



# MODERN ROAD SURFACES IN STONE

**MAPESTONE JOINT**  
.....  
**MAPESTONE SYSTEM**



## THE “STRADA MAGGIORE” CONSTRUCTION SITE

THE STORY OF A ROAD TOLD BY THE  
TOOLS WHICH BUILT IT

CANTIFRE  
**BOBO**  
BOLOGNA PER BOLOGNA



# YOU NEED LOCKING UP

## A MORTAR'S POINT OF VIEW

“They say that I am seven times stronger than the concrete used to make pillars that hold up buildings. They say that I have formidable resistance to aggressive salts and freezing weather. This all makes me seem like matter from another planet; as if I were that stuff that melts and then recombines that you can see in the movie Terminator. But all I am is mortar; okay, I am **Mapestone TFB 60** ultra high-strength supermortar, but I am still only mortar, something that locks stone together. And you'd best not forget it. Anyway, if the ancient Romans had been able to use me to build their roads, nobody else would have got a look in. They have used me on the Bobo (Bologna for Bologna) construction site to get the maximum cohesion possible between one flagstone and another in Strada Maggiore, and I can hear the antique flagstones now as they whisper: “you make everything look so simple, little mortar”, “your masters don't work as well as the Romans”, “they manage to get by thanks to you”, and even “of course it was all so different in the good old days, shame on you, it's a sacrilege...”. Nasty little flagstones, ungrateful masochists, don't you remember how badly those Roman chisels treated you, strike after strike, pushing one stone against the other, with just really tight, narrow joints to create a solid mass effect, forcing you to match as close as possible? Sand and river gravel were the weak points. The binder was the weak point. The Romans didn't have a really sound binder but, let's get to the point; the Italians are still the best in the world at constructing roads. And if today they can count on me, it means we have always been at the forefront, right back since ancient Roman times. The mallet blows will make you sink into the support of my cradle, my gums will rise up, the wheelbarrows will pour me into the gaps until they are filled, when the bonding slurry has dried out you will be tied to me forever, I will hold you tight in the heat and in the cold, in the rain and snow, even under the weight of the wheels of the trolleybuses and cars, from here you will never move again. **I am a super-mortar because you need locking up.**”



**Tper**  
Trasporto Passeggeri Emilia-Romagna



è Bologna

# MODERN ROAD SURFACES IN STONE

---



## MAPESTONE JOINT

Pervious and flexible  
paving

---



## MAPESTONE SYSTEM

Monolithic waterproofing  
paving



# THE CAUSES OF DETERIORATION





## MECHANICAL STRESSES

The constant passage of cars and heavy vehicles generate compressive stress (the weight of the vehicles themselves) and tensile stress (manoeuvres carried out by vehicles) that cause failure in weak and irregular substrates on which the blocks of stone that make up the road surface have been installed.



## DE-ICING SALTS, FREEZE/THAW CYCLES AND SEA-SALTS

There is a contrast between the high amount of heat generated when using de-icing salts (calcium and sodium chloride) and brusque cooling down due to low surrounding temperatures.

This alternation in temperatures, combined with freeze/thaw cycles (with stresses caused by water cooling down and turning into ice), causes contraction, expansion and crumbling, which in turn deteriorate the joints and substrate. The action of chlorides in the sea-salts accelerates deterioration in porous cementitious matrixes.



## DESIGN AND INSTALLATION

Modern stone road surfaces must be developed and then designed as structures that are meant TO LAST over the years, similar to any other vertical structure. With this in mind, choosing the most suitable installation system is fundamental. Also, using only expert workers qualified in the installation of stone is a key factor to ensure that this type of system is installed correctly. If unsuitable installation systems or methods are chosen, the service life of stone road surfaces will be shortened.





# THE MAPEI SOLUTIONS



## MAPESTONE JOINT



**Mapestone Joint** is a solvent-free, odourless, one-component polyurethane binder intended to grout joints for setts, blocks and pebbles for flexible and pervious architectural stone paving, particularly resistant to deicing salts, to thermal shock and to acids, sound absorbent; allows opening to vehicular traffic in short times, after 48 hours after placing at +20°C.

**Mapestone Joint Cleaner** is the new specific cleaner and thinner for **Mapestone Joint**. It is used to remove resin residues that deposit on stone architectural paving during joint grouting made with **Mapestone Joint**. It is also efficient for cleaning the tools after **Mapestone Joint** application.



Install the stone blocks on a bed of 4-8 mm coarse stone chippings



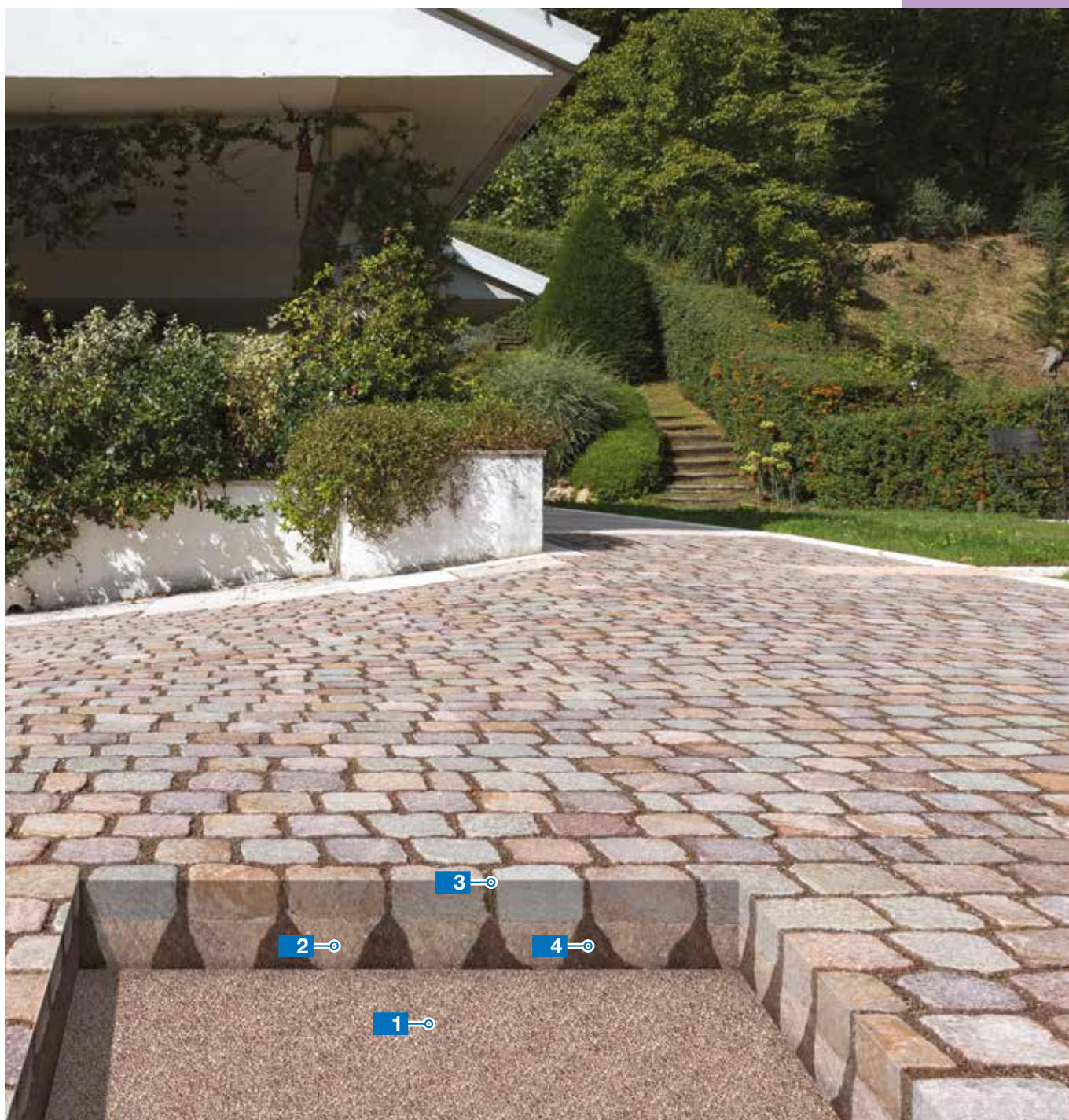
Fill the grout lines with 2/4 mm medium stone chippings



Fill the grout lines with Mapestone Joint resin

- 1** 5-8 cm thick installation bed of 4-8 mm coarse stone chippings
- 2** Blocks of porphyry or other stone

- 3** 2-4 mm gravel infill
- 4** **Mapestone Joint**



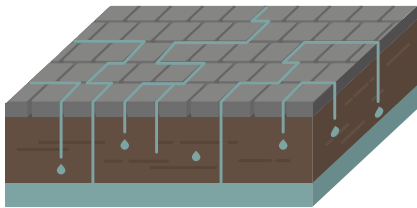


# MAPESTONE JOINT



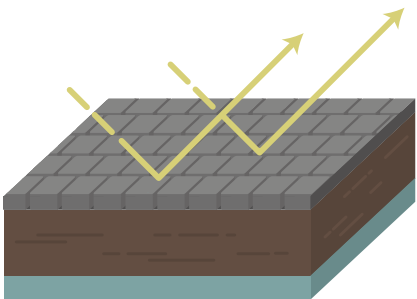
## PERVIOUS

---



## FLEXIBLE

---







MODERN  
ROAD SURFACES  
IN STONE



## TECHNICAL ADVANTAGES

- FLEXIBLE SYSTEM
- PERVIOUS CAPACITY
- RESISTANT TO FREEZING WEATHER, DE-ICING, SALTS, SEA-SALTS AND SEA SPRAY

## ECONOMIC ADVANTAGES

- HIGHLY DURABLE FINISHED WORK
- HIGH RESISTANCE TO THE CLEANING ACTION OF POWER SWEEPERS
- NO WASTE OF MATERIAL
- LESS TIME REQUIRED FOR ROAD WORKS





# THE MAPEI SOLUTIONS



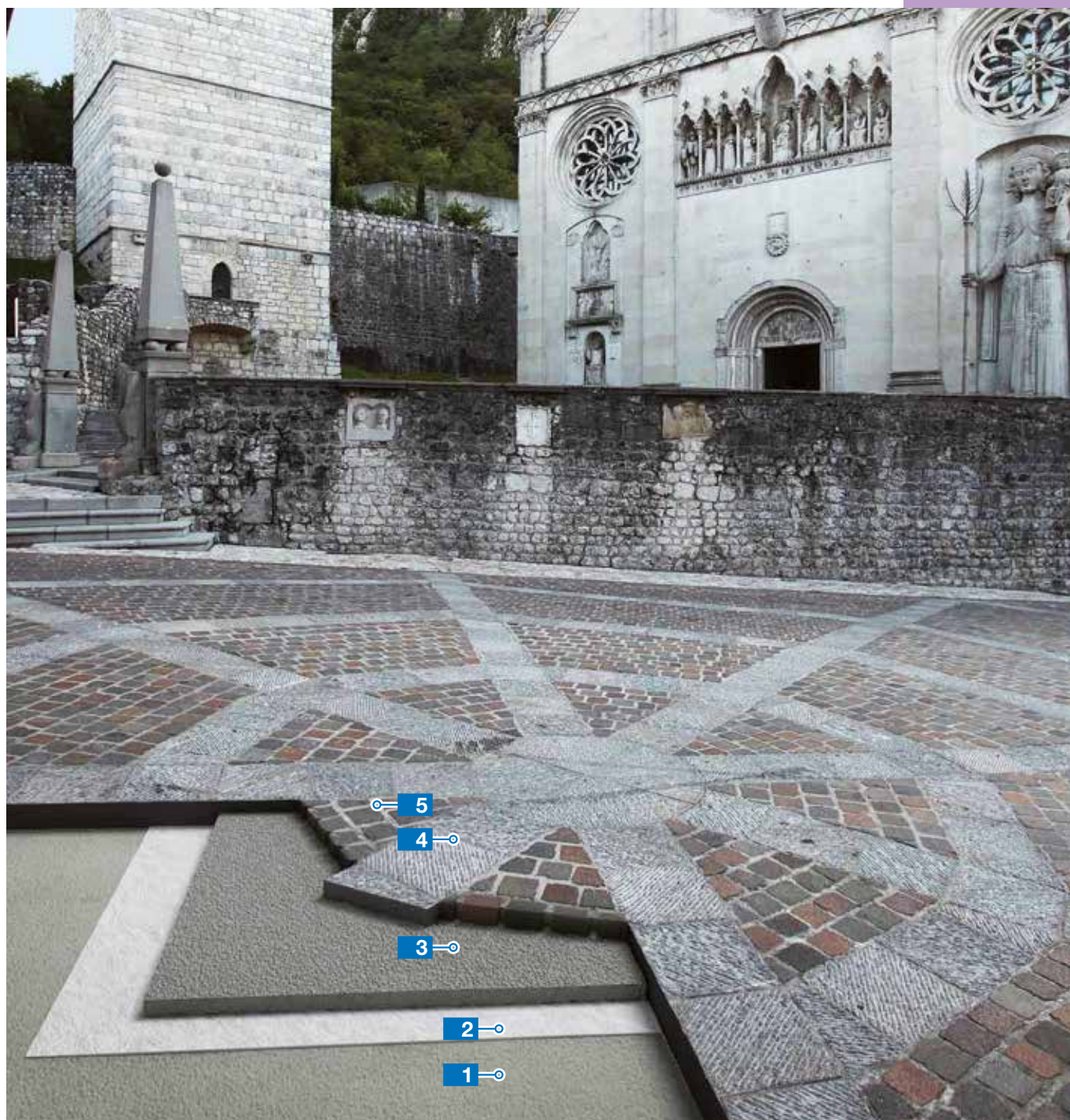
## MAPESTONE SYSTEM

The monolithic **Mapestone System** represents a “turnkey” solution to obtain durable, long-lasting work resistant to de-icing salts, freeze-thaw cycles and to sea water. Mapei has specifically developed pre-blended cementitious products with exceptional physical-chemical characteristics suitable for areas exposed cyclically to wet and dry periods, as described in exposure class XF4 cementitious products which need only to be mixed with water, made from special binders and selected aggregates, to make architectonic stone flooring which is suitable for vehicles. The System includes: **Mapestone TFB 60**, a pre-blended powder mortar, particularly suitable for making screeds and installing stone; **Mapestone PFS**, **Mapestone PFS 2 Visco** and **Mapestone PFS PCC 2**, pre-blended powder mortars for grouting joints. **The combined use of these products creates a long-lasting monolithic structure.**



- 1 Concrete
- 2 Non-woven fabric
- 3 Mapestone TFB 60

- 4 Setts and flagstones
- 5 Mapestone PFS 2, Mapestone PFS 2 Visco or Mapestone PFS PCC 2





# MAPESTONE SYSTEM

## WHERE TO USE

The monolithic **Mapestone System** is used to make architectural stone floors (made from cubes, kerbstones, cobblestones, slabs and blocks).

When it is not necessary to meet the requirements for exposure classes XF4 and XS3, joints may be quickly grouted with **Keracolor PPN**.



### SAFETY

Prevents wear and tear, often the cause of accidents.



### DURABILITY

Withstands the rigours of the most intense road traffic.





## TECHNICAL ADVANTAGES

- HIGH MECHANICAL STRENGTH
- HOMOGENOUS, UNIFORM PRODUCT
- RESISTANT TO FREEZING WEATHER AND DE-ICING SALTS
- RESISTANCE TO SEA SALTS OR DURABLE, LONG-LASTING WORK

## LOGISTIC ADVANTAGES

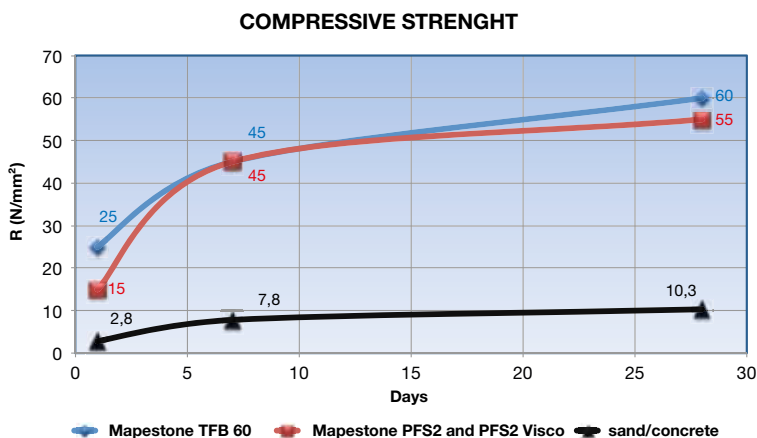
- REDUCTION IN AMOUNT OF WASTE AND OBSTACLES DUE TO ROAD-WORKS
- LOW IMPACT ON THE ENVIRONMENT
- EASY TO CLEAN

## SOCIAL ADVANTAGES

- LOWER MAINTENANCE COSTS
- LESS NOISE
- LESS DISRUPTION FOR INHABITANTS
- FEWER ACCIDENTS (DUE TO FALLS FROM BIKES, MOPEDS AND HIGH HEELS)

## ECONOMIC ADVANTAGES

- HIGHLY DURABLE FINISHED WORK
- REDUCTION IN MAINTENANCE AND/OR REPAIRS
- NO WASTE OF MATERIAL
- LESS TIME REQUIRED FOR ROAD WORKS



Colours available for **Mapestone PFS 2** and **Mapestone PFS 2 Visco**

*Due to the printing processes involved, the colours should be taken as merely indicative of the shades of the actual products*

# SOME **WORKS** CARRIED OUT WITH MAPESTONE SYSTEM



Public square  
Nova Gorica  
(Slovenia)



Public square  
San Donà di  
Piave,  
Venice  
(Italy)



Piazza Duca  
D'Aosta  
Milan  
(Italy)



◀ Danube Gate square  
Gyor  
(Hungary)



▲ Piazza Solferino  
Torino  
(Italy)

▶ Lakefront  
Gardone  
Riviera  
(Italy)



◀ Hôtel de Ville  
Vincennes  
Paris  
(France)

▲ Piazza  
XX Settembre  
Pisa  
(Italy)



**HEAD OFFICE**  
**MAPEI SpA**  
Via Cafiero, 22 - 20158 Milan  
Tel. +39-02-37673.1  
Fax +39-02-37673.214  
Internet: [www.mapei.com](http://www.mapei.com)  
E-mail: [mapei@mapei.it](mailto:mapei@mapei.it)

