



TERRASYSTEM®- GREEN TECHNOLOGIE



TERRA-4000-TREATED SOIL

The building material of the future
ecological - saving resources, energy
and CO2 neutral

Based on the millennia-long use of clayey soils in construction, including in infrastructure construction, clayey loam is used worldwide.

The main problem with the use of cohesive soil material is the swelling and shrinkage of the soil material caused by water and the transition from a stable material to a liquid slurry.

There are various attempts to use the locally occurring soil material in such a way that cost-effective building materials are used. In decades of development work, TERRASYSTEM® has managed to create a solution to this problem and thus developed a soil stabilizer for on-site construction sites as an additive for producing an environmentally friendly, CO2-friendly, cost-effective building material..



Climate polluter concrete - a building material is looking for a successor
People are currently building more with concrete than ever before.
The raw material sand is already becoming scarce. Above all, however,
cement is responsible for almost every tenth ton of CO₂ that humans emit.

TERRA-4000-treated earth is highly sustainable as it has a high thermal mass and a 40th of the carbon footprint of concrete which is composed of 20% cement. It is also completely recyclable and has low transport emissions as the main material is already on site.

Rammed-earth buildings need to have walls that are considerably thicker than their concrete counterparts, but they are fire-proof, termite-proof, breathable and have insulating properties as they can absorb heat during the daytime and release it at night. This makes them popular in the developing world and in countries with extreme climates .

Why is **TERRA-4000**-treated earth in times of climate protection goals not by architects or construction companies taken over?

Architects have been researching low-carbon building for 50 years and have developed very complex, worthy solutions such as the passive house. Simple structures can be built using complex and sophisticated techniques, but we have to move away from modernity, which dictates that buildings must always look like new.

This has resulted in insane maintenance and cleaning costs, and we need to rethink our relationship with buildings and how we interact with them.

TERRA-4000-treated earth buildings could be part of the high density low carbon living solution, but they have their own characteristics, variations, textures and colors and a different kind of purity.





TERRASYSTEM® BRICK PRODUCTION

The BRICK s are manufactured by hydraulically compressing a special stabilized TERR A-4000-soil-mixture in a Interlocking -Brick -making machine.



The **TERRASYSTEM® BRICK** building system replaces conventional bricks and mortar through the use of **TERRASYSTEM® BRICK** s, which are largely dry-stacked. The other components of the conventional building system remain unchanged.

The high performance of soil buildings in respect of insulation against heat and noise and the healthy climate inside, such buildings have until now been limited to areas with low rainfall.

The **TERRASYSTEM®** is the only and world-wide unique system, which allows to upgrade any soil to an acceptable raw material for Brick-making. It allows to get the water sensitivity fully under control and even reach full impermeability, if required, in a simple process of intermixing a additive in the soil.

The special character of this process yields in the overwhelming majority of applications with the same high effectiveness and with the same quantities of additive – irrespective of the physical and chemical composition of the soil, provided that an adequate natural cohesion exists or is provided by adding clayey material to the in-situ soil.

TERRASYSTEM® BRICK BUILDING BENEFITS

- Cost effectiveness
- Quality of production
- Speed of production
- Independence
- Community involvement
- Simplicity of use
- Environmentally friendly
- Labour for own people





TERRASYSTEM® has many benefits for the user:

Substantial cost savings because freely-available subsoil is the main raw material; the BRICKS do not require costly burning; transport costs are minimised since BRICK production takes place on site; unskilled labour can be trained in both BRICK-making and building with **TERRASYSTEM®** BRICKS.

Mortar is largely eliminated in superstructure walls because the interlocking BRICKS are dry-stacked except in the ring beam and in high gables.

Speed of construction is a valuable feature of the System, which is much faster than Other building methods. A BRICK-layer can lay until 1000 **TERRASYSTEM®** BRICKS (25 m² of walling) per day.

Excellent thermal properties –**TERRASYSTEM®** BRICKS have excellent thermal capacity (the ability to absorb and hold heat **TERRASYSTEM®** BRICKS are three times as efficient as concrete and almost twice as efficient as fired clay bricks ...in terms of the thermal insulation they offer

Environmental friendliness is a major feature of the **TERRASYSTEM®** BRICKS are produced under high compression from subsoil, without the need for the fuel-wood used to burn bricks.

High strength has been demonstrated in **TERRASYSTEM®** structures, showing that these have considerably higher impact strength than those constructed from concrete BRICKS.

Attractive, face-brick finishes are achieved with **TERRASYSTEM®** BRICKS in a variety of natural colours derived from the soil found at individual sites. The interior walls may be plastered, painted or sealed.

Simplicity characterises the **TERRASYSTEM®** Building System. Both the production of BRICKS and the erection of walls using **TERRASYSTEM®** BRICKS are simple; relatively unskilled labour may be used to carry out both processes, operating under **TERRASYSTEM®** trained supervision.



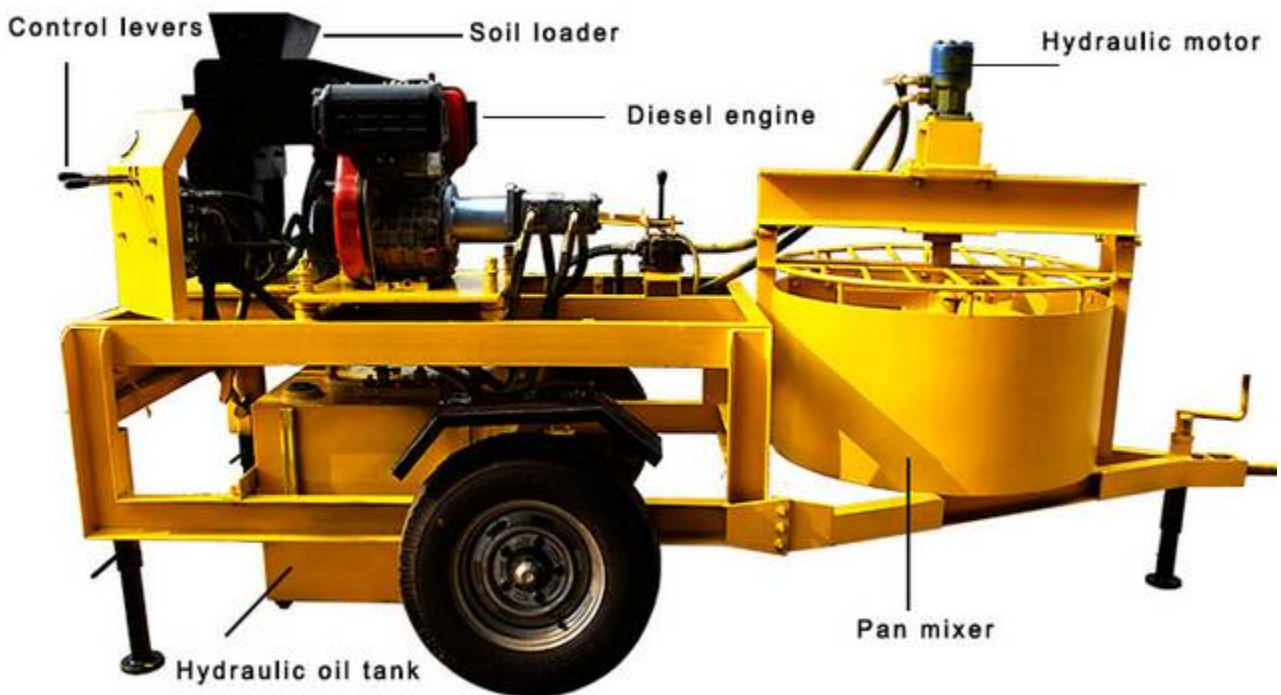


BRICK-production machine:

Is inclusive of a diesel engine , hydraulic power pack including cylinders, compression Chamber, pre-compacting top gate assembly, loading assembly, all fitted on a trailer
Inclusive of spring-axle, tail lights, tow-hitch and road tyres.

Alternator – 10 kVA, 380 V, 3 Phase alternator with two socket for on-site electric Power output. Power output 50% when running the mixer simultaneously with alternator

Pan mixer with +-180 liter capacity mounted on the machine's sub frame and powered by the hydraulic system.



Production: 80 – 120 BRICK s per hour

Alternativ mechanical hand press :





Moulds and spares

The 220mm mould is fitted standard with the BRICK -making machines (BRICK dimensions: 220 mm wide x 115 mm high x 50-240mm long.)

Approximate weight is 11 kg).

This is an interlocking mould. Minimal mortar is used, i.e. on the base three courses and on the top four courses.

The remainders of the courses are dry-stacked. This BRICK is ideal for community and fast track projects as fewer skills are required when laying the BRICK s.

220 mm interlocking drystacking BRICK

Width =	220 mm
Length =	120 mm - 240 mm (variable length)
Height =	115 mm



Machines are fitted with the standard 220 mm BRICK mould

140 mm interlocking semi drystacking BRICK

Width =	140 mm
Length =	120 mm - 240 mm (variable length)
Height =	115 mm



Optional extra

Conduit interlocking dry stacking BRICK

Width =	220 mm
Length =	120 mm - 240 mm (variable Length)
	Optional extra





All the moulds are interchangeable in the BRICK -making machines

Brick-mold modification: * Verry important *****

The supplied standard compression moldings of most brick presses which are available on the market, are not usable because of the missing Drainage holes who are necessary for the **TERRA- technology**. These need a modification.

The water, that serves as an **TERRA catalyst carrier** and what is located after the mixing process in the base material, necessarily must have the possibility to get out of the soil during the pressing and compacting process of the brick.

The brick-compression molding should therefore already be modified in the factory of the press manufacturer with the necessary drainage holes (dm. 0,5mm – 1mm) at a distance of 10 mm to 20 mm.

Should this not be possible at the factory, the brick mold must be modified e.g. in a metalworking company, backfitting with these important drainage holes. The prerequisite for this, should be ensured.



Images : Examples of a brick-mold with the necessary drainage holes.

Useful additional equipment:

1. mechanical brick cutting machine:



2. mechanical testing device for break load:





TERRA-4000 – Concentrate

is a liquid catalyst concentrate that, when used as specified, helps to produce a valuable and relatively inexpensive building material from locally cohesive soil (clay / loam) - also for brick production without the bricks having to be burned - (weatherproof and water-resistant) - surface active agents in monomeric and polymeric mixture, solvents, wetting agents and catalysts. - customs tariff number Nr: 38.24.99.15

1 lit. **TERRA-4000** concentrate sufficient for 5m³ loamy soil

SOIL SELECTION

A TERRA BRICK is made from soil and TERRA-4000 water mixture. The soil type is classified as sandy-loamy. The clay content (<0.002mm) must be more than 15% and should not exceed 30%. If the clay content is too high, sand must be added to the soil.

The clay keeps the brick together so it is easy to carry the brick during brick-making. The sandy portion is what binds with the solution to give the brick its ultimate strength.

Too little clay will make brick handling difficult, too much clay will make the brick shrink and crack during curing.

TERRA-BRICK are made from sub-soil (min 30cm) below ground level, never top soil, which contains organic material.

Depending on the soil type a water content of 8-12 % is required (read the instructions).

BRICK Production Process

1. Find and test the soil to be used
2. Move the Interlocking BRICK -making machine to the construction site
3. Mix soil and **TERRA-4000** in predetermined ratio's by hand or in the pan mixer
4. Load the soil-mix into the Interlocking BRICK -making machine and produce BRICK (20-30 second per BRICK).
5. You can use the Brick immediately , better dry if possible 1 - 2 days



Bricks/m³ treated soil with 0.2 lit. TERRA-4000

6 Inch (200x150x80mm) ca. 415 Stk./m³ treated soil
Weight/pieces approx.. 5,4 kg until 6,5 kg
1 m² brick wall = 83 bricks

or

Standard brick with interlock:

can be used without mortar in the dry method or
with liquid TERRA-4000-soil mixture.

1 m³ of compressed soil is 0,2 l = TERRA-4000 =
approx. 217 bricks (200 x 200 x 115 mm)

1 m² brick wall = 43 bricks



Average weight, depending on the type of soil: approx. 9 - 11 kg

These bricks are very easy to process, no previous knowledge required,
very stable, good heat and sound insulating, water-resistant.

For the floor or bottom plate, the treated TERRA-4000 soil material can also be stamped .
The result is a very good insulating and water-impermeable layer – where you can lay
directly floor coverings or tiles after good drying – for the entire house, hardly or rather
no cement is required.



Once the base is completed the building may
commenced upon this stable base.

Upon completion this base may be tiled,
carpeted or left bare.



TERRASYSTEM® - Rammed earth

Is made by naturally occurring soil material, through adjustment of the grading curve (grain size), the optimal moisture and the addition of a water-soluble catalyst – **TERRA-4000** - a modern, inexpensive, ecological building material, which can easily be processed by untrained staff, can be processed - also suitable for the production of unfired bricks – made in simple presses in various shapes.

TERRASYSTEM® rammed earth not only conserves resources (sand and gravel – on-site-material is processed - lower transport costs), does not require any cement – these savings prevent CO2 emissions.

For seismic zones, steel reinforcement is added according to the technical specifications, creating earthquake-proof buildings.

TERRASYSTEM® rammed earth houses are special because of their thermal mass (Outer walls are typically 2 feet thick) particularly suitable for regions with extreme climatic applications.

Combining modern construction methods, quality control and beauty creates the ultimate masonry system.

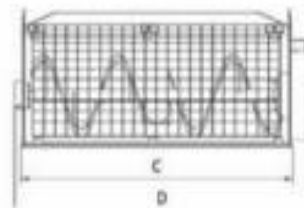
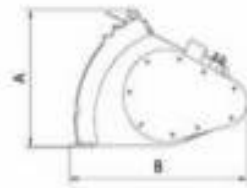
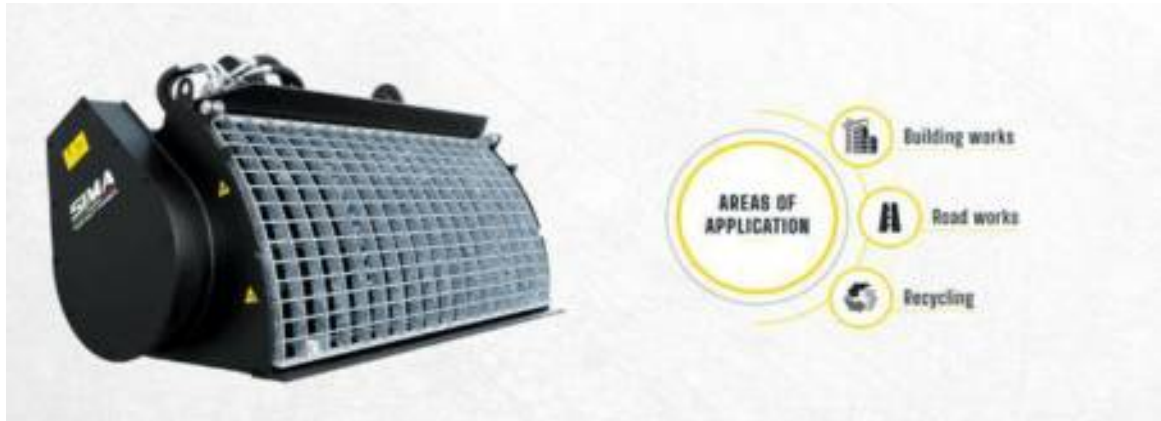
Advantages of the **TERRASYSTEM®** rammed earth construction:

- Natural beauty of the rammed earth material
- Uses local materials for walls
- load-bearing walls with great bearing capacity
- High sound resistance - inside and outside
- Good insulation, lowers heating costs
- Good indoor climate
- Frost-proof, water-resistant
- No maintenance, fireproof
- Designed for earthquakes
- Protects against electromagnetic fields and radiation
- Rodent-proof, insect repellent - termites, carpenter ants, etc ...
- Free from fungicides and pesticides
- Sustainable for 1000+ years.
- Green building for the health of future generations





Hydraulic add-on mixing bucket



Auch erhältlich für...



Weights may vary depending on the type of attachment and optional equipment used
Depending on the classification, the specific weight of the soil is approx. 1,900 kg/m³
up to 2,200kg/m³.





TECHNICAL SPECIFICATIONS

The Hydraulic Mixing Bucket is the ideal piece of equipment to mix soil and transport it wherever it is needed.

The mix is made quickly and under the best conditions: it takes 3-10 minutes to mix the soil components perfectly.

The range includes buckets with a capacity of 100 liters to 2000 liters.

The mixer buckets are suitable for all types of earthmoving machines: skid steer loaders, backhoe loaders, wheel loaders, telehandlers, excavators and tractors with front loaders.

STANDARD EQUIPMENT. As standard, each model is equipped with a Danfoss hydraulic motor, hard-wearing Hardox 500 steel mixing propellers, a hot-dip galvanized grille, a Bosch Rexroth device for opening the drain, hydraulic hoses, an electrical connection kit for attachment to the machine and a rubber spiral drain hose

In order to improve the performance of the mixer bucket and make the mixing more practical, indicates several options such as the grille with hydraulic or gas spring opening, double bottom in Hardox 500 Tuf wear-resistant steel, pressure control valves and a multi-fastening system to expand the possibilities of use to increase.

Mixing Bucket S30



Prepare 0.3 m³ of mix at once with the S30
The S30 mixing bucket is 10cm wider than the S25 and can therefore hold up to 350l of mixed material. Due to the reinforced chain drive, powerful mixing and a circulation of approx. 6 minutes per mixing process is still possible. Carrier vehicles should already be able to lift over a ton to operate the S30 efficiently.



