FR 1044
Fire Retardant Polyurea

1-Description

FR 1044 two component, solventless, UV resistance, %100 pure polyurea system. It can be applied by special hot spraying equipment. As a result of the reaction, applied surface forms a membrane with excellent mechanical and chemical resistance properties. It is a self extinguishing coating material which is specially formulated to obtain fire resistant surfaces. It has the feature of delaying the spread of flame in case of fire.

2-Properties & Features

- Excellent fire resistance (Bfl fire retardant class)
- Two component, aromatic, UV resistant
- 100 % solid content
- VOC free, odorless
- Fast set and service time
- Seamless
- Applicable on all surfaces with suitable primer
- Can be used on horizontal and vertical surface
- Excellent adhesion force to concrete, metal, wood and foam substrates
- Excellent resistance to weather conditions
- Applicable in any desired thickness

3-Fields of Application

- General waterproofing applications anywhere a fire retardant system is required
- Roofs, terraces and balconies
- Industrial floors
- Production and food processing facilities
- Pickup and bedliners
- On thermal insulation products (polyurethane foam, EPS, XPS etc.)

4-Product Information

Packacking	225 kg drum (A - MDI Prepolymer), 225 kg drum (B - Amine Resin)
Shelf Life	6 months
Storage Conditions	Store in cool and dry conditions between +5°C and +30°C

5-Technical Data

Component Properties	Unit	Method	(A) Component	(B) Component
Chemical Structure	-	-	MDI Prepolymer	Amine Resin
Physical Condition	-	-	Liquid	Liquid
Density (25°C)	gr/ml	ASTM D 1217	1,2 ± 0,03	1,14 ± 0,02
Viscosity (25°C)	cps	ASTM D 4878	2000- 2500	300 - 600
Solid Content	%	ASTM D 2697	100	100
VOC Content	%	ASTM D 1259	0	0
Color	-	-	Transparent Yellow	Desired RAL Codes

Reaction Properties	Unit	Method	Value
Gel Time	Second	-	5 - 10
Tack Free Time	Second	-	15 - 30

Finished Product Properties	Unit	Method	Value
Final Product Structure	-	-	Solid Elastomeric Membrane
Tensile Strength	MPa	ASTM D 638	12
Repeat coating time	hour	-	0-12
Elongation	%	ASTM D 638	125 - 150
Shore D	-	ASTM D 2240	45 - 50
Tear Resistance	N/mm	ASTM D 624	≥ 50
Adhesion Strength	N/mm2	ASTM D 4541	Concrete: ≥ 2 Steel: ≥ 6
Fire Resistance Class	-	EN ISO 11925-2 :2011 EN ISO 9239-1 :2011	Bfl-s1

6-Directions for Use

A. Application Conditions

- The surface must be strong and of sufficient strength. Application should not be made on screed concrete which has low quality. The compressive strength for surface must be minimum 2,5 MPa, the lowest adhesion strength should be 1,5 MPa.
- Before application on fresh concrete the concrete should be allowed to dry for at least 28 days.
- The surface and ambient temperature should be at least 5°C and not more than 35°C.
- Relative air humidity should be less than %85.
- The maximum amount of surface moisture should be 4% for the surfaces applied polyurethane primer (AKFİX PRIMER S80), maximum 6% for surfaces applied moisture tolerant epoxy primer (AKFİX PRIMER 80), maximum 7% for surfaces applied water based epoxy primer (AKFİX PRIMER W80).
- Attention should be paid to condensation on the surface. Application should not be made early in the morning. The surface temperature should be at least 3°C higher than the dew point.
- Do not apply on frozen, melting surfaces or on surfaces where rain is expected within 6-8 hours.
- The above conditions apply to both primer and polyurea application

B. Surface Preparation

- The application surface should be clean and dry. The elements that prevent adhesion should be cleaned from the surface. Do not wash to clean the surface.
- If necessary, the surface should be wiped off with suitable wiping machines in order to remove the weak concrete on the surface for to open the eyelets and openings. The glazed top layer of ceramic surfaces should be roughened. Dust happened after wiping should be removed from the surface by brush or vacuum cleaners.
- Dilatations on the surface should be insulated with the appropriate polyurethane based filler material (AKFİX PU DF 25) and dilatation tape.
- Any fractures, gaps and segregations on the surface must be repaired with suitable epoxy mortar (AKFİX EP MORTAR 310) or cement based repair mortars.
- Corner chamfers should be supported with appropriate repair mortar or chamfer tape.
- The large screed concrete surfaces should be cut. The inside of the joints should be filled with polyurethane or polyurea based sealant (AKFİX WP 35 - AKFİX POLYUREA JH 1070 / JH 1080).
- Sanding and polishing should be done according to the standards for corrosive areas in metal surface coatings. The joints on the cleaned metal surface should be covered with polyurethane based sealant (AKFİX WP 35), flexible tape or steel paste.
- As a result of these processes, dust and debris on the surface should be removed from the surface for the last time.

C. Primer Application

If the surface moisture is less than 4% on absorbent surfaces (concrete, wood etc.), it is recommended to use a low viscosity primer (AKFİX PRIMER 90 - AKFİX PRIMER E80) for the first coat primer application. This application will reduce the amount of epoxy primer to be applied on the second layer priming and the number of pinholes on the surface in polyurea application.

- After the impregnation primer application, one can choose between AKFİX PRIMER S80, AKFİX PRIMER 80 or AKFİX PRIMER W80 according to surface moisture.
- If the surface moisture is above 4%, the moisture tolerant primer (AKFİX PRIMER 80) or AKFİX PRIMER W80 should be used instead of first layer impregnation primer.
- For metal surfaces, choose AKFİX PRIMER M80.
- For non-absorbent surfaces (ceramic, glass or metal), choose AKFİX PRIMER S80, AKFİX PRIMER 80 or AKFİX PRIMER W80.

- To obtain a homogeneous primer mixture, the primer should be mixed with an electric mixer for 3-4 minutes, low speed (~ 300 - 400 rpm) or with suitable equipment. Do not mix at high speed for a long time to prevent air bubbles.
- The prepared primer mixture is applied to the surface by brush, roller or airless spraying machines.
- When the primer is still wet, it is recommended to spray 0.3-0.7 mm of silica sand on the surface to increase the adhesion of the polyurea to the surface.
- Before applying AKFİX FR1044, make sure that the primed surface is sufficiently dry. The primed surface should not be too wet or completely dry. It is sufficient to leave a feeling of adhesion in your hand.
- Foreign objects adhering to the primer surface and quartz sand, which is highly sprinkled, should be cleaned by brush or vacuum before application.

D. Polyurea Application

Preparation of Components:

Before starting the application, the component B (amine resin) must be mixed in the barrel for at least 60 minutes until a homogenous color is obtained. The mixing process must continue during application. It is important that the temperature of components A and B be in the range of 25-30 °C before application. The components should not be diluted in any way.

Spray Machine Settings:

The polyurea is applied to floors with a spraying machine operating at high pressure and temperature. Machine settings must be checked continuously during application.

Product	Data
Component (Amine Resin) Temperature	67-68 C
B Component (Prepolymer) Temperature	70-71 C
Hose Temperature	67-68 C
Machine Pressure (bar)	150-170

- Filters of transfer pump and gun should be removed before application.
- After all preparations are finished, the polyurea is applied by spraying on the surface with a minimum thickness of 2 mm for 2 layers.

It should be noted that the flame retardant feature of the product is directly proportional to the thickness of the product.

Mixing Ratio:

It should be checked continuously whether the mixing ratio is correct or not with looking at machine pressure bar hours.

Mixing Ratio	Unit	Data
A/B	Volume	100 / 100
	Weight	100 / 112

E. Top Coat Application

- When the applied FR 1044 product is in direct sunlight, color change can be observed after a certain period of time. However, this does not affect the physical properties and performance of the product.
- When color stability is desired, aliphatic top coat is applied. Aliphatic polyurethane paint, aliphatic polyurea system or polyaspartic polyurea system may be preferred as the top coat application. The final coat should be applied within 0 - 12 hours after the application of the main coat.

7-Consumption

Product	Data
AKFİX PRIMER	300 - 500 g/m^2
0,3-0,7 mm Quartz Sand	1,0 - 1,5 kg/m^2
AKFİX FR 1044	2,2 - 2,4 kg/m^2 (for 2mm)

* Consumption in the table is theoretical. Consumption may vary according to surface permeability, weather conditions, and the technique of application.

8-Cleaning

Clean all tools and application equipment with suitable cleaner solvent immediately after use. Hardened / cured material can only be cleaned by mechanical methods.

9-Remarks & Restrictions

- AKFIX FR 1044 components contains corrosive polyamines isocyanates. Follow the instructions in MSDS form before or after use or when a problem is encountered.
- Personal protective equipment and full face mask with appropriate filter should be used during application.
- There must be sufficient air circulation in the application area.
- Give empty barrels to hazardous waste collector authorized companies.

10-Safety

Contains Diphenylmethane-4,4'-Diisocyanate. Harmful by inhalation. Irritating to eyes, respiratory system and skin. Do not breathe spray/vapor. Wear suitable protective clothing and gloves. Use only in well-ventilated areas. Pressurized container. Keep away from direct sunlight and do not expose temperatures over 50°C. Do not pierce or burn, even after use. Keep away from sources of ignition, no smoking. Keep out of the reach of children.

11-Disclaimer