



Socli
Italcementi Group

Effix Design

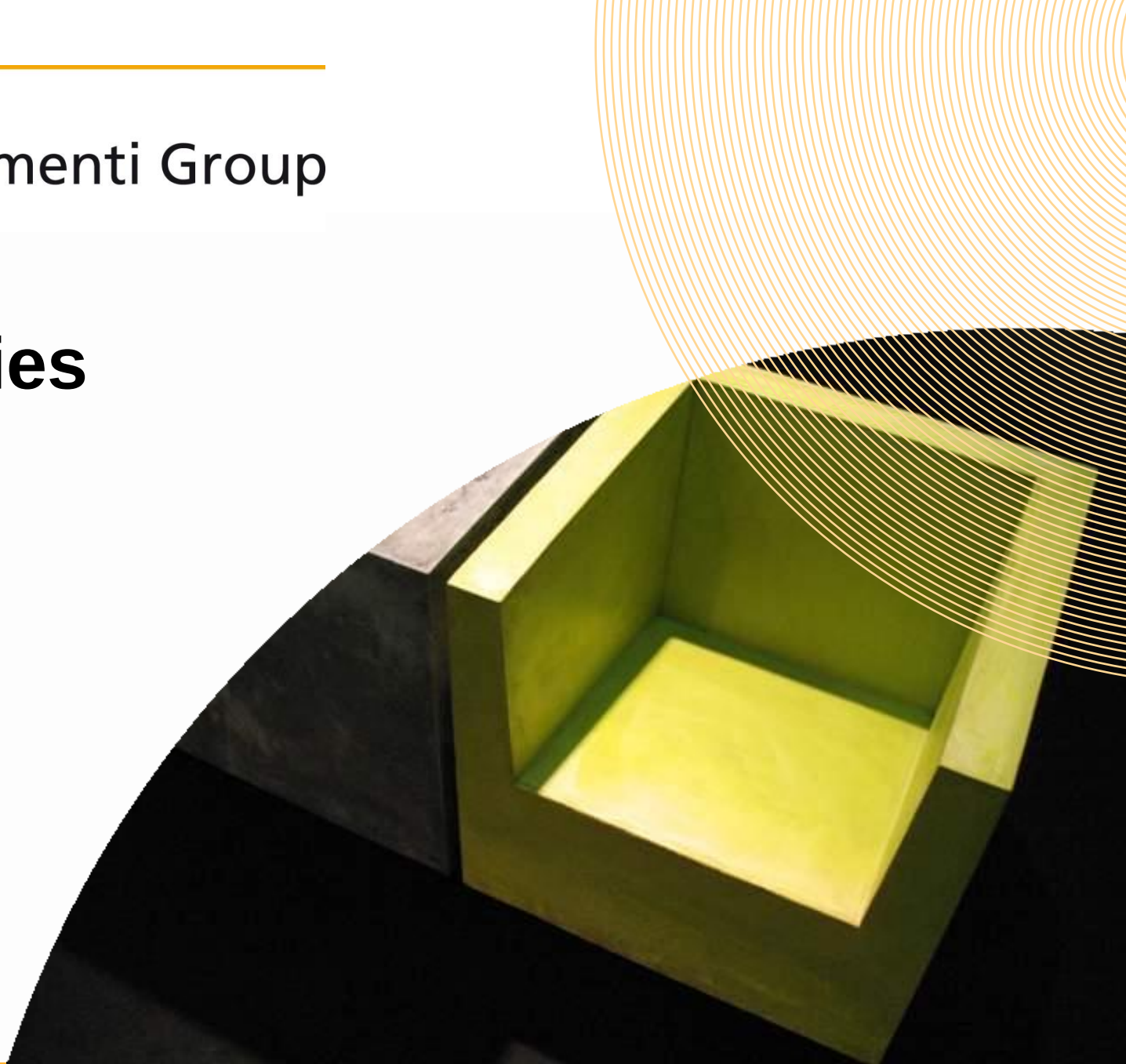
Technical information





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Properties



Main product performances

CHARACTERISTICS	ADVANTAGES
Ready Mix Mortar	Just add water
Fibers	Not visible in the hardened surface
Mixing	Fast with a traditional mixer
Consistency	Easy to use
Mechanical Behavior	High compressive strength at early age Shock resistant
Microstructure	Low porosity Low permeability
Aesthetics	Good details reproduction
Whiteness	Less pigment needed
Photocatalytic effect	Available upon request

Main product performances

MECHANICAL PERFORMANCE

(as conditions stated for the process placing)

Average data based on 4x4x16 cm specimen

Time	Compressive Strength at 20° C (MPa)	Flexural Strength at 20° C (MPa)
1 day	≥ 60	≥ 6
7 days	≥ 90	≥ 9
28 days	≥ 100	≥ 10

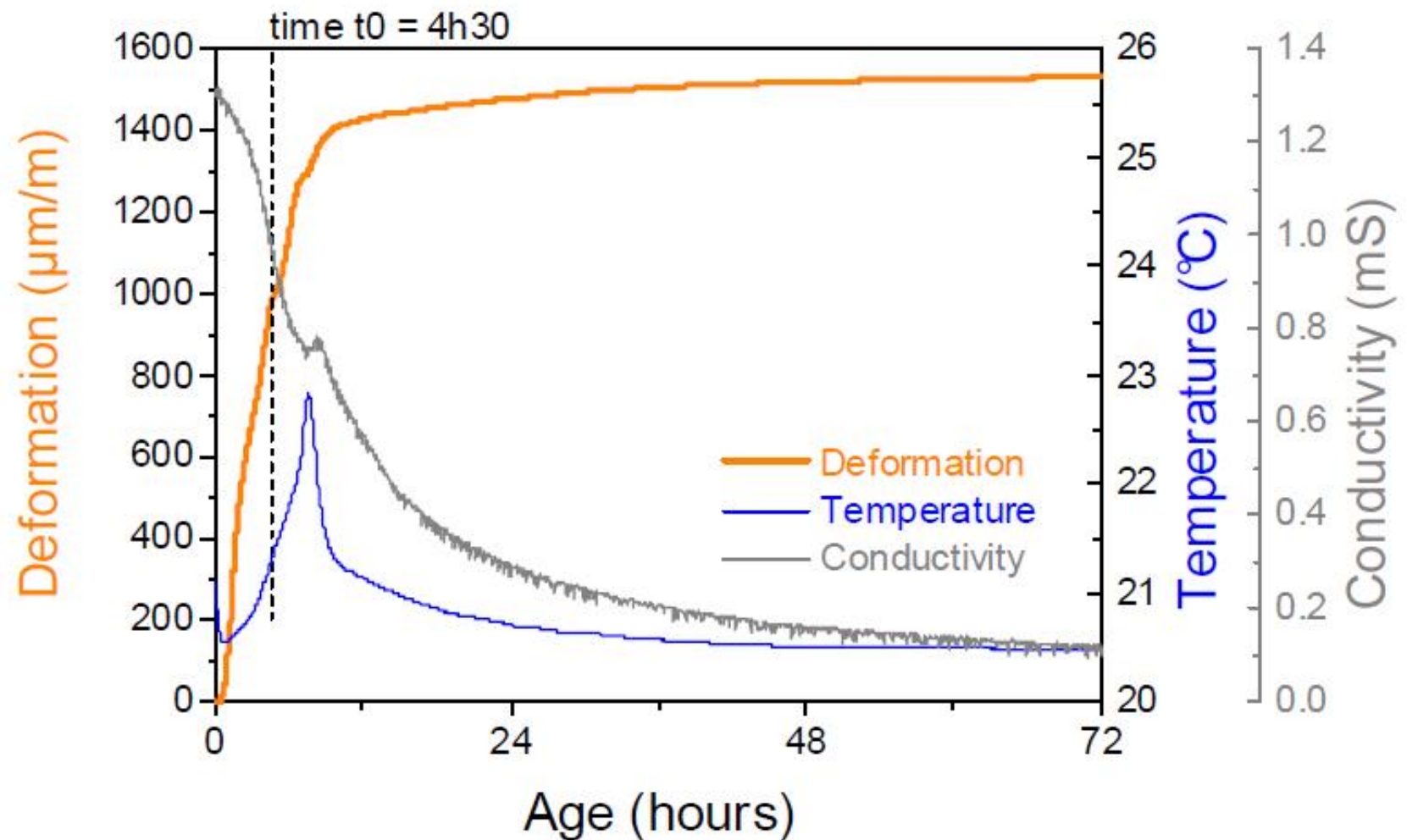
PHYSICAL PERFORMANCE

Fresh Mortar Density	2.340 kg/m ³
Particle Size	0 – 500 μ m

Durability indicators

Air content	< 3 %
Water porosity	~ 2-3 %
Oxygen permeability	< $2.5 \times 10^{-17} \text{ m}^2$
Chloride-ion diffusion factor	$3.6 \times 10^{-13} \text{ m}^2/\text{s}$
Portlandite content	< 80 kg/m ³

Shrinkage properties

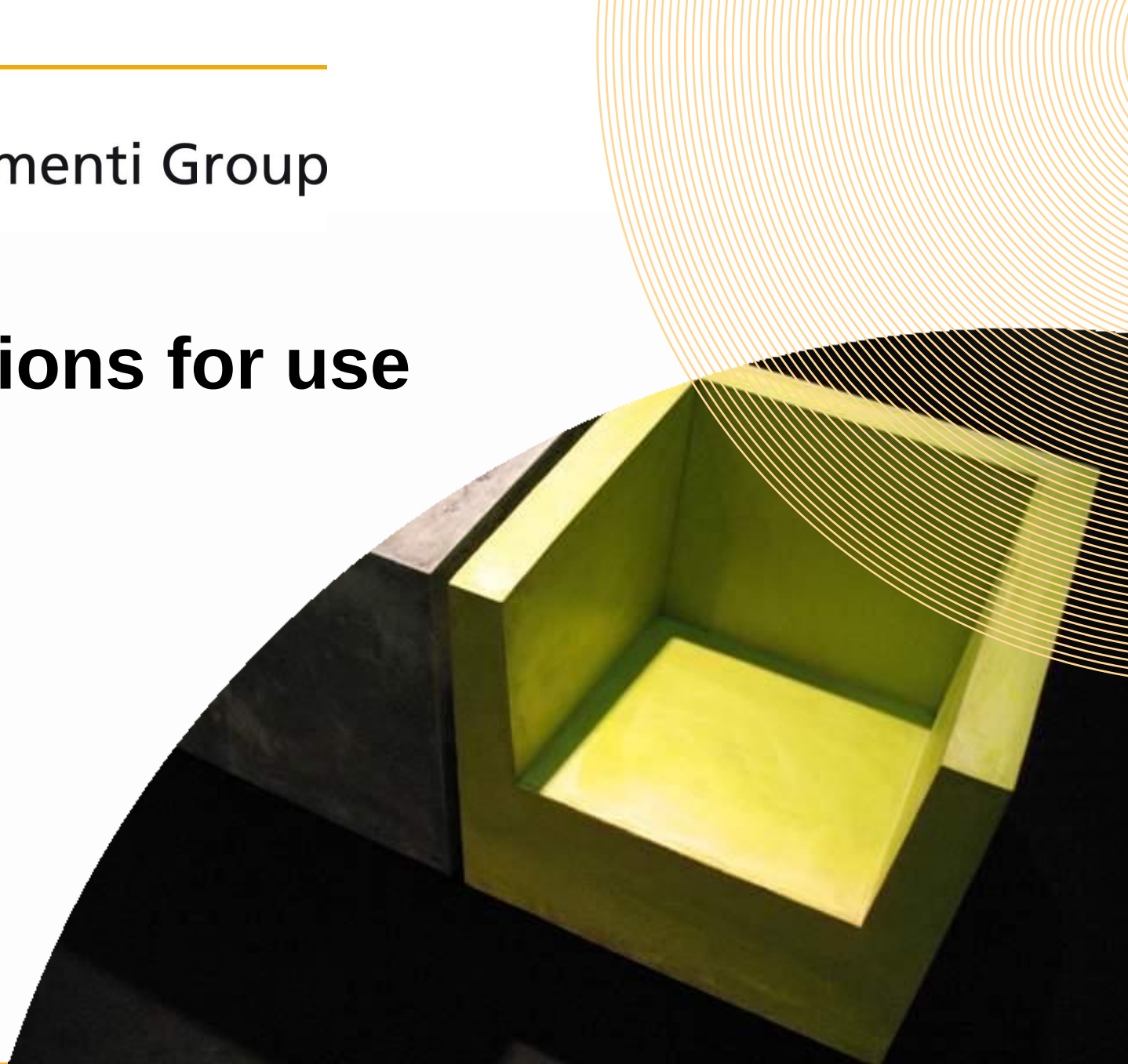


Deformations, temperature and conductivity



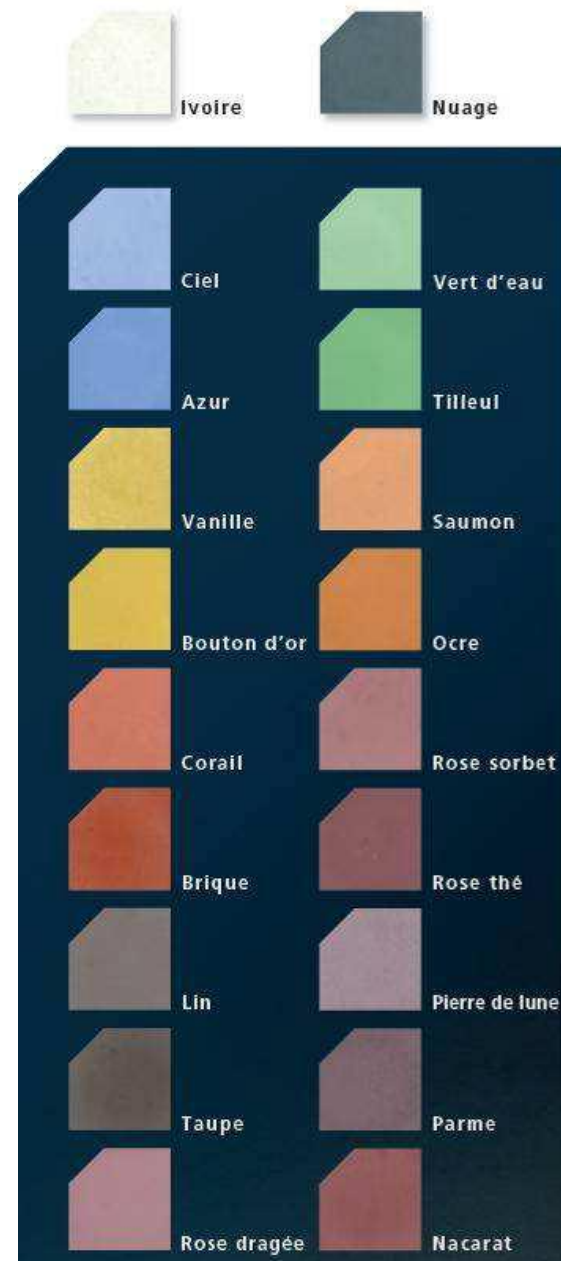
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Instructions for use



Instructions for use: colors

Colors	Trade name of the pigment	Pigment (% of dry premix)	Water (% of dry premix)
IVOIRE	—	—	11,0 %
NUAGE	Noir Bayferrox 318	1,5 %	11,5 %
CIEL	Ferro PK 5091	0,5 %	11,2 %
AZUR	Ferro PK 5091	1,5 %	11,5 %
VERT D'EAU	Vert Chrome Oxyde	0,5 %	11,2 %
TILLEUL	Vert Chrome Oxyde	1,5 %	11,5 %
VANILLE	Jaune Bayferrox 910	0,5 %	11,2 %
BOUTON D'OR	Jaune Bayferrox 910	1,5 %	11,5 %
SAUMON	Jaune Bayferrox 960	0,5 %	11,2 %
OCRE	Jaune Bayferrox 960	1,5 %	11,5 %
CORAIL	Rouge Bayferrox 110	0,5 %	11,2 %
BRIQUE	Rouge Bayferrox 110	1,5 %	11,5 %
ROSE SORBET	Rouge Bayferrox 160	0,5 %	11,2 %
ROSE THE	Rouge Bayferrox 160	1,5 %	11,5 %
PIERRE DE LUNE	Rouge Bayferrox 180	0,5 %	11,2 %
PARME	Rouge Bayferrox 180	1,5 %	11,5 %
LIN	Brun Bayferrox 686	0,5 %	11,2 %
TAUPE	Brun Bayferrox 686	1,5 %	11,5 %
ROSE DRAGEE	Rouge Bayferrox 140	0,5 %	11,2 %
NACARAT	Rouge Bayferrox 140	1,5 %	11,5 %



Instructions for use

For EFFIX Design® traditional mixers could be used and generally, the optimal volume of a mix is the half of the maximum capacity of the mixer.

EFFIX Design® is packaged in bags of 25 kg each and a water/premix ratio of **0,110** is needed.

1 bag of 25 kg + 2,75 kg of water ≈ 12 liters of mortar

Mixing of the product

- Insert the required number of bags in the mixer
- Add the coloring agents (if needed) ;
- Mix during 30 seconds ;
- Add water (2,75 kg x number of bags) ;
- Mix for 2 minutes (after fluidification of the product) ;
- Stop and scrape the bowl of the mixer ;
- Mix for other 2 minutes.

Reduction of the quantity of air entrained

A time with no solicitation could be required to reduce the quantity of air entrained in the material and it depends on the type of mixer used.

Advices and use precaution

Storage

- Dry and ventilated place.
- Use bags during the first six months ;
- In hot weather conditions, place bags at a cooler temperature (conditioned air) and mix the product with cool water;
- In cold temperature conditions, mix the product with tepid water (~30 °C)

Working Temperature conditions

- Too hot (30°C) Reduction of the time of workability / more shrinkage
- Too cold (5°C) Increase of hardening time

Advices and use precaution

Formwork and moulding

- An huge quantity of material can be used as mould for EFFIX Design® product (wood, thermoformed plastic, silicone...);
- Be sure that the mould is well disposed (horizontal);
- Due to the fluidity of the fresh mortar, be sure that the mould is waterproof;
- Due to the fineness of all the material in the product, the mortar “copy” all the textures but also all the default of the surfaces of the mould. Moulds have to be well cleaned.
- De-moulding agent is necessary for wood, polyurethane or metal moulds. When used, just a fine thickness of oil is needed. Thermoformed plastics don't need it.
- Don't use de-moulding agent with silicone mould (just dry it after the application of soap water).
- For a mirror effect of the hardened surface, the use of Plexiglas is to be recommended.
- For big elements, be caution about the size of formwork : Risk of deformation of the mould and leaks in the mortar

Advices and use precaution

Casting

In EFFIX Design® formulations fibers follow the flow of the mortar and for thin elements, fibers are mainly parallel to the surface of the mould. It is possible to disorient the fiber to improve the “all directions” mechanical behavior.

Cure at early age



The cure at early age of EFFIX Design® based products is important to insure against desiccation and it consists in keeping elements in a moist air, protecting them with a plastics sheet or putting in a special room. A particular attention is needed for elements with small thickness (high ratio “exposed surface/volume”) that are more sensitive to desiccation.



Advices and use precaution

Cure after de-moulding

Elements should be de-mould between 18 and 24 hours after their preparation. After de-moulding elements have to be kept in a moist environment for the longest time. The best way of curing is to let elements during 28 days in water; if this is not possible, protect them from the environment during at least 7 days (before protecting, just wait the cooling of the element).

The curing in water during 28 days guarantees:

- Best mechanical performances
- Surfaces well hardened
- Insure that elements aren't use too early

but it has some disadvantages :

- Efflorescence can appear (white mark on the surfaces) even if they could be deleted by polishing

Advices and use precaution

Cure after de-moulding

If material's surfaces are not protected there could be an important drying shrinkage, an early drying of the surfaces (the grain of cement will not be hydrated on the surfaces) and an increasing of the porosity with a loss of mechanical performances.

***Remember the cement must undergo hydration not drying.
This sentence is even more important for EFFIX Design® formulation
because of the low water/cement ratio.***

Advices for final product design

Length (mm)	Width (mm)	Min thickness for demoulding (mm)	Min thickness in load 3kN (mm)
500	500	10	24
1000	500	10	35
2000	500	18	53
2000	1000	18	39

By using EFFIX Design® formulation attention should be paid in designing the geometry of the final element. As example the thickness of panel elements stressed by a flexural strain has been estimated. In the following table a minimum recommended thickness in load (ex. 300 kg in center) are reported.

With low thickness elements some problems could be observed:

- Increased of the sensitivity to curing environment (microcrack)
- More sensitive to torsion
- More sensitive to thermal shocks
- Observation of cracks for Kitchen sink (if $T_{\text{water}} > 70^{\circ}\text{C}$) and Flower pot applications



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FAQ



Frequent asked questions

- **Possibility to mix 2 colored fresh mortar ?**

No problem.

- **Maximum quantity of color agent added ?**

2,0 % of the weight of premix. The color agent reduce the fluidity of the product. We advice to adjust the fluidity (if needed) by introducing water : don't go over the ratio 0,12 % of the weight of dry premix.

- **Minimal thickness ?**

A minimal thickness of 15 mm is adviced. The thickness depends on the element to produce. For complicated elements make a dimensional study.

- **What about producing big elements ? Structural elements ?**

Reinforcement must be added. Reinforcement can be made with extra thickness (like the big elements) and/or a wire.

- **Is it possible to stick something on EFFIX Design® ?**

It could that it is possible.

Frequent asked questions

- **Is it possible to vibrate when casting ?**

A non excessive vibration is recommended to avoid segregation.

- **Which material used for a “home-made” mould ?**

For rectangular elements, it is easier to design the mould in wood. For complex design, it is possible to create a mould with silicone or polyurethane (1- create a patern / 2- cast the pattern with the liquid form of the silicone or polyurethane / 3- create a reinforcement for the polymer / 4- fill the mould with EFFIX Design®). The choice of the material and the texture of the mould will have an effect on the texture of the final element.