Fosroc Polyurea FLM

constructive solutions

Fast setting, pure polyurea elastomeric floor coating

General Information

Fosroc Polyurea FLM is a spray-applied, 100% solids, flexible, two-component, rapid curing pure Polyurea system, designed as a floor protective coating. It combines the advantages of seamless, waterproof coating with very long life cycles and high durability.

Polyurea FLM consists of the two components Fosroc Polyurea FLM Part A ISO and Fosroc Polyurea FLM Part B AMINE. The system offers excellent surface properties and overall physical properties.

Uses

Anti-corrosion, protective coating for flooring applications in a wide range of environmental conditions.

Typical applications include:

- Industrial floors
- Processing plants
- Food processing areas
- Warehousing
- Car parks & garages
- Stadia
- Helipads
- Workshops & production facilities
- Manufacturing plants
- Plant rooms

Note: Anti-slip and other coating properties may be provided by the introduction of fillers or fibres, provided as a separate component supplied in-situ by modified spray gun. Refer to the Fosroc Polyurea Method Statement, and contact Fosroc for further advice.

Advantages

- Environment friendly - zero VOC
- Excellent chemical resistance, thermal stability and UV Resistance *
- Very fast turn-around time. The coated substrate can be put into service within an hour
- Excellent impact, abrasion and puncture resistance
- Seamless and monolithic, including field joints
- Significantly enhances the durability of reinforced concrete
- Low permeability values
- Can be applied at ambient temperatures from -30ºC ** to +70ºC
- Designed for service temperatures from -30ºC to +135ºC

* see Chemical Resistance and Colour sections
** Note for applications below 5ºC, e.g in cold storage rooms in service, consult Fosroc for specific advice.

Specification

Where mentioned in the contract drawings, the protective coating shall be Fosroc Polyurea FLM, a 100% solids, flexible, two component, rapid curing pure Polyurea coating system providing high corrosion, abrasion and thermal shock resistance. It shall meet the values under the section " Properties".

Properties

Typical Physical properties at 23ºC

Solids by Volume	: 100%
Volatile organic compounds	: 0 g/litre
Viscosity	: A ISO =1000 mPas : B AMINE <1500 mPas
Density at 25ºC	: 1.01 g/ml
Tensile strength ASTM D412	: >16 MPa
Modulus 100%/ 200%/ 300% ASTM D412	: >9/ 12/ 15 MPa
Tear Resistance ASTM D624C	: 85 ± 5 N/mm
Elongation ASTM D412	: >300%
Shore D ASTM D2240	: 47
Abrasion (1kg,H22 wheels) ASTM D4060	: 29 mg /1000 cycles
Abrasion (1kg,CS17 wheels) DIN EN ISO 5470	: ≤0.02 mg /1000 cycles
Service temperature ASTM D4060	: -30ºC to +135ºC

Clarification of property values

The typical physical properties given above are derived from independent testing of Fosroc Polyurea WPE spray-applied in accordance with the Fosroc Polyurea Method Statement, in controlled laboratory environment. Results derived from testing field-applied samples may vary dependent on several factors, including the type and condition of equipment utilised (particularly the spray gun effecting air entrapment), static and dynamic working pressures, application temperatures and weather conditions, film thickness, age of sample tested.

Chemical Resistance (ASTM D3912, 72 hours immersion)

Chemical	Result	Max service temp.
Anti-freeze (Texaco)	R	50ºC
Brake fluid	R-C	50ºC
Hydraulic Oil	R	50ºC
Motor Oil	R-DIS	50ºC
Kerosene	R	25ºC
Diesel Fuel	R	25ºC
Petrol	R-DIS	25ºC
Skydrol	NR	
Sodium hydroxide (50%)	R	50ºC
Potassium Hydroxide (50%)	R	50ºC
Ammonia (0.880) 33%	R	25ºC
Sea water	R	50ºC
Urea (10%)	R	50ºC
Urea solution conc.	R	50ºC
Sugar solution conc.	R	50ºC
Bleach (5%)	R-DIS	50ºC
Butanol	R-C	25ºC
Industrial Methylated spirits	NR	
Acetic Acid (10%)	R	50ºC
Lactic Acid (20%)	R	50ºC
Citric Acid (50%)	R	50ºC
Tartaric acid (50%)	R	50ºC
Oleic Acid (100%)	R-DIS	50ºC
Phosphoric Acid (10%)	R	50ºC
Hydrochloric acid (20%)	R-C	50ºC
Hydrochloric acid Conc.	NR	
Nitric acid (30%)	R-C	25ºC
Sulphuric Acid (10%)	R	50ºC
Sulphuric Acid (70%)	R-C	25ºC

R : Recommended
R-DIS : Recommended – Discolouration only
R-C : Recommended – Conditional; discolouration and/or slight softening or swelling – wash down within one hour to avoid effects
NR : Not Recommended

Note: The chemical resistance recommendations given above apply to 72 hours contact duration; for any other requirements contact Fosroc for further advice.

Processing and cure parameters

Block Temperature	: +70ºC to +80ºC
Hose Temperature	: +70ºC to +80ºC
Volume ratio	: 1:1
Pressure	: 120 - 150 bar
Gel Time	: 5 - 10 sec
Walkable	: : 2 mins
Trafficable (light duty)	: 15 - 20 minutes
Trafficable (medium duty)	: 24 hours
Trafficable (heavy duty)	: 7 days

Refer to Application section below and Fosroc Polyurea Method Statement for further detail.

Instructions for use

Surface preparation

All surfaces must be clean, dry and free from contamination. The surface must be assessed and treated in accordance with ISO 8504.

Concrete
Dry abrasive blasting, wet abrasive blasting, vacuum-assisted abrasive blasting, and centrifugal shot blasting, as described in ASTM D4259, may be used to remove contaminants, laitance, and weak concrete, to expose blow holes, and to produce a sound concrete surface with adequate profile and surface porosity. All blow holes and minor surface imperfections shall be filled with recommended filler prior to application of Primer.

Bare Steel
All welding seams must have a surface finish which ensures that the quality of the paint system will be maintained in all respects. Holes in welding seams, undercuts, cracks, etc. must be avoided. If found, they must be remedied by welding and/or grinding. All weld spatters must be removed. All sharp edges must be removed or rounded off in such a way that the specified film thickness can be build-up on all surfaces. The radius of the rounding must be minimum 2 mm. The steel must be of first class quality and must not have been allowed to rust more than corresponding to grade B of ISO 8501-1:2007. Any laminations must be removed. Blast cleaning to Sa 2½. (ISO 8501-1:2007). Roughness: using abrasives suitable to achieve a coarse surface of Grade Medium G (50-85µm, Ry5) (ISO 8503-2).

Priming

Following correct preparation, the substrate must be primed.
For sound, dry concrete and at ambient/substrate temperatures of ≥25ºC, prime using Fosroc Nitoprime 31.
For all other conditions, Fosroc Primer 195 must be used.
For concrete, suggested application rate is 250ml per m^2;
For steel substrates, a suggested rate of 150ml per m^2. A broadcast of fire-dried sand must be used, for optimum adhesion properties.
The primer shall be allowed to become touch-dry prior to application of Fosroc Polyurea FLM.
Refer to Fosroc Polyurea Method Statement for full details.

Spray Equipment

A high pressure spray proportioning machine/ spray gun for plural heated polyurea components such as those manufactured by GlasCraft or Graco should be used for this product.
A list of appropriate equipment is provided in the Fosroc Polyurea Method Statement.

Safety handling

Avoid contact with eyes and skin. Wear suitable protective clothing, gloves and eye/face protection at all times.
Ensure adequate ventilation and avoid inhalation of vapour and aerosol. Use supplied air hood.
Fosroc Polyurea FLM Part A ISO, Fosroc Nitoprime 31 (Parts A and B), Fosroc Primer 195 (A and B sides) may cause sensitisation by inhalation and skin contact.
In case of eye contact, first aid must be administered immediately. The eyes should be held open while flushing with a continuous low pressure stream of water for at least 15 minutes. Seek medical advice immediately. If swallowed, seek medical attention immediately - do not induce vomiting.
The use of barrier creams provides additional skin protection.
Refer to safety data sheets for detailed information.

Estimating

Supply:

Fosroc Polyurea FLM Part A ISO component	
Drums	: 200 ltrs

Fosroc Polyurea FLM Part B AMINE component	
Drums	: 200 ltrs
Or Drums	: 195 ltrs + separate colour pack

Fosroc Nitoprime 31 Part A Base	
Tin container	:
Fosroc Nitoprime 31 Part B Hardener	
Tin container	:

Fosroc Primer 195 Part A Base	
Pail	: 12.5kg in 25 litre pail
Fosroc Primer 195 Part B Hardener	
Pail	: 7.5kg in 10 litre pail

Coverage:	
Fosroc Nitoprime 31/ Fosroc Primer 195	: see Priming section and refer to Fosroc Polyurea Method Statement
Fosroc Polyurea FLM	: 1.5 – 3.0 ltrs per m^2 * depending on specification

* Note:
Normal recommended coverage is 2.0 litres/m^2.
1.5 litre/m^2 coverage rate is the absolute minimum and requires a highly experienced operator for even and effective coverage, using a cross-hatch spray pattern.
3.0 litres/m^2 rate is the maximum coverage rate for a single coat application.

Application

The client/ main contractor must be satisfied that the applicator has suitable equipment and expertise, and will follow the procedures detailed in this datasheet and in the Fosroc Polyurea Method Statement.
Do not dilute Fosroc Polyurea FLM, Fosroc Nitoprime 31 or Fosroc Primer 195 under any circumstances.
Normal recommended minimum applied thickness of Fosroc Polyurea FLM is 2.0mm, using a cross-hatch spray pattern.
Applied product can be walked on carefully after approximately 2 mins; is light duty trafficable (e.g. light foot traffic) after approximately 15-20 minutes, medium duty trafficable (regular foot traffic, occasional car, fork-lift truck, hard plastic-wheeled trolleys) after 24 hours, and heavy duty trafficable (frequent car, fork-lift truck, up to 3 tonne truck) after 7 days.
For heavy duty use, durability may be enhanced by the incorporation of special fillers and fibres; contact Fosroc for job-specific advice.
For temperatures below +5ºC, longer cure times must be anticipated. Contact Fosroc for further advice if necessary.
Use appropriate non-solvent chemical for the flushing of equipment.
In the case of prolonged storage prior to use, thoroughly mix the amine component with a drum mixer until a homogenous mixture and colour is obtained.
Refer to Fosroc Polyurea Method Statement for further detail.

Storage

Fosroc Polyurea FLM has a shelf life of 12 months if kept in a dry, air conditioned store between +5°C and +30°C in the original unopened containers. Any changes in colour have no negative effect on reactivity and physical properties of the coating.

Colour

It should be noted that Fosroc Polyurea FLM is an aromatic polyurea; therefore, as with all aromatics, over a period of time colour change will occur if exposed to UV rays. This will not cause any negative effect on the physical properties of the product.
If long-term aesthetics regarding colour stability is of critical importance, contact Fosroc for further advice.

Technical support

Fosroc offers a comprehensive technical support service to specifiers, end users and contractors. Fosroc is also able to offer on-site technical assistance, an AutoCAD facility and dedicated specification assistance in locations all over the world.

Disposal Considerations

Cured Fosroc Polyurea FLM cured Fosroc Nitoprime 31 and cured Fosroc Primer 195 can be disposed of without restriction. The uncured A and B components should be disposed of according to local environmental laws and ordinances.
"Drip free" containers should be disposed of according to local environmental laws and ordinances.
Refer to safety data sheets for all relevant information on Fosroc Polyurea FLM, Nitoprime 31 and Fosroc Primer 195.

Additional Information

Fosroc manufactures a wide range of complementary products which include :

- waterproofing membranes & waterstops
- joint sealants & filler boards
- cementitious & epoxy grouts
- specialised flooring products

Fosroc additionally offers a comprehensive package of products specifically designed for the repair and refurbishment of damaged concrete. Fosroc's 'Systematic Approach' to concrete repair features the following :

- hand-placed repair mortars
- spray-grade repair mortars
- fluid micro-concretes
- chemically resistant epoxy mortars
- anti-carbonation/ anti-chloride protective coatings
- chemical and abrasion resistant coatings

For further information on any of the above, please consult your local Fosroc office.

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