Neuthane 100 Series

TDI – PTMEG Ether Prepolymers

Quick Guide to Hardness Range:

The following data is, unless otherwise stated, based on the hardness obtained when cured with MOCA. Other amine curatives are available and the hardness may differ from the values quoted (See Library section)
Higher hardness is available with the Neuthane 2100 Low Odour series
Lower hardness can be achieved with Neuthane CA amine/polyol curatives (non standard)

Hardness		Neuthane Grade
Shore A	Shore D	
<30	-	
40	-	
50	-	
55	-	
60	-	
65	-	
70	-	**Neuthane 122** with Neuthane CA6 = 72A
75	-	**Neuthane 122** = 78A
80	-	
85	-	**Neuthane 128S** = 83A, **Neuthane 128** = 84A, **Neuthane 132S & 132** = 85A
90	37	**Neuthane 143S & 143** = 90A
95	43	**Neuthane 155S & 155** = 94A/43D, **Neuthane 163S & 163** = 95A/47D,
	60	**Neuthane 178** = 60D
	65	
	70	
	75	
	80	
	85	

Neuthane 100 Series

TDI – PTMEG Ether Prepolymers (72 Shore A – 60 Shore D)

Properties

The Neuthane 100 series are high performance TDI – PTMEG ether prepolymers designed to produce items for use in arduous application areas

They offer:

- a high level of physical properties
- very good dynamic performance
- good hydrolysis resistance
- ease of use
- low viscosity
- choice of normal or long pot life grades
- hardness range from 70A-60D*

* Lower hardness can be obtained with Neuthane CA curatives (details available upon request). Hardness above 60D can be achieved with the Neuthane 2100 series

Typical Applications

- Wheels (e.g. fork truck, pallet truck and press on bands)
- High load roller coverings (e.g. steel & paper industry)
- Mining and quarrying (e.g. screen decks)
- Hydrocyclones
- Oil and gas industry (e.g. gaskets)
- Automotive (e.g. suspension bushes)
- Pipe-linings
- Metal Finishing (e.g. vibration bowls)

Processing

Processing can be by hand or by dispensing machine.

Hand Processing

- Melt prepolymer at 50-70°C for 12-24 hours (as a guide the grades with the lower NCO value will take longer to melt than those with higher NCO values)
- Heat the prepolymer and curative to the recommended temperature
- Add pigments and Antifoam, as applicable, whilst mixing
- It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
- Add the curative and thoroughly mix ensuring that no unmixed material is left on the container sides (if necessary the mix can be transferred to a second clean container and mixed again)
- Remove air under vacuum
- Cast into moulds, preheated to the recommended temperature
- Cure as recommended

Special Considerations

Processing

- Avoid prolonged storage of prepolymers at elevated temperatures. This will result in low hardness and lower properties of the cured material
- Avoid moisture contamination of all materials
- Part used containers should be flushed with dry nitrogen and resealed immediately after use

Alternatives

- ***Solvents/Abrasion*** - ester based systems should be considered: Neuthane 200 [TDI] or Neuthane 700 [MDI]
- ***Humid/Wet*** - MDI or Aliphatic Isocyanate based systems should be considered: Neuthane 600 [MDI] or Neuthane 500 [Aliphatic]
- ***Resilience –*** improvements can be achieved with MDI based systems: Neuthane 600HR [Prepolymer]
- ***Cost*** – Neuthane 100 [PTMEG/PPG], Neuthane 300 [PPG] or Neuthane 200 [Ester] can be considered

COST	PROCESSING	ABRASION	DYNAMIC	RESILIENCE	SOLVENT	HUMID/WET	TEMPERATURE	UV STABILITY

Neuthane 100 Series

TDI – PTMEG Ether Prepolymers (72 – 85 Shore A)

Neuthane			122	122	128S	128	132S	132
%NCO		%	2.2	2.2	2.8	2.8	3.4	3.2
Curative			**CA6**	**MOCA**	**MOCA**	**MOCA**	**MOCA**	**MOCA**
Optimum Stoichiometry		%	95	95	95	95	95	95
Mix Ratio Curative per 100 Parts Resin		by weight	5.3	6.6	8.5	8.5	10.3	9.7
Resin Temperature Curative Temperature		°C °C	80 25	80 110	75 110	75 110	75 110	75 110
Recommended Mould Temperature		°C	100	100	90	90	90	90
Viscosity @ 100°C		cps	1000	1000	1000	1000	530	880
Pot life (on a 500g mix)		minutes	12	15	18	13	17	11
Recommended Cure Temperature		°C	100	100	90	90	90	90
Recommended Cure Time		hrs	16	16	16	16	16	16
Hardness	**DIN 2240-91**	**Shore A**	**72**	**78**	**83**	**84**	**85**	**85**
	DIN 2240-91	**Shore D**	**-**	**-**	**-**	**-**	**-**	**-**
100% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	480 (3.3)	510 (3.5)	700 (4.8)	810 (5.6)	840 (5.8)	790 (5.5)
300% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	770 (5.3)	820 (5.66)	1270 (8.8)	1290 (8.9)	1420 (9.8)	1410 (9.7)
Tensile Strength	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	3800 (26.2)	4000 (27.6)	4150 (28.6)	4500 (31.0)	4100 (28.3)	5300 (36.6)
Elongation at Break	BS 903 Pt A2 - ISO 37	%	720	600	530	610	510	600
Tear Strength	BS 903 Pt A3 - ISO 34-1	lb/in (KN/m)	360 (63.0)	370 (64.8)	380 (66.5)	420 (73.5)	380 (66.5)	440 (77.0)
Compression Set	BS903 Pt A6 - ISO 815	%	27	22	30	25	38	29
Abrasion loss	DIN 53516	mm³	52	32	48	38	59	43
Resilience	ASTM D 2632-92	%	62	59	54	63	46	54
Specific Gravity		g/cm³	1.05	1.05	1.06	1.06	1.07	1.06

Neuthane 100 Series

TDI – PTMEG Ether Prepolymers (90 Shore A – 60 Shore D)

Neuthane			143S	143	155S	155	163S	163	178
%NCO		%	4.3	4.3	5.5	5.5	6.3	6.3	7.8
Curative			**MOCA**	**MOCA**	**MOCA**	**MOCA**	**MOCA**	**MOCA**	**MOCA**
Optimum Stoichiometry		%	95	95	95	95	95	95	95
Mix Ratio Curative per 100 Parts Resin		by weight	12.9	12.9	16.5	16.5	18.9	18.9	23.4
Resin Temperature Curative Temperature		°C °C	75 110	75 110	70 110	65 105	65 110	65 110	60 105
Recommended Mould Temperature		°C	90	90	90	90	90	90	90
Viscosity @ 100°C		cps	580	580	380	380	270	310	200
Pot life (on a 500g mix)		minutes	12	7	7	5	5	3.5	3.5
Recommended Cure Temperature		°C	90	90	90	90	90	90	90
Recommended Cure Time		hrs	16	16	16	16	16	16	16

Hardness	**DIN 2240-91**	**Shore A**	**90**	**90**	**94**	**94**	**95**	**95**	**-**
	DIN 2240-91	**Shore D**	**37**	**37**	**43**	**43**	**47**	**47**	**60**
100% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	1260 (8.7)	1320 (9.1)	1730 (11.9)	1820 (12.6)	2250 (15.5)	2210 (15.2)	4270 (29.5)
300% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	2410 (16.6)	2630 (18.1)	3500 (24.2)	3350 (23.1)	4350 (30.0)	4560 (31.5)	6050 (41.7)
Tensile Strength	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	6420 (44.3)	6230 (43.0)	6200 (42.8)	6070 (44.2)	6380 (44.0)	6110 (42.2)	6750 (46.6)
Elongation at Break	BS 903 Pt A2 - ISO 37	%	480	460	390	430	400	410	320
Tear Strength	BS 903 Pt A3 - ISO 34-1	lb/in (KN/m)	480 (84.0)	510 (89.3)	560 (98.0)	570 (99.8)	575 (100.6)	610 (106.7)	735 (128.6)
Compression Set	BS903 Pt A6 – ISO 815	%	30	29	30	28	31	32	21
Abrasion loss	DIN 53516	mm³	34	29	34	31	36	36	28
Resilience	ASTM D 2632-92	%	43	47	47	44	44	47	41
Specific Gravity		g/cm³	1.09	1.09	1.11	1.11	1.12	1.12	1.16

Quick Guide to Hardness Range:

The following data is, unless otherwise stated, based on the hardness obtained when cured with MOCA. Other amine curatives are available and the hardness may differ from the values quoted
Lower hardness can be achieved with Neuthane CA amine/polyol curatives (non standard)

Hardness		Neuthane Grade
Shore A	Shore D	
<30	-	
40	-	
50	-	
55	-	
60	-	
65	-	
70	-	
75	-	
80	-	**Neuthane 127** = 82A
85	-	
90	37	**Neuthane 142** = 90A
95	43	**Neuthane 153** = 93A, **Neuthane 162** = 95A
	60	
	65	
	70	
	75	
	80	
	85	

Neuthane 100 Series

TDI – PTMEG/PPG Ether Prepolymers (82 – 95 Shore A)

Properties

The Neuthane 100 TDI - PTMEG / PPG ether prepolymers are designed to offer a good level of physical properties at a price advantage over pure TDI – PTMEG systems

They offer:

- a good level of physical properties
- good dynamic performance
- good hydrolysis resistance
- ease of use
- low viscosity

Typical Applications

- Wheels (e.g. pallet truck)
- Medium load roller coverings (e.g. conveyor rollers for the steel industry)
- Mining and quarrying (e.g. scraper blades)

Processing

Processing can be by hand or by dispensing machine

Hand Processing

- Melt prepolymer at 50-70°C for 12-24 hours
- Heat the prepolymer and curative to the recommended temperature
- Add pigments and Antifoam, as applicable, whilst mixing
- It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
- Add the curative and thoroughly mix ensuring that no unmixed material is left on the container sides (if necessary the mix can be transferred to a second clean container and mixed again)
- Remove air under vacuum
- Cast into moulds, preheated to the recommended temperature
- Cure as recommended

Special Considerations

Processing

- Avoid prolonged storage of prepolymers at elevated temperatures. This will result in low hardness and lower properties of the cured material
- Avoid moisture contamination of all materials
- Part used containers should be flushed with dry nitrogen and resealed immediately after use
- The development of cure is longer than for pure PTMEG systems so in mould times may need to be extended. Rapid temperature changes during the early stages of cure may result in splits forming in large components.

Alternatives

- ***Solvents*** - ester based systems should be considered: Neuthane 200: [TDI] or Neuthane 700 [MDI]
- ***Humid/Wet*** - MDI or Aliphatic Isocyanate based systems should be considered: Neuthane 600 [MDI] or Neuthane 500 [Aliphatic]
- ***Dynamic*** – pure PTMEG systems should be considered: Neuthane 100 [TDI] or Neuthane 600 [MDI]

Neuthane 100 Series

TDI – PTMEG/PPG Ether Prepolymers (82 – 90 Shore A)

Neuthane		127	142
%NCO	%	3.0	4.3
Curative		**MOCA**	**MOCA**
Optimum Stoichiometry	%	95	95
Mix Ratio Curative per 100 Parts Resin	by weight	9.1	13.0
Resin Temperature Curative Temperature	°C °C	75 110	70 110
Recommended Mould Temperature	°C	90	90
Viscosity @ 100°C	cps	300	290
Pot life (on a 500g mix)	minutes	10	10
Recommended Cure Temperature	°C	95	95
Recommended Cure Time	hrs	16	16

Hardness	**DIN 2240-91**	**Shore A**	**82**	**90**
	DIN 2240-91	**Shore D**	**-**	**-**
100% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	640 (4.4)	1150 (7.9)
300% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	1200 (8.3)	2100 (14.5)
Tensile Strength	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	2650 (18.3)	4950 (34.2)
Elongation at Break	BS 903 Pt A2 - ISO 37	%	670	500
Tear Strength	BS 903 Pt A3 - ISO 34-1	lb/in (KN/m)	320 (56.0)	430 (75.3)
Compression Set	BS903 Pt A6 - ISO 815	%	37	39
Abrasion loss	DIN 53516	mm³	83	55
Resilience	ASTM D 2632-92	%	55	40
Specific Gravity		g/cm³	1.07	1.09

Neuthane 100 Series

TDI – PTMEG/PPG Ether Prepolymers (93 – 95 Shore A)

Neuthane		153	162
%NCO	%	5.5	6.3
Curative		**MOCA**	**MOCA**
Optimum Stoichiometry	%	95	95
Mix Ratio Curative per 100 Parts Resin	by weight	16.6	19.0
Resin Temperature Curative Temperature	°C °C	70 110	65 110
Recommended Mould Temperature	°C	90	90
Viscosity @ 100°C	cps	220	210
Pot life (on a 500g mix)	minutes	8	4.5
Recommended Cure Temperature	°C	95	95
Recommended Cure Time	hrs	16	16

Hardness	**DIN 2240-91**	**Shore A**	**93**	**95**
	DIN 2240-91	**Shore D**	**-**	**-**
100% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	1630 (11.2)	1900 (13.1)
300% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	2970 (20.5)	3400 (23.5)
Tensile Strength	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	5350 (36.9)	4950 (34.2)
Elongation at Break	BS 903 Pt A2 - ISO 37	%	430	395
Tear Strength	BS 903 Pt A3 - ISO 34-1	lb/in (KN/m)	450 (78.8)	520 (91.0)
Compression Set	BS903 Pt A6 - ISO 815	%	42	41
Abrasion loss	DIN 53516	mm³	61	70
Resilience	ASTM D 2632-92	%	32	39
Specific Gravity		g/cm³	1.12	1.12

Quick Guide to Hardness Range:

The following data is, unless otherwise stated, based on the hardness obtained when cured with MOCA. Other amine curatives are available and the hardness may differ from the values quoted
Lower hardness can be achieved with Neuthane CA amine/polyol curatives (non standard)

Hardness		Neuthane Grade
Shore A	Shore D	
<30	-	
40	-	
50	-	
55	-	
60	-	
65	-	
70	-	
75	-	
80	-	
85	-	**Neuthane 2132** = 85A
90	37	**Neuthane 2143** = 90A
95	43	**Neuthane 2155** = 94A/43D **Neuthane 2163** = 95A/47D
	60	**Neuthane 2178** = 60D
	65	
	70	
	75	**Neuthane 2192** = 75D
	80	
	85	

Neuthane 2100 Series

Low Odour TDI – PTMEG Ether Prepolymers (85 Shore A – 75 Shore D)

Properties

The Neuthane 2100 series are low-odour, high performance TDI – PTMEG ether prepolymers designed to produce items for use in arduous application areas

They offer:

- low levels of free isocyanate
- a high level of physical properties
- very good dynamic performance
- good hydrolysis resistance
- ease of use
- low viscosity
- harness range from 85A-75D*

* Lower hardness can be obtained with Neuthane CA curatives. (Details available upon request)

Typical Applications

- Wheels (e.g. fork truck, pallet truck and press on bands)
- High load roller coverings (e.g. steel & paper industry)
- Mining and quarrying (e.g. screen decks, pipe lining)
- Hydrocyclones
- Oil and gas industry (e.g. gaskets)
- Automotive (e.g. suspension bushes)
- Metal Finishing (e.g. vibration bowls)

Processing

Processing can be by hand or by dispensing machine.

Hand Processing

- Melt prepolymer at 50-70°C for 12-24 hours (as a guide the grades with the lower NCO value will take longer to melt than those with higher NCO values)
- Heat the prepolymer and curative to the recommended temperature
- Add pigments and Antifoam, as applicable, whilst mixing
- It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
- Add the curative and thoroughly mix ensuring that no unmixed material is left on the container sides (if necessary the mix can be transferred to a second clean container and mixed again)
- Remove air under vacuum
- Cast into moulds, preheated to the recommended temperature
- Cure as recommended

Special Considerations

Processing

- Avoid prolonged storage of prepolymers at elevated temperatures. This will result in low hardness and lower properties of the cured material
- Avoid moisture contamination of all materials
- Part used containers should be flushed with dry nitrogen and resealed immediately after use

Alternatives

- ***Solvents*** - ester based systems should be considered: Neuthane 200 [TDI] or Neuthane 700 [MDI]
- ***Humid/Wet*** - MDI or Aliphatic Isocyanate based systems should be considered: Neuthane 600 [MDI] or Neuthane 500 [Aliphatic]
- ***Resilience*** – improvements can be achieved with MDI based systems: Neuthane 600HR [Prepolymer]
- ***Cost*** – Neuthane 100 [PTMEG/PPG], Neuthane 300 [PPG] or Neuthane 200 [Ester] can be considered

COST	PROCESSING	ABRASION	DYNAMIC	RESILIENCE	SOLVENT	HUMID/WET	TEMPERATURE	UV STABILITY

Neuthane 2100 Series

Low Odour TDI – PTMEG Ether Prepolymers (85 Shore A – 75 Shore D)

Neuthane			2132	2143	2155	2163	2178	2192
%NCO		%	3.2	4.3	5.5	6.3	7.8	9.2
Curative			**MOCA**	**MOCA**	**MOCA**	**MOCA**	**MOCA**	**MOCA**
Optimum Stoichiometry		%	95	95	95	95	95	95
Mix Ratio Curative per 100 Parts Resin		by weight	9.7	13.0	16.6	19.0	23.6	27.8
Resin Temperature Curative Temperature		°C °C	80 110	70 110	70 110	70 110	60 105	55 105
Recommended Mould Temperature		°C	90	90	90	90	90	90
Viscosity @ 100°C		cps	780	580	330	300	280	270
Pot life (on a 500g mix)		minutes	17	10	7	5	4	2
Recommended Cure Temperature		°C	90	90	90	90	90	90
Recommended Cure Time		hrs	16	16	16	16	16	16
Hardness	**DIN 2240-91**	**Shore A**	**85**	**90**	**94**	**95**	**-**	**-**
	DIN 2240-91	**Shore D**	**-**	**37**	**43**	**47**	**60**	**75**
100% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	915 (6.3)	1320 (9.1)	1850 (12.8)	2660 (18.4)	4390 (30.3)	4400 (30.4)
300% Modulus	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	1590 (11.0)	2400 (16.6)	3600 (24.8)	4990 (34.4)	6240 (43.1)	_
Tensile Strength	BS 903 Pt A2 - ISO 37	lb/in² (Mpa)	5900 (40.7)	6980 (48.2)	7900 (54.5)	6570 (45.3)	6920 (47.7)	6280 (43.3)
Elongation at Break	BS 903 Pt A2 - ISO 37	%	560	470	420	380	310	190
Tear Strength	BS 903 Pt A3 - ISO 34-1	lb/in (KN/m)	480 (84.0)	500 (87.5)	580 (101.5)	620 (108.5)	874 (152.3)	1050 (183.8)
Compression Set	BS903 Pt A6 - ISO 815	%	30	31	30	28	20	_
Abrasion loss	DIN 53516	mm³	40	34	35	41	53	90
Resilience	ASTM D 2632-92	%	55	44	47	44	40	30
Specific Gravity		g/cm³	1.06	1.10	1.11	1.12	1.17	1.18