



# FullService

GREEN SOLUTIONS

*Systems, products and know-how  
for a better environment*



## TerraPlus<sup>®</sup>

STABILIZING AGENT  
AND DUST RETARDANT  
FOR POOR SOILS



# TerraPlus®

## STABILIZING AGENT FOR ROAD SURFACES

**TERRA PLUS** is a liquid stabilizer that can permanently improve the geotechnical features of poor road soils.

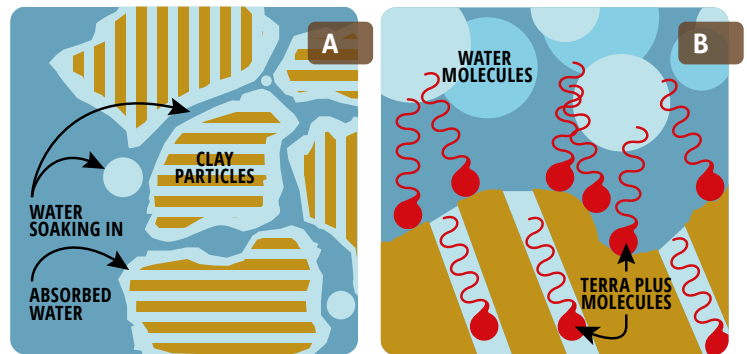
**TERRA PLUS** has been used for more than 20 years all over the world, restoring more than 40.000 km of roads. It represents an alternative to traditional hydraulic binders, and it is indicated in the stabilization of clay or loam soils, which do not have the right qualities for being used in the road sector.

The soil worked with **TERRA PLUS** has a better bearing capacity and a greater density, though the geological nature of the treated aggregates is not modified by the product – that is what makes **TERRA PLUS** different from traditional binders.

### How does it work?

The peculiarity of clay particles is their lamellar structure, which allows water to penetrate thoroughly. Water permeates not only the spaces between the particles, but also the interspaces between the layers of a single particle (**fig. A**). The absorbed water makes the clay particles swell – which causes loss of lift and makes the soil unstable.

**TERRA PLUS** creates a waterproof layer around the clay particles (**fig. B**). Since this reaction is permanent, the result is that clay loses its natural affinity to water and remains stable even with wet conditions.



Thanks to its surfactant qualities, to the typology of the aggregate and to the dilution ratio in water, **TERRA PLUS** penetrates the ground deeply, surrounding the particles of which these poor soils are made and making them almost waterproof.

Moreover, the product's viscosity, the engineering compaction and the subsequent consolidation due to the passage of cars, the particles of the soil get closer and closer to each other, hence improving the ground density and bearing capacity. Depending on the transit loads and on the type of soil, only the machining thickness and the quantity of product to be applied per square meter shall be adjusted.

When the process is completed, the soils stabilized with **TERRA PLUS** reach thicknesses of 30-40 cm. In some cases, the stabilized surface was 80 cm thick.

**TERRA PLUS** is indicated for the stabilization of surfaces such as construction site roads, embankment roads, agricultural roads, cycling paths, road foundations and reinforced earth structures.

Furthermore, **TERRA PLUS** reduces up to 90% of dust formation on rural roads.



## Preparatory steps before application

On the basis of the AASHTO Guidelines, before any application one shall analyze the soil to be treated. Only when the conditions of the soil are known – e.g. problems due to its composition, traffic intensity, loads to which it will be subject, etc. – one will be able to know the amount of product to be used per square meter and the type of application.

## ADVANTAGES OF TERRA PLUS

- Fire-proof
- Non-corrosive
- Non-dangerous
- Cheap
- Can be applied to areas subjected to environmental constraints
- Improves working conditions for operators, because unlike other binders (cement, lime) it does not create dust
- Recovery of poor soils to be found in situ, with consequent reduction of costs for supplying aggregates
- Elimination / reduction of aggregates from natural resources (mines)
- Soils treated with **TERRA PLUS** show an increase of their **CBR** and **compressive strength**
- The product reduces surface erosion and cracks in dirt roads
- Roads treated with **TERRA PLUS** are more “resilient” than those treated with lime and cement
- Maintenance costs are reduced
- Fast and easy application
- Reduction or elimination of conventional hydraulic binders
- Efficient in bringing down dust levels on dirt roads or construction sites
- The soil treated with **TERRA PLUS** retains its natural color

## Application systems

Thanks to its liquid formula, **TERRA PLUS** can be used in different ways – after proper mixing with water:

- Convex shaping of the surface to be treated, followed by application of Terra Plus e compaction.
- Milling or scarification of the soil, application of Terra Plus, convex shaping of the ground and compaction.
- Processing with **Pulvimixer** and simultaneous application of Terra Plus, convex shaping and compaction.



BEFORE



LAYING PROCESS



AFTER



- Rural roads
- Construction sites
- Parking lots
- Airport runways
- Natural parks
- Reinforced soils
- Forest roads



FOREST ROAD



ROAD INSIDE A NATURAL PARK



MOUNTAIN ROAD

## FAQ

### WHAT IS TERRA PLUS?

Terra Plus is a liquid agent that can permanently bind even the poorest grounds.

### WHAT KIND OF SURFACES CAN I BUILD WITH TERRA PLUS?

With Terra Plus you can build construction sites where transit of heavy vehicles is expected, embankment roads, parking lots, cycling paths, and reinforced earth structures.

### WHICH KIND OF SOILS CAN BE TREATED WITH TERRA PLUS?

All types of soils included in the AAS-HTO CNR UNI 10006 Table, especially poor, clay soils.

### IS TERRA PLUS AN ALTERNATIVE TO CEMENT AND LIME?

Yes, Terra Plus substitutes both traditional hydraulic binders, but in some cases it can be mixed to cement – where the quantity of cement will drop up to 50% than its usual application.

### WHICH ARE THE BENEFITS OF A CLAY SOIL TREATED WITH TERRA PLUS?

Terra Plus stabilizes the soil, independently from traffic intensity or weather conditions, increasing the mechanical strength without altering the natural geotechnical characteristics of the soil.

### WHICH THICKNESS CAN TERRA PLUS STABILIZE?

Depending on the type of soil and of application, Terra Plus stabilizes the soil at a minimum thickness of around 15 cm. Sometimes it is possible to reach 80 cm deep.

### HOW IS TERRA PLUS TO BE APPLIED?

The application can be made just with a tank truck, sprinkling on the surface Terra Plus diluted in water, or after having milled the soil.

### DO THE AGGREGATES TREATED WITH TERRA PLUS KEEP THEIR NATURAL COLOR?

Of course. Terra Plus does not modify the natural color of the aggregates.

### ARE THERE FURTHER ADVANTAGES IF A SOIL IS TREATED WITH TERRA PLUS?

Besides stabilizing the soil, Terra Plus reduces surface dust resulting from the passage of heavy vehicles.

### HOW MUCH WATER IS NEEDED TO MIX TERRA PLUS?

The quantity of water depends on the temperatures and on soil humidity.



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