fuel consumption, reduced vehicle wear** and **tear** and **increased uptime**.

**Lignex improves driving conditions** — visibility and braking ability — and **reduces** the risk of **occupational hazards** such as silicosis, asthma and cancer.

Interested in Lignex? Get in touch: eMail us at [lignin@sappi.com](mailto:lignin@sappi.com) or call Sappi Biotech on +27 (0)11 407 8111.

**How does Lignex work?** continued

**Polymeric binder** Lignosulphonate acts as natural glue to bind very fine particles and soil aggregates together, and the polymer traps moisture which retards evaporation and thus prolongs the wetting effect. The binding action is aided by the presence of sugars (derived from hemicellulose breakdown).

**Disperser/plasticiser** Lignosulphonate acts as disperser in a matrix of very fine particles and clay to disperse clay particles effectively for improved plasticity at lower moisture levels — leading to reduced abrasion and erosion. This allows for more dense and firmer compaction of the road surface. As an ongoing benefit, lignosulphonate leaches into the road matrix.

**Lignex 101**

**Lignex 101** is a neutral pH, high lignin content, **liquid** product, providing superior surfactant (wetting) and binding performance in road dust management and soil stabilisation applications. Lignex 101 has a solid content of 45% ( $\pm$  3%).

**Lignex 201**

**Lignex 201** is a neutral pH, high lignin content, **powder** product, providing superior surfactant (wetting) and binding performance in road dust management and soil stabilisation applications.



Lignex is available in liquid (Lignex 101) and powder (Lignex 201) forms.

**Lignex packaging options**

**Lignex 101 liquid** can be packaged to meet customer requirements as follows:

- Flexitanks loaded into containers (for export)
- ISO tanks (for export subject to availability)
- IBC Containers (subject to availability)
- Bulk road tankers.

**Lignex 201 powder** is packaged in big bags — 1m<sup>3</sup> bags with a bottom discharge valve — that hold 600kg.

**What are the benefits of using Lignex?****Savings**

The correct application of Lignex could provide the following savings:

- Water usage
- Road maintenance
- Improved vehicle tyre lifespan
- Fuel consumption
- Reduced wear and tear on vehicles
- Increased uptime and operating hours.

**Safety**

The correct application of Lignex will improve safety due to:

- Improved driving conditions (visibility and braking ability)
- Reduction in the risk of occupational hazards such as silicosis, asthma and cancer.

**Environmental**

Lignex is environmentally friendly, biodegradable and manufactured from renewable resources.

**How should Lignex be applied?\*****Spray-on application**

Surface treatments involve the spraying of diluted product directly onto the road surface. As a rule of thumb, less permeable soils (like clay) require Lignex to be diluted down to 10% dry solids and applied multiple times to facilitate surface penetration.

This application method produces a less permanent solution to that of the mix-in application where Lignex is blended with the soil prior to compaction, but it is ideally suited when:

- Road building equipment is not available for the mix-in application
- Maintenance of previously compacted roads need to be conducted
- A short term dust suppression solution is required.

**Mix-in application**

Blending Lignex with the soil prior to compaction, will provide a more permanent or longer lasting solution compared to surface treatments.

This process is ideally suited when compaction water is substituted with a lignosulphonate mix during the regravelling process of unsealed road construction. Additional costs incurred will be recovered because less frequent rejuvenation will be required and the overall improved road surface will translate into reduced vehicle operating costs.

An application guide for Lignex is available on request.

**Specifications and Material Safety Data Sheets (MSDS)**

Specifications and Material Safety Data Sheets (MSDS) are available on request.