



Water Resistant Soil Bases

TerraSil is an easy to apply soil modifier that permanently eliminates infiltration of water (water permeability), improves maximum dry density (MDD), increases resilient modulus and improves structural stability of soil bases and sub-grades. TerraSil creates soil bases and dirt roads that are impervious to water and improves soil stability. TerraSil has a significant impact on overall life cycle costs.

Benefits of TerraSil

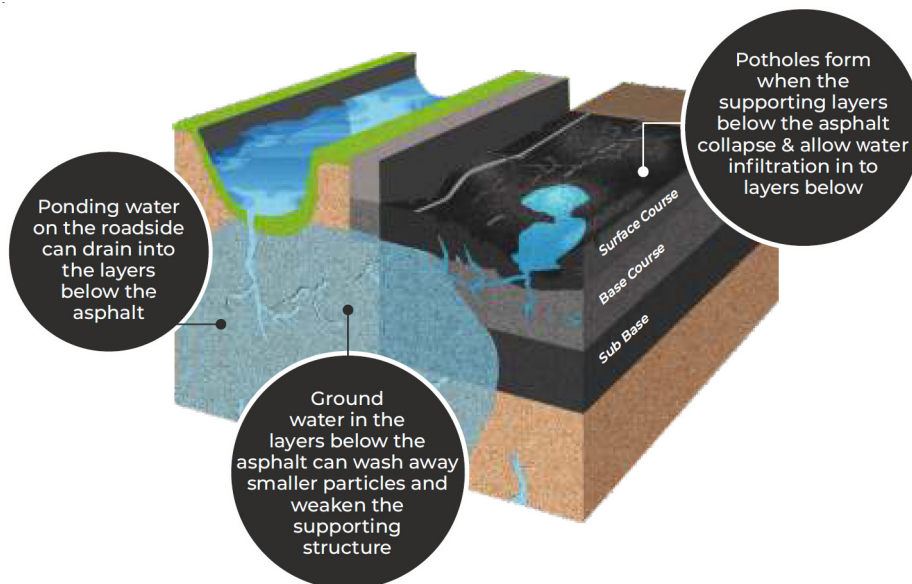
- ✓ Permanent water resistance
- ✓ Eliminates capillary rise
- ✓ Prevents freeze/thaw
- ✓ Reduces PI and expansivity
- ✓ Improves compaction density
- ✓ Improves load bearing capacity
- ✓ Water dilutable
- ✓ Easy to apply
- ✓ Non-leaching
- ✓ Environmentally safe & friendly



The Challenge

Moisture damage is the leading cause of fatigue for soil sub-layers and dirt/gravel roads. Infiltration of water can cause the soil to expand and become less cohesive, leading to ruts, corrugations, cracks and raveling. TerraSil complements conventional soil additives like cement and lime by eliminating the degradation of the cementitious bonds and increases the durability of the road's structural layers.

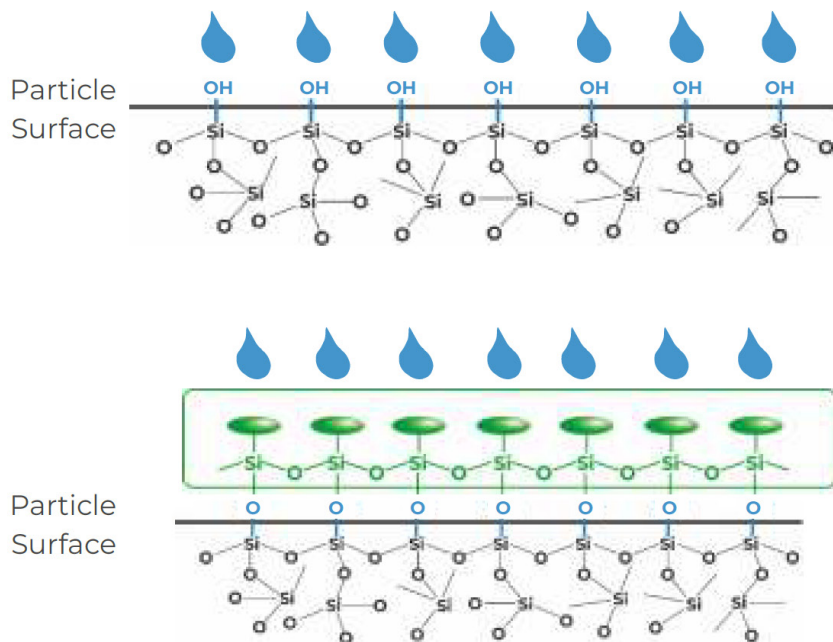
TerraSil offers an innovative solution to improve the soil strength (CBR) and stability of local soils, offering a cost-effective method for soil stabilization. TerraSil imparts soil waterproofing to the soil layers and prevents water ingress and capillary rise in road bases successfully eliminating water-induced pavement damage.





Chemical Action of TerraSil

TerraSil is a reactive soil modifier that permanently modifies the soil layer making it hydrophobic (water hating). TerraSil chemically converts water-absorbing hydroxyl groups to water resistant alkyl groups. This additive applies to all structural layers of the road pavement. It is safe, friendly to the environment and construction crews, and is non-leaching.



-OH groups make surface very hydrophilic (water loving):

High water permeability leads to capillary rise and shoulder ingress, leading to pavement damage.

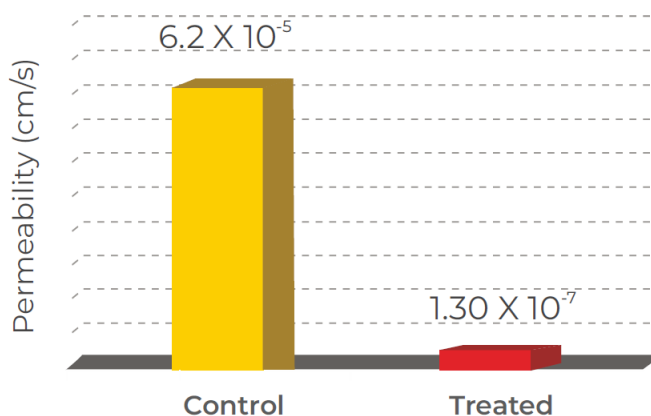
Molecular level hydrophobic zone (water repellent):

TerraSil reacts upon contact with soil, and creates a permanent water repellent layer on its surface. The soil is subsequently rendered impermeable to water ingress.

TerraSil is designed to be utilized with ZycoBond a nano polymer that chemically bonds soil particles together into a flexible crosslinked network. This chemical bonding polymer leads to improved load bearing capacity and soil flexibility.

Reduces Water Permeability

TerraSil solution, (1:200 dilution) when mixed and spray applied can reduce water permeability by a factor of 500, thereby significantly decreasing the rate of water infiltration and capillary rise in the soil layer. As a result, TerraSil treated soil bases remain significantly dry regardless rain. Additionally, TerraSil treated soil is breathable and allows for the escape of any trapped water in the soil layer in the form of vapor.





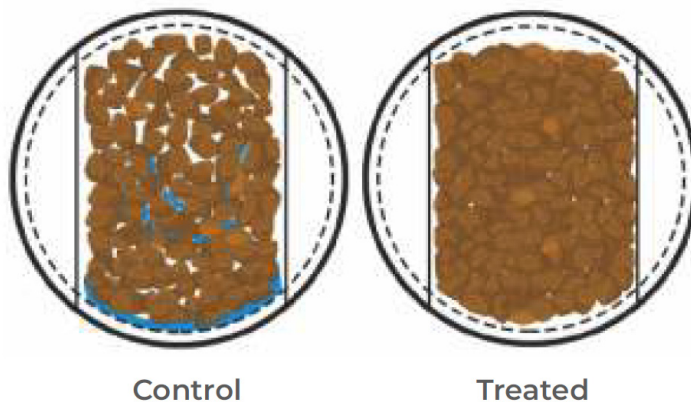
Reduces Expansivity

Hydrated soil expands horizontally and vertically creating swelling pressure in the soil bases due to water absorption. This causes undulation and can also lead to cracking of pavement layers. TerraSil reduces expansiveness by up to 90% at dosages of 0.5 to 1 KG per cubic meter of soil (plasticity of 5 to 25). The addition of cement ensures additional quick wet strength and the addition of ZycoBond improves soil cohesion and flexibility.

Sample	CBR 5mm (4 days soak)	% Water Absorption	Expansion (inches)
Control Soil	10.50	3.5	1.83
Soil + 1 Kg/m ³ TerraSil + 1 Kg/m ³ ZycoBond	28.10	0.5	0.31
Soil + TerraSil (1 Kg/m ³) + Cement (3%)	57.10	0.8	0.08

Increase Compaction

In addition to waterproofing soil bases, TerraSil improves compactive efforts whereas field proctor densities of 100-105 are easily achieved. The net result of making soils water resistant and improving soil compaction is the attainment of dry CBR values even under wet conditions. The improved compaction is a result of chemically bonded alkyl chains that provide lubricity and charge shielding to the soil particles during the compaction process.



Storage and Shelf Life

Store TerraSil between 41°F-113°F (5°C-45°C) in shady dry areas away from direct sunlight, heat, spark sources, rain or standing water. Fasten the container lid securely after use. Shelf life is 48 months. Should the product freeze, allow it to thaw before use.

About Zydex

TerraSil is a product of Zydex Industries. All States Materials Group is a licensed distributor of TerraSil and other Zydex pavement products. Established in 1997, Zydex is a specialty chemicals company with the purpose of innovating for sustainability. Beyond pavement products, Zydex offers a diverse set of chemical technologies for the textile, agricultural, and civil construction industries.

Sustainable Green Chemistry

Zydex is deeply committed to sustainable chemistries that ensure a greener future for everyone. This commitment has made Zydex a pioneer in introducing non-polluting and non-hazardous technologies that conserve, protect and enhance the environment. Zydex technologies have been recognized by the International Road Federation (IRF) and have been globally adopted.