MAPEI

Aquaflex System

Permanent encapsulation of asbestos cement and flexible, waterproofing and anti-fracture liquid membrane

WHERE TO USE

- Permanent encapsulation type A (external overcovering), B (internal overcovering) and C (no overcovering, before straying) in compliance with the August 20, 1999 Italian Ministerial Decree, of asbestos cement structures exposed to atmospheric agents, therefore subject to progressive degradation, with emerging and release of asbestos fibre.
- Liquid waterproofing membrane for every type of surface in interiors and exteriors as long as not permanently immersed in water.
- Flexible anti-fracture membrane for damaged substrates on which ceramic tiles or stone material can be installed, to prevent the formation of surface cracks.

Some application examples

- Permanent encapsulation of flat and corrugated asbestos cement roofs which still carry out structural and roofing requirements.
- Waterproofing terraces and balconies with no pedestrian access or subject to light foot traffic only.
- Waterproofing of existing ceramic tile floor before installing new ceramic tile flooring.
- Repair of existing bituminous or asphalt waterproofing.
- Waterproofing cornices, gutters, chimneys, etc.

TECHNICAL CHARACTERISTICS

The Aquaflex System is suitable to be used as a type A, B and C encapsulation covering as prescribed by the August 20, 1999 Italian Ministerial Decree and possesses all the requisites, according to the Italian law, and authorised laboratory certificates.

This encapsulation cycle should be adopted also in other countries provided that not in opposition with the domestic norms in force.

The permanent encapsulation cycle is made up of certified quality products:

- **Primer for Aquaflex**: a synthetic resin in solvent solution based compound which, thanks to its high wetting property, penetrates into the damaged material binding the fibres to each other and to the cement matrix. This avoids dispersion into the atmosphere and forms an anchoring base for the next encapsulating layer.
- **Aquaflex**: single-component coating encapsulating product based on elastomeric resins in water dispersion. The product is available in grey and white. As prescribed by the August 20, 1999 Italian Ministerial Decree for type A and B encapsulating cycles, **Aquaflex** must be applied in two contrasting coloured coats since the appearance of the colour of the first coat must indicate the need to repair again. **Aquaflex** is ready to use and has a consistency that makes it easy to apply on horizontal, sloping and vertical surfaces. When necessary, **Aquaflex** can be thinned with water by 3%. Once the water evaporates it becomes a flexible membrane with high bonding strength. Due to its elasticity, **Aquaflex** can withstand expansion and shrinkage movements caused by temperature variations and vibrations. **Aquaflex** is rated as Class 1 for fire-resistance (UNI 8457 - 9174).

The **Aquaflex** membrane maintains its flexibility properties even after accelerated ageing tests. Permanent encapsulation carried out with certified quality products on well preserved buildings is an excellent solution. It is durable, has contained costs, the building remains habitable during the encapsulation and the application is carried out by specialised companies. Furthermore, the encapsulation cycle does not produce toxic wastes and health and environmental risks are minimal.

RECOMMENDATIONS

- Do not use the **Aquaflex System** cycle at temperatures below +5°C or when rain is imminent.
- Create a sloping surface to prevent water from accumulating.

Aquaflex System

Anti-fracture test of Aquaflex

Spraying Aquaflex onto corrugated asbestos cement after treating with Primer for Aquaflex

Applying Primer for Aquaflex

- Do not use the **Aquaflex System** cycle on wet cementitious surfaces or substrates subject to rising damp.
- Do not use the **Aquaflex System** cycle on bituminous or fresh asphalt membranes that may bleed oils or plasticisers.
- Do not use the **Aquaflex System** cycle for permanent immersion in water (swimming pools, fountains, cisterns, etc.).
- Do not use the **Aquaflex System** cycle to cover cracks resulting from shear stress.

APPLICATION PROCEDURE

• ENCAPSULATING ASBESTOS

All encapsulating cycle works must be carried out in accordance with the law in force.
Once the asbestos cement surface has been cleaned and dried, apply a coat of **Primer for Aquaflex** or **Malech** (in cases where the surface is not too damaged).
Primer for Aquaflex or **Malech** can be applied with a brush, roller or airless spray gun with Taiver Gold 10,000-type pumps, 0.021-inch nozzle. Wait until completely dry (approximately 10-12 hours) before applying **Aquaflex**.
For exterior or interior view applications, apply two contrasting coloured coats of **Aquaflex** (the first coat grey and the second white or vice-a-versa) as prescribed by the August 20, 1999 Italian Ministerial Decree for encapsulation of types A and B. During the course of time, the appearance of the colour of the first coat indicates the need for repair. In cases of non view applications for confinement and over-covering (type C), a single coat of **Aquaflex** is sufficient.
The product can be applied by trowel, roller, brush or airless spray gun (for example: Taiver Gold 1000 with Taiver P500 Top Gun, SCR/5 nozzles with 21/40 opening) at a pressure of 200-210 Bar. Apply the second coat once the first has dried. For easy application, **Aquaflex** can be thinned with water 5-10% by weight.
The thickness must be respected as provided by the law depending on the type of work carried out, as indicated in the table below.

• ANTI-FRACTURE MEMBRANE

Clean the cracks by removing the dust and any loose parts (use **Nivorapid** if they need reparation). Apply a coat of **Primer for Aquaflex** as described above.
Apply a coat of **Aquaflex** (grey or white) with a notched trowel (for example the MAPEI no. 4 trowel with 4x4 mm notches) then go over it immediately with the straight-edge of the trowel to form a continuos and smooth layer approximately 2 mm thick. The **Aquaflex** strip should always be at least 10-15 cm wider than the tiles set over it. If the crack is not stable, embed a Mapei fibreglass mesh into the still fresh **Aquaflex**.
Let dry for 24 hours before installing the ceramic tiles, preferably with **Granirapid**.
If there are widespread cracks, it is recommended to treat the entire surface with **Aquaflex** using the method described above.

• LIQUID WATERPROOFING MEMBRANE

Substrates must be solid, clean, dry and free of oils, grease, old paint, rust and mould. Clean existing surfaces thoroughly (old flooring, bituminous membranes, asphalt, metal surfaces, etc.), removing mould, smog film, loose particles and rust by machine scrubbing and rinsing or with a high-pressure cleaner.
Using **Primer for Aquaflex** or **Malech** is generally recommended for perfect adhesion of **Aquaflex** on difficult surfaces such as asphalt, bituminous membranes, old glazed ceramic tiles and cementitious surfaces with low absorbency.
Aquaflex can be applied with a trowel, brush, roller or airless spray gun on dry surfaces. The product must be applied evenly and in thin coats (about 1 mm maximum per coat). Wait until each coat dries before applying the next (from 2 to 12 hours, depending on the ambient temperature).
The last coat of **Aquaflex** should not be less than 1 mm thick so as to form a consistent, flexible and continuos film, making sure that there are no breaks in it caused by unevenness in the substrate. Protect the **Aquaflex** membrane from rain and washdowns until completely dry. For areas with full pedestrian access where the **Aquaflex** membrane is to be covered with ceramic tile, natural stone, etc., wait until the **Aquaflex** has hardened and then install the floor tiles, preferably with adhesives such as **Granirapid**, **Keraquick** or **Adesilex P4**.
It is recommended to spread cement powder over the **Aquaflex** membrane to protect it from damage during the installation of the tiles and to make it less sticky.
It is essential to install the tiles with the suitably wide joints depending on the size of the floor tiles.
Grout the joint with the special Mapei cementitious epoxy grouts. Expansion joints on the substrate must be respected during the tile installation and sealed with the special Mapei sealants.
In order to avoid the formation of cracks due to substrate or ceramic tile floor movement, it is recommended to embed the Mapei **Fibreglass Mesh** into the **Aquaflex**. The use of the mesh is particularly necessary in corners – or use **Mapeband**.

TYPES OF INCAPSULATING COVERINGS (Italian Ministerial Decree 20/8/99)

	APPLICATIONS	SEQUENCE OF PRODUCTS	THICKNESSES AND CONSUMPTIONS
A	Exterior view	• One coat of **Primer for Aquaflex** (or **Malech**). • One coat of **Aquaflex** grey. • One coat of **Aquaflex** white.	Average total thickness: 300 µm Minimum total thickness: 250 µm The average thickness of the last coat must not be more than 20% the average thickness of the second-to-last coat
B	Interior view	• One coat of **Primer for Aquaflex**. • One coat of **Aquaflex** grey. • One coat of **Aquaflex** white.	Average total thickness: 250 µm Minimum total thickness: 200 µm The average thickness of the last coat must not be more than 20% the average thickness of the second-to-last coat
C	No view	• One coat of **Primer for Aquaflex** • One coat of **Aquaflex** grey or white	Average total thickness: 200 µm Minimum total thickness: 200 µm

TECHNICAL DATA (typical values) In compliance with:	– Italian Ministerial Decree 20 August 1999 – UNI 10686 - UNI 8457 - UNI 9174
PRIMER FOR AQUAFLEX **PRODUCT IDENTITY**	
Consistency:	liquid
Colour:	grey
Specific gravity (g/cm³):	1.1
Dry solid content (%):	50
Storage:	24 months
Drying time:	10-12 hours
Hazard classification acc. to 99/45/EC:	yes. Inflammable. Before use consult the “Safety instructions” paragraph and the information on the packaging and on the safety data sheet
Customs class:	3824 90 95
MALECH **PRODUCT IDENTIY**	
Consistency:	fluid liquid
Colour:	transparent
Specific gravity (g/cm³):	1.01
Dry solid content (%):	15
Storage:	24 months in original packing
Drying time:	24 hours at +20°C
Hazard classification according to 99/45/EC:	none
Customs class:	3903 90 00
AQUAFLEX **PRODUCT IDENTITY**	
Consistency:	paste
Colour:	grey and white. Other colours on request (minimum 300 kg)
Specific gravity (g/cm³):	1.4
pH:	8.5
Dry solid content (%):	70
Brookfield viscosity (HELIPATH D RPM 5):	60 000
Storage:	24 hours in sealed original packing. Protect from frost
Hazard classification according to 99/45/EC:	none
Customs class:	4002 11 00
APPLICATION DATA AT +23°C AND 50% H.R.	
Minimum film-forming temperature:	+5°C
Application temperature range:	from +5°C to +40°C
Forming of surface film:	3 hours
Complete hardening (3 mm thick):	7 days
FINAL PERFORMANCES	
Resistance to sprayed water:	approx. 6 hours after application
Shore A hardness / DIN 53505:	52
Tensile strength / DIN 53504 (N/mm²): **– after 28 days at +23°C** **– after 7 days at +23°C + 21 days at +50°C:** **– after 7 days at +23°C + 21 days water vapour and condensate:** **– after 7 days at +23°C + 21 days in H_2O + 1 day at +23°C:**	 1.6 1.6 1.5 1.5
Elongation to break point / DIN 53504 (%): **– after 28 days at +23°C:** **– after 7 days at +23°C + 21 days at +50°C:** **– after 7 days at +23°C + 21 days water vapour and condensate:** **– after 7 days at +23°C + 21 days in H_2O + 1 day at +23°C:**	 400 360 360 400
Water absorption (by weight) / UNI 8202/22 (%):	5
Resistance to acids and alkali:	fair
Resistance to oils:	fair
Bonding strength / UNI EN 24624 (N/mm²):	1.6
Bonding strength after freeze/thaw cycles (N/mm²):	1.6
Bonding after sun/rain cycles (N/mm²):	1.6
Resistance to penetration by water vapour at a thickness of 3 mm / UNI 8202/23:	600 µ
Permeance to water vapour at a thickness of 3 mm / UNI 8202/23:	10 g/m² per day
Flame resistance / UNI 8457 – UNI 9174:	class 1

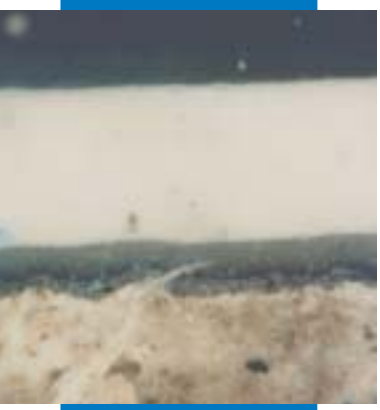
Using a roller to apply Aquaflex

Applying Primer for Aquaflex over an existing asphalt membrane

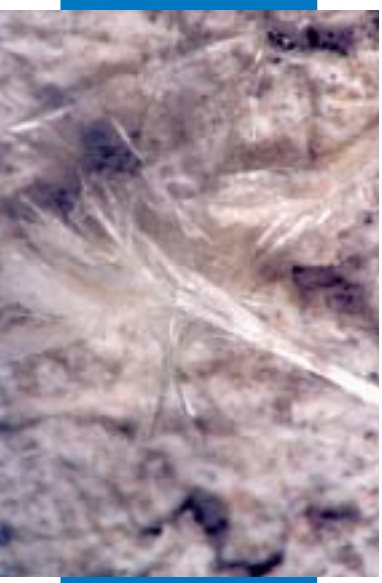
Trowelling on Aquaflex

Aquaflex System

A terrace waterproofed with Aquaflex and covered with ceramic tiles



This picture highlights both the penetration of the primer into the asbestos cement as well as the efficiency of the encapsulation of the asbestos fibres which is already guaranteed by the primer



A microscope view of asbestos cement

SAFETY INSTRUCTIONS FOR THE PREPARATION AND APPLICATION

Primer for Aquaflex contains solvents and is easily inflammable if placed by ignition sources. If in contact with skin or eyes, wash immediately with plenty of water. Properly ventilate the rooms where the product is stocked.

Cleaning

Primer for Aquaflex can be cleaned with solvents.

Malech can be cleaned from brushes, rollers or other spraying equipment with water before it dries.

Aquaflex can be cleaned from tools, hands and surfaces with water while fresh. Once it has hardened it can be cleaned from metal surfaces only mechanically.

CONSUMPTION

Primer for Aquaflex (single coat):

	160 g/m² (wet)	60 µm (dry)
Malech:	150 g/m²	

Aquaflex (single coat):

– by brush:	450 g/m² (wet)	240 µm (dry)
– by roller:	300 g/m² (wet)	130 µm (dry)
– by spray:	400 g/m² (wet)	190 µm (dry)

PACKAGING

Primer for Aquaflex is supplied in 5 kg ADR/RD approved packaging.

Malech is supplied in 10 kg plastic drums.

Aquaflex is supplied in 25-10-5 kg drums.

STORAGE

Aquaflex, Aquaflex System and **Malech** can be stored 24 months in sealed original packing. Protect from frost.

FOR PROFESSIONALS.

WARNING

N.B. - Although the technical details and recommendations contained in this product report correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical applications: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

All relevant references of the product are available upon request

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