TECHTHANE® 345, 421, 631, 761 TDI/POLYETHER PREPOLYMERS

DESCRIPTION

TECHTHANE 345, 421, 631, and 761 are standard performance, TDI / polyether / PPG or PPG/PTMEG-blend urethane prepolymers, which, when reacted with MBCA or DMTDA, yield elastomers in the 77 Shore A to 61 Shore D hardness range. Notable characteristics of these elastomers are their low viscosity liquid state at room temperature, ease of processing, and low cost.

PROPERTIES OF LIQUID PREPOLYMER

PROPERTY	345	421	631	761
Makeup	PPG	PPG/PTMEG	PPG/PTMEG	PPG
Liquid-Solid Transition Point, °F (°C)	< 0 (-18)	50 (10)	50 (10)	< 0 (-18)
Available Isocyanate Content	3.30--3.60	4.10--4.50	6.10--6.50	7.50--7.70
Viscosity Brookfield, cps @ 110°F (45°C)	3,500	2,700	1,750	1,000
Viscosity Brookfield, cps @ 212°F (100°C)	500	350	150	200
Specific Gravity @ 75°F (24°C)	1.06	1.06	1.09	1.09
Specific Gravity @ 212°F (100°C)	1.00	1.00	1.03	1.03

PROPERTIES OF CURED ELASTOMER

PROPERTY	345	421	631	761
Hardness, Shore A/D (ASTM D2240)	80 A	86 A	92 A	61 D
Tensile Strength, psi (ASTM D412)	2,900	3,200	4,000	6,100
Elongation, % (ASTM D412)	875	450	390	280
100% Modulus, psi (ASTM D412)	500	850	1,400	2,000
300% Modulus, psi (ASTM D412)	1,000	1,350	2,800	4,100
Tear Strength, Die-C, pli (ASTM D624)	400	410	410	400
Tear Strength, Split, pli (ASTM D470)	80	75	90	120
Rebound, Bashore, % (ASTM D2632)	27	40	31	28
Compression Set, 22 hrs. @ 158°F, %, Method B	35	35	34	35
Specific Gravity (ASTM D792)	1.12	1.12	1.13	1.17
Bell Brittle Point,°F (°C) (ASTM D746)	<-20 (-6)	<-50 (-45)	<-50 (-45)	<-20 (-6)

PROCESSING SUMMARY (MBCA)

	345	421	631	761
MBCA level, pph, approximate	10.50	12.00	19.00	22.90
Prepolymer, mold temperature, °F (°C)	180 (82)	180 (82)	180 (82)	160 (71)
MBCA temperature, °F (°C)	180 (82)	180 (82)	180 (82)	180 (82)
Pot Life @ 180°F (82°C), minutes	15	10	6	3
Cure @ 212°F (100°C), hours	1	1	1	1
Post Cure @ 180°F (80°C), hours	16	16	16	16

INFORMATION BASED ON 95% THEORY

PROCESSING

Thawing

TECHTHANE prepolymers will solidify at temperatures below their liquid/solid transition point. If solidified, thawing can normally be achieved by heating the container to a maximum of 130°F (55°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 thoroughly after 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 was exposed or even potentially exposed to cold temperatures or if less than the entire quantity in the container is to be used at one time. Re-blend prior to each use.

Degassing

Removal of any air which has become entrained in the prepolymer can normally be acheived either by heating the prepolymer to 160-180°F (71-82°C) for 15-20 minutes, or by application of vacuum and agitation. Either method is complete when the majority of air is removed.

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.

Curing

Suggested: Cure for 1 hour at 212°F (100°C), remove from mold if desired, post-cure for 16 hours at 180°F (82°C)

Optional: Cure for 1 hour at 212°F (100°C), remove from mold if desired, post-cure for 6 hours at 212°F (100°C)

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

AVAILABILITY

TECHTHANE prepolymers are packaged in 43 lb. (20 kg) pails and 450 lb. (200 kg) drums. Specific quantities and special packaging are available by request.

STORAGE AND SHELF LIFE

TECHTHANE prepolymers are packaged sealed under a dry nitrogen 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 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 NC0 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. MSDS available 24 hrs. at 888-TECHFACTS / 540-667-2664 (MSDS # 400).

These products are intended for use by professional casting facilities only.

FOR INDUSTRIAL USE ONLY

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