VIBRATHANE® 8595

MDI-Terminated Polyester Prepolymer

Description

VIBRATHANE® MDI prepolymers are available in polyether, polyester, polycaprolactone and polycarbonate compositions. These prepolymers are used in cast elastomer applications and can be cured with a variety of curatives that result in elastomers with unique performance.

Benefits of VIBRATHANE® MDI Prepolymers:

- Long Wear Life
- Low Compression Set
- Processability as 2K or 3K System

Long Wear Life

VIBRATHANE® MDI prepolymers create tough, high-quality elastomers that exhibit high tear strength, when tested across standard methods (Trouser, Split, Die C, and DIN). In addition, this product grade has excellent resistance to abrasion, flexural fatigue, and exposure to hydrocarbon solvents.

Low Compression Set

VIBRATHANE® MDI prepolymers create elastomers with low compression set which can be advantageous in applications where the PU elastomer is under load.

Processability as a 2K or 3K System

VIBRATHANE® MDI prepolymers can be cured with a single curative, such as 1,4-butane diol. They can also be processed as a 3K system via the use of 2 curatives. This approach yields a series of PU elastomers with a range of hardness. This product grade has low viscosities and working life suitable for both machine and hand-batching procedures. This product grade is unique in its heat stability during processing and its uniform, predictable response to the addition of catalyst.

Processing Guidance

Prepolymer Meltdown Procedure

VIBRATHANE® MDI prepolymers must be pre-heated for processing. Devices such as melting ovens, thermostatically controlled warming blankets or drum heaters can be used to pre-heat these prepolymers. See data tables for approximate pre-heat times and temperatures.

Prepolymer exposed to temperatures lower than 24°C during shipment and/or storage may require longer meltdown times. Containers of prepolymer should be rolled for 15-30 minutes prior to use to ensure homogeneity.

Note: Do not loosen the pail or drum to relieve the pressure. This will allow moisture into the prepolymer which can damage the material.

Heat Stability

The NCO content of VIBRATHANE® MDI prepolymers decreases with time upon exposure to heat. Prolonged heat exposure will result in lower than expected final hardness and physical properties of the cured elastomer and longer demold times. Maximum recommended heating times as a function of temperature are shown below.

Temperature	Duration
70°C (158°F)	3 Days
85°C (180°F)	24 Hours
100ºC (212°F)	8 Hours

Curing Process

VIBRATHANE® MDI prepolymers can be cured with a range of diol and diamine curatives, including 1,4-butane diol (BDO). See data tables for specific curative properties.

Catalyst Usage

VIBRATHANE® MDI prepolymers can be catalysed for faster reactivity. LANXESS offers VIBRACAT® catalysts, which are mercury-free.

Industrial Hygiene

For detailed industrial hygiene information for all VIBRATHANE® MDI prepolymers, VIBRACURE® curatives, and VIBRACAT® catalysts included in this document, please refer to the relevant Safety Data Sheet (SDS).

Technical Data

Prepolymer Properties	Unit	Typical Value
Nominal NCO Content	%	9.55
Brookfield Viscosity @ 100°C (212°F)	Centipoise	400
Density @ 70°C (158°F)	g/cm^3	1.19
Appearance @ 23°C (73°F)		Solid
Color	Gardner Scale	Clear
Prepolymer Meltdown Conditions (20.4 kg / 5 gal pail)	Hours / °C (°F)	16-24 / 70 (158)
Prepolymer Meltdown Conditions (204 kg / 55 gal drum)	Hours / °C (°F)	36-48 / 70 (158)

Curative Properties	Unit	1,4-Butanediol
Equivalent Weight		45
Appearance at Room Temperature		Liquid
Melting Point	°C (°F)	Liquid at RT

Processing Conditions	Unit	Typical Value
1,4-Butane Diol Curative, 97% Theory	pph[1]	9.90
Prepolymer Temperature	°C (°F)	93 (200)
Curative Temperature	°C (°F)	25 (77)
Mold Temperature	°C (°F)	115 (240)
Pot Life[2] to 10,000 cP	Minutes	3
Nominal Demold Time[3]	Minutes	60
Post Cure Conditions	Hours / °C (°F)	16 / 115 (240)

[1] Curative amount (pph) is based on nominal NCO value

[2] Pot life determined using Brookfield Viscosity method, 300 gram, #4 Spindle

[3] Demold time is dependent on catalyst dosage, part shape and volume; demolding can occur when part has built sufficient green strength

Technical Data, continued

Physical Properties	ASTM Standard	Unit	Typical Value
Hardness	D2240	Shore A or D	95A
100% Modulus	D412	psi (MPa)	2170 (15.0)
300% Modulus	D412	psi (MPa)	3350 (23.1)
Stress at Break	D412	psi (MPa)	7500 (51.7)
Strain at Break	D412	%	360
Tear Strength, Split	D470	pli (kN/m)	140 (24.5)
Tear Strength, Trouser	D1938	pli (kN/m)	300 (52.5)
Tear Strength, Die C	D624 Die C	pli (kN/m)	850 (148.9)
Rebound Resilience (Bayshore)	D2632	%	27
Compression Set @ 70°C, 22 hrs	D395, Method B	%	40
Compression Modulus @ 5%	D575	psi (MPa)	550 (3.8)
Compression Modulus @ 10%	D575	psi (MPa)	1100 (7.6)
Compression Modulus @ 15%	D575	psi (MPa)	1660 (11.5)
Compression Modulus @ 20%	D575	psi (MPa)	2200 (15.2)
Compression Modulus @ 25%	D575	psi (MPa)	2790 (19.2)
Specific Gravity	D792		1.24

Physical Property Testing: The stated data has been generated in a laboratory environment and is considered typical.

Unless specified to the contrary, the values given have been established on standardized test specimens at room temperature. The figures should be regarded as guide values only and not as binding minimum values. Kindly note that the results refer exclusively to the specimens tested. Under certain conditions, the test results established can be affected to a considerable extent by the processing conditions and manufacturing process.

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