



TERRASYSTEM® - Soil Stabilization

Innovative technology of soil stabilization
for earth- and road construction

Ecological, economical, environmentally friendly,
resources and CO2 saving

Governments in developed and developing countries worldwide generally continue to face the challenge of providing adequate, appropriate and quality infrastructure to meet the demands of their people. Although substantial progress has been made, significant program constraints still exist and threaten prospects of meeting this goal.

The challenge is enormous especially for many developing countries frantically grappling with the search for more cost efficient, sustainable and environment-friendly solutions.

The peculiar demands of social development especially in most developing countries presupposes for example that infrastructure development kept pace with unprecedented population growth in the light of increasing pressure on scarce resources to meet the varied demands.

Most developing countries rely mainly on road transport system for the bulk movement of both goods and people. Feeder roads for example represent about 70% of the total road network in most countries.

Such roads are the lifeblood of most economies - improvement in rural-based industries, source of food for the cities as well as raw materials.

It is obvious that a good infrastructure base is crucial for investment promotion, the boom for internal and international business and the enhancement of the general welfare of the people.

The satisfaction of these demands has therefore become a policy priority for many governments.

It is against this background that a new approach to infrastructure development called the **TERRASYSTEM®** has become a household word in many countries.

To maintain high quality in the design, construction and maintenance of roads, railways, industrial places, and airports through the use of **TERRASYSTEM®**.



The **TERRASYSTEM®** was specifically developed for soil stabilisation. Through the addition of **TERRA-3000®** catalyst, we can activate treated soils toward this process.

TERRA-3000® does not react as a binder or oxidant and is an catalysator, which breaks up the adhering water film and leads to an irreversible agglomeration of the fine particles, substantially reducing the capillary rise of water. It allows better compaction of the treated soil and increases the desired density during the time of construction and later under traffic.

TERRA-3000® is effectively improving the compressibility of cohesive soils sustainable. Substantial reduction of water absorption is increasing the load capacity, frost resistance and abrasion resistance permanently. Roads and squares, constructed with **TERRA-3000®**, are dust free even without surface layer and can be released for traffic immediately after termination of the construction works.

The effect of **TERRA-3000®** is based on many years of experience of the **TERRASYSTEM®** Nano-Technology. The method is proven in many applications worldwide and the product is 100% ecological and environmentally friendly.



Areas of application

TERRA-3000® is suitable for various applications where sustainable soil stabilization is required and for almost all soils with a minimum clay content (<0.002mm particle size) of 15 until 20%.

- all kind of road (agricultural, forest roads, access roads, cycle tracks)
- industrial areas (storage areas, foundation plates)
- railroad embankments, road embankments
- parking lots and squares
- embankments, water channels, irrigation channels
- landscaping

TERRA-3000® applications require always a "mixing procedure", where the majority of soil particles need to get in contact with the product.

There are 2 methods of processing **TERRA-3000®**. The best possible method can be selected in accordance to the local conditions and the type of the construction project.



Mixed-on-site (in-situ) Technology

The existing soil material will be milled on site with a soil stabilizing milling machine. This can be an automotive soil stabilizer or a tractor-towed soil stabilizer.



The addition of **TERRA-3000®** and water is ideally processed during the milling process, controlled by a flow controlling unit and ejected by nozzles directly into the mixing chamber of the soil stabilizer.

In the following process steps, the treated soil material will be levelled and compacted until the requested density is reached.

There is basically no material transport necessary, the construction material is available on-site.

Material analyses (grading-curve determination) need to be done in advance in order to get the results available before the beginning of the construction works.

Mixed-in-Plant Technology

The soil material will be pre-finished in the mixing plant which should be in a reasonable distance to the construction site. The material is prepared for delivery by truck and will be applied at the current construction stage.





In the following process steps, the treated soil material will be levelled and compacted until the requested density is reached.

Material analyses (grading-curve determination) as well as moisture measurement and humidity control is done frequently in the mixing plant.

Advantages - Cost savings

All construction projects, which are suitable to be processed with **TERRA-3000®** and the **TERRASYSTEM®** Nano-Technology can be implemented in short processing time and reduced costs, achieved by:

- Reduced excavation works

The "mixed-in-plant" technology reduces the excavation works substantially, because there is no sub-base required for the implementation of a compacted base layer of soil material treated with **TERRA-3000®**.

The mixed-on-site technology combines the mixing procedure with the material extraction on site, excavation works can be dropped.

- Reduced material handling - transport logistics

Regardless on the preferred method, the transport logistic will be reduced to the minimum of carrying the treated soil material to the construction site in case of the "mixed-in-plant" technology or can be almost dropped when proceed with the "mixed-on-site" technology.

- Simple construction

The **TERRASYSTEM®** Nano-Technology enables a continuous workflow. The entire construction project can be split into variable construction stages which can be finalized accordingly.

- Savings through elimination of additional sub-base material request.



Conclusion

TERRASYSTEM® Nano-Technology and **TERRA-3000®** is the most economic method for sustainable soil stabilization applications of various construction projects. Depending on local conditions and circumstances of executed projects, cost savings up to 50%, compared with conventional construction methods were achieved.

TERRA-3000®: water soluble catalyst – no binder, ion exchanger

Mode of action: physical - by compression (static, heavy weight no vibration)

Installation: Liquid - is processed directly with a milling machine in the ground introduced, no emissions

Environmental impact: due to low expenditure (0.05lt / 0.3m³) - for this 1 km road (5000m² / 30 cm thick) So a total of 250 liters of catalyst, Evidence shows no elutriation due to eluate tests or harmful effects on the environment –

Health: application solution at least 1:20 to 1:40, PH - neutral, no health risk, no special regulations and requirements, see safety data sheet

Climatic pollution: very low CO₂ pollution in production and transportation production: approx. “5 tons of CO₂” per ton of catalyst, i.e. for 1km / road (5000m²) = 1.25 to. CO₂ transport of 250kg - practically negligible