

# ELASTOCOLOR SYSTEM

Elastomeric finishes

G U G G E N H E I M

M U S E U M



FILM-FORMING FINISHES WITH PERMANENT  
ELASTICITY: PROTECTION FOR SUBSTRATES  
IN AN UNLIMITED RANGE OF COLOURS.



# Elastocolor system

## Elastomeric finishes

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# Deterioration of concrete

Concrete, including reinforced concrete, is widely used in the building sector because of its versatility, strength and long-lasting durability. If it is not adequately treated, however, even this material can be at risk of various forms of degradation.

## Cracking

Infrastructures, hydraulic structures and concrete structures in general have to withstand static and dynamic loads, thermal shock and temperature variations that can cause the formation of new cracks or cause existing cracks to open even more. This leads to water and carbon dioxide penetrating into the structure, causing deterioration. This is why they need to be protected with materials that can follow these movements and act as a “bridge” over the cracks to preserve the underlying concrete.



## Carbonation

This phenomenon is triggered when carbon dioxide penetrates into the pores of concrete and reduces its pH. **Carbonated concrete** is mechanically **less resistant** and, when exposed to atmospheric phenomena such as wind, rain and mechanical erosion, it starts flaking, from the external layers up to the internal layers. Carbonation also **lowers the pH level within the concrete** and with the consequent loss of “passive” protection of the steel reinforcement. Along with cracking, carbonation completes the **initial deterioration phase** of an unprotected concrete or reinforced concrete structure, after which the final phase starts: corrosion of the steel reinforcement, which leads to serious consequences for the whole structure.

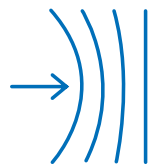




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## Corrosion of steel reinforcement

The layer of **carbonated concrete** is no longer able to maintain a passive condition for the steel reinforcement and, in addition, the reduction of the protective layer of concrete eventually exposes the steel reinforcement directly to the air. The simultaneous presence of water and oxygen triggers the **formation of rust**, which increases the thickness of the rods until the entire **concrete cover bursts**. This situation leads to the inevitable **total deterioration of the unprotected reinforced concrete**.



## Elastomeric system

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**Elastocolor** is an **elastomeric acrylic resin-based** system in water dispersion **for the protection of concrete and reinforced concrete** surfaces. Thanks to properties such as permanent elasticity and impermeability to carbon dioxide, it is suitable for use on facades affected by cracking and on concrete structures subject to deformation.

### Application examples

- Protecting concrete structures subject to small deformations when under load against carbonation.
- Protecting and decorating render with micro-cracks, including painted render, with a continuous flexible layer.
- Protecting thin, pre-fabricated structures subject to cracking.

### Main characteristics of the system

- Resistant to CO<sub>2</sub>
- Resistant to UV rays
- Adhesion to substrates
- Permanent elasticity



Zeeland Bridge  
Netherlands

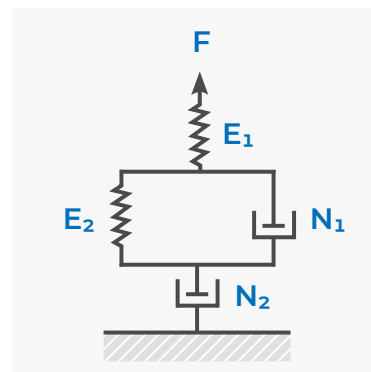


# Elastocolor

## DESCRIPTION

### Elastomeric system

Elastomeric system for internal and external surfaces with permanent elasticity and CO<sub>2</sub> resistant. Ideal for renovation work on concrete structures subject to deformation and for restoring facades affected by cracking. Defends structures against carbonation and forms an elastic coating that decorates and protects render with micro-cracks, including painted render. Also suitable for low-thickness prefabricated structures subject to cracking.



## CHARACTERISTICS



Highly flexible



Stops CO<sub>2</sub> penetration



Resistant to climatic aggression



Certified product



Wide range of colours available

## BASED ON

**Elastomeric acrylic resin in water dispersion**

## AREAS OF USE

**Protecting and decorating the surface of concrete and reinforced concrete**

## COLOURS AVAILABLE

- White
- 1,002 shades from Mapei MasterCollection
- Customised shades using the ColorMap® Automatic Tinting System

## CERTIFICATIONS



Paint and skimming product



Textured render finish

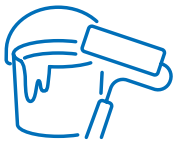


## MAPEI TECHNOLOGIES



Plus products

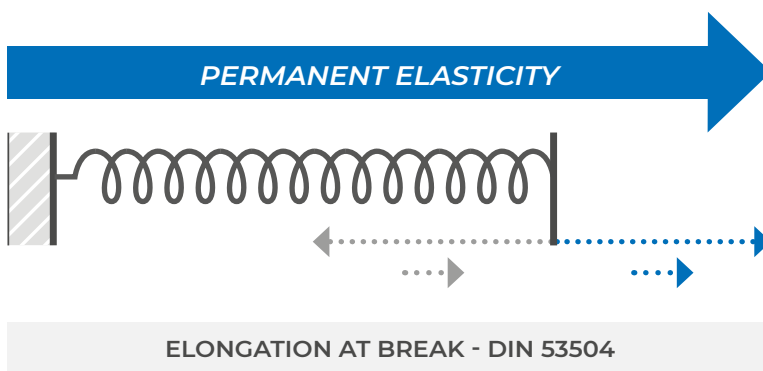




# Elastocolor system

## Permanent elasticity

All the products in the **Elastocolor** system maintain their elasticity over time. Their elasticity has been tested regarding both **elongation at break** and **crack-bridging ability**, including at low temperatures.



## Elongation at break

**Elongation at break** is measured with a dynamometer: a perfectly dry film of paint is placed between two clamps and stretched until it breaks. This test is used to determine the capacity of a finish to follow the movements of a substrate due to thermal expansion, for example. It measures the capacity of the film to **elongate under load** before reaching its failure point. The result is given as a percentage.



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## Elasticity test results

The various tests carried out demonstrated the real effectiveness of **Elastocolor** products. When properly applied, these products are able to overcome various problems related to cracking.

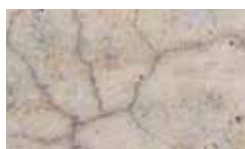
## Cracking: problems and solutions

Products from the **Elastocolor** system **overcome various crack-related problems** by applying finishes in various thicknesses. The greater the thickness of the product applied, the better its ability to contain cracking.



### Small cracks on the surface

Finish with **Elastocolor Paint**.



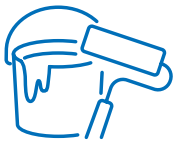
### Small cracks in the layer of render or reinforced concrete

One coat of **Elastocolor Rasante** and finish with **Elastocolor Paint**.



### Large non-structural cracks

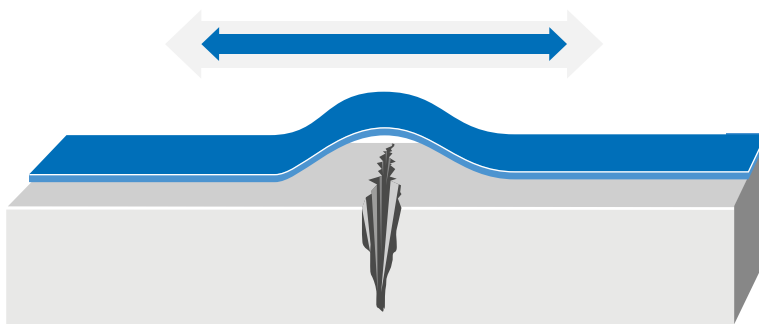
Two intermediate coats of **Elastocolor Rasante** and finish with **Elastocolor Paint**.



# Elastocolor system

## Crack Bridging Ability

Crack-bridging represents the ability of a protective finish to act as a “**bridge**” with respect to the cracking movements in the substrate.



CRACK-BRIDGING ABILITY - EN 1062-7

## Tested performance

To verify its effective performance, the product is applied in a defined thickness on a concrete specimen. Once it is perfectly dry, the concrete specimen is then pre-cracked and elongated until it reaches its failure point.



**Crack-bridging ability classification  
according to EN 1504-2**

EN 1062-7 Static test method:

**Elastocolor Paint** achieved **class A4**.

CLASS	WIDTH OF CRACK
A1	> 0.100 mm
A2	> 0.250 mm
A3	> 0.500 mm
A4	> 1.250 mm
A5	> 2.500 mm





# Elastocolor system

## Anti-carbonation protection

Damage caused by carbon dioxide reduces the thickness of reinforced concrete until the steel reinforcement is exposed to aggression by  $\text{CO}_2$ ,  $\text{O}_2$  and water (corrosion).

**Carbonation of concrete** and the resulting **rusting of steel reinforcement** contained in the concrete are the main causes of the **deterioration of structures** in reinforced concrete. This is why it is very important to protect reinforced concrete structures against this type of aggression.

- Carbonation occurs in concrete at both its fresh state (watery phase) and its dry state (gaseous phase).
- Carbonation lowers the pH level of concrete from 12 to 9.

## Elastocolor against carbonation

One of the fundamental characteristics of products in the **Elastocolor** system is their resistance to the passage of  $\text{CO}_2$ . According to **Klopfer Engelfried's** theory, a paint product, in order to adequately protect a reinforced concrete substrate, must have an  $S_d$  value higher than 50 m. This limit is also considered as a minimum requirement according to **EN 1504-2** standard.

Every product in the **Elastocolor** range exceeds this limit by 5/6 times, guaranteeing **very high protection for substrates** on which they are applied.



Standards  
compliance



EN 1504-2, which covers products and systems for the protection and repair of concrete structures, specifies  $S_d > 50 \text{ m}$ .







## Durability

A **predictive durability study** on carbonation penetration and potentiometry monitoring of steel reinforcement degradation has been carried out in Mapei R&D Laboratories.

### Phenolphthalein test

After 211 days exposure in a carbonation chamber, tests using phenolphthalein as a reagent showed that the concrete test piece treated with **Elastocolor Paint** had a homogeneous pink colour: there was practically no CO<sub>2</sub> penetration. In the reference sample, on the other hand, the colour left by the phenolphthalein could only be seen in the central part, a symptom of CO<sub>2</sub> penetration down to a significant depth. Research has demonstrated that concrete treated with **Elastocolor Paint** has **9 times more protection** than similar concrete without this treatment.

	SAMPLE	AFTER 20 YEARS
Concrete with w/c = 0.65 (reference)		Depth of carbonation 18 mm
Concrete with w/c = 0.65 protected with Elastocolor		Depth of carbonation 2 mm

w/c: water/cement mixing ratio



# Products used in **Elastocolor system**

## PRIMER

Products that improve  
the adherence of paint.



Fibre-reinforced elastomeric  
skimming products.



### Malech

Transparent  
primer



### Elastocolor Primer

Fixative and  
consolidating primer



### Elastocolor Rasante

Pigmented  
skimming product

PRODUCT	TYPE	USE	GRAIN SIZE				
				BRUSH	ROLLER	SPRAY	TROWEL
Malech	primer	I/E					
Elastocolor Primer	primer	E					
Elastocolor Rasante	pigmented skimming product	I/E					
Elastocolor Rasante SF	pigmented skimming product	I/E	0.3 mm				
						 (no airless)	
Elastocolor Paint	paint	I/E					
Elastocolor Pittura Plus	paint	I/E					
Elastocolor Tonachino Plus	textured coating	I/E	1.2 mm			 (no airless)	
Elastocolor Waterproof	paint for surfaces in contact with water	I/E					

The **Elastocolor system** is made up of a complete range of products: **Malech** transparent primer or **Elastocolor Primer** fixative and consolidating primer to **prepare substrates**; two types of skimming products, normal or with filling properties; **final protection** with a choice of paint with a smooth finish or a textured coating.

# FINISH

heric

Anti-crack elastomeric finishes  
with permanent elasticity for internal and external use.



## Elastocolor Rasante SF

Pigmented skimming product with filling properties



## Elastocolor Paint

Smooth paint



## Elastocolor Waterproof

Waterproof acrylic paint



## Elastocolor Tonachino Plus

Textured coating



## Elastocolor Pittura Plus

Smooth paint

CONSUMPTION/m <sup>2</sup>	N° COATS	YIELD PER CAN	PACKAGING	DILUTION WITH WATER	DENSITY	NOTES
50-100 g	1	130 m <sup>2</sup>	10 kg	100-200%	1.01	internal substrates
100-150 g	1	80 m <sup>2</sup>		50%		external substrates
100-150 g	1	80 m <sup>2</sup>	10 kg	--	0.96	
0.6-0.8 kg	2	30 m <sup>2</sup>	20 kg	--	1.35	
0.4 kg	1	50 m <sup>2</sup>		5-10 %		
0.4-0.7 kg	1	35 m <sup>2</sup>		5-10%		
1.4-1.6 kg	2	15 m <sup>2</sup>	20 kg	--	1.47	
0.5 kg	1	40 m <sup>2</sup>		5-10 %		
0.8-1.0 kg	1	25 m <sup>2</sup>		5-10%		
0.4-0.8 kg	2	40 m <sup>2</sup>	20 kg	10-15 %	1.37	
0.4-0.8 kg	2	40 m <sup>2</sup>	20 kg	10-15 %	1.37	
1.9-2.3 kg	1	12 m <sup>2</sup>	25 kg	1-2 %	1.70	
0.3-0.5 kg	2	50 m <sup>2</sup>	20 kg	5-10 %	1.18	not immersed substrates
0.6-0.8 kg	3	30 m <sup>2</sup>				immersed substrates





# Elastocolor Tonachino Plus

## DESCRIPTION

**Elastomeric hygienising coating for internal and external use. Elastic, water-repellent and resistant to algae and mould.**

A finish with unique performance properties, a combination of **water-repellence and breathability**. **Elastocolor Tonachino Plus** is an **elastomeric, fibre-reinforced coating product** with a rustic-effect finish for new, old and painted surfaces and surfaces with micro cracks. **Effectively counteracts the growth of algae and mould**, even in conditions particularly exposed to aggression from biological agents.

Contains **silicone resin** to give substrates very good water repellence combined with good vapour permeability. The combined action of the **elastomeric acrylic** and **silicone** polymers forms a film with exceptional adhesion, resistance, protection, durability, colour stability and low dirt pick-up. It has a grain size of 1.2 mm.



## Why you should use Elastocolor Tonachino Plus

### ***Overcomes the problem of crazing and cracking***

The fibres contained in **Elastocolor Tonachino Plus** create a tight-knit **strengthening matrix** that helps withstand deformations in the coating and **covers micro-cracks** in the finish.

### ***Fights algae and mould***

**Elastocolor Tonachino Plus** also has **BioBlock®** technology by **Mapei** that impedes the development and proliferation of algae and mould.

### ***Guarantees long-lasting protection***

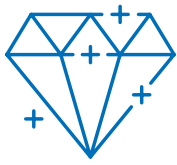
Thanks to the synergic action of its components it eliminates all the **causes that contribute to the degradation of facades**. It protects them and maintains their appearance over time.

### ***Decorates surfaces***

**Elastocolor Tonachino Plus** has an attractive, rustic-effect finish and is available in a **wide range of colours** using the **ColorMap®** automatic colouring system.

### ***Provides certified performance properties***

As with all the other products in the **Elastocolor System** it has **CE marking**, in that it complies with the requirements of **EN 1504-2** for products and systems for the protection of concrete structures, and comes with an **EPD (Environmental Product Declaration)**.



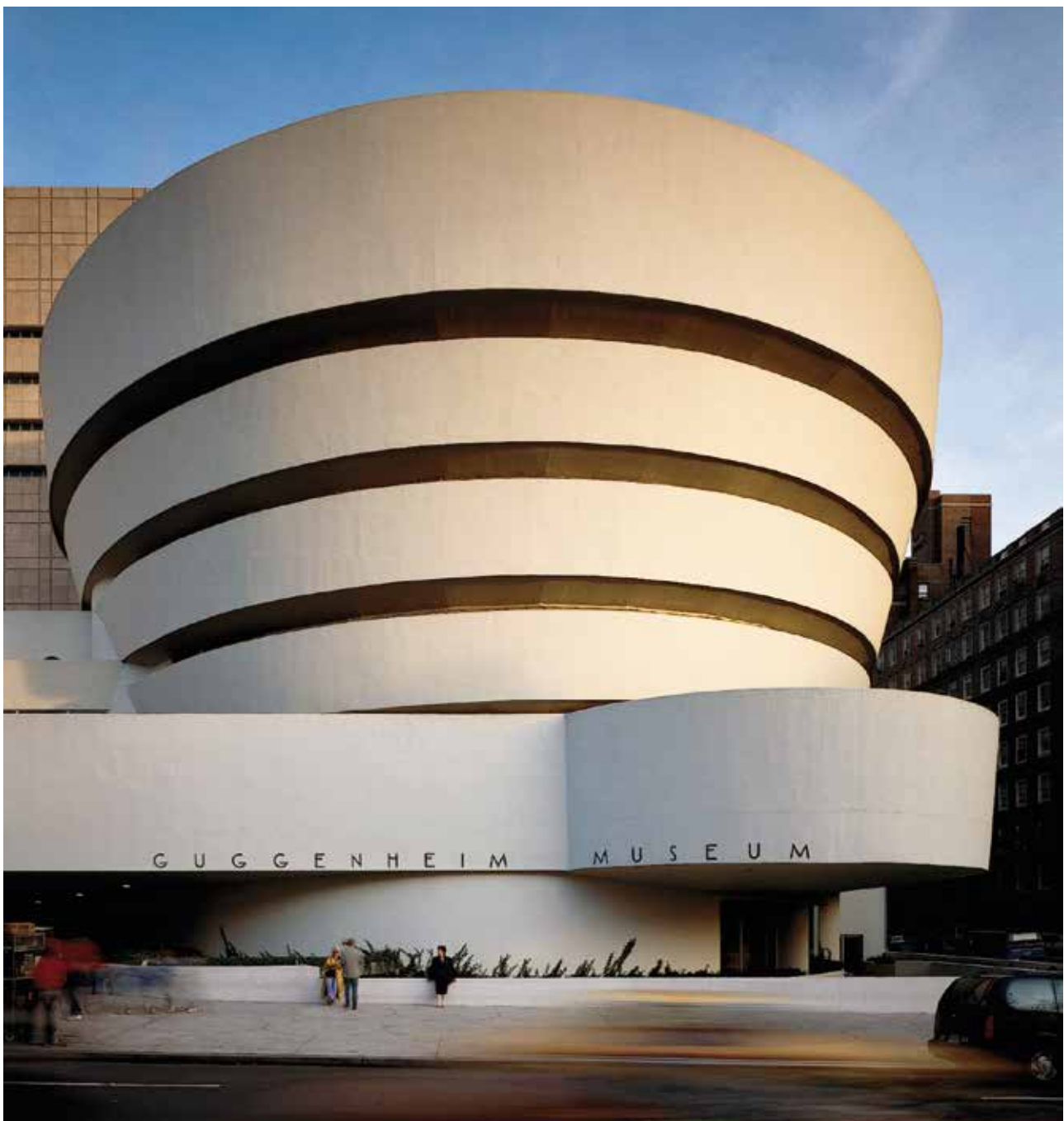
## Case history

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### Solomon R. Guggenheim Museum - New York, USA

Products used:

- Elastocolor Rasante
- Elastocolor Waterproof

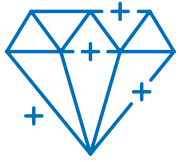


## KRK Bridge - Croazia

Products used:

- Elastocolor Primer.
- Elastocolor Rasante.
- Elastocolor Paint.





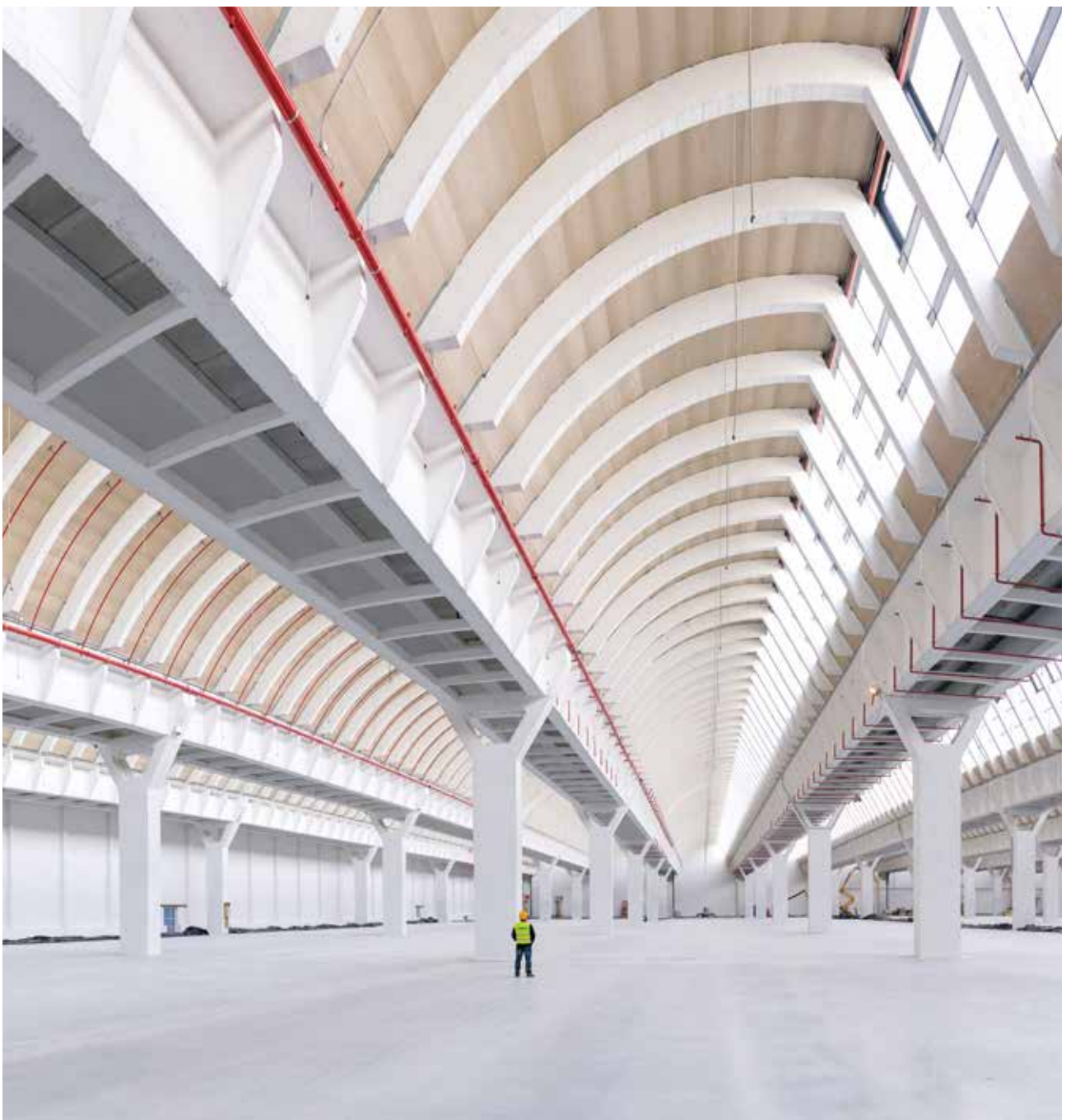
## Case history

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### Mayoral Logistics Hub - Spain

Products used:

- Elastocolor Paint

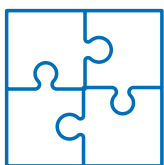


## Catania Polyclinic – Italy

Products used:

- Elastocolor Tonachino Plus
- Malech





# Interactions with **Mapei systems**

## The colour that completes

**Elastocolor** is the coloured finish ideal for various **Mapei product lines**. Thanks to its particular technical characteristics it improves and complements their efficiency very effectively. The variety of colours and textures available means there is always a perfect solution available for any project.



The Elastocolor System is the ideal finish for:



Products for the  
building sector



Products for structural  
strengthening



Products for  
waterproofing



## Certified sustainability

### Increasingly lower impact on the environment

All finishes from the **Elastocolor** range come with an **EPD** (Environmental Product Declaration). **EDPs** describe the **environmental impact of a product throughout its entire life cycle** by measuring its impact using standardised LCA (Life Cycle Assessment) methods.



Elastocolor Paint, Elastocolor Pittura Plus, Elastocolor Rasante, Elastocolor Rasante SF, Elastocolor Tonachino

Plus and Elastocolor Waterproof come with EPD certification and comply with international standard ISO 14025.

# EVERYTHING'S OK WITH MAPEI

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