FLEXITUFF™

Polyurea Elastomer Coating — PC 390

FEATURES

- OUTSTANDING ABRASION RESISTANCE
- SUITABLE FOR POTABLE WATER
- EXCEPTIONALLY HIGH TENSILE STRENGTH AND ELONGATION
- INCREASED PRODUCTIVITY
- 100% SOLIDS
- GOOD CHEMICAL RESISTANCE

USES

FLEXITUFF™ is designed specially for control of abrasion and/or corrosion. This product is suitable for use in mining and process industries as a resilient lining for hopper cars, conveyers, tanks, slurry systems and various equipment parts that are subject to extreme abrasion. It is also suitable for use in sewerage and waste treatment plants on walls and rake arm assemblies in settling tanks, clarifiers and filters.
FLEXITUFF™ provides excellent protection when sprayed directly to pipe or over urethane foam pipe insulation, as due to its balance of physical properties it is capable of withstanding rough installation treatment and burial in a variety of soils without the benefit of graded back fill.
Tested in accordance with ASTM G8 Method A for use with Cathodic protection systems when used with Durepon® P14 or Durepon® FRX.

SPECIFICATIONS AS/NZS 4020:2005 for use with potable water.

RESISTANCE GUIDE

HEAT RESISTANCE	Up to 120°C dry heat.
WEATHERABILITY	On exterior exposure some chalking and yellowing may also occur. This will not detract from the protective properties of the coating.
SOLVENTS	Poor, not recommended for areas subject to splash and spillage of aromatic hydrocarbon solvents, esters, ketones or alcohols.
ACIDS	Suitable for splash and spillage of mild inorganic acids.
ALKALIS	Suitable for splash and spillage of strong alkali.
SALTS	Unaffected by splash and spillage of neutral and alkaline salt solutions.
WATER	Excellent resistance to immersion in fresh and salt water.
ABRASION	Outstanding abrasion resistance.

TYPICAL PROPERTIES AND APPLICATION DATA

CLASSIFICATION	Polyurea elastomer coating
FINISH	Semi Gloss
COLOUR	Natural Cream.
COMPONENTS	Two
SOLIDS BY VOLUME	100%
VOC LEVEL	Zero
FLASH POINT	>149°C
POT LIFE	Plural Component Only
MIXING RATIO (V/V)	Part A : 1 Part B : 1
THINNER	Do not thin
LINE/SHADE	499-84745 Part A 976-84746 Part B

APPLICATION CONDITIONS	Min	Max
Air Temperature	5°C	50°C
Substrate Surface Temperature	2°C	50°C
Relative Humidity		85%

	Min	Max	Recom.
Wet film per coat (microns)	1,000	>10,000	2,000
Dry film per coat (microns)	1,000	>10,000	2,000

SUITABLE SUBSTRATES	Suitably primed steel, aluminium or concrete.
PRIMERS	DUREPON® P14, LUXEPOXY® 66, LUXEPOXY® Sealer
APPLICATION METHODS	Heated plural component airless spray.

Drying characteristics at 2000 microns dry film thickness

Temperature	Humidity	Touch	Handle	Full Cure*	Overcoat Min	Overcoat Max
25° C	50%	30-60 Seconds	1 Hours	24 Hours	See Page 3	

These figures are given as a guide only, as ventilation, film thickness, humidity, thinning and other factors will influence the rate of drying.

* At this time the product can be put into service, however coating properties will continue to develop after this period and will reach full performance in 7 – 10 days.

If the maximum overcoat interval is exceeded then the surface MUST be abraded to ensure maximum intercoat adhesion.

Refer to PRECAUTIONS section for immersion service requirements.

TYPICAL SPREADING RATE AT RECOMMENDED DRY FILM BUILD

A spreading rate of 0.50 sq. metres per litre corresponds to 2000 microns dry film thickness assuming no losses.
Practical spreading rates will vary depending on such factors as method and conditions of application and surface roughness.

FLEXITUFF™

TYPICAL SYSTEMS

(*The typical systems are offered as a guide only and are not to be used as a specification. It is recommended that the specific needs of a project be discussed with a Dulux Protective Coatings Consultant.)*

SURFACE	PREPARATION GUIDE	SYSTEM		DRY FILM THICKNESS
STEEL Chemical	Abrasive blast AS1627.4 Class 3, 75-100 microns profile.	1st Coat 2nd Coat	DUREPON® P14 FLEXITUFF™	50 Microns >2000 Microns
STEEL Abrasion	Abrasive blast AS1627.4 Class 3, 75-100 microns profile.	1st Coat 2nd Coat	DUREPON® P14 FLEXITUFF™	50 Microns >3000 Microns
CONCRETE Chemical	Clean surface to remove contaminants. Diamond grind, track or light-shot blast. Remove dust.	1st Coat 2nd Coat	LUXEPOXY® Sealer FLEXITUFF™	40 Microns >2000 Microns
CONCRETE Abrasion	Clean surface to remove contaminants. Diamond grind, track or light-shot blast. Remove dust.	1st Coat 2nd Coat	LUXEPOXY® Sealer FLEXITUFF™	40 Microns >3000 Microns

SURFACE 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 that will interfere with proper adhesion and/or coating quality.

Steel: It is recommended that specifiers follow the guidelines for surface preparation from the data sheet for the primer selected. The primer surface must be free from grease, oil, dirt and other loosely adhering materials.

Concrete: Remove all laitance, form release, curing compounds, oil, grease and other surface contaminants. Diamond grind, track or light shot-blast to provide suitable profile. Remove all dust by vacuum cleaning. Fill any large voids exposed using Luxepoxy Filler. Cement based substrates should be at least 21 days old before coating.

APPLICATION

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 55-60°C. It has been successfully sprayed through Graco Reactor machine using a Fusion spray gun.

EQUIPMENT

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 a transfer pump such as a Graco 2:1 Piston Pump. Normally a 3m (10 foot) long 19mm (3/4") I.D., 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, such as a Graco Reactor E-XP2 or A-XP2, 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 (3/8") I.D. with the air feed hose to the gun being 6mm (1/4") hose. A short section of hose assembly (3-15') of 6mm (1/4") hose is usually attached to the gun end of the hose to aid in the maneuvering of the spray gun in application. This assembly should also be heated. The Graco HP Reactor Heated Hose should be suitable.

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 Graco Fusion Gun AP or MP should be suitable.

Material Protection

Moisture vapour entering the drum through the small bunghole, which is normally used as a vent, can cause unwanted blowing or microcellular structure in the spray film. The nitrogen gas purge system slightly pressures the container and prevents air from entering the container.

As a secondary method, a desiccant drier 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

Agitators of 1/2 HP or greater, such as a Graco Twistork Agitator, should be available and used for the Part B to thoroughly mix the material prior to any application. The agitator should be designed for the container in which it will be used.

AIRLESS SPRAY

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 pre-heaters 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 insure 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 DPGDB (Dipropylene Glycol Dibenzoate, eg Benzoflex 988) or DIOP (Di-Iso-Octyl Phthalate, eg Palatinol AH) 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 insure an evenly coated surface. Spray continuously as much as possible and minimise triggering the gun.

Anytime 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. Depressurise 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 plasticiser 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 plasticiser to be used to flush the system.
3. Thoroughly flush the entire system with appropriate plasticiser. 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 plasticiser through the entire system until no colour or evidence of material is left.
5. Remove and clean filters, reassemble.
6. Insure that the entire system is pressurised to 200-500 psi with plasticiser 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.

Caution: Prior to introducing any 100% solids coating, plasticiser such as DPGDB (Dipropylene Glycol Dibenzoate, eg Benzoflex 988) or DIOP (Di-Iso-Octyl Phthalate, eg Palatinol AH) 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.

OVERCOATING

The minimum applied thickness of FLEXITUFF™ is 1mm for the initial coat and 0.5mm for subsequent coats provided that the product is still setting up and warm (within 10 minutes). If the product is left to cool and is within 24 hours of application a wash with MEK is required and the minimum thickness that can be applied is 1mm. Once the product has been left longer than 24 hours the surface must be abraded with 60 grit paper and the minimum thickness that can be applied is 1mm.

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PRECAUTIONS

This is an industrial product designed for use by experienced Protective Coating applicators. Where conditions may require variation from the recommendations on this Product Data Sheet contact your nearest Dulux® representative for advice prior to painting. Do not apply in conditions outside the parameters stated in this document without the express written consent of Dulux® Australia. The rate of cure is dependent upon temperature. Do not apply at temperatures below 1°C. Do not apply at relative humidity above 85% or when the surface is less than 3°C above the dewpoint. If the maximum overcoat interval is exceeded then the surface must be abraded to ensure maximum intercoat adhesion. The coating MUST be fully cured prior to being placed under immersion conditions. This material MUST NOT be thinned.

Prior to introducing any 100% solids coating, plasticiser such as DPGDB (Dipropylene Glycol Dibenzoate, eg Benzoflex 988) or DIOP (Di-Iso-Octyl Phthalate, eg Palatinol AH) 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.

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.

CLEAN UP

Glysolv DPM may be used for general clean up of equipment and hoses. Allow unit to cool before cleaning.

TYPICAL PROPERTIES

Tensile Strength	ASTM D412-92	16.5 MPa
Elongation @ 24C	ASTM D412-92	427%
Tear Strength	ASTM D624-86	50 N/mm.
Hardness	ASTM D2240-91	78 Shore A
Abrasion Resistance	ASTM C501-84	50mg, H18 wheel, 1,000 rev, 1,000g
Early Fire Hazard	AS1530 Part 3 (1989)	2mm sample
	Ignitability (0-20)	16
	Spread of Flame (0-10)	8-9
	Heat Evolved (0-10)	9-10
	Smoke Developed (0-10)	7
	ASTM D1692-68	Self Extinguishing
Potable Water	AS4020	7,500mm^2 per Litre

CHEMICAL RESISTANCE*

10% Acetic Acid	Excellent	20% Phosphoric Acid	Excellent	Methylene Chloride	Poor
50% Acetic Acid	Fair	47% Phosphoric Acid	Fair	Glycerine	Excellent
10% Hydrochloric Acid	Excellent	Lactic Acid	Poor	Diethylene Glycol	Excellent
10% Sulphuric Acid	Excellent	Oleic Acid	Poor	Methyl Ethyl Ketone	Poor
Ca. 40% Sulphuric Acid	Excellent	25% Ammonia	Excellent	Ethyl Acetate	Poor
10% Nitric Acid	Excellent	46% Sodium Hydroxide	Excellent	Formaldehyde	Excellent
20% Nitric Acid	Poor	Methylated Spirits	Poor	Transmission Fluid	Excellent
Hydrofluoric Acid	Excellent	Kerosene	Fair	Saturated Salt Solution	Excellent

* Two months immersion at room temperature

SAFETY PRECAUTIONS **Read Data Sheet, Material Safety Data Sheet and any precautionary labels on containers.**

STORAGE Store as in a bunded area under cover. Store in well-ventilated area away from sources of heat.

HANDLING As with any chemical, ingestion, inhalation and prolonged or repeated skin contact should be avoided by good occupational work practice. Eye protection approved to AS1337 should be worn where there is a risk of splashes entering the eyes. Always wash hands before smoking, eating, drinking or using the toilet.

USING Use with good ventilation and avoid inhalation of spray mists and fumes. If risk of inhalation of spray mists exists, wear combined organic vapour/particulate respirator. When spray painting, users should comply with the provisions of the respective State Spray Painting Regulations.

WELDING Avoid inhalation of fumes if welding surfaces coated with this paint. Grind off coating before welding.

MATERIAL SAFETY DATA SHEET is available from Customer Service (132377) or www.duluxprotectivecoatings.com.au

Dulux Protective Coatings a division of DuluxGroup (Australia) Pty Ltd
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PACKAGING	Available in 425 Kg kits
TRANSPORTATION WEIGHT	1.10 kg/litre (Average of components)
DANGEROUS GOODS	Part A: Non Dangerous Good
	Part B: Class 8 UN 2735