

MAPESOIL 100

High-performance, fibre-reinforced powdered stabilising agent for sports sub-base construction surfaces



DESCRIPTION

Mapesoil 100 is a hydraulic, high-performance, fibre-reinforced powdered stabilising agent used to treat and consolidate soil and recycled or raw aggregates.

WHERE TO USE

- Stabilising sub-bases for artificial turf playing surfaces, such as synthetic grass football pitches.
- Cold-recycling old sub-bases from existing sports surfaces made from bitumen conglomerate.
- Creating sub-bases for playing surfaces by recycling old, worn out synthetic playing surfaces.
- Stabilising existing clay courts and converting them into artificial grass pitch.

TECHNICAL CHARACTERISTICS

Mapesoil 100 has been specifically developed and perfected in the MAPEI Research & Development laboratories to stabilise soil used to create sub-bases for playing surfaces, such as those in artificial turf, with a horizontal drainage system.

Mapesoil 100 is an extremely fine, hydraulic, fibre-reinforced powdered stabilising agent which, in combination with its special formulation, makes the product suitable for use with soil, recycled aggregates and raw aggregates (e.g. naturally graded soil).

Mapesoil 100 contains specially selected pozzolanic-action minerals (not derived from the use of cement) that also have high binding properties (> 22% in weight), which considerably increase the durability of the sub-base made using the product and the resistance to leaching of the sub-base after treatment. Also, even though the polypropylene fibres ($\geq 0.1\%$) contained in **Mapesoil 100** have an aspect ratio of more than 600, they disperse easily in the mix and improve the final mechanical characteristics of the soil being treated.

The **Mapesoil 100** stabilising system improves the mechanical characteristics of soil and allows the thickness of the treated layer to be reduced compared with traditional systems (e.g. 8 cm on existing pitches and courts). This makes it easier to apply the product with agricultural equipment (stone buriers, tractors with a cultivator attachment, spreaders, etc.) and more suitable for the treatment required to prepare playing fields. The mechanical properties combined with the durability of the material treated with **Mapesoil 100** also improve the horizontal drainage capacity of playing surfaces (e.g. artificial grass), and over the years prevents hollows forming in the surface where water could collect and form puddles. Thanks to its high performance characteristics, sub-bases constructed using **Mapesoil 100** are particularly suitable for installing the latest generation of synthetic grass, such as "FIFA 2 star" or "Professional" turf for the soccer sector (e.g. according to National Amateur League regulations LND), and for installing "top level" playing surfaces as specified by the relative Sports Federation for other disciplines.

APPLICATION PROCEDURE

Preparation of the installation bed

When necessary (e.g. natural grass playing surfaces), we recommend removing the sods and topsoil (around 5-10 cm) and any vegetation and roots under the surface using suitable equipment, such as a stripping machine. This operation is necessary to remove any residues of organic material from the soil to be treated (<2% according to ASTM D2974) that

could inhibit and/or slow down the hydraulic reaction of the product and compromise, therefore, the final mechanical properties of the sub-base. Before applying **Mapesoil 100** on the soil/aggregate already in place, we recommend breaking up and then re-mixing it with suitable equipment, such as a disk harrow, rotovator, stone burier, etc.

The material to be treated

Mapesoil 100 can be used to stabilise soil, recycled aggregates and raw aggregates, as long as they are in classes A1-A2-A3-A4 and no lower than class A2-4 (according to CNR UNI 10006 or AASHTO soil classification). We recommend using material with a good assortment of grain sizes (such as the one recommended in Fig. 1) in order to improve the workability of the mix and the final mechanical properties of the sub-base. When recycled aggregates are used, they may be debris from demolished concrete structures, waste material from the concrete industry or the ceramics industry or aggregates from demolition work (bricks, tiles, etc.), as long as they have no foreign bodies in them such as steel reinforcement, wood, plastic and/or any other type of material that could decay. Also, to optimise the efficiency of the stabilising treatment, recycled aggregates must contain no more than 2% in weight of organic matter (according to ASTM D2974).

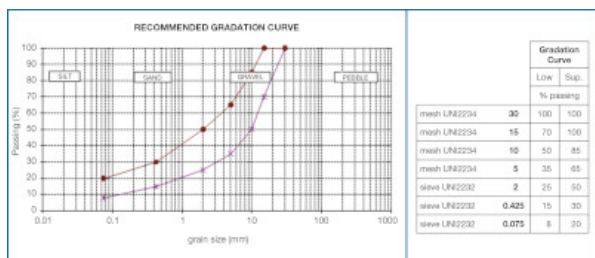


Fig. 1 - Advised gradation curve (in compliance with CNR UNI 10006 and AASHTO soil classification)

Pre-wetting the soil/aggregates

Before spreading the **Mapesoil 100** powder, we recommend pre-wetting the soil/aggregates until its moisture content is around half that of the total moisture content of the mix. This operation helps reduce the time required to apply the product and to homogenise the water dispersed in the mix that acts as an activator for the product.

Spreading the product

Once the material has been pre-wetted, spread on the specified amount of **Mapesoil 100** stabiliser with a suitable spreader (e.g. an infill sander). This operation must only be carried out over the area that can be treated within the maximum workability time of **Mapesoil 100**, which is approximately 4 hours at ordinary temperatures. The amount of **Mapesoil 100** required must be established with preliminary laboratory tests, and must be as uniform as possible and checked periodically. Even though the maximum workability time of **Mapesoil 100** is higher than with traditional systems (e.g. cement) it must be strictly adhered to, especially in hot weather, so that it reaches the final mechanical properties required from the treatment process.

Mixing the soil/aggregates

After spreading the **Mapesoil 100**, mix the soil/aggregates with the stabilising agent down to the specified depth by going over it a number of times with suitable equipment until an even, regular mass is formed. Add the rest of the mixing water until it reaches the specified moisture content level established with the preliminary laboratory tests. While adding the water, keep mixing by going over the material a number of times until the off-white colour of the **Mapesoil 100** is no longer visible. Make sure puddles do not form otherwise the final mechanical properties of the mix could be compromised.

Levelling, shaping and compacting the mix

Level off the fresh, even mix of **Mapesoil 100**, water and soil/aggregates with a laser-controlled levelling machine to create the slope and respect the tolerances specified by the relative Sports Federation for that particular playing surface. The shaped mix must then be compacted with a roller (e.g. a 3 tonnes dual-action tandem roller) until the compaction density is at least 98% Mod. AASHTO. If the compacting operation brings out areas in the surface that are not perfectly flat, we recommend filling all the hollows while the mix is still fresh with the same mixture of **Mapesoil 100**, water and soil used for the rest of the surface. This filling operation to correct the slope and flatness using the "fresh on fresh" technique improves the adhesion of the 2 compacted layers so that they become monolithic and more durable.

Curing

After applying the **Mapesoil 100**, protect the exposed surface for at least 24 hours to prevent the water evaporating off too quickly by covering it with waterproof sheets, or by wetting the surface occasionally with water. Make sure that the mechanical action of the water does not leach the surface, which should be applied evenly over the surface with a sprinkler.

DOSAGE

The amount of **Mapesoil 100** required depends on the type of material to be treated and the final mechanical properties required, and varies from 3% to 5% of the weight of soil to be treated, or around 5-8 kg per m² for a layer at least 8 cm thick (from 60 kg to 95 kg per m³). The optimum amount of **Mapesoil 100** stabiliser and mixing water required in the mix are established through preliminary laboratory tests (modified Proctor soil density test according to EN 13286-2 and the CBR load-bearing index according to EN 13286-47). MAPEI's geotechnical laboratory is available to carry out a preliminary analysis and optimum mix design if required by the project.

RECOMMENDATIONS

- In poor weather conditions (such as strong winds or if it is about to rain), we recommend suspending work after closing and rolling the areas already treated.
- Please note that the optimum moisture content (OMC) for site purposes may vary from 1% to 3% depending on the conditions during application (e.g. particularly sunny days or variable aggregates).
- A minimum dosage of 3% on weight of the soil to be treated is suggested.
- It is advisable not to spread loosen sand over the sub-base treated with **Mapesoil 100**, in order to prevent the formation of hollows which could compromise the adequate sports surface drainage functionality.
- The thickness of the finished layer treated with **Mapesoil 100** must be at least 8 cm.
- The workability time of the mix (soil-**Mapesoil 100**-water) depends on the conditions during application and varies from a minimum of 2 hours to a maximum of 4 hours, depending mainly on the surrounding temperature during application.
- To reach the specified mechanical properties we recommend protecting the surface from rain for at least 48-72 hours, depending on the surrounding temperature and, therefore, on how quickly the **Mapesoil 100** hardens.

PACKAGING

Mapesoil 100 is supplied in 15 kg bags and 500 kg big-bags.

STORAGE

Mapesoil 100 may be stored for 12 months in its original packaging in a dry, covered area.

This product conforms to the prescriptions of Reg. (EC) N. 1907/2006 (REACH) - Annex XVII, item 47.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapesoil 100 contains cement that when in contact with sweat or other body fluids causes irritant alkaline reactions and allergic reactions to those predisposed.

It can cause damage to eyes.

It is recommended to use protective gloves and goggles and to take the usual precautions for handling chemicals.

If the product comes in contact with the eyes or skin, wash immediately with plenty of water and seek medical attention.

For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)	
PRODUCT IDENTIFICATION	
Appearance:	powder with fibres
Color:	off-white
Bulk density (kg/m ³):	580 ± 10
Dry solids content (%):	100
APPLICATION DATA OF THE PRODUCT	

Density of mix (kg/m ³):	2,100 ± 100
Compressive strength after 24 hours (EN 196) (N/mm ²):	> 2
Compressive strength after 7 days (EN 196) (N/mm ²):	> 20
Compressive strength after 28 days (EN 196) (N/mm ²):	> 30
Application temperature (°C):	> 15

WARNING

Although the technical details and recommendations contained in this product data sheet correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical application; for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application. In every case, the user alone is fully responsible for any consequences deriving from the use of the product.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

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