TECHTHANE® ES-134 TDI POLYESTER PREPOLYMER

DESCRIPTION

TECHTHANE ES-134 is a polyester TDI urethane prepolymer, which when reacted with 4,4-Methylene-bis-[orthochloroanaline] (MBCA), yields an elastomer of approximately 91 Shore A hardness. Notable characteristics are high physical properties, high abrasion resistance, high resistance to oils and solvents, and low cost. Typical applications are severe abrasion mining wear parts - particularily those with larger, dry aggregate.

PROPERTIES OF LIQUID PREPOLYMER

PROPERTY	VALUE
Available Isocyanate Content	4.10-4.45
Liquid-Solid Transition Point,°F (°C), approximate	77 (25)
Viscosity Brookfield, cps @ 77°F (25°C)	40,000+
Viscosity Brookfield, cps @ 212°F (100°C)	700
Specific Gravity @ 75°F (24°C)	1.16
Specific Gravity @ 212°F (100°C)	1.12

PROPERTIES OF CURED ELASTOMER (MBCA)

PROPERTY	VALUE
Hardness, Shore A (ASTM D2240)	91
Tensile Strength, psi (ASTM D412)	4,600
Elongation, % (ASTM D412)	480
100% Modulus, psi (ASTM D412)	1045
Tear Strength, Die-C, pli (ASTM D624)	540
Tear Strength, Split, pli (ASTM D470)	105
Specific Gravity (ASTM D792)	1.25
Bell Brittle Point,°F (°C) (ASTM D746)	<-60 (-51)

PROCESSING SUMMARY

PROPERTY	VALUE
Prepolymer temperature, °F (°C)	212 (100)
Mold temperature, °F (°C)	212 (100)
Pot Life @ 212°F (100°C), minutes	10
Cure @ 212°F (100°C), hours	1
Post Cure @ 180°F (82°C), hours	16

INFORMATION BASED ON 92% THEORY

PROCESSING

Thawing

TECHTHANE ES-134 will solidify at approximately 77°F (25°C). If solidified, pre-thawing can normally be achieved by heating the container to a maximum of 180°F (80°C) using a melting oven, thermostatically-controlled blanket heater, or other uniform heating device (heat bands are not recommended) for a period of 12--24 hours. Re-blend contents thoroughly after each thawing.

Re-blending

Prepolymers must be re-blended thoroughly prior to use to ensure homogenity of the prepolymer. This is especially important if the prepolymer has solidified or possibly solidified, or if less than the entire quantity in the container is to be used at one time. Re-blend prior to each use for best results.

Degassing

Removal of any air which has become entrained in the prepolymer can normally be acheived either by heating the prepolymer to 180-200°F (80-93°C) for 15-20 minutes, or preferably via vacuum and agitation. Either method is complete when the majority of air is removed.

Heating

Prepolymer and MBCA should be processed at recommended temperatures to achieve proper results. Heating of components at temperatures other than recommended can result in poor physical properties, poor surface finish, and incorrect hardness. Heating to alternate temperatures must only be done after prior testing has confirmed that desired results will be acheived.

Casting

To ensure optimum physical properties and surface finish, molds should be heated to or slightly higher than cure temperature. Application of mold release agents should be in accordance with release agent manufacturer's guidelines. Mold release can be avoided by having molds Teflon® coated.

Curing

Cure/Post Cure in accordance with guidelines on opposite page.

Note: If using curatives other than MBCA such as Ethacure® 300 or Techcure™ 915B, refer to curative manufacturer's suggested cure cycles.

AVAILABILITY

TECHTHANE prepolymers are packaged in 44 lb. (20 kg) pails and 451 lb. (205 kg) drums. Specific quantities and special packaging are available by request.

STORAGE AND SHELF LIFE

TECHTHANE prepolymers are packaged sealed under an argon gas blanket. Containers should be kept in this condition and stored in a cool, dry area that is protected from direct sunlight until they are to be used. A container that has been opened should be resealed immediately, and if its contents are not to be used within 24 hours, it must be purged with argon or clean dry nitrogen to prevent moisture contamination.

In the absence of heat and moisture, TECHTHANE prepolymers are stable and have a shelf life of a minimum of 1 year. In the presence of heat, however, the NCO of all prepolymers decreases, affecting their reactivity. The following is a summary of the maximum recommended time that prepolymers should be maintained at the given temperature without significant decrease in NCO:

TEMPERATURE	MAXIMUM STORAGE TIME
90°F (32°C)	6 weeks
180°F (82°C)	36 hours
200°F (93°C)	12 hours
212°F (100°C)	8 hours

SAFETY

TECHTHANE prepolymers, in their uncured liquid form, contain a small amount of free toluene-diisocyanate (TDI) which can cause severe irritation to the eyes, skin, respiratory system, and mucous membranes. Contact by inhalation, skin, eye, or ingestion must be avoided. All guidelines for handling TDI-containing materials must be followed when using TECHTHANE prepolymers.

To avoid inhalation, forced air ventilation must be used for all indoor applications. When working in tanks and other confined areas, or anywhere the TLV is exceeded, fresh air breathing equipment must be worn. Chemical cartridge masks suitable for organic vapors and approved by MSHA/OSHA may be used under some conditions with adequate ventilation. To avoid contact with skin or clothing, protective clothing must be worn at all times.

Refer to the Material Safety Data Sheet (MSDS) for further information prior to use of this material.

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