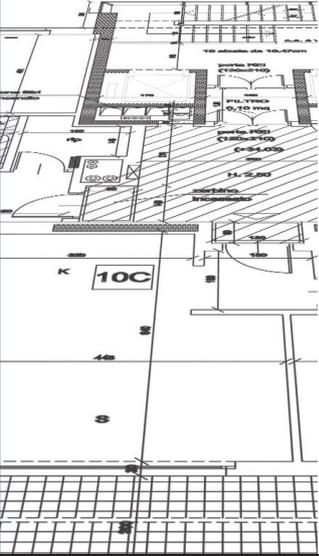


# SPORTS FACILITIES



# P

## specifications of SPORTS FACILITIES

The MAPEI system for installing structures and playing surfaces for sports and leisure activities

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## **P.0 The MAPEI system for installing structures and playing surfaces for sports and leisure activities**

### **Adesilex G19**

Two-component epoxy-polyurethane adhesive for installing rubber and PVC flooring, including on non-absorbent substrates and substrates subject to intense traffic.

### **Adesilex UP71**

Two-component solvent and water-free polyurethane adhesive for bonding internal PVC and rubber flooring, including on non-absorbent substrates.

### **Mapelay**

PVC waterproofing and isolating sheet reinforced with glass fibres for installing internal resilient and textile flooring on cracked or damp substrates.

### **Mapesoil 100**

Hydraulic, fibre-reinforced, powdered stabilising agent for installing substrates for playing surfaces (e.g. synthetic grass football pitches).

### **Ultrabond Turf PU 1K**

One-component green polyurethane adhesive for bonding synthetic grass.

### **Ultrabond Turf PU 2K**

Two-component solvent and water-free, green polyurethane adhesive with very low emission of volatile organic compounds (VOC) for bonding synthetic grass.

### **Ultrabond Turf Tape 100**

Jointing strip for fastening synthetic grass in place and for marking out playing surfaces for various sporting disciplines.

### **Mapecoat TNS Base Coat**

Semi-elastic acrylic resin filler paste in water dispersion with selected fillers for preparing substrates before applying **MAPECOAT TNS**.

### **Mapecoat TNS Finish**

Coloured acrylic resin finishing product in water dispersion with selected fillers for indoor and outdoor playing surfaces and multi-discipline sports surfaces.

### **Mapecoat TNS Line**

Acrylic resin paint in water dispersion for marking out indoor and outdoor playing surfaces.

## **P.1      *INSTALLATION OF SWIMMING POOLS***

### **P.1.1      Procedure**

The procedure for installing coatings in swimming pools in sports complexes is the same as described in Chapter **4.3** for installing swimming pools for civil use. Please refer to the said Chapter.

### **P.2.1      Procedure**

#### **Checking and preparing the substrate**

Check that asphalt substrates are compact, as level as possible and have no cracks or loose portions. Before installation, flood the surface of the substrate to make sure that slopes run in the correct direction.

If imperfections or hollows in the substrate need to be evened out or slopes need to be corrected, skim the surface using **Adesilex G19**.

Install the flooring as soon as the skimming coat sets to foot traffic. If more than 24 hours have gone by between skimming the substrate and installing the flooring, the skimmed surface will have to be sanded.

#### **Installation of the flooring**

The flooring material and adhesives must be acclimatised before use. Loosen the packaging of the sheets or unroll them and leave them open so they may acclimatise to the surrounding conditions and to relieve any accumulated stress in the sheets.

The adhesives must be mixed according to the prescribed doses to guarantee their correct reticulation. Mechanical means must be used to mix the two components together until a homogenous blend is obtained.

After mixing the adhesive, spread it on the substrate with a notched trowel suitable for the type of backing on the flooring to be installed. For laying rubber, No 3 or No 4 notched trowels are usually recommended.

Install the flooring on the fresh adhesive within its open time and, to get better transfer of the adhesive and to help with the removal of air bubbles from the edges of the sheets, roll the surface of the sheets with a 68 kg roller starting from the centre working towards the edges.

Install rubber sports flooring using **Adesilex G19**(see section **P.2.1.1**).

## P.2 INSTALLATION OF ATHLETICS TRACKS

### P.2.1.1 Installation of rubber sports flooring

Supply and installation of rubber sports flooring for athletics tracks, after checking and preparing the installation surface according to specification, using two-component, epoxy-polyurethane adhesive (such as **Adesilex G19** produced by MAPEI S.p.A.).

The adhesive used to install the flooring must have the following characteristics:

density of mix (kg/m <sup>3</sup> ):	1,450
pot life of mix:	50-60 minutes
open time:	1 hour
time to completely set:	9 hours
set to foot traffic:	12-24 hours

The following are included and calculated in the price:

- checking the suitability of the installation surface;
- cutting and trimming to size;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



### **P.3.1 Procedure**

#### **Checking and preparing the substrate**

The surface of the screed must be compact, solid, clean and free of cracks. The screed must also be checked for loose layers on the surface which, if present, must be carefully removed using suitable mechanical means (such as scarifying, sand-blasting or brushing). If cracks are noticed when checking the surface, carefully clean the screed when it has dried and pour **Eporip** (see section **F.7.1.3**) two-component, epoxy adhesive into the cracks to monolithically seal them before skimming the surface and installing the flooring. The installation surface must be flat. Surface roughness and small corrections in flatness may be carried out by skimming the surface with a cementitious product suitable for the thickness required (see section **R.1.3**). The flooring may only be applied directly once the substrate is completely dry. The maximum permitted residual humidity in a 4-5 cm thick cementitious substrate is approximately 2-2.5%. Measure the level of residual humidity using a carbide hygrometer. If the screed incorporates pipe-work for a heating system, only install the flooring after running the heating system as prescribed in UNI EN 1264-4:2003 standards. In all cases, the instructions supplied by the manufacturer of the flooring material must be strictly adhered to. If there is rising damp coming from the substrate, the flooring may only be laid after installing **Mapelay** to form an isolating layer.

#### **Installation of the flooring**

The flooring material and adhesives must be acclimatised to the surrounding area for at least one day. Unroll the sheets and spread them out. In compliance with the instructions supplied by the manufacturer, install the flooring at an ambient temperature of  $+18^{\circ}\text{C} \pm 3^{\circ}\text{C}$ .

Which adhesive to use will depend on the type of flooring to be installed and the final performance characteristics required. The installation technique will depend on which adhesive is used to install the flooring.

Install the flooring by spreading the adhesive on the substrate with a notched trowel suitable for the type of backing on the flooring to be installed. For smooth backings use a No 1 or No 2 trowel, and for dimpled or embossed backings use a No 3 or No 4 trowel. Only apply the adhesive on an area which may be installed within the open time of the adhesive.

Install the flooring on the fresh adhesive and, to get better transfer of the adhesive and to help with the removal of air bubbles, immediately roll the surface of the flooring with a 68 kg roller starting from the centre working towards the edges.

Since the reactive adhesives recommended for bonding rubber or PVC flooring in gymnasiums do not have immediate tack, to prevent steps or uneven areas around joints, put weights in these areas (such as sacks of sand) until the adhesive has completely hardened.

Install rubber or PVC flooring on cementitious substrates using **Adesilex UP71** (see section **P.3.1.1**) or **Adesilex G19** (see point **P.3.1.2**). The first adhesive has very low emission of volatile organic compounds (VOC), and may also be used by floor layers allergic to epoxy adhesives.

If the flooring is installed on **Mapelay**, make sure the joints in the flooring do not coincide with the joints in the **Mapelay**. Stagger the joints by at least 10-20 cm and make sure there is a 5-10 mm gap between the flooring and walls and pillars. Use a No 1 trowel to apply an even, regular coat of adhesive on the **Mapelay**. **Adesilex UP71** (see section **P.3.1.3**) or **Adesilex G20** (see section **P.3.1.4**) may also be used on this type of substrate.

### P.3 INSTALLATION OF FLOORING FOR INDOOR GYMNASIUMS

#### P.3.1.1 Installation of rubber or PVC sports flooring using polyurethane adhesive

Supply and installation of rubber or PVC sports flooring after checking and preparing the installation surface according to specification using two-component, polyurethane adhesive with very low emission of volatile organic compounds (such as **Adesilex UP71** produced by MAPEI S.p.A.).

The adhesive used to install the flooring must have the following characteristics:

density of mix (kg/m <sup>3</sup> ):	1,550
pot life of mix:	30 minutes
open time:	50-60 minutes
time to completely set:	4 hours
set to foot traffic:	12-24 hours
EMICODE:	EC1 R Plus

The following are included and calculated in the price:

- checking suitability of the installation surface;
- cutting and trimming to size and sealing where required;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



### P.3 INSTALLATION OF FLOORING FOR INDOOR GYMNASIUMS

#### P.3.1.2 Installation of rubber or PVC sports flooring using epoxy-polyurethane adhesive

Installation of rubber or PVC sports flooring after checking and preparing the installation surface according to specification, using two-component, epoxy-polyurethane adhesive (such as **Adesilex G19** produced by MAPEI S.p.A.).

The adhesive used to install the flooring must have the following characteristics:

density of mix (kg/m <sup>3</sup> ):	1,450
pot life of mix:	50-60 minutes
open time:	1 hour
time to completely set:	9 hours
set to foot traffic:	12-24 hours

The following are included and calculated in the price:

- checking suitability of the installation surface;
- cutting and trimming to size and sealing where required;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



### P.3 INSTALLATION OF FLOORING FOR INDOOR GYMNASIUMS

#### P.3.1.3 Installation of rubber or PVC sports flooring on Mapelay using polyurethane adhesive

Installation of rubber or PVC sports flooring after applying an isolating layer of waterproof PVC sheets reinforced with glass fibres (such as **Mapelay** produced by MAPEI S.p.A.), using two-component, polyurethane adhesive with very low emission of volatile organic compounds (such as **Adesilex UP71** produced by MAPEI S.p.A.).

The adhesive used to install the flooring must have the following characteristics:

density of mix (kg/m <sup>3</sup> ):	1,550
pot life of mix:	30 minutes
open time:	50-60 minutes
time to completely set:	4 hours
set to foot traffic:	12-24 hours
EMICODE:	EC1 R Plus

The following are included and calculated in the price:

- checking suitability of the installation surface;
- cutting and trimming to size and sealing where required;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



### P.3 INSTALLATION OF FLOORING FOR INDOOR GYMNASIUMS

#### P.3.1.4 Installation of rubber or PVC sports flooring on Mapelay using epoxy-polyurethane adhesive

Installation of rubber or PVC sports flooring after applying an isolating layer of waterproof PVC sheets reinforced with glass fibres (such as **Mapelay** produced by MAPEI S.p.A.), using two-component, polyurethane adhesive (such as **Adesilex G20** produced by MAPEI S.p.A.).

The adhesive used to install the flooring must have the following characteristics:

density of mix (kg/m <sup>3</sup> ):	1,450
pot life of mix:	50-60 minutes
open time:	1 hour
time to completely set:	9 hours
set to foot traffic:	12-24 hours

The following are included and calculated in the price:

- checking suitability of the installation surface;
- cutting and trimming to size and sealing where required;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



### P.4.1 Procedure

#### **Checking and preparing the substrate**

Before installing artificial grass, the substrate must be prepared according to specification.

After checking that the ground is suitable, it may be stabilised using **Mapesoil 100** (see section **P.4.1.1**). When analysing the ground soil in the laboratory, the amount of stabiliser and mixing water required must also be defined.

The first step is to prepare the ground:

- for existing pitches, remove the topsoil and any vegetation in the ground, break up the surface of the exposed soil and, if required, correct the grain size of the broken-up soil;
- for new pitches, roll the surface of the installation layer and spread on a layer of aggregate according to the specified design thickness.

After preparing the ground as described above, spread on a layer of **Mapesoil 100** with a sand-blaster, salt-spreader or similar equipment at the rate per square metre defined during the laboratory tests. Mix the **Mapesoil 100** thoroughly into the entire thickness of the layer of ground to be stabilised using a harrow, disk harrow, horizontal plough, etc. After mixing the **Mapesoil 100** into the ground soil, wet the ground if required until the level of humidity defined during the laboratory tests is reached. Once the required level of humidity is reached, complete the stabilisation treatment by compacting the ground with a vibro-roller (minimum 3 tons). Roll the ground a number of times until the grade of compaction defined during the preliminary phase is reached. Level and form the slope on the surface either before or after compacting the ground. The entire surface must then be cured by spraying on water for at least 24 hours. Before installing the synthetic grass, the prepared substrate must be checked to make sure it meets the client's specifications or, if it requires approval, that it meets the specifications of the relative sporting federation.

Before installing the grass, unroll and lay out the rolls to acclimatise it to the surrounding conditions and to relieve any stresses accumulated in the rolls.

#### **Installation of the grass**

After laying out and acclimatising the rolls of grass, bond the joints between each roll using special 40 cm wide Ultrabond Turf Tape 100 jointing tape coated with a suitable adhesive applied using a notched trowel or a spreader.

It is very important that the correct amount of adhesive is applied so that the adhesive transfers fully onto the back of the rolls of synthetic grass and prevents it detaching. After bonding the edges and once the adhesive has set, the pitch may be marked out by bonding rolls of regulation-width white lines with the same characteristics as the synthetic grass on the surface. The system used to bond the lines is the same as that used to bond the edges of the rolls. After marking out the lines, dress the pitch with silica sand and infill the surface with organic rubber granules to stabilise the grass surface and promote the drainage of water, as specified by various sports federations (FIFA; UEFA; LND). Which adhesive to use to bond the joints between the rolls depends particularly on the type of grass installed, and also whether approval is required for sports federations. To bond the joints, use either **Ultrabond Turf PU 1K** (see section **P.4.1.2**) or **Ultrabond Turf PU 2K** (see section **P.4.1.3**) adhesive, depending on the federation's certificate of approval. The second adhesive has very low emission of volatile organic compounds (VOC).

### **P.4.1.1 Preparation of substrates by stabilisation**

Supply and application of an inorganic, fibre-reinforced, powdered stabilising system (such as **Mapesoil 100** produced by MAPEI S.p.A.). The stabilising agent is either mixed into the ground soil using suitable equipment to correct the ground soil without removing and replacing it (class A1-A2, and in all cases no lower than class A2-A4), or into recycled material applied in layers according to design specifications (minimum thickness 8 cm). Recycled material means inert material from demolition and maintenance work of buildings or infrastructures, including partial demolition and maintenance work. The content of organic substances in the material to be stabilised must be less than 3% according to UNI EN 1744/1 standards.

The stabilising agent is a pre-blended, fibre-reinforced, powdered hydraulic binder (fibre content  $\geq 0.1\%$ ) made from pozzolanic minerals (minimum 50% in weight of the agent, of which at least 22% with inert and binder properties). The stabilising agent must also guarantee that the loss in compressive strength is less than 30% after 28 days, demonstrated on 4x4x16 cm test pieces prepared according to UNI EN 196-1 standards with a binder/water ratio of 0.5 and subject to freeze/thaw cycles according to EN 1348 standards.

Apply the stabilising agent using a binder spreading machine equipped with a dosing system to guarantee even distribution of the stabiliser if the consistency and characteristics of the ground soil or the spreading speed vary. Mix the ground soil with the stabilising agent using equipment which scarifies, pulverises and mixes the material evenly. The installation surface must be prepared according to specification using laser-controlled equipment, and according to the specified apparent density (NR B.U. N°22) and load-bearing capacity (minimum 500 kg/cm<sup>2</sup> - Deformation modulus measured using a Ø 300 mm plate).

Before starting work, the installation company must prepare a preliminary laboratory study of the material to be stabilised containing the following information:

- granulometric analysis (CNR UNI 10006);
- Atterberg limits (CNR UNI 10014);
- classification (CNR UNI 10006);
- optimum moisture content (OMC) and dry density of the ground soil and ground soil/stabiliser mix;
- CBR load-bearing index (CNR UNI 10009) of the ground soil as is and after adding the stabiliser.

Prepare the substrate as follows:

- remove the topsoil and any vegetation in the ground using a skimmer;
- break up the surface of the exposed ground soil or the soil added to bring it up to the specified level (to a depth of at least 10 cm) with a disk-harrow, plough, harrow or similar equipment;
- wet the ground to the specified optimum moisture content (OMC), as per the value determined by laboratory tests (Proctor curve);
- spread on the stabilising agent using a suitable spreading machine. This operation must only be carried out on the portion of ground which will be treated the same day. The dose of **Mapesoil 100** or similar stabiliser, calculated through laboratory tests, varies between 3 and 6% on the weight of the ground soil, equal to approximately 6-12 kg per square metre to a depth of 8 cm (minimum);
- mix the ground soil using a horizontal plough or disk harrow to mix the binder and ground soil together down to the specified depth. The number of times it must be mixed will depend on the type of ground soil and the level of humidity;
- level and even out the ground using laser-controlled equipment;
- compact the ground with a vibro-roller (minimum 3 tons) to a compaction density of at least 98% AASHTO;
- cure the surface for at least 24 hours after application with water.

..... (€/m<sup>2</sup>)



## P.4 INSTALLATION OF SYNTHETIC GRASS PLAYING SURFACES

### P.4.1.2 Installation of synthetic grass using one-component polyurethane adhesive

Installation of synthetic grass after preparing the installation surface according to specification and checking the surface. Install the grass as follows:

- lay the rolls of grass in their required position so they may acclimatise to the surrounding conditions;
- position jointing tape (such as Ultrabond Turf Tape 100 produced by MAPEI S.p.A.) in correspondence with the joints between each adjacent roll;
- spread one-component polyurethane adhesive (such as **Ultrabond Turf PU 1K**) on the tape using a notched trowel or spreader;
- bond the edges of the sheets to the tape.

The jointing tape must have the following characteristics:

thickness:	0.100 mm
width of roll:	400 mm

The adhesive used to install the grass must have the following characteristics:

density of mix (kg/m <sup>3</sup> ):	1,350
pot life of mix:	60 minutes
open time:	80-100 minutes
time to completely set:	12 hours
set to foot traffic:	12 hours

The following are included and calculated in the price:

- checking suitability of the installation surface;
- cutting and trimming to size and marking out the surface of the grass;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



## P.4 INSTALLATION OF SYNTHETIC GRASS PLAYING SURFACES

### P.4.1.3 Installation of synthetic grass using two-component polyurethane adhesive

Installation of synthetic grass after preparing the installation surface according to specification and checking the surface. Install the grass as follows:

- lay out the rolls of grass in their required position so they may acclimatise to the surrounding conditions;
- position jointing tape (such as Ultrabond Turf Tape 100 produced by MAPEI S.p.A.) along the joints between each adjacent roll;
- spread two-component, polyurethane adhesive with very low emission of volatile organic compounds (**Ultrabond Turf PU 2K**) on the tape using a notched trowel or spreader;
- bond the edges of the sheets to the tape.

The jointing tape must have the following characteristics:

thickness: 0.100 mm  
width of roll: 400 mm

The adhesive used to install the grass must have the following characteristics:

density of mix (kg/m<sup>3</sup>): 1,600  
pot life of mix: 60 minutes  
open time: 70-80 minutes  
time to completely set: 12 hours  
set to foot traffic: 12-24 hours  
EMICODE: EC1 R Plus

The following are included and calculated in the price:

- checking suitability of the installation surface;
- cutting and trimming to size and marking out the surface of the grass;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- all other activities required to consign work completed according to specifications.

..... (€/m<sup>2</sup>)



## **P.5      INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### **P.5.1      INSTALLATION OF TENNIS COURTS Procedure**

#### **Checking and preparing the substrate**

Before finishing off the surface, check that the substrate is in good condition. Asphalt substrates must be uniform, compact and have no loose areas, cracks or hollows. Concrete substrates must be solid, well-cured and dry and have no loose areas, paint, wax or any other material or substance which could compromise the bond of the finishing layer. Concrete surfaces impregnated with oil and grease must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If these substances have penetrated deeper into the substrate, all the polluted concrete must be removed by scarifying and then repaired.

Treat concrete substrates with an even coat of Mapecoat I 600 W applied using a medium or long-haired roller.

#### **Application of the coating system**

After preparing the surface according to specification, apply the **Mapecoat TNS Professional** system (see section **P.5.1.1**).

Apply **Mapecoat TNS White Base Coat** on the surface. This product may also be used to eliminate uneven areas and hollows before applying the coloured finishing coat. Apply the undercoat as is or diluted with 5-15% of water using a metal or rubber trowel. Apply 1 or 2 coats of undercoat according to the condition of the substrate and the amount of cover required, especially if the finishing coat is a particularly bright colour. Wait 8-12 hours between each coat.

Do not expose **Mapecoat TNS White Base Coat** to direct sunlight or the external environment, and protect it with a final coat of **Mapecoat TNS Finish**.

When the base product is dry, apply 2-3 coats of **Mapecoat TNS Finish** with a rubber trowel, waiting 8-12 hours between each coat. The number of coats required depends on the intensity of colour required (the colour is brighter if more coats are applied) and the hiding capacity of the colour.

When the final coat of **Mapecoat TNS Finish** is dry, mark out the tennis court using **Mapecoat TNS Line**.

## P.5 **INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### P.5.1.1 **Installation of tennis courts by applying an acrylic resin system in water dispersion**

Installation of tennis courts by applying an acrylic resin system in water dispersion.

Apply the system as follows:

- check that the surface of the asphalt or concrete is suitable for application;
- on concrete substrates, we recommend applying a two-component, transparent epoxy primer in water dispersion (such as Mapecoat I 600 W produced by MAPEI S.p.A.);
- apply 1-2 coats of undercoat with good filling properties using a metal or rubber trowel to prepare and even out the surface (such as **Mapecoat TNS White Base Coat** produced by MAPEI S.p.A.), diluted if required with 5-15% of water. Wait 8-12 hours between each coat;
- when the undercoat is dry, apply 2-3 coats of coloured acrylic resin finish with selected fillers in water dispersion (such as **Mapecoat TNS Finish** produced by MAPEI S.p.A.), in the colour indicated by the Director of Works. Wait 8-12 hours between each coat;
- mark out the tennis court if required using acrylic resin paint in water dispersion (such as **Mapecoat TNS Line** produced by MAPEI S.p.A.).

The coloured finishing product must have the following characteristics:

dry solids content (%):	70
density (g/cm <sup>3</sup> ):	approx. 1.40
failure load (DIN 53504 after 7 days at +23°C):	0.7 N/mm <sup>2</sup>
vapour diffusion resistance coefficient (μ):	200
adhesion to concrete:	2.4 N/mm <sup>2</sup>

The following are included and calculated in the price for installation according to specification:

- checking suitability of the installation surface;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

- *per square metre* ..... (€/m<sup>2</sup>)



## **P.5 INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### **P.5.1.2 MAPECOAT TNS REINFORCED Procedure**

#### Checking and preparing the substrate

Before finishing off the surface the condition of the substrate must be checked. Asphalt substrates must be even and compact and have no detached areas. Concrete substrates must be sound, well cured and dry and have no detached areas. Fill any cracks and hollows with products suitable for that particular type of substrate.

#### Application phases

- Concrete substrates must be primed with two-component, transparent epoxy primer in water dispersion (such as Mapecoat I 600 W by MAPEI S.p.A.); approximate consumption 0.050-0.100 kg/m<sup>2</sup>.
- Apply a coat of undercoat with good filling/covering properties using a metal or rubber spreader diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat by MAPEI S.p.A.); approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When dry, apply another coat of undercoat with good filling/covering properties using a metal or rubber spreader diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat by MAPEI S.p.A.); approximate consumption 1.5 kg/m<sup>2</sup>. Lay sheets of glass fibre mesh (such as Mapenet 150 by MAPEI S.p.A.) on the surface and overlap the sheets by at least 10 cm. Press the mesh down onto the substrate with a flat spreader so that it is embedded in the undercoat.
- When dry, apply another coat of undercoat with good filling/covering properties using a metal or rubber spreader diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat by MAPEI S.p.A.); approximate consumption 0.5-0.8 kg/m<sup>2</sup>.
- When dry, apply a coat of coloured, fillerized acrylic resin coating in water dispersion certified by the ITF (International Tennis Federation) in the colour specified by the Works Director (such as Mapecoat TNS Finish 1 by MAPEI S.p.A.) with a rubber spreader; approximate consumption 0.5-0.8 kg/m<sup>2</sup>;
- When dry, apply 2 coats of coloured, fillerized acrylic resin coating in water dispersion certified by the ITF (International Tennis Federation) in the colour specified by the Works Director (such as Mapecoat TNS Finish 1, 3, 4 by MAPEI S.p.A.) with a rubber spreader. Wait 8-12 hours between each coat; approximate consumption 0.5-1.0 kg/m<sup>2</sup>.
- Mark out the court, if required, with acrylic resin paint in water dispersion (such as Mapecoat TNS Line by MAPEI S.p.A.).

#### Characteristics of the products used

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 80
Density (g/cm <sup>3</sup> ):	approx. 1.55
Viscosity of product (mPa·s):	85,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	46
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	&Delta;E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	400
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.2
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.08
Adhesion to concrete (N/mm <sup>2</sup> ):	3.50

The coloured coating product must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	70
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	70,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 15,000
Taber abrasion test after 7 days at +23°C and 50% R.H. CS17 disk, weight 1,000 g, loss in weight after 1,000 revs (g):	< 0.1 g (< 1%)
Shore A hardness:	60
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.7
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	110
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	
– blue:	&Delta;E < 0.8
– green:	&Delta;E < 0.5
– sky blue:	&Delta;E < 0.5
– red:	&Delta;E < 0.5
– white:	&Delta;E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	250
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.12
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.09
Adhesion to concrete (N/mm <sup>2</sup> ):	2.40

Not included in the price for work carried out according to specification (to be calculated according to the condition of the substrate to be treated):

- checking the suitability of the surface for application of the system;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

– *supply and application of system per square meter* 30.00 (€/m<sup>2</sup>)

## **P.5      *INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS***

### **P.5.1.3    MAPECOAT TNS REMOVE Procedure**

Checking and preparing the substrate

Before finishing off the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well cured and dry and have no detached areas.

Application phases

- Fill any hollows in the substrate with cementitious adhesive (such as Adesilex P4 by MAPEI S.p.A.) admixed with special elasticising latex (such as Latex Plus by MAPEI S.p.A.);
- Lay on special PVC sheets (such as Mapecoat TNS Re Play by MAPEI S.p.A.) and bond the joints with two-component polyurethane adhesive (such as Ultrabond Turf 2 Stars by MAPEI S.p.A.) over special jointing tape (such as Ultrabond Turf Tape 100 by MAPEI S.p.A.);
- Prepare and even out the surface by applying a coat of resin with good filling properties using a metal or rubber spreader diluted, if required, with 10-15% of water (such as Mapecoat TNS Color by MAPEI S.p.A.); approximate consumption 0.5-0.8 kg/m<sup>2</sup>;
- When dry, apply a coat of undercoat with good filling/covering properties using a metal or rubber spreader diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat by MAPEI S.p.A.); approximate consumption 0.5-0.8 kg/m<sup>2</sup>;
- When dry, apply a coat of coloured, fillerized acrylic resin coating in water dispersion certified by the ITF (International Tennis Federation) in the colour specified by the Works Director (such as Mapecoat TNS Finish 1 by MAPEI S.p.A.) with a rubber spreader; approximate consumption 0.5-0.8 kg/m<sup>2</sup>;
- When dry, apply 2 coats of coloured, fillerized acrylic resin coating in water dispersion certified by the ITF (International Tennis Federation) in the colour specified by the Works Director (such as Mapecoat TNS Finish 1.3.4 by MAPEI S.p.A.) with a rubber spreader. Wait 8-12 hours between each coat; approximate consumption 0.5-1.0 kg/m<sup>2</sup>;
- Mark out the court, if required, with acrylic resin paint in water dispersion (such as Mapecoat TNS Line by MAPEI S.p.A.).

System requirements:

- class ITF3 certification;
- class C<sub>fl</sub> S1 fire resistance certification.

#### Characteristics of the products used

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 80
Density (g/cm <sup>3</sup> ):	approx. 1.55
Viscosity of product (mPa·s):	85,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	46
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	∅E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	400
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.2
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.08
Adhesion to concrete (N/mm <sup>2</sup> ):	3.50

The coloured coating product must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	70
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	70,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 15,000
Taber abrasion test after 7 days at +23°C and 50% R.H. CS17 disk, weight 1,000 g, loss in weight after 1,000 revs (g):	< 0.1 g (< 1%)
Shore A hardness:	60
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.7
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	110
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	
– blue:	∅E < 0.8
– green:	∅E < 0.5
– sky blue:	∅E < 0.5
– red:	∅E < 0.5
– white:	∅E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	250
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.12
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.09
Adhesion to concrete (N/mm <sup>2</sup> ):	2.40

Not included in the price for work carried out according to specification (to be calculated according to the condition of the substrate to be treated):

- checking the suitability of the surface for application of the system;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

– supply and application of system per square meter

55.00 (€/m<sup>2</sup>)

## **P.5      INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### **P.5.2      INSTALLATION OF MULTI-PURPOSE PLAYING SURFACES Procedure**

#### **Checking and preparing the substrate**

Before finishing off the surface, check that the substrate is in good condition. Asphalt substrates must be uniform, compact and have no loose areas, cracks or hollows. Concrete substrates must be solid, well-cured and dry and have no loose areas, paint, wax or any other material or substance which could compromise the bond of the finishing layer. Concrete surfaces impregnated with oil and grease must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If these substances have penetrated deeper into the substrate, all the polluted concrete must be removed by scarifying and then repaired.

Treat concrete substrates with an even coat of Mapecoat I 600 W applied using a medium or long-haired roller.

#### **Application of the coating system**

Afterpreparing the surface according to specification, apply the **Mapecoat TNS Multisport Professional** system (see section **P.5.2.1**).

Apply **Mapecoat TNS White Base Coat** on the surface. This product may also be used to eliminate uneven areas and hollows before applying the coloured finishing coat. Apply the undercoat as is or diluted with 5-15% of water using a metal or rubber trowel. Apply 1 or 2 coats of undercoat according to the condition of the substrate and the amount of cover required, especially if the finishing coat is a particularly bright colour. Wait 8-12 hours between each coat.

Do not expose **Mapecoat TNS White Base Coat** to direct sunlight or the external environment, and protect it with a final coat of **Mapecoat TNS Finish**.

When the undercoat is dry, apply 2-3 coats of **Mapecoat TNS Finish** with a rubber trowel, waiting 8-12 hours between each coat. The number of coats required depends on the intensity of colour required (the colour is brighter if more coats are applied) and the hiding capacity of the colour.

When the final coat of **Mapecoat TNS Finish** is dry, mark out the surface using **Mapecoat TNS Line**.

## P.5 **INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### P.5.2.1 **Installation of multi-purpose playing surfaces by applying an acrylic resin system in water dispersion**

Installation of multi-purpose playing surfaces by applying a coloured acrylic resin system in water dispersion.

Apply the system as follows:

- check that the surface of the asphalt or concrete is suitable for application;
- on concrete substrates, we recommend applying a two-component, transparent epoxy primer in water dispersion (such as Mapecoat I 600 W produced by MAPEI S.p.A.);
- apply 1-2 coats of undercoat with good filling properties using a metal or rubber trowel to prepare and even out the surface (such as **Mapecoat TNS White Base Coat** produced by MAPEI S.p.A.), diluted if required with 5-15% of water. Wait 8-12 hours between each coat;
- when the undercoat is dry, apply 2-3 coats of coloured acrylic resin finish with selected fillers in water dispersion (such as **Mapecoat TNS Finish** produced by MAPEI S.p.A.), in the colour indicated by the Director of Works. Wait 8-12 hours between each coat;
- mark out lines on the playing surface if required using acrylic resin paint in water dispersion (such as **Mapecoat TNS Line** produced by MAPEI S.p.A.).

The coloured finishing product must have the following characteristics:

dry solids content (%):	70
density (g/cm <sup>3</sup> ):	approx. 1.40
failure load (DIN 53504 after 7 days at +23°C):	0.7 N/mm <sup>2</sup>
vapour diffusion resistance coefficient (μ):	200
adhesion to concrete:	2.4 N/mm <sup>2</sup>

The following are included and calculated in the price for installation according to specification:

- checking suitability of the installation surface;
  - cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;
- per square metre ..... (€/m<sup>2</sup>)



## **P.5      INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### **P.5.3      INSTALLATION OF CYCLE TRACKS AND FOOTPATHS Procedure**

#### **Checking and preparing the substrate**

Before finishing off the surface, check that the substrate is in good condition. Asphalt substrates must be uniform, compact and have no loose areas, cracks or hollows. Concrete substrates must be solid, well-cured and dry and have no loose areas, paint, wax or any other material or substance which could compromise the bond of the finishing layer. Concrete surfaces impregnated with oil and grease must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If these substances have penetrated deeper into the substrate, all the polluted concrete must be removed by scarifying and then repaired.

Treat concrete substrates with an even coat of Mapecoat I 600 W applied using a medium or long-haired roller.

#### **Application of the coating system**

After preparing the surface according to specification, apply the **Mapecoat TNS Urban** (see section **P.5.3.1**).

Apply **Mapecoat TNS Urban** on the surface. The first coat of undercoat may be applied as is or diluted with 5-15% of water using a metal or rubber trowel.

When the undercoat is dry, apply 2-3 coats of **Mapecoat TNS Urban** with a rubber trowel, waiting 8-12 hours between each coat. The number of coats required depends on the intensity of colour required (the colour is brighter if more coats are applied) and the hiding capacity of the colour.

When the final coat of **Mapecoat TNS Urban** is dry, mark out the cycle track or footpath using **Mapecoat TNS Line**.

## **P.5 INSTALLATION OF TENNIS COURTS, MULTI-PURPOSE PLAYING SURFACES, CYCLE TRACKS AND FOOTPATHS**

### **P.5.3.1 Installation of cycle tracks and footpaths by applying an acrylic resin system in water dispersion**

Installation of cycle tracks and footpaths by applying a coloured acrylic resin system in water dispersion.

Apply the system as follows:

- check that the surface of the asphalt or concrete is suitable for application;
- on concrete substrates, we recommend applying a two-component, transparent epoxy primer in water dispersion (such as Mapecoat I 600 W produced by MAPEI S.p.A.);
- when the undercoat is dry, apply 3-4 coats of coloured acrylic resin finish with selected fillers in water dispersion (such as **Mapecoat TNS Urban** produced by MAPEI S.p.A.), in the colour indicated by the Director of Works. Wait 8-12 hours between each coat;
- mark out lines for the cycle track or footpath if required using acrylic resin paint in water dispersion (such as **Mapecoat TNS Line** produced by MAPEI S.p.A.).

The coloured finishing product must have the following characteristics:

dry solids content (%):	70
density (g/cm <sup>3</sup> ):	approx. 1.40
failure load (DIN 53504 after 7 days at +23°C):	0.7 N/mm <sup>2</sup>
vapour diffusion resistance coefficient (μ):	200
adhesion to concrete:	2.4 N/mm <sup>2</sup>

The following are included and calculated in the price for installation according to specification:

- checking suitability of the installation surface;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges;

- *per square metre* ..... (€/m<sup>2</sup>)



## P.6 TECHNICAL SPECIFICATIONS FOR PLAYING SURFACES USING THE ACRYLIC RESIN-BASED MAPECOAT TNS SYSTEM

### TENNIS COURTS

#### P.6.1 MAPECOAT TNS PROFESSIONAL Procedure

##### Checking and preparing the substrate

Before coating the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be with a particle size of between 0/6 and 0/8 mm, uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well-cured and dry and have no detached or loose areas, paint, wax or any other material or substance that could compromise adhesion of the coating products. Concrete surfaces with oil or grease stains must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If oil or grease has penetrated deeper into the substrate, all the affected concrete must be removed by scarifying and then reintegrated.

##### Application phases

- Prime the surface of concrete substrates with two-component transparent epoxy primer in water dispersion (such as Mapecoat TNS Primer EPW produced by MAPEI S.p.A.). Approximate consumption 0.050-0.100 kg/m<sup>2</sup> for one coat applied with a roller.
- Prepare and even out the surface by applying 1-2 coats of undercoat with good filling/covering properties using a metal or rubber trowel diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When the undercoat is dry, apply 2 or 3 coats of coloured acrylic resin coating with selected fillers in water dispersion certified by the ITF (International Tennis Federation) using a rubber trowel in the colour specified by the Works Director (such as Mapecoat TNS Finish 1.3.4 produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- Mark out if required, using acrylic resin paint in water dispersion (such as Mapecoat TNS Line produced by MAPEI S.p.A.).

##### System requirements:

- class ITF1 certification;
- class B<sub>fl</sub> S1 fire resistance certification.

##### Characteristics of the products used

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 80
Density (g/cm <sup>3</sup> ):	approx. 1.55
Viscosity of product (mPa·s):	85,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	46
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	ΔE < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	400
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.2
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.08
Adhesion to concrete (N/mm <sup>2</sup> ):	3.50

The coloured coating product must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	70
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	70,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 15,000
Taber abrasion test after 7 days at +23°C and 50% R.H. CS17 disk, weight 1,000 g, loss in weight after 1,000 revs (g):	< 0.1 g (< 1%)
Shore A hardness:	60
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.7
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	110
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	
– blue:	∅E < 0.8
– green:	∅E < 0.5
– sky blue:	∅E < 0.5
– red:	∅E < 0.5
– white:	∅E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	250
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.12
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.09
Adhesion to concrete (N/mm <sup>2</sup> ):	2.40

Not included in the price for work carried out according to specification (to be calculated according to the condition of the substrate to be treated):

- checking the suitability of the surface for application of the system;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges.

– *supply and application of system per square meter* 23.00 (€/m<sup>2</sup>)

## **P.6 TECHNICAL SPECIFICATIONS FOR PLAYING SURFACES USING THE ACRYLIC RESIN-BASED MAPECOAT TNS SYSTEM**

### TENNIS COURTS

#### **P.6.2 MAPECOAT TNS CUSHION Procedure**

##### Checking and preparing the substrate

Before coating the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be with a particle size of between 0/6 and 0/8 mm, uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well-cured and dry and have no detached or loose areas, paint, wax or any other material or substance that could compromise adhesion of the coating products. Concrete surfaces with oil or grease stains must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If oil or grease has penetrated deeper into the substrate, all the affected concrete must be removed by scarifying and then reintegrated.

- Prime the surface of concrete substrates with two-component transparent epoxy primer in water dispersion (such as Mapecoat TNS Primer EPW produced by MAPEI S.p.A.). Approximate consumption 0.050-0.100 kg/m<sup>2</sup> for one coat applied with a roller.
- Prepare and even out the surface by applying one coat of undercoat with good filling/covering properties using a metal or rubber trowel (such as Mapecoat TNS White Base Coat produced by MAPEI S.p.A.). Apply one coat of undercoat diluted, if required, with 10/15% of water. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- Prepare and even out the surface by applying a coat of flexible undercoat with a metal or rubber trowel (such as Mapecoat TNS Grey Base Coat produced by MAPEI S.p.A.). Apply a further 2 to 3 coats of undercoat diluted, if required, with 10-15% of water, to form a flexible base layer made up of 3 to 4 coats. Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When the undercoat is dry, apply 2 or 3 coats of coloured acrylic resin coating with selected fillers in water dispersion certified by the ITF (International Tennis Federation) using a rubber trowel in the colour specified by the Works Director (such as Mapecoat TNS Finish 1.3.4 produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- Mark out the playing area, if required, using acrylic resin paint in water dispersion (such as Mapecoat TNS Line produced by MAPEI S.p.A.).

##### System requirements:

- class ITF3 certification.

#### Characteristics of the products used

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 75
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	90,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	63
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	600
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.3
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> ·h <sup>0.5</sup> )] (EN 1062/3):	0.08
Adhesion to concrete (N/mm <sup>2</sup> ):	3.50

The coloured coating product must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	70
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	70,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 15,000
Taber abrasion test after 7 days at +23°C and 50% R.H. (CS17 disk, weight 1,000 g, loss in weight after 1,000 revs) (g):	< 0.1 g (< 1%)
Shore A hardness:	60
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.7
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	110
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	
– blue:	&Delta;E < 0.8
– green:	&Delta;E < 0.5
– sky blue:	&Delta;E < 0.5
– red:	&Delta;E < 0.5
– white:	&Delta;E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	250
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.12
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> ·h <sup>0.5</sup> )] (EN 1062/3):	0.09
Adhesion to concrete (N/mm <sup>2</sup> ):	2.40

Not included in the price for work carried out according to specification (to be calculated according to the condition of the substrate to be treated):

- checking the suitability of the surface for application of the system;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges.

– *supply and application of system per square meter* 28.00 (€/m<sup>2</sup>)

## **P.6 TECHNICAL SPECIFICATIONS FOR PLAYING SURFACES USING THE ACRYLIC RESIN-BASED MAPECOAT TNS SYSTEM**

### TENNIS COURTS

#### **P.6.3 MAPECOAT TNS COMFORT Procedure**

##### Checking and preparing the substrate

Before coating the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be with a particle size of between 0/6 and 0/8 mm, uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well-cured and dry and have no detached or loose areas, paint, wax or any other material or substance that could compromise adhesion of the coating products. Concrete surfaces with oil or grease stains must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If oil or grease has penetrated deeper into the substrate, all the affected concrete must be removed by scarifying and then reintegrated.

##### Application phases

- Fill any hollows in the substrate with polyurethane epoxy adhesive fillerized with spherical quartz sand (such as Adesilex G19 produced by MAPEI S.p.A.).
- Lay 4 or 5 mm thick rubber mat on the substrate (such as Mapecomfort produced by MAPEI S.p.A.) and then bond the mat to the substrate using polyurethane epoxy adhesive (such as Adesilex G19 produced by MAPEI S.p.A.).
- Prime the surface with special two-component transparent epoxy primer in water dispersion (such as Mapecoat I 600 W produced by MAPEI S.p.A.). Approximate consumption 0.050-0.100 kg/m<sup>2</sup> for one coat applied with a roller.
- Prepare and even out the surface by applying 1-2 coats of undercoat with good filling/covering properties using a metal or rubber trowel diluted, if required, with 10-15% of water (such as Mapecoat TNS Primer EPW produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.00-1.2 kg/m<sup>2</sup>.
- When the undercoat is dry, apply 2 or 3 coats of coloured acrylic resin coating with selected fillers in water dispersion certified by the ITF (International Tennis Federation) using a rubber trowel in the colour specified by the Works Director (such as Mapecoat TNS Finish 1.3.4 produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- Mark out the playing area, if required, using acrylic resin paint in water dispersion (such as Mapecoat TNS Line produced by MAPEI S.p.A.).

##### System requirements:

- class ITF2 certification.

##### Characteristics of the products used

The rubber mat must have the following characteristics:

Weight (kg/m <sup>2</sup> ):	3.00
Dynamic stiffness (MN/m <sup>2</sup> ):	53
Tensile strength (KPa):	> 600
Load-bearing capacity (kg/m <sup>2</sup> ):	> 2000

The adhesive must have the following characteristics:

Density of mix (kg/m <sup>3</sup> ):	1,450
Pot life of mix:	50-60 mins
Open time:	1 hour
Setting time:	9 hours
Set to foot traffic:	12-24 hours

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 75
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	90,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	63
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	600
Resistance to the passage of water vapour for a 0.5 mm thick dry layer SD (m) (EN ISO 7783/2):	0.3
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> ·h <sup>0.5</sup> )] (EN 1062/3):	0.08
Adhesion to concrete (N/mm <sup>2</sup> ):	3.50

The coloured coating product must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	70
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	70,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 15,000
Taber abrasion test after 7 days at +23°C and 50% R.H. CS17 disk, weight 1,000 g, loss in weight after 1,000 revs (g):	< 0.1 g (< 1%)
Shore A hardness:	60
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.7
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	110
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	
– blue:	☒E < 0.8
– green:	☒E < 0.5
– sky blue:	☒E < 0.5
– red:	☒E < 0.5
– white:	☒E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	400
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.12
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> ·h <sup>0.5</sup> )] (EN 1062/3):	0.09
Adhesion to concrete (N/mm <sup>2</sup> ):	2.40

Not included in the price for work carried out according to specification (to be calculated according to the condition of the substrate to be treated):

- checking the suitability of the surface for application of the system;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges.

– *supply and application of system per square meter* 36.00 (€/m<sup>2</sup>)

## **P.6 TECHNICAL SPECIFICATIONS FOR PLAYING SURFACES USING THE ACRYLIC RESIN-BASED MAPECOAT TNS SYSTEM**

TENNIS COURTS

### **P.6.4 MULTI-PURPOSE PLAYING SURFACES - MAPECOAT TNS MULTISPORT PROFESSIONAL Procedure**

#### **Checking and preparing the substrate**

Before coating the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be with a particle size of between 0/6 and 0/8 mm, uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well-cured and dry and have no detached or loose areas, paint, wax or any other material or substance that could compromise adhesion of the coating products. Concrete surfaces with oil or grease stains must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If oil or grease has penetrated deeper into the substrate, all the affected concrete must be removed by scarifying and then reintegrated.

#### **Application phases**

- Prime the surface of concrete substrates with two-component transparent epoxy primer in water dispersion (such as Mapecoat I 600 W produced by MAPEI S.p.A.). Approximate consumption 0.050-0.100 kg/m<sup>2</sup> for one coat applied with a roller.
- Prepare and even out the surface by applying 1-2 coats of undercoat with good filling/covering properties using a metal or rubber trowel diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When the undercoat is dry, apply 2 or 3 coats of coloured acrylic resin coating with selected fillers in water dispersion using a rubber trowel in the colour specified by the Works Director (such as Mapecoat TNS Finish 1.3.4 produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When the product is dry, apply 1 or 2 coats of coloured acrylic resin coating with selected fillers in water dispersion, suitable for multi-purpose playing surfaces such as basketball, tennis and handball, using a rubber trowel or roller in the colour specified by the Works Director (such as Mapecoat TNS Color produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.4-0.8 kg/m<sup>2</sup>. For other sports such as volleyball, 5-a-side football and roller figure skating, apply 1 or 2 coats of coloured acrylic resin coating in water dispersion using a rubber trowel, roller or by spray in the colour specified by the Works Director (such as Mapecoat TNS Paint produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.25-0.500 kg/m<sup>2</sup>.
- Mark out the playing area, if required, using acrylic resin paint in water dispersion (such as Mapecoat TNS Line produced by MAPEI S.p.A.).
- When the product is dry, apply 1 or 2 coats of transparent protective finish, preferably by spray or alternatively with a roller, to help maintain the colour of the surface and to improve its strength and resistance to dirt (such as Mapecoat TNS Protection produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.100-0.200 kg/m<sup>2</sup>.

#### **Characteristics of the products used**

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 80
Density (g/cm <sup>3</sup> ):	approx. 1.55
Viscosity of product (mPa-s):	85,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50

## **P.6 TECHNICAL SPECIFICATIONS FOR PLAYING SURFACES USING THE ACRYLIC RESIN-BASED MAPECOAT TNS SYSTEM**

TENNIS COURTS

### **P.6.5 MAPECOAT TNS MULTISPORT COMFORT Procedure**

#### **Checking and preparing the substrate**

Before coating the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be with a particle size of between 0/6 and 0/8 mm, uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well-cured and dry and have no detached or loose areas, paint, wax or any other material or substance that could compromise adhesion of the coating products. Concrete surfaces with oil or grease stains must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If oil or grease has penetrated deeper into the substrate, all the affected concrete must be removed by scarifying and then reintegrated.

#### **Application phases**

- Fill any hollows in the substrate with polyurethane epoxy adhesive fillerized with spherical quartz sand (such as Adesilex G19 produced by MAPEI S.p.A.).
- Lay 4 or 5 mm thick rubber mat on the substrate (such as Mapecomfort produced by MAPEI S.p.A.) and then bond the mat to the substrate using polyurethane epoxy adhesive (such as Adesilex G19 produced by MAPEI S.p.A.).
- Prime the surface with special two-component transparent epoxy primer in water dispersion (such as Mapecoat I 600 W produced by MAPEI S.p.A.). Approximate consumption 0.050-0.100 kg/m<sup>2</sup> for one coat applied with a roller.
- Prepare and even out the surface by applying a coat of undercoat with good filling/covering properties using a metal or rubber trowel diluted, if required, with 10-15% of water (such as Mapecoat TNS Grey Base Coat produced by MAPEI S.p.A.). Approximate consumption 0.5-0.7 kg/m<sup>2</sup>.
- When the undercoat is dry, apply 2 or 3 coats of coloured acrylic resin coating with selected fillers in water dispersion using a rubber trowel in the colour specified by the Works Director (such as Mapecoat TNS Finish 1.3.4 produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When the product is dry, apply 1 or 2 coats of coloured acrylic resin coating with selected fillers in water dispersion, suitable for multi-purpose playing surfaces for basketball, tennis and handball, using a rubber trowel or roller in the colour specified by the Works Director (such as Mapecoat TNS Color produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.4-0.8 kg/m<sup>2</sup>. For other sports such as volleyball, 5-a-side football and roller figure skating, apply 1 or 2 coats of coloured acrylic resin coating in water dispersion using a rubber trowel, roller or by spray in the colour specified by the Works Director (such as Mapecoat TNS Paint produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.25-0.500 kg/m<sup>2</sup>.
- Mark out the playing area, if required, using acrylic resin paint in water dispersion (such as Mapecoat TNS Line produced by MAPEI S.p.A.).
- When the product is dry, apply 1 or 2 coats of transparent protective finish, preferably by spray or alternatively with a roller, to help maintain the colour of the surface and to improve its strength and resistance to dirt (such as Mapecoat TNS Protection produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.100-0.200 kg/m<sup>2</sup>.

#### **Characteristics of the products used**

The rubber mat must have the following characteristics:

Weight (kg/m <sup>2</sup> ):	3.00
Dynamic stiffness (MN/m <sup>2</sup> ):	53
Tensile strength (KPa):	> 600

## **P.6 TECHNICAL SPECIFICATIONS FOR PLAYING SURFACES USING THE ACRYLIC RESIN-BASED MAPECOAT TNS SYSTEM**

TENNIS COURTS

### **P.6.6 CYCLE TRACKS AND URBAN FEATURES AND FURNISHING - MAPECOAT TNS URBAN Procedure**

Checking and preparing the substrate

Before coating the surface the substrate must be checked to make sure it is in good condition. Asphalt substrates must be with a particle size of between 0/6 and 0/8 mm, uniform and compact and have no loose or detached areas, cracks or hollows. Concrete substrates must be sound, well-cured and dry and have no detached or loose areas, paint, wax or any other material or substance that could compromise adhesion of the coating products. Concrete surfaces with oil or grease stains must be thoroughly cleaned with a 10% solution of water and caustic soda and then rinsed several times with plenty of clean water. If oil or grease has penetrated deeper into the substrate, all the affected concrete must be removed by scarifying and then reintegrated.

Application phases

- Prime the surface of concrete substrates with two-component transparent epoxy primer in water dispersion (such as Mapecoat TNS Primer EPW produced by MAPEI S.p.A.). Approximate consumption 0.050-0.100 kg/m<sup>2</sup> for one coat applied with a roller.
- Prepare and even out the surface by applying 1-2 coats of undercoat with good filling/covering properties using a metal or rubber trowel diluted, if required, with 10-15% of water (such as Mapecoat TNS White Base Coat produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- When the undercoat is dry, apply 2-3 coats of coloured acrylic resin coating with selected fillers in water dispersion certified by the ANAS laboratories in the colour specified by the Works Director (such as Mapecoat TNS Urban produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 1.0-1.5 kg/m<sup>2</sup>.
- Mark out the cycle tracks or designated areas, if required, using acrylic resin paint in water dispersion (such as Mapecoat TNS Line produced by MAPEI S.p.A.).
- When the product is dry, apply 1 or 2 coats of transparent protective finish, preferably by spray or alternatively with a roller, to help maintain the colour of the surface and to improve its strength and resistance to dirt (such as Mapecoat TNS Protection produced by MAPEI S.p.A.). Wait 8-12 hours between each coat. Approximate consumption 0.100-0.200 kg/m<sup>2</sup>.

System requirements:

- ANAS certification for resistance to de-icing substances, resistance to oil and fuel, resistance to icing/ de-icing salts, resistance to footsteps with average BPN value of 62, class Bfl S1 fire resistance certification.

#### Characteristics of the products used

The undercoat to prepare and even out the surface must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	approx. 80
Density (g/cm <sup>3</sup> ):	approx. 1.55
Viscosity of product (mPa·s):	85,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 10,000
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.50
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	46
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	&Delta;E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	400
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.2
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.08
Adhesion to concrete (N/mm <sup>2</sup> ):	3.50

The coloured coating product must have the following characteristics:

Consistency:	thick liquid
Dry solids content (%):	70
Density (g/cm <sup>3</sup> ):	approx. 1.40
Viscosity of product (mPa·s):	70,000 ± 5,000
Wet abrasion (DIN 53778) (cycles):	> 15,000
Taber abrasion test after 7 days at +23°C and 50% R.H. CS17 disk, weight 1,000 g, loss in weight after 1,000 revs (g):	< 0.1 g (< 1%)
Shore A hardness:	60
Ultimate tensile strength (DIN 53504) after 7 days at +23°C (N/mm <sup>2</sup> ):	0.7
Elongation at failure (DIN 53504) after 7 days at +23°C (%):	110
Change in colour after 1,000 hours exposure to a Weather-Ometer (according to ASTM G 155 cycle 1):	
– blue:	&Delta;E < 0.8
– green:	&Delta;E < 0.5
– sky blue:	&Delta;E < 0.5
– red:	&Delta;E < 0.5
– white:	&Delta;E < 0.5
Resistance to water vapour diffusion factor (μ) (EN ISO 7783/2):	250
Resistance to the passage of water vapour for a 0.5 mm thick dry layer S <sub>D</sub> (m) (EN ISO 7783/2):	0.12
Capillary action water absorption factor W <sub>24</sub> [kg/(m <sup>2</sup> h <sup>0.5</sup> )] (EN 1062/3):	0.09
Adhesion to concrete (N/mm <sup>2</sup> ):	2.40

The protective finishing product must have the following characteristics:

Mixing ratio:	comp. A : comp. B = 100 : 20
Colour of mix:	opalescent, milky
Consistency of mix:	fluid
Workability time:	
Dust dry (at +23°C and 50% R.H.):	70 mins
Set to foot traffic (at +23°C and 50% R.H.):	minimum 12 hours
Full hardening time:	7 days
Taber Test (after 7 days, CS17 disk, 1000 cycles, 1000 g):	30 mg
Consumption:	0.1-0.2 kg/m <sup>2</sup> depending on the absorption of the substrate
Density A 1.03 kg/l - Viscosity A:	(needle 1, 50 rpm) 82
Density B 1.15 kg/l - Viscosity B:	(needle 2, 20 rpm) 600
Density A+B 1.05 kg/l - Viscosity A+B:	(needle 2, 100 rpm) 176
Finish:	transparent, opaque
Gloss factor:	2
Resistance to QUV:	excellent

Not included in the price for work carried out according to specification (to be calculated according to the condition of the substrate to be treated):

- checking the suitability of the surface for application of the system;
- cleaning and removal of waste material upon completion of work, differential collection of waste material, transport and delivery of waste material to an authorised waste disposal site and all waste disposal charges.

- per square metre

22.00 (€/m<sup>2</sup>)