NEUTHANE 700 Series

MDI – Ester Prepolymers

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MDI - Ester Prepolymers

The NEUTHANE 700 series are high performance MDI - ester prepolymers designed to produce items for use in arduous application areas.

- a high level of physical properties
- good cut and abrasion resistance
- good chemical resistance
- extended hardness range with CA curatives

Typical Applications	
	Mining and quarrying (e.g. screen decks, scraper blades)
	Medium load roller coverings (e.g. steel industry – dry applications)
	Oil and gas industry (e.g. gaskets, pipe pigs)
	Wheels (e.g. pallet truck)

Processing can be carried out by hand or by dispensing machine

- 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
- Development of cure is long compared to TDI systems. Rapid temperature change during the early stages of cure should be avoided.

Hand Processing

1. Melt prepolymer at 60-70°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)
2. Heat the prepolymer and curative to the recommended temperature
3. Ensure NEUTHANE CA14 is dry by applying vacuum at 115°C
4. Add pigments and Antifoam, as applicable, whilst mixing
5. It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
6. 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)
7. Remove air under vacuum
8. Cast into moulds, preheated to the recommended temperature
9. Cure as recommended

Alternatives			
	Dynamic Resilience	- PTMEG ether-based systems should be considered	NEUTHANE 100 [TDI], 600 [MDI], NEUTHANE 801 [Quasi]
	Humid/Wet	- PTMEG ether-based systems should be considered	NEUTHANE 100 [TDI], 600 [MDI], NEUTHANE 500 [Aliphatic]
	Temperature	-TDI PTMEG or Aliphatic based system	NEUTHANE 100 [TDI], NEUTHANE 500 [Aliphatic]

NEUTHANE 700 Series MDI - Ester Prepolymers (80- 95 Shore A)

NEUTHANE GRADE		760	765	766	775	795
%NCO (mid-point)	%	6.0	6.5	6.5	7.5	9.5
Recommended Stoichiometry	%	98.5	98.5	98.5	98.5	98.5
Mix Ratio NEUTHANE CA14 per 100 Parts Resin	by weight	6.33	6.86	6.86	7.92	10.03
Resin Temperature	°C	80	80	80	75	75
Curative Temperature	°C	60	60	60	60	60
Recommended Mould Temperature	°C	105	105	105	105	105
Resin Viscosity (100°C)	cPs	830	700	635	500	245
Pot life (on a 500g mix)	minutes	10	9	8	7	6
Recommended Cure Temperature / Time	°C / hrs	105 / 16 + 24 at RT	105 / 16 + 24 at RT	105 / 16 + 24 at RT	105 / 16 + 24 at RT	105 / 16 + 24 at RT

Hardness	ISO 48-4	Shore A	80	85	85	90	95
	ISO 48-4	Shore D	-	-	-	-	-
100% Modulus	ISO 37	MPa (lb/in²)	5.4 (780)	6.2 (900)	6.1 (880)	6.6 (950)	15.2 (2200)
300% Modulus	ISO 37	MPa (lb/in²)	9.6 (1380)	12.1 (1750)	15.9 (2300)	19.0 (2760)	27.7 (4020)
Tensile Strength	ISO 37	MPa (lb/in²)	44.0 (6380)	45.9 (6650)	51.0 (7400)	51.0 (7400)	45.4 (6590)
Elongation at Break	ISO 37	%	630	650	480	480	600
Tear (Die C)	ISO 34-1	kN/m (lbf/in)	85.1 (485)	97.2 (555)	85.8 (490)	85.8 (490)	128 (730)
Compression Set	ISO 815-1	%	59	53	41	36	32
Abrasion loss	ISO 4649	mm^3	23	20	19	22	34
Resilience	ASTM D 2632-92	%	38	36	16	20	30
Specific Gravity		g / cm^3	1.23	1.24	1.24	1.24	1.25

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NEUTHANE 700 Series MDI - Ester Prepolymers (80- 95 Shore A - High Resilience)

NEUTHANE GRADE		760HR	765HR	775HR	795HR
%NCO (mid-point)	%	6.0	6.5	7.5	9.5
Recommended Stoichiometry	%	98.5	98.5	98.5	98.5
Mix Ratio NEUTHANE CA14 per 100 Parts Resin	by weight	6.33	6.86	7.92	10.03
Resin Temperature	°C	80	80	75	75
Curative Temperature	°C	60	60	60	60
Recommended Mould Temperature	°C	105	105	105	105
Resin Viscosity (100°C)	cPs	810	700	560	280
Pot life (on a 500g mix)	minutes	11	10	8	7
Recommended Cure Temperature / Time	°C / hrs	105 / 16 + 24 at RT	105 / 16 + 24 at RT	105 / 16 + 24 at RT	105 / 16 + 24 at RT

Hardness	ISO 48-4	Shore A	80	85	90	95
	ISO 48-4	Shore D	-	-	-	-
100% Modulus	ISO 37	MPa (lb/in²)	6.2 (900)	5.0 (730)	6.2 (900)	7.2 (1050)
300% Modulus	ISO 37	MPa (lb/in²)	10.6 (1530)	11.4 (1655)	12.3 (1800)	14.4 (2500)
Tensile Strength	ISO 37	MPa (lb/in²)	48.3 (7020)	46.9 (6810)	37.5 (5440)	36.6 (5300)
Elongation at Break	ISO 37	%	515	550	570	590
Tear (Die C)	ISO 34-1	kN/m (lbf/in)	82.5 (470)	87.7 (500)	105.2 (600)	128.0 (730)
Compression Set	ISO 815-1	%	42	30	30	28
Abrasion loss	ISO 4649	mm³	23	22	22	30
Resilience	ASTM D 2632-92	%	44	49	49	40
Specific Gravity		g / cm³	1.23	1.24	1.24	1.25

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NEUTHANE 700AW Series

MDI – Ester Prepolymers

The Neuthane 700AW series are high performance MDI - ester prepolymers designed to produce items requiring a combination of high resilience and excellent tear strength.
Compared to other prepolymers the 'AW' materials are characterised by not only impressive DIE C tear strength but also Trouser tear.

- a high level of physical properties
- good cut and abrasion resistance
- high resilience

Typical Applications	Mining and quarrying (e.g. screen decks, scraper blades) Medium load roller coverings (e.g. steel industry – dry applications) Wheels (e.g. pallet truck)

Processing can be carried out by hand or by dispensing machine

- 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
- Development of cure is long compared to TDI systems. Rapid temperature change during the early stages of cure should be avoided.

Hand Processing

1. Melt prepolymer at 60-70°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)
2. Heat the prepolymer and curative to the recommended temperature
3. Ensure NEUTHANE CA14 is dry by applying vacuum at 115°C
4. Add pigments and Antifoam, as applicable, whilst mixing
5. It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
6. 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)
7. Remove air under vacuum
8. Cast into moulds, preheated to the recommended temperature
9. Cure as recommended

Alternatives

Dynamic Resilience	- PTMEG ether-based systems should be considered	NEUTHANE 100 [TDI], 600 [MDI], NEUTHANE 801 [Quasi]
Humid/Wet	- PTMEG ether-based systems should be considered	NEUTHANE 100 [TDI], 600 [MDI], NEUTHANE 500 [Aliphatic]
Temperature	-TDI PTMEG or Aliphatic based system	NEUTHANE 100 [TDI], NEUTHANE 500 [Aliphatic]

NEUTHANE 700AW Series –MDI –Ester Prepolymers (85 - 95 Shore A)

NEUTHANE GRADE		765AW	795AW
%NCO (mid-point)	%	6.5	9.5
Recommended Stoichiometry	%	98.5	98.5
Mix Ratio NEUTHANE CA14 per 100 Parts Resin	by weight	6.86	10.03
Resin Temperature	°C	75	75
Curative Temperature	°C	60	60
Recommended Mould Temperature	°C	105	105
Resin Viscosity @ 100°C	cPs	900	385
Pot life (on a 500g mix)	minutes	7	4.5
Recommended Cure Temperature / Time	°C / hrs	105 / 16 + 24 at RT	105 / 16 + 24 at RT

Hardness	ISO 48-4	Shore A	**85**	**95**
	ISO 48-4	Shore D	-	-
100% Modulus	ISO 37	MPa (lb/in²)	5.8 (840)	10.6 (1543)
300% Modulus	ISO 37	MPa (lb/in²)	15.4 (2227)	21.7 (3144)
Tensile Strength	ISO 37	MPa (lb/in²)	51.2 (7416)	45.5 (6601)
Elongation at Break	ISO 37	%	594	579
Tear (Die C)	ISO 34-1	kN/m (lbf/in)	106.6 (609)	131.1 (750)
Tear Trouser	ISO 34-1	kN/m (lbf/in)	85.6 (489)	146.1 (835)
Resilience	ASTM D 2632-92	%	38	40
Specific Gravity		g/cm³	1.24	1.25

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NEUTHANE 700 Series

MDI – Caprolactone Ester Prepolymers

The NEUTHANE 700 Caprolactone series are high performance MDI – ester prepolymers designed to produce items for use in arduous application areas. They offer advantages over conventional ester MDI prepolymers in several key areas.

- a high level of physical properties
- good cut and abrasion resistance
- good chemical resistance
- good low temperature flexibility
- low viscosity and long pot life[1]
- improved hydrolysis resistance[1]
- improved dynamic performance[1]

[1] Compared with conventional MDI ester prepolymers

Typical Applications	Mining and quarrying (e.g. screen decks, scraper blades) Medium load roller coverings (e.g. steel industry – dry applications) Wheels (e.g. pallet truck)

Processing can be carried out by hand or by dispensing machine

- 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
- Development of cure is long compared to TDI systems. Rapid temperature change during the early stages of cure should be avoided.

Hand Processing

1. Melt prepolymer at 60-70°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)
2. Heat the prepolymer and curative to the recommended temperature
3. Ensure NEUTHANE CA14 is dry by applying vacuum at 115°C
4. Add pigments and Antifoam, as applicable, whilst mixing
5. It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
6. 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)
7. Remove air under vacuum
8. Cast into moulds, preheated to the recommended temperature
9. Cure as recommended

Alternatives

Dynamic Resilience	- PTMEG ether-based systems should be considered	NEUTHANE 100 [TDI], 600 [MDI], NEUTHANE 801 [Quasi]
Humid/Wet	- PTMEG ether-based systems should be considered	NEUTHANE 100 [TDI], 600 [MDI], NEUTHANE 500 [Aliphatic]
Temperature	-TDI PTMEG or Aliphatic based system	NEUTHANE 100 [TDI], NEUTHANE 500 [Aliphatic]

NEUTHANE 700 Series –MDI –Caprolactone Ester Prepolymers (85 - 95 Shore A)

NEUTHANE GRADE		765C	765HRC	765AWC	795C	795HRC	795AWC
%NCO (mid-point)	%	6.5	6.5	6.5	9.5	9.5	9.5
Recommended Stoichiometry	%	95	95	95	95	95	95
Mix Ratio NEUTHANE CA14 per 100 Parts Resin	by weight	6.6	6.6	6.6	9.7	9.7	9.7
Resin Temperature	°C	80	80	80	75	75	75
Curative Temperature	°C	60	60	60	60	60	60
Recommended Mould Temperature	°C	105	105	105	105	105	105
Resin Viscosity (100°C)	cPs	700	730	900	280	250	450
Pot life (on a 500g mix)	minutes	11	10	7	6	7	3
Recommended Cure Temperature / Time	°C / hrs	105 / 16 + RT / 24	105 / 16 + RT / 24	105 / 16 + RT / 24	105 / 16 + RT / 24	105 / 16 + RT / 24	105 / 16 + RT / 24

Hardness	ISO 48-4	Shore A	85	85	85	95	95	**95**
	ISO 48-4	Shore D	-	-	-	-	-	-
100% Modulus	ISO 37	MPa (lb/in²)	6.1 (880)	4.7 (680)	5.8 (840)	14.4 (2080)	6.8 (990)	11.2 (1620)
300% Modulus	ISO 37	MPa (lb/in²)	20.8 (3020)	10.1 (1460)	15.1 (2190)	35.1 (5080)	20.0 (2895)	20.4 (2955)
Tensile Strength	ISO 37	MPa (lb/in²)	48.2 (6980)	33.9 (4920)	44.9 (6510)	43.4 (6287)	38.5 (5585)	41.0 (5945)
Elongation at Break	ISO 37	%	430	555	565	445	565	510
Tear (Die C)	ISO 34-1	kN/m (lbf/in)	66.5 (380)	71.8 (410)	105.9 (605)	130.0 (745)	127.0 (726)	126.0 (720)
Compression Set	ISO 815-1	%	44	23	31	30	20	42
Abrasion loss	ISO 4649	mm³	-	-	33	-	-	39
Resilience	ASTM D 2632-92	%	20	55	58	25	51	50
Specific Gravity		g / cm³	1.17	1.17	1.17	1.18	1.18	1.18

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