

ENDURATHANE 6000

An Aromatic Pure Polyurea Spray Protective Coating

ENDURATHANE 6000 is a 100% solids (solvent free), two component, fast-cure polyurea elastomer spray lining designed specifically for abrasion or corrosion resistance applications.

BENEFITS

Abrasion Resistance

The balance of physical properties inherent in this elastomer provides outstanding abrasion resistance.

Potable Water

This product is suitable for lining tanks used to store water intended for human consumption.

Increased Productivity and Economy

The exceptionally high tensile strength and elongation of this product provides protection from mechanical damage and resistance to puncture and compression.

Increased Productivity and Economy

This product may be sprayed to thicknesses exceeding 1mm per pass and cures to become rain insensitive within minutes.

Safety

This product contains no volatile or flammable solvents. This reduces hazards during transport, storage and application.

Chemical Resistance

This product has good resistance to many dilute acids, alkalis, salts and solvents.

SPECIFICATION

Primer

Refer to Polymer Group Ltd for recommendations.

Recommended Thickness

Recommended minimum thickness for abrasion resistant duty is 3mm. Recommended minimum thickness for corrosion and chemical resistance duty is 2mm.

Number of Coats

This product can be applied in thicknesses from 1mm up to several cm in one operation. To build to specification, allow just enough cure time for the first coat to become firm, then spray the next coat.

Colour

Natural cream colour.

PRODUCT DESCRIPTION LIMITATIONS

UV Resistance

This product will discolour and will undergo surface chalking when exposed to sunlight.

Service Temperature

This product is suitable for applications up to 120°C. Samples exposed up to 120°C show no significant loss of tensile strength and elongation after 3 days continuous exposure.

APPLICATION INSTRUCTIONS

Introduction

This coating is designed for application through heated, plural component, high pressure airless spray equipment capable of supplying material at the spray gun at a minimum of 2000 psi spray pressure and material temperature of 60 - 65°C It has been successfully sprayed through Graco Reactor E-XP1 machines using a Fusion AP spray gun.

Mix Ratio: A:B 1:1 (v/v)

Equipment Specification

Drum Heaters

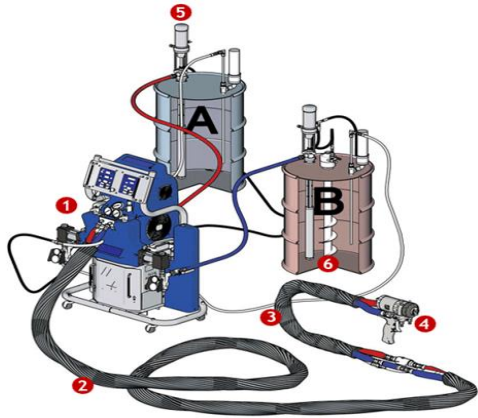
Flexible 1000W adjustable band heaters can be used to condition materials in drums to the optimum temperature.

Transfer System

The proportioner should be supplied by transfer pumps of at least 2:1 ratio. Normally a 3m long 19mm ID, 500 psi rated, nylon lined transfer hose connects each pump to the proportioner. There should also be a screen filter of about 40 mesh in place between the transfer pump and the proportioner.

Proportioning Pump

A plural (1:1) proportioning pump capable of developing a minimum of 2000 psi pressure.



Materials or Primary Heaters

Material heaters are necessary in the system to reduce and maintain material viscosities at optimum levels. These primary heaters are usually mounted on the proportioner and are connected in line after the proportioning pump. These heaters should be capable of raising the temperature of the material 30°C at the flow rate during normal application. They should be rated to withstand the maximum pressures the system can develop. These heaters function better in the system if they are controlled accurately by a thermostat incorporated into the heater.

Heated Hose Assembly

Nylon lined hoses for each component rated for the proportioning pumps maximum pressure are used to transfer the material under pressure from the pump to the spray gun.

These hoses should be heated and controlled thermostatically by temperature controls at the proportioner. The hose heat should be capable of maintaining the material temperature set by the primary heaters to the spray gun.

The hose assembly is usually insulated with flexible pipe insulation and the airline necessary for the operation of the spray gun is incorporated into the package. These hoses are usually 10mm ID with the air feed hose to the gun being 6mm hose. A sort section of hose assembly (3-15') of 6mm hose is usually attached to the gun end of the hose to aid in the manoeuvring of the spray gun in application. This assembly should also be heated.

Spray Gun

Plural component spray gun utilising impingement mixing and a mechanical purge. Further, the spray gun should be designed to spray coatings with a flat spray pattern and be rated for the proportioning pumps maximum pressure. The Fusion AP spray gun has been found to be suitable).

Material Protection

Moisture vapour entering the resin drum through the small bung hole, which is normally used as a vent, can cause unwanted blowing or microcellular structure in the spray film. Moisture vapour entering the isocyanate drum can cause formation of solid contaminants. A nitrogen gas purge system slightly pressures the container and prevents air from entering the container.

As an alternative method, a desiccant dryer system will remove most of the moisture from the air as it passes through the desiccant to equalise the pressure in the container as material is used.

Other Equipment

Mixing is not normally required for either component of ENDURATHANE 6000. If pigment is added to the resin component an agitator of ½ HP or greater should be used to thoroughly mix the material prior to any application. The agitator should be designed for the container in which it will be used.

Procedure

Pre-conditioning

The materials should be maintained prior to any application at an optimum temperature of 24-27°C. This may mean heating the material in the drum if the surrounding ambient temperature is much below 24°C. This will allow the preheaters to reach and maintain the proper application temperatures of the materials.

Thinning

Absolutely no solvent should be allowed to come in contact with or be added to 100% solids coatings. Viscosity can be reduced by an increase of temperature.

Setting up to Spray/Start Up Procedures

For new equipment individual components should be connected as previously described. Be sure to lubricate all pumps as per manufacturer's instructions. Use plasticiser for the wet cups. Check and clean all fluid filters. Check and clean all air traps and filters. Check electrical system to ensure proper power requirements are satisfied and there is complete continuity in all circuits. For existing equipment thoroughly clean the system including the line filters. Flush the system and fill (using transfer pumps) with inert plasticiser such as Mesamol or DIOP and test by slowly bringing the unit up to full pressure and heat.

For new equipment decide which side will contain the isocyanate component and which side will contain the polyol. Mark all isocyanate pumps, inlets, outlets, heaters, hose fittings and gun inlets

“A side”. Mark all polyol pumps, inlets, outlets, hose fittings, and gun inlets “B side”. Retain this identification and use only as indicated to avoid cross contamination.

Turn on the heaters and bring the system up to temperature then purge the system of plasticiser (using the transfer pumps) with the coating material. This may result in the loss of 1-2 litres of each component.

Fully pressure the system and test spray to ensure proper operation. Always spray off the project first to check proper operation and cure of materials. Observe the material and film; make additional or final equipment adjustments, then proceed with the project.

Spraying

Using a 50% overlap to ensure an evenly coated surface, spray continuously as much as possible and minimise triggering the gun.

Any time there is even a small change in pressure, spray pattern, colour or consistency of the material the sprayer should stop immediately and troubleshoot the equipment.

Filters should be checked periodically for any build-up of material. If the whip hose is unheated, the material that is contained in the whip will cool down during extended periods when not spraying. This material will not be the proper temperature and will not yield a quality pattern or product. Spray off the project until this material is cleared and the warmer material sprays properly. The temperature of the material near the gun can be checked by inserting a small thermometer in the hose jacket along the hoses. Generally the material temperature is higher by 3-6°C than the reading on the thermometer.

Shutting Down the Plural Component Equipment

If you are simply shutting down for a short period such as overnight, the material may be left in the system under pressure so as not to waste materials:

1. Shut off the transfer pumps and proportioner and turn off the heaters (disconnect air and power supply).
2. Depressurize the system so that a maximum of 1000 psi remains on the fluid system.
3. Shut off all in-line valves at proportioner and gun.
4. Remove, disassemble, and thoroughly clean the spray gun and store.
5. Nitrogen purge and blanket any partially filled coating containers and seal tightly.

6. You may leave the transfer pumps wetted out in their respective materials.

If all the material was used then the transfer pumps should be wiped clean and placed in a sufficient amount of plasticizer to cover the lower portion of the pump.

If you anticipate not using the equipment for more than two or three days, then the material should be flushed from the entire system. In this case a different set of procedures is followed:

1. Turn off the heaters, hose heat, and any drum heaters.
2. Remove the transfer pumps from their respective materials and wipe them clean. Place them in separate pails of the plasticizer to be used to flush the system.
3. Thoroughly flush the entire system with appropriate plasticizer. The transfer pumps alone should be able to flush the system. The proportioner can be used with caution to assist in the flushing process.
4. Recycle clean plasticizer through the entire system until no colour or evidence of material is left.
5. Remove and clean filters, reassemble.
6. Ensure that the entire system is pressurized to 200-500 psi with plasticizer upon final shut down.
7. Shut off all air and power supplies.
8. Plug or cap any open inlets or outlets.
9. Clean gun and tip thoroughly and store.
10. Be sure to nitrogen purge and seal any partially filled material containers and store at room temperature indoors.

Equipment Clean-up

Icinol DPM may be used for general cleanup of equipment and hoses. For soaking of contaminated metal parts use NMP (N-Methyl Pyrrolidone). Allow unit to cool before cleaning.

Caution: Prior to introducing any 100% solids coating, plasticizer such as mesamol or DIOP must be used to flush the system. The system must be free of solvent to avoid any potential foaming of the coating resulting from the reaction of solvent with the solventless coating.

Application Guidelines

Substrate Preparation

Substrates should be clean and basically dry. This material will spray satisfactorily on cold substrates. Further, the substrate should be free of grease, oil, dirt or other contaminants which will interfere with proper adhesion and/or coating quality.

Application Temperatures

Minimum recommended material and substrate temperatures are 24°C and 2°C respectively.

Maximum recommended substrate temperature is 50°C.

Cure Time and Recoat Time

This material will become tack-free within 30-60 seconds of spraying. Development of a full cure may take up to 24 hours. Material may be recoated when tack-free. Older coatings should be lightly abraded to remove any oxidised material and cleaned thoroughly prior to recoat.

STORAGE AND HANDLING PRECAUTIONS

The resin has a nominal storage life of 6 months at a recommended temperature of 20-25°C.

The isocyanate should be kept properly closed and stored indoors in a well-ventilated area under normal factory conditions. Storage at room temperature (20-25°C) also provides a convenient viscosity for handling. Storage at low temperatures (below 10°C) is not recommended because it may lead to some crystallisation; this material must therefore be protected from frost.

If crystallisation does occur, the material should be heated to 70-80°C to melt it and should then be thoroughly agitated before use, to ensure homogeneity. Drum heaters may be used with the heat setting at low.

The material should be agitated to uniformly distribute the heat. On no account should the material be heated above 80°C during melting. Storage temperatures above about 50°C are not recommended since they can accelerate the formation of insoluble solids and also increase the rate of viscosity increase on extended storage.

Under the recommended storage conditions and in properly sealed containers, the isocyanate has a nominal storage life of 6 months. If either component is opened and partially used, it should be purged with nitrogen or desiccated air and resealed or refilled into smaller containers to their maximum volume.

Typical Wet Properties

Density (kg/l)

Component A:	1.11
Component B:	1.00

Viscosity (Cps @ 21°C)

Component A:	1600
Component B:	800

Solids (mixed) by volume (%): 100

Flash Point: >149°C

(Pensky Martens Closed Cup)

Theoretical Coverage: 1.0 m²/litre @ 1mm

Pack Size (drums): 200L

Kit Size (unpigmented): 425 Kgs

TYPICAL PROPERTIES OF ENDURATHANE 6000

Property	Test Method Basis	Typical Result
Tensile Strength	ASTM D 412-92	16.5 MPa
Elongation @ 24°C	ASTM D 412-92	427%
Tear Strength	ASTM D 624-86	50 N/mm
Hardness	ASTM D 2240-91, Shore A Shore D	78
		38
Abrasion Resistance	ASTM C501-84, H18 wheel 1000 rev, with 1000g weight	50 mg
Early Fire Hazard Properties	AS1530 part 3 (1989)	2mm sample
	Ignitability Index (0-20)	16
	Spread of Flame Index (0-10)	8-9
	Heat Evolved Index (0-10)	9-10
	Smoke Developed Index (0-10)	7
Suitability for storage of potable water	ASTM D 1692-68 AS 4020 (int) – 1994	Self-extinguishing Passes all requirements at 7500mm ² per litre exposure

Rev 2