

# Torggler

## Waterproofing

# FLEXISTAR

**Extra-flexible, single-component, fibre-reinforced cementitious polymer sheath for waterproofing and protecting concrete.**



- Highly adhesive to the substrate
- Excellent workability
- Applicable with roller, brush and trowel
- Suitable for contact with drinking water
- UV resistant
- Waterproof even under pressure
- Resistant to freeze-thaw cycles
- Good treadable surface



### APPLICATION AREAS

- Medium-sized terraces, balconies, horizontal surfaces and swimming pools on mineral screeds, monolithic cementitious screeds, cement plasters and cement mortars, cured concrete.
- Flexible waterproofing of external and internal surface, underground and above ground, of cementitious supports and masonry.
- Flexible waterproof skimming of micro-cracked plasters.
- Waterproofing of tanks, swimming pools and water containers in cracked concrete.
- Flexible renovation and waterproofing under the ceramic covering of balconies and terraces of medium surfaces (always respecting the expansion joints).
- Liquid-applied waterproofing type CM P to be used under ceramic tiles bonded with adhesives.
- Protective coating of concrete surfaces for 1.3 (C) principles (protection against penetration risks – PI), 2.3 (C) (moisture control – MC) and 8.3 (C) (increased resistivity – IR) according to EN 1504-9.
- The product can be walked on as it meets the requirements for direct traction adhesion strength according to EN 1542: 2.6 MPa (on dry concrete) Without traffic: > 0.8 MPa With traffic: > 1.5 MPa
- Prefabricated and cast concrete.
- Well cured screeds, mortars and cementitious plasters.

## MAXIMUM ATTAINABLE THICKNESSES

1-2 mm each coat, up to a total of 3 mm

## FEATURES

Flexistar is a grey single-component, pre-mixed, elastic, polymer-cement sheath based on special highly flexible polymers, cement, selected fine-grained aggregates, fibres and specific additives, for protecting concrete, classified C according to EN 1504-2 for PI, MC, IR, according to EN 1504-9 and for flexible waterproofing before installing ceramic elements, type CM P according to EN 14891. Once mixed with water, a mixture having excellent workability is obtained, which is easily applied with a roller, brush and trowel, even vertically without dripping and scraps, with excellent adhesion to the substrate. It is featured by high flexibility that allows it to withstand cracks in the substrate up to 1 mm. It is resistant to frost-thaw cycles and thawing salts, and has excellent resistance to the spread of CO<sub>2</sub>. It keeps excellent elasticity even at low temperatures. The product is certified by GEV as EC1 Plus for its very low emissions of volatile organic compounds.

## WARNINGS

- Never mix Flexistar with other binders such as cement, hydraulic lime, gypsum, etc.
- Do not add water and stop using the mixed product when it is firm.
- Never apply Flexistar in thickness greater than 2 mm each coat.
- Do not use Flexistar in the case of cementitious substrates and screeds completely impregnated with water that are subject to continuous water or humidity damping rise and do not apply the product on substrates with a residual moisture content of more than 5%.
- Do not apply on metal or wooden supports, on bituminous sheaths to waterproof exposed surfaces that can be walked on, on lightened screeds, on inverted roof insulation made with insulation panels or lightened materials. It is recommended to use forced ventilation systems, if possible.
- Do not apply Flexistar at temperatures below +5 °C or above +30 °C.
- Do not apply on screeds which are not sufficiently compact, homogeneous and flat, that must be suitable for treatment with thin-layer coatings and waterproofing, with mechanical strength appropriate to the intended use and reasonably with values in terms of tear resistance in the order of 1 N/mm<sup>2</sup>.
- Protect against runoff, rain and night-time condensation between the coats, and at least 24 hours after the application.
- In dry climatic conditions, in the presence of direct sunlight, with high temperatures and ventilation, use drop cloths to protect the surface from too rapid evaporation of the mixing water for at least 24 hours.
- In conditions of high relative humidity and/or low temperatures (applications in basements, closed rooms or in critical weather conditions), Flexistar takes more time to harden.

## INSTRUCTIONS FOR USE

### Preparation for use

Substrates must be damp, solid and regular but sufficiently roughened, clean and sound, free of oil and grease, dust, crumbly material and dirt in general, and free of residues of paint film, and must be suitably cured and free of significant shrinkage. In case of efflorescence these must be carefully removed on the surface by mechanical cleaning. Imperfections and surface irregularities such as gravel nests, eroded or deteriorated points, spacer holes in the reinforcement formworks, must be repaired beforehand and evened out with a suitable mortar. Where an elastic connection is not necessary, round off the wall-floor connections in a concave (shell) shape. Just moisten the surface to be waterproofed, taking care to remove any film of surface water with a dry sponge.

### Product preparation

Depending on the type of application used, mix Flexistar with the following amounts of clean water:

Roller and brush application:

32-36% (equal to 6.4-7.2 litres per 20 kg bag).

Trowel application:

21-23% (equal to 4.2-4.6 litres per 20 kg bag).

In a special container pour all the mixture water, then pour the powder product slowly using a mechanical stirrer (low-speed drill with a specific propeller). Once the powder has been completely poured mix until the mixture is homogeneous and free of lumps. Allow to stand for approx. 10 minutes, then mix briefly and if necessary correct the consistency with a small addition of water. The mix thus prepared remains workable for about 1 hour under normal conditions (at 20 °C); at higher temperatures the workability time is shortened, at lower temperatures the workability time is extended.

### Instruction for preparation

Roller application: apply the product in at least 2-3 coats, waiting between one coat and the other long enough to allow the previous coat to harden (about 4-6 hours at 20 °C). For roller application it is recommended to use a medium hair roller. Brush application: apply the product in at least 2-3 coats, crossing the direction of application of each coat with respect to the previous one and waiting between one coat and the other long enough to allow the previous coat to harden (about 4-6 hours at 20 °C). Trowel application: apply the product in at least two coats, waiting between one coat and the other long enough to allow the previous coat to harden (about 4-6 hours at 20 °C). In the presence of pre-existing perimeter joints, expansion joints or connection joints, apply the appropriate coats of Flexistar applied to the edges and first millimetres of the sides of the joint, avoiding clogging, possibly with the help of a polystyrene and/

or polyurethane strip. After sufficient hardening of the last coat of the waterproofer, remove the strip, clean and remove the residues, if any, from the joint and then seal it. It is advisable and, in cases of highly stressed joints and/or in situations where adhesion may be critical, it is necessary to primer the sides of the joint with primer, before applying the sealant, in order to guarantee maximum performance in terms of mechanical seal and waterproofing of the system. Particular attention must be paid to waterproofing at corners and/or floor-wall connections if these, even in the absence of expansion joints, are characterised by a certain mobility; in this case, before applying the various coats of Flexistar, it is necessary to install a tape on top and along the line at the connection. The area adjacent to the connecting line must be sufficiently regular and uniform to ensure adequate positioning and correct adhesion of the self-adhesive tape; if this is not possible, the area should first be regularised with other mortars and/or skimming such as Rinnova, Monorasante, Multifinish or Mastofix, opting for the most suitable product according to the nature and condition of the substrate, the level of irregularity and the mechanical strength guaranteed by it. The surface waterproofed with Flexistar, while having good mechanical resistance, is not suitable to withstand the continuous traffic of people and/or vehicles and its impact resistance is limited, so if the surface has to be regularly used, it will be necessary to install a ceramic covering or other protective flooring. On the surface waterproofed with Flexistar and hardened for at least 7 days, ceramic floor and/or wall tiles can be bonded with Tile 900, Tile 700, Tile 480, Tile 350, Tile 250 or with T 250 and T 50 mixed with Flex. When installing ceramic floor and wall tiles, it will be necessary to respect the joints and fittings by sealing the ceramic elements matching them, after appropriate curing of the cementitious grouting of the joints, with silicone sealants from the Torggler Silicone line. In case of doubt about the most appropriate adhesive and/or sealant and/or for further processing, contact the Torggler Technical Assistance Service. The tools used for applying Flexistar can be cleaned with water before the material hardens; afterwards cleaning can only be carried out by mechanical removal. In case of contact with drinking water, allow Flexistar to harden for at least 14 days. Then wash thoroughly with water and remove the wash water before filling.

### WAITING TIMES

Waiting time between coats: 4 to 6 hours depending on the porosity of the substrate and environmental conditions. After the application of Flexistar wait at least 5 days of curing time before laying the ceramic tile. Under good weather and temperature conditions, on dry substrate, this period can be suitably reduced to 24 hours. Waiting time before preliminary washing required for contact with potable water: at least 14 days.

### TECHNICAL SPECIFICATIONS

POWDER PRODUCT VARIATIONS	
Consistency	powder
Bulk density (according to EN 2811)	930 kg/m <sup>3</sup>
Particle size (EN 12192-1)	0 – 0,15 mm
Ash content (EN 3451-1)	71,6%
FRESH MIXTURE VARIATIONS	
Mixing water: roller and brush application	32 -36 % (6.4 – 7.2 litres per 20 kg bag / 1.6-1.8 litres per 5 kg bag.
Mixing water: trowel application	21 -23 % (4.2 – 4.6 litres per 20 kg bag / 1.1-1.2 litres per 5 kg bag.
Mixture consistency	Plastic workable with trowel or fluid
mixture pH	> 12
Mixture density (EN 1015-6)	1500 kg/m <sup>3</sup>

Mixture workability time	> 60 minutes
Waiting time for setting between coats	4 to 6 hours depending on the porosity of the substrate and the environmental conditions
Full curing time	28 days
Application temperature	+5 °C to +35 °C
Operatig temperaure	+20 °C to +90 °C

DETERMINATIONS ON HARDENED PRODUCT ACCORDING TO EN 1504-2 *		REQUISITION/LIMIT/CLASS
Permeability to water vapour (EN 7783)	SD =1.1 m (thickness 2 mm)	Class I (SD 5m , permeable)
Liquid water transmission rate (EN 1062-3)	w = 0.03 kg/(m <sup>2</sup> *h <sup>0.5</sup> )	w < 0.1 kg/(m <sup>2</sup> *h <sup>0.5</sup> )
Pull-off adhesion (EN 1542-1)	1.8 MPa (on dry concrete)	With no traffic: > 0.8 MPa
Pull-off adhesion (EN 1542-1)	1.8 MPa (on dry concrete)	With traffic: > 1.5 MPa
Permeability to CO <sub>2</sub> (EN 1062-6) (method A)	SD (CO <sub>2</sub> ) = 139 m	> 50 m
Cracking capacity (EN 1062-7) (method A; static)	0.580 mm (23 °C)	Class A3 (23 °C)
Cracking capacity (EN 1062-7) (method A; static)	0.617 mm (-10 °C)	Class A3 (-10 °C)
Cracking capacity (EN 1062-7) (method B; dynamic)	No cracking after 1000 cycles, maximum width 0.150 mm	Class B2 (23 °C)
Exposure to artificial weathering (EN 1062-11)	No swelling, cracking and delamination. Colour change (clearer). Chalking	No swelling, cracking, flaking. Slight colour change, loss of gloss and chalking can be accepted, but they must be described.
HARDENED PRODUCT VARIATIONS ACCORDING TO EN 14891		REQUIREMENTS
Initial tensile adhesion strength** (EN 14891 A.6.2)	1,9 N/mm <sup>2</sup>	≥ 0.5 N/mm <sup>2</sup>
Tensile strength after immersion in water** (EN 14891 A.6.4)	1,5 N/mm <sup>2</sup>	≥ 0.5 N/mm <sup>2</sup>
Tensile strength after exposure to heat** (EN 14891 A.6.5)	2,5 N/mm <sup>2</sup>	≥ 0.5 N/mm <sup>2</sup>
Tensile strength after freeze-thaw cycles** (EN 14891 A.6.6)	1,3 N/mm <sup>2</sup>	≥ 0.5 N/mm <sup>2</sup>
Tensile adhesion strength after immersion in lime water** (EN 14891 A.6.9)	1,4 N/mm <sup>2</sup>	≥ 0.5 N/mm <sup>2</sup>
Waterproofing (EN 14891 A.7)	No penetration	No penetration
Waterproofing (EN 14891 A.7)	Weight increase 3 g	Weight increase ≤ 20 g
Impermeability (according to DIN 1048) of positive hydrostatic pressure (thickness > 2.0 mm)	resists	28 days at 1,5 bar
Resistance to negative hydraulic pressure, UNI 8298/8 (thickness > 2.0 mm)	resists	0,5 bar in 72 hours

Crack bridging ability under standard conditions (EN 14891 A.8.2)	≥ 0.75 mm	≥ 0.75 mm
Tensile strength after immersion in chlorinated water** (EN 14891 A.6.8)	1.5 N/mm <sup>2</sup>	≥ 0.5 N/mm <sup>2</sup>
Classification according to EN 14891	CM P	
Reaction to fire class (EN 13501-1)	B-s1,d0	
Consumption	approx. 1.2 kg/m <sup>2</sup> each mm of thickness	
Maximum achievable thickness	3 mm	
Color	Grey	
Packaging	bag	
Packaging size	4x5 kg, 20kg	
Pallet	40 cardboards, 50 bags	

## CONSUMPTION


The total requirement for a minimum total thickness of 2 mm is 2.4-2.6 kg/m<sup>2</sup>. The consumption of Flexistar using a roller or brush is about 0.6 kg/m<sup>2</sup> for each thickness coat, using a trowel it is about 1.0 kg/m<sup>2</sup> each coat.

## STORAGE

Flexistar must be stored in a dry and sheltered place. In the original closed 5 kg bags it will keep for at least 24 month and in 20 kg bags it will keep for 12 months.

## CERTIFICATIONS

The compatibility of the product for contact with drinking water, according to M.D. 174 of 04/06/2004, is documented by the test report 0160-2013 issued by the Istituto di Ricerche e Collaudi M. Masini srl of Rho – (Milan), available on request. Product classified as type C coating according to EN 1504-2 and type CM P according to EN 14891.

	
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Torggler S.r.l., Via Prati Nuovi 9, I – 39020 Marlengo (BZ) DoP n° 0052/14 EN 1504-2:2005 EN 14891:2017 NB n° 1305 NB n° 0761 (for waterproofing) NB n° 0407 (for reaction to fire)	
Surface protection product for ingress protection, moisture control and increasing resistivity (C-PI-MC-IR) Liquid applied water impermeable product for external installations on walls and floors, beneath ceramic tiling (CM-P)	

Permeability to CO<sub>2</sub>: S<sub>D</sub> > 50 m  
 Water vapour permeability: Class I  
 Capillary absorption and permeability to water: w < 0,1 kg/m<sup>2</sup>h<sup>0,5</sup>  
 Adhesion strength by pull off test: ≥ 0,8 N/mm<sup>2</sup>  
 Reaction to fire: B-s1, d0 Initial tensile adhesion strength: ≥ 0,5 N/mm<sup>2</sup>  
 Tensile adhesion strength after water contact: ≥ 0,5 N/mm<sup>2</sup>  
 Tensile adhesion strength after heat ageing: ≥ 0,5 N/mm<sup>2</sup>  
 Tensile adhesion strength after freeze-thaw cycles: ≥ 0,5 N/mm<sup>2</sup>  
 Tensile adhesion strength after contact with lime water: ≥ 0,5 N/mm<sup>2</sup>  
 Waterproofing: No penetration / Weight gain ≤ 20 g  
 Crack bridging ability under standard conditions: ≥ 0,75 mm

#### LEGEND OF CLASSIFICATION ACCORDING TO EN 1504-2

##### TYPES

H	Hydrophobic impregnation
I	Impregnation
C	Coating

##### CLASSES

PI	Protection against penetration risks
MC	Moisture control
PR	Physical resistance/surface improvement
RC	Resistance to chemical agents
IR	Increased resistivity by limiting moisture content

#### LEGEND OF CLASSIFICATION ACCORDING TO EN 14891

##### TYPES

CM	Waterproofing product for liquid cement-based modified-polymer application
DM	Waterproofing product for liquid dispersion application
RM	Waterproofing product for liquid application based on reactive resins

##### CLASSES

01	Waterproofing product applied liquid with crack bridging capacity at -5 °C
02	Waterproofing product applied liquid with crack bridging capacity at -20 °C
P	Waterproofing product applied liquid resistant

The information contained in this document is reported on the basis of our experience and knowledge; therefore, any recommendations and suggestions made are without any guarantee and must be verified before using the product by those who intend to use it, who assume all responsibility that may result from its use since the conditions of use are not under our direct control. In case of doubt, it is always advisable to make preliminary tests and/or ask for the intervention of our technicians. Torggler reserves the right to modify, replace and/or delete the items, as well as to change the product data in this document without prior notice; in this case the indications given here may no longer be valid. Always refer to the latest version of the data sheet, available at [www.torggler.com](http://www.torggler.com). Version 30.06.2021.