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ARMOUR FLEX
FLEXIBLE POLYUREA SURFACE COATING

PRODUCT DESCRIPTION

ARMOUR FLEX is a flexible and durable polyurea system which can be used to provide a seamless, protective, waterproof coating over a variety of substrates.

ARMOUR FLEX is specifically designed for easy application with good physical properties. This material has been formulated to perform, once cured, in wet environments and exhibits good resistance to hydrolysis.

ARMOUR FLEX is available in a range of colours as indicated, others by arrangement:

Black
Dark Grey
Neutral

ARMOUR FLEX is also available in a fire retardant grade. ARMOUR FLEX FR achieves a Class 1 result for surface spread of flame in the BS 476 Part 7 fire test. A full technical datasheet is available separately on this product. Please consult Isothane personnel for further details.

TYPICAL APPLICATIONS

- Tank linings for primary containment of waste water not requiring WRAS certification
- Bund Lining/Secondary containment – Please contact Isothane for suitability
- Basement tanking (external walls)
- Roof waterproofing, flat roofs, corrugated asbestos, profile steel sheet etc.
- Hail, bird, traffic and waterproofing protection over of rigid polyurethane insulation foam
- Overcoating of flexible foam (furniture, impact scenarios)
- Overcoating of polystyrene (dunnage, etc)
- Film and TV productions, sets costumes and props
- Marine buoyancy encapsulation

PROCESSING

ARMOUR FLEX is a 2 component system. A Hardener component, ARMOUR FLEX H50, is mixed under high pressure with ARMOUR FLEX Resin, This mixture is then immediately sprayed to produce the cured polymer. The mixing, reaction, spraying and curing process takes a matter of seconds from start to finish.

The mixing ration of the two components is 1:1 by volume. This is fully automated by the spray machine

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Due to the speed of reaction of the two components, only high pressure impingement mixing is suitable for application of this product. Isothane has developed its products on, and recommends Graco® Reactor spray machines.

Further information on Graco® Reactor spray machines is available upon request. Full product and machine training can be provided by Isothane Personnel or by an approved spray machine supplier.

Typical processing conditions – machine setup

Graco® Reactor spray machine: A-XP1, E-XP2, H-XP2 or H-XP3
Spray gun: Probler P2 with 00 or 01 mixing chamber and respective spray tip.

A drum of ARMOUR FLEX H50 is attached to the 'A' Side of the spray machine via a drum mounted transfer pump and line. The A side return line from the machine is attached to the drum return ¾" bung. A desiccant cartridge is recommended to prevent moisture ingress back into the drum.

A drum of ARMOUR FLEX Resin is attached to the 'B' Side of the spray machine via a drum mounted transfer pump and line. The B side return line from the machine is attached to the drum return ¾" bung. A third bung, mounted in the centre of the lid of the drum, is used for attaching an air powered stirrer. Stirring of the resin for 30 mins prior to application of the product is recommended

The machine should be set to 70°C for all 3 heaters (A side, B side and spray hose)
Recommended pressure setting: 2000 psi minimum. 2500 recommended. Higher setting may be required, depending on the length of spray hose.

Preparing the product for spraying

1. At the start of the day or a minimum of 30 mins prior to spraying. Turn on the machine and turn on the heater for the spray hoses.
2. Perform daily, weekly or monthly maintenance checks on the machine and spray gun, as required. The line filters should be removed and inspected for cleanliness at regular intervals, ideally whenever the drums are changed.
3. Open the recirculating valves on the machine, so that each chemical can be pumped into the machine and returned to its respective drum.
4. Turn on the stirrer for drum B
5. Turn on the transfer pumps for both drums A and B.
6. Turn on the heaters for both drums A and B
7. Allow the transfer pumps to bring material into the machine, warm it and return in to the drums. For 30 mins or until the drum temperatures have reached at least 35°C
8. Once the drums have been suitably warmed, close the recirculating valves on the machine.
9. The machine is now ready for spraying.

For more details on operating the machine, such as maintenance and shutdown procedures please consult Isothane technical staff or your spray machine supplier

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APPLICATION – COVERAGE RATES

Recommended minimum dry film thickness (DFT) of ARMOUR FLEX is 2mm. ARMOUR FLEX is a protective coating, not a paint and as such protection is only achieved with a high film build to minimise the possibility of thin patches, missed areas and pin holing.

Coverage rates may vary with surface texture and porosity. The information given is based on average usage. A site trial is recommended.

Armour Prime: 4 – 6m² / lt

ARMOUR FLEX: 2 litre / m² on a smooth flat surface will provide the minimum film thickness of approx. 2mm. Any surface texture will increase the surface area which must be allowed for when calculating usage e.g. on a chipping embedded surface the actual area will be approximately doubled.

Sloping/vertical surfaces:
Due to the cure speed of armour-Flex it is possible to build layers quickly on vertical surfaces. Therefore coverage rate for vertical surfaces is equal to that on horizontal surfaces.

APPLICATION – METHOD – TYPICAL FLAT ROOF SCENARIO

1. Remove all loose material by vigorous brushing, wire brush if necessary.
2. Blasting of steel substrates to SA2.5 is recommended for improved adhesion. No primer is required when the steel has been blasted.
3. Treat any fungal growth with proprietary fungicide as recommended and remove.
4. Allow surface to dry thoroughly and any moisture contained in the structure to evaporate. **Armour Prime** and **ARMOUR FLEX** should not be applied to damp substrates. (Moisture content <5%)
5. Fill cracks and voids with a polyurethane mastic sealant.
6. Prime with **Armour Prime** (4 - 6 m²/lt, depending on substrate texture and porosity) which cures to a slightly tacky film within 2-4 hours. Overcoat with **ARMOUR FLEX** as soon as possible after this time and certainly within 48 hours. If delay exceeds this, re-priming is advised.
7. Apply **ARMOUR FLEX** at a minimum film thickness of 2 mm by spraying in a cross-hatch pattern. Care must be taken with respect to overspray. Mask the area accordingly and apply the material when the wind conditions are light to minimise the distance that the aerosol will travel.
8. Day-work joints – where application extends over more than a working day, an overlap of 150mm should be used.

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APPLICATION – REPAIRS

Minor damage to **ARMOUR FLEX** can be repaired by

1. Removing loose coating around the damaged area;
2. Abrade to 150mm overlap onto sound, old membrane around the area to be recoated and remove dust.
3. Wipe the overlap area with acetone
4. Prime the whole area with **Armour Prime**, including overlap.
5. Once the armour prime has suitably cured, apply a 2mm overcoat of **ARMOUR FLEX**.

APPLICATION – GENERAL

Ambient conditions should be suitable for PU processing, with particular emphasis on humidity. Armour Flex should not be sprayed if the relative humidity is above 90% or if the substrate temperature is less than 3ºC above the local dew point.

It is recommended any applicators of polyurea systems familiarise themselves with the guidelines set out by the Polyurea Developers Association.

Further specific application details are available on request, covering a wide range of application scenarios.

STORAGE, HANDLING AND PERSONAL PROTECTION

- Recommended storage temperature: max 25°C.
- ARMOUR-FLEX Resin has a shelf life of 6 months.
- ARMOUR-FLEX H50 has a shelf life of 6 months if stored at 25°C. When in use, a desiccant cartridge on the small bung of the isocyanate drum is recommended to eliminate moisture ingress into the drum and help prolong storage life
- Opened, part used containers must be resealed immediately after use.
- It is recommended that the drums be left attached to the machine as this closed system will protect both the machine and the material, so long as the desiccant cartridge on the isocyanate component is checked regularly for saturation.
- The recommendations in our Safety Data Sheet for this product must be followed at all times. More general information is included in our publication “A Guide to the Safe Handling of Polyurethane Chemicals” and in the following Technical Data Sheet which is available on request:-
    - Decontamination of Isocyanates using Isothane Decontaminant

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TYPICAL PROPERTIES OF THE LIQUID COMPONENTS

	ARMOUR FLEX Resin	ARMOUR FLEX H50
Appearance	Dark Amber Liquid	Amber liquid
Viscosity, cPs @ 25°C	400 - 700	700 - 1100
Specific Gravity @ 25°C	1.01 – 1.05	1.10 – 1.13
Water Content	< 0.1	N/A

ARMOUR FLEX CURED PHYSICAL PROPERTIES

	UNITS	TYPICAL VALUES	TEST METHOD
Shore Hardness	°A	80-85	ASTM D2240
Tensile Strength	MPa	20	ASTM 638
Elongation	%	380	ASTM 638
100% Modulus	MPa	6.8	ASTM 638
300% Modulus	MPa	10	ASTM 638
Tear Strength	KN/m	65	ASTM D624, Die C
Abrasive Resistance (Loss)	Mg	150 max	ASTM D4060

REACTION PROFILE

Gel Time (sprayed @ 70°C)	5 – 8 secs
Touch Dry	< 30 secs
Cure	80% of maximum tensile strength is attained within 24 hrs at 20°C

CHEMICAL RESISTANCE

The cured elastomer has a good resistance to 5% Acetic Acid, 5% Hydrochloric Acid, 5% sulphuric Acid, 15% Sodium Hydroxide, 10% Sodium Chloride, Sea Water and Motor Oil. Moderate resistance to 5% Nitric Acid, 20% Phosphoric Acid and Ethylene Glycol and is not recommended with MEK.

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