

## NEUTHANE 200 Series

TDI – Ester Prepolymers & TDI - Caprolactone Ester Prepolymers

Published March 2025 Version 15

TDI - Ester Prepolymers

The NEUTHANE 200 series are high performance TDI – 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
- hardness range from 70 - 95A

### Typical Applications

Medium load roller coverings (e.g. steel industry – dry application areas)  
 Roller coverings where lubricants are present (e.g. aluminium manufacture)  
 Wheels (e.g. pallet truck)  
 Mining and quarrying (e.g. screen decks, scraper blades)  
 Oil and gas industry (e.g. gaskets, pipe pigs)  
 Press blocks  
 Paper converting (e.g. anvil rollers)

**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

### Hand Processing

1. 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)
2. Heat the prepolymer and curative to the recommended temperature
3. Add pigments and Antifoam, as applicable, whilst mixing
4. It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
5. 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)
6. Remove air under vacuum
7. Cast into moulds, preheated to the recommended temperature
8. 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] |
| Resilience         | -MDI based system                                | NEUTHANE 600HR series                                   |

## NEUTHANE 200 Series TDI - Ester Prepolymers (70- 95 Shore A)

| NEUTHANE GRADE                                |           | 223           | 223           | 225           | 225           | 231           | 234           | 235S          | 235S          |
|-----------------------------------------------|-----------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|---------------|
| %NCO (mid-point)                              | %         | 2.3           | 2.3           | 2.5           | 2.5           | 3.1           | 34            | 3.5           | 3.5           |
| <b>Curative</b>                               |           | <b>MOCA</b>   | <b>CA6</b>    | <b>MOCA</b>   | <b>CA6</b>    | <b>MOCA</b>   | <b>MOCA</b>   | <b>MOCA</b>   | <b>CA6</b>    |
| Recommended Stoichiometry                     | %         | 95            | 95            | 95            | 95            | 95            | 95            | 95            | 95            |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 7.0           | 5.6           | 7.5           | 6.0           | 9.4           | 10.3          | 10.6          | 8.5           |
| Resin Temperature                             | °C        | 80            | 80            | 80            | 80            | 80            | 80            | 80            | 80            |
| Curative Temperature                          | °C        | 110           | 20-25         | 110           | 20-25         | 110           | 110           | 110           | 20-25         |
| Recommended Mould Temperature                 | °C        | 90            | 90            | 90            | 90            | 90            | 90            | 90            | 90            |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 850 / 2250    | 850 / 2250    | 1030 / 1200   | 1030 / 1200   | 1000 / n.a    | 500 / n.a     | 860 / 1310    | 860 / 1310    |
| Pot life (on a 500g mix)                      | minutes   | 10 - 20       | 10 - 20       | 17            | 17            | 10            | 7             | 15            | 13            |
| Recommended Cure Temperature / Time           | °C / hrs  | 90 - 100 / 16 | 90 - 100 / 16 | 90 - 100 / 16 | 90 - 100 / 16 | 90 - 100 / 16 | 90 - 100 / 16 | 90 - 100 / 16 | 90 - 100 / 16 |

|                     |                |                             |                |                |                |                |                |                |                |                |
|---------------------|----------------|-----------------------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
| Hardness            | ISO 48-4       | Shore A                     | 70             | 70             | 76             | 73             | 80             | 85             | 85             | 83             |
|                     | ISO 48-4       | Shore D                     | -              | -              | -              | -              | -              | -              | -              | -              |
| 100% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 380<br>(2.6)   | 381<br>(2.6)   | 480<br>(3.3)   | 439<br>(3.0)   | 580<br>(4.0)   | 800<br>(5.5)   | 760<br>(5.2)   | 800<br>(5.5)   |
| 300% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 500<br>(3.5)   | 590<br>(4.1)   | 770<br>(5.3)   | 711<br>(4.9)   | 1000<br>(6.9)  | 1450<br>(10.0) | 1310<br>(9.1)  | 970<br>(6.7)   |
| Tensile Strength    | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 4500<br>(31.1) | 2161<br>(14.9) | 5400<br>(37.3) | 2810<br>(19.4) | 6000<br>(41.4) | 5250<br>(36.2) | 7400<br>(51.0) | 5800<br>(40.0) |
| Elongation at Break | ISO 37         | %                           | 800            | 965            | 750            | 787            | 700            | 500            | 570            | 700            |
| Tear (Die C)        | ISO 34-1       | lbf/in<br>(kN/m)            | 280<br>(49.0)  | 353<br>(63.0)  | 340<br>(59.5)  | 345<br>(60.3)  | 400<br>(70.1)  | 430<br>(75.0)  | 475<br>(83.5)  | 460<br>(80.5)  |
| Compression Set     | ISO 815-1      | %                           | 33.8           | 43.8           | 27.0           | 42.6           | -              | -              | 37             | 36             |
| Abrasion loss       | ISO 4649       | mm <sup>3</sup>             | 75             | 21             | 43             | 15             | -              | -              | 42             | 14             |
| Resilience          | ASTM D 2632-92 | %                           | 42             | 51             | 40             | 51             | -              | -              | 30             | 38             |
| Specific Gravity    |                | g / cm <sup>3</sup>         | 1.23           | 1.15           | 1.23           | 1.17           | 1.24           | 1.23           | 1.24           | 1.24           |

Data above represents typical physical properties. Since conditions of use are beyond our control, no warranty is given or implied in respect of any recommendations or suggestions made by ourselves, nor is freedom from patent infringement inferred.



## NEUTHANE 200 Series TDI - Ester Prepolymers (70- 95 Shore A)

| NEUTHANE GRADE                                |           | 235         | 235        | 235TS       | 235DS       | 235DS      | 239         | 242S        | 242S       |
|-----------------------------------------------|-----------|-------------|------------|-------------|-------------|------------|-------------|-------------|------------|
| %NCO (mid-point)                              | %         | 3.5         | 3.5        | 3.5         | 3.5         | 3.5        | 3.9         | 4.2         | 4.2        |
| <b>Curative</b>                               |           | <b>MOCA</b> | <b>CA6</b> | <b>MOCA</b> | <b>MOCA</b> | <b>CA6</b> | <b>MOCA</b> | <b>MOCA</b> | <b>CA6</b> |
| Recommended Stoichiometry                     | %         | 95          | 95         | 95          | 95          | 95         | 95          | 95          | 95         |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 10.6        | 8.5        | 10.6        | 10.6        | 8.5        | 11.8        | 12.7        | 10.2       |
| Resin Temperature                             | °C        | 80          | 80         | 80          | 80          | 80         | 80          | 80          | 80         |
| Curative Temperature                          | °C        | 110         | 20-25      | 110         | 110         | 20-25      | 105         | 105         | 20-25      |
| Recommended Mould Temperature                 | °C        | 90          | 90         | 90          | 90          | 90         | 95          | 95          | 95         |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 950 / 1313  | 950 / 1313 | 950 / n.a   | 800 / 1985  | 800 / 1985 | 560 / 1200  | 700 / 1800  | 700 / 1800 |
| Pot life (on a 500g mix)                      | minutes   | 7.5         | 5          | 9           | 7.5         | 5          | 6.5         | 8           | 3.5        |
| Recommended Cure Temperature / Time           | °C / hrs  | 95 / 16     | 95 / 16    | 90 / 16     | 90 / 16     | 90 / 16    | 90/16       | 95 / 16     | 95 / 16    |

|                     |                |                             |                |                |                 |                 |                 |                |                 |                 |
|---------------------|----------------|-----------------------------|----------------|----------------|-----------------|-----------------|-----------------|----------------|-----------------|-----------------|
| Hardness            | ISO 48-4       | Shore A                     | 86             | 87             | 86              | 86              | 84              | 90             | 92              | 93              |
|                     | ISO 48-4       | Shore D                     | -              | -              | -               | -               | -               | -              | -               | -               |
| 100% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 840<br>(5.8)   | 814<br>(5.6)   | 500<br>(3.45)   | 718<br>(4.95)   | 838<br>(5.76)   | -              | 1330<br>(9.20)  | 1420<br>(9.79)  |
| 300% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 1420<br>(9.8)  | 1250<br>(8.6)  | 1100<br>(7.59)  | 1420<br>(9.79)  | 1470<br>(10.14) | 1400<br>(9.7)  | 2600<br>(18.00) | 2360<br>(16.28) |
| Tensile Strength    | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 7360<br>(50.7) | 6220<br>(42.9) | 5700<br>(39.33) | 8360<br>(57.64) | 8090<br>(55.78) | 6500<br>(44.8) | 8700<br>(60.0)  | 8250<br>(56.90) |
| Elongation at Break | ISO 37         | %                           | 630            | 622            | 550             | 510             | 670             | 600            | 500             | 538             |
| Tear (Die C)        | ISO 34-1       | lbf/in<br>(kN/m)            | 495<br>(86.8)  | 509<br>(89.0)  | 410<br>(71.80)  | 225<br>(39.30)  | 279<br>(48.70)  | 450<br>(79.0)  | 610<br>(107.50) | 700<br>(122.00) |
| Compression Set     | ISO 815-1      | %                           | 35.0           | 33.2           | 27              | -               | 29              | -              | 32              | 33.5            |
| Abrasion loss       | ISO 4649       | mm <sup>3</sup>             | 40             | 30             | -               | -               | 39              | -              | 42              | 19              |
| Resilience          | ASTM D 2632-92 | %                           | 36             | 36             | 40              | -               | 15              | -              | 25              | 25              |
| Specific Gravity    |                | g / cm <sup>3</sup>         | 1.24           | 1.17           | 1.24            | -               | 1.22            | -              | 1.27            | 1.21            |

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## NEUTHANE 200 Series TDI - Ester Prepolymers (70- 95 Shore A)

| NEUTHANE GRADE                                |           | 242        | 242        | 254        | 254           | 254LV     | 254LV         |
|-----------------------------------------------|-----------|------------|------------|------------|---------------|-----------|---------------|
| %NCO (mid-point)                              | %         | 4.2        | 4.2        | 5.4        | 5.4           | 5.4       | 5.4           |
| Curative                                      |           | MOCA       | CA6        | MOCA       | CA6           | MOCA      | CA6           |
| Recommended Stoichiometry                     | %         | 95         | 95         | 95         | 95            | 95        | 95            |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 12.7       | 10.2       | 16.3       | 13.1          | 16.3      | 13.1          |
| Resin Temperature                             | °C        | 80         | 80         | 80         | 80            | 80        | 80            |
| Curative Temperature                          | °C        | 105        | 20-25      | 110        | 20-25         | 110       | 20-25         |
| Recommended Mould Temperature                 | °C        | 95         | 95         | 95         | 90            | 95        | 90            |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 830 / 1450 | 830 / 1450 | 800 / 1000 | 800 / 1000    | 350 / 950 | 350 / 950     |
| Pot life (on a 500g mix)                      | minutes   | 5          | 3          | 4.5        | 5             | 4         | 5             |
| Recommended Cure Temperature / Time           | °C / hrs  | 95 / 16    | 95 / 16    | 95 / 16    | 90 - 100 / 16 | 95 / 16   | 90 - 100 / 16 |

| Hardness            | ISO 48-4       | Shore A                     | 93             | 94             | 95             | 93             | 97              | 95             |
|---------------------|----------------|-----------------------------|----------------|----------------|----------------|----------------|-----------------|----------------|
|                     | ISO 48-4       | Shore D                     | -              | -              | 45             | -              | -               | -              |
| 100% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 1400<br>(6.7)  | 1250<br>(8.6)  | 2020<br>(13.9) | 1680<br>(11.6) | 2283<br>(15.7)  | 1670<br>(11.5) |
| 300% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 2670<br>(18.4) | 2050<br>(14.1) | 4210<br>(29)   | 3300<br>(22.8) | 4757<br>(32.8)  | 2600<br>(17.9) |
| Tensile Strength    | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 8110<br>(56.0) | 8545<br>(58.9) | 9030<br>(62.2) | 6000<br>(41.4) | 10204<br>(70.3) | 8500<br>(58.6) |
| Elongation at Break | ISO 37         | %                           | 520            | 680            | 460            | 500            | 520             | 600            |
| Tear (Die C)        | ISO 34-1       | lbf/in<br>(kN/m)            | 660<br>(115.7) | 975<br>(170.5) | 715<br>(125.2) | 550<br>(96.3)  | 811<br>(142)    | 749<br>(131.0) |
| Compression Set     | ISO 815-1      | %                           | 28             | 34.2           | 29             | 41.5           | -               | -              |
| Abrasion loss       | ISO 4649       | mm <sup>3</sup>             | 40             | 52             | 38             | 22             | -               | -              |
| Resilience          | ASTM D 2632-92 | %                           | 27             | 24             | 30             | 30             | -               | -              |
| Specific Gravity    |                | g / cm <sup>3</sup>         | 1.27           | 1.20           | 1.28           | 1.28           | -               | -              |

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## NEUTHANE 200 Series

### TDI – Ester Prepolymers with NEUTHANE CA2

The NEUTHANE 200 series cured with NEUTHANE CA2 improves dynamics and load carrying properties.

- a high level of physical properties
- higher load bearing
- extend operating temp range vs MBOCA or NEUTHANE CA6. -Customer to confirm suitability in applications

#### Typical Applications

Medium load roller coverings (e.g. steel industry – dry application areas)  
 Roller coverings where lubricants are present (e.g. aluminium manufacture)  
 Wheels (e.g. pallet truck)  
 Mining and quarrying (e.g. screen decks, scraper blades)  
 Oil and gas industry (e.g. gaskets, pipe pigs)  
 Press blocks  
 Paper converting (e.g. anvil rollers)

**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

Hand Processing

1. Melt prepolymer at 60-70°C for 16-24 hours
2. Heat the prepolymer and curative to the recommended temperature
3. Remove moisture from plasticiser or FP3 (after blending) under vacuum at 110-120°C
4. Add pigments and Antifoam, as applicable, whilst mixing
5. 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)
6. If using more than one mix, blend to ensure homogeneity and mix again.
7. Remove air under vacuum
8. Cast into moulds, preheated to the recommended temperature
9. Cure as recommended.

#### Alternatives

|                         |                                                  |                                                            |
|-------------------------|--------------------------------------------------|------------------------------------------------------------|
| Abrasion/cut resistance | - Ester based systems                            | NEUTHANE 802 [MDI]                                         |
| Humid/Wet               | - PTMEG ether-based systems should be considered | NEUTHANE 100 [TDI], 600 [MDI],<br>NEUTHANE 500 [Aliphatic] |

## NEUTHANE 200 Series TDI - Ester Prepolymers (cured with NEUTHANE CA2)

| NEUTHANE GRADE                                |           | 223        | 225         | 231        | 232        | 244        | 255        |
|-----------------------------------------------|-----------|------------|-------------|------------|------------|------------|------------|
| %NCO (mid-point)                              | %         | 2.3        | 2.5         | 3.1        | 3.2        | 4.4        | 5.5        |
| <b>Curative</b>                               |           | <b>CA2</b> | <b>CA2</b>  | <b>CA2</b> | <b>CA2</b> | <b>CA2</b> | <b>CA2</b> |
| Recommended Stoichiometry                     | %         | 95         | 95          | 95         | 95         | 95         | 95         |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 9.9        | 10.7        | 13.3       | 13.7       | 18.9       | 23.6       |
| Resin Temperature                             | °C        | 80         | 80          | 80         | 80         | 80         | 80         |
| Curative Temperature                          | °C        | 110        | 110         | 110        | 110        | 110        | 110        |
| Recommended Mould Temperature                 | °C        | 130        | 130         | 130        | 130        | 130        | 130        |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 850 / 2250 | 1030 / 1200 | 700 / n.a  | 710 / 1240 | 500 / n.a  | 500 / 1238 |
| Pot life (on a 500g mix)                      | minutes   | 1-2        | 1-2         | 1-2        | 1-2        | 1-2        | 1-2        |
| Recommended Cure Temperature / Time           | °C / hrs  | 130 / 16   | 130 / 16    | 130 / 16   | 130 / 16   | 130 / 16   | 130 / 16   |

| Hardness            | ISO 48-4       | Shore A                     | 85              | 86              | 91              | 90              | 96              | 97              |
|---------------------|----------------|-----------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
|                     | ISO 48-4       | Shore D                     | -               | -               | -               | -               | -               | -               |
| 100% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 715<br>(4.93)   | 809<br>(5.58)   | 1112<br>(7.67)  | 1070<br>(7.38)  | 2050<br>(14.14) | 2470<br>(17.03) |
| 300% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 960<br>(6.62)   | 1067<br>(7.36)  | 1401<br>(9.66)  | 1690<br>(11.66) | 4350<br>(30.00) | 5950<br>(41.03) |
| Tensile Strength    | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 4887<br>(33.70) | 5728<br>(39.50) | 6888<br>(47.50) | 8430<br>(58.14) | 7640<br>(52.69) | 7350<br>(50.70) |
| Elongation at Break | ISO 37         | %                           | 782             | 761             | 707             | 543             | 409             | 350             |
| Tear (Die C)        | ISO 34-1       | lbf/in<br>(kN/m)            | 464<br>(81.2)   | 490<br>(85.7)   | 618<br>(108.0)  | 638<br>(112.0)  | 724<br>(127.0)  | 668<br>(117.0)  |
| Compression Set     | ISO 815-1      | %                           | -               | 29.5            | -               | -               | -               | -               |
| Abrasion loss       | ISO 4649       | mm <sup>3</sup>             | -               | 57              | -               | -               | -               | -               |
| Resilience          | ASTM D 2632-92 | %                           | -               | 48              | -               | -               | -               | -               |
| Specific Gravity    |                | g / cm <sup>3</sup>         | -               | 1.15            | -               | -               | -               | -               |

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## NEUTHANE 200 Series

### TDI – Ester Prepolymers with TMP & Plasticiser

The NEUTHANE 200 series cured with TMP and plasticised produces low hardness polyurethanes with (in the case of NEUTHANE 234 and 242) exceptional solvent swell resistance.

- long pot life
- excellent solvent swell resistance
- good cut resistance
- hardness ranges from <40 - 60A
- the option to be combined with fillers to reduce cost and improve grinding characteristics (NEUTHANE FP3)

#### Typical Applications

Lacquer and paint applicator rollers and wheels (NEUTHANE 235, 234 & 242)  
Isostatic bage (NEUTHANE 235)  
Printing rollers

#### 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

#### Hand Processing

1. Melt prepolymer at 60-70°C for 16-24 hours
2. Heat the prepolymer and curative to the recommended temperature
3. Remove moisture from plasticiser or FP3 (after blending) under vacuum at 110-120°C
4. Blend plasticiser or FP3 into the NEUTHANE prepolymer at process temperature
5. Add pigments and Antifoam, as applicable, whilst mixing
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. If using more than one mix, blend to ensure homogeneity and mix again.
8. Remove air under vacuum
9. Cast into moulds, preheated to the recommended temperature
10. Cure as recommended.

#### Alternatives

|                         |                                                  |                                                            |
|-------------------------|--------------------------------------------------|------------------------------------------------------------|
| Abrasion/cut resistance | - Ester based systems                            | NEUTHANE 802 [MDI]                                         |
| Humid/Wet               | - PTMEG ether-based systems should be considered | NEUTHANE 100 [TDI], 600 [MDI],<br>NEUTHANE 500 [Aliphatic] |

## NEUTHANE 200 Series – TDI - Ester Prepolymers (cured with NEUTHANE TMP/TIPA & Plasticiser)

| NEUTHANE GRADE                                |           | 234        | 234        | 239        | 243MS      | 250LS **   | 270        |
|-----------------------------------------------|-----------|------------|------------|------------|------------|------------|------------|
| %NCO (mid-point)                              | %         | 3.4        | 3.4        | 3.9        | 4.3        | 5.0        | 7.0        |
| <b>Curative</b>                               |           | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 3.5        | 3.5        | 4.0        | 4.4        | 5.1        | 7.1        |
| NEUTHANE Plasticiser per 100 Parts Resin      | by weight | 0          | 15         | 0          | 0          | 0          | 20         |
| Resin Temperature                             | °C        | 80         | 80         | 80         | 80         | 80         | 80         |
| Curative Temperature                          | °C        | 70         | 70         | 70         | 70         | 70         | 70         |
| Plasticizer Temperature                       | °C        | -          | 90         | -          | -          | -          | 90         |
| Recommended Mould Temperature                 | °C        | 110        | 110        | 110        | 110        | 110        | 110        |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 400 /1200  | 400 /1200  | 560 / 1200 | 425 / n.a  | 940 / n.a  | 300        |
| Pot life (on a 500g mix)                      | minutes   | 90+        | 90+        | 90+        | 90+        | 90+        | 90+        |
| Recommended Cure Temperature / Time           | °C / hrs  | 110 / 22   | 110 / 22   | 110 / 24   | 110 / 22   | 110 / 22   | 110 / 24   |

|                     |          |                             |                 |      |                 |                 |                 |                 |
|---------------------|----------|-----------------------------|-----------------|------|-----------------|-----------------|-----------------|-----------------|
| Hardness            | ISO 48-4 | Shore A                     | 53              | 35   | 52              | 58              | 75              | 60              |
|                     | ISO 48-4 | Shore D                     | -               | -    | -               | -               | -               | -               |
| 100% Modulus        | ISO 37   | lb/in <sup>2</sup><br>(MPa) | 148<br>(1.02)   | -    | 197<br>(1.36)   | 208<br>(1.43)   | 535<br>(3.69)   | 273<br>(1.88)   |
| 300% Modulus        | ISO 37   | lb/in <sup>2</sup><br>(MPa) | 354<br>(2.44)   | -    | 513<br>(3.54)   | 522<br>(3.60)   | 2470<br>(17.03) | -               |
| Tensile Strength    | ISO 37   | lb/in <sup>2</sup><br>(MPa) | 1590<br>(10.96) | -    | 1940<br>(13.38) | 2830<br>(19.51) | 6890<br>(47.50) | -               |
| Elongation at Break | ISO 37   | %                           | 493             | -    | 459             | 456             | 372             | 159             |
| Tear (Die C)        | ISO 34-1 | lbf/in<br>(kN/m)            | 87<br>(15.23)   | -    | 113<br>(19.76)  | 96<br>(16.81)   | 204<br>(35.72)  | 79.7<br>(13.95) |
| Specific Gravity    |          | g / cm <sup>3</sup>         | 1.21            | 1.29 | 1.26            | 1.20            | 1.26            | 1.17            |

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## NEUTHANE 200 Series – TDI - Ester Prepolymers (cured with NEUTHANE TMP/TIPA & Plasticiser)

| NEUTHANE GRADE                                |           | 242        | 242        | 242        | 242        | 242        | 242        | 242        |
|-----------------------------------------------|-----------|------------|------------|------------|------------|------------|------------|------------|
| %NCO (mid-point)                              | %         | 4.2        | 4.2        | 4.2        | 4.2        | 4.2        | 4.2        | 4.2        |
| <b>Curative</b>                               |           | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> | <b>TMP</b> |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 4.4        | 4.4        | 4.4        | 4.4        | 4.4        | 4.4        | 4.4        |
| NEUTHANE Plast002 per 100 Parts Resin         | by weight | 10         | 15         | 20         | 25         | 30         | 35         | 40         |
| Resin Temperature                             | °C        | 90         | 90         | 80         | 80         | 80         | 80         | 80         |
| Curative Temperature                          | °C        | 110        | 110        | 110        | 110        | 110        | 110        | 110        |
| Plasticizer Temperature                       | °C        | 90         | 90         | 90         | 90         | 90         | 90         | 90         |
| Recommended Mould Temperature                 | °C        | 110        | 110        | 110        | 110        | 110        | 110        | 110        |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 830 / 1100 | 830 / 1100 | 830 / 1100 | 830 / 1100 | 830 / 1100 | 830 / 1100 | 830 / 1100 |
| Pot life (on a 500g mix)                      | minutes   | 90+        | 90+        | 90+        | 90+        | 90+        | 90+        | 90+        |
| Recommended Cure Temperature / Time           | °C / hrs  | 110 / 22   | 110/24     | 110 / 24   | 110 / 22   | 110 / 22   | 110 / 24   | 110 / 24   |

|                  |          |                     |      |      |      |      |      |      |      |
|------------------|----------|---------------------|------|------|------|------|------|------|------|
| Hardness         | ISO 48-4 | Shore A             | 55   | 50   | 47   | 41   | 35   | 32   | 27   |
|                  | ISO 48-4 | Shore D             | -    | -    | -    | -    | -    | -    | -    |
| Specific Gravity |          | g / cm <sup>3</sup> | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 | 1.20 |

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## NEUTHANE 200 Series – TDI - Ester Prepolymers (cured with NEUTHANE TMP/TIPA & Plasticiser)

| NEUTHANE GRADE                                |           | 235S              | 235S              | 242               | 242               | 242S              | 242S              | 242S              | 254               |
|-----------------------------------------------|-----------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| %NCO (mid-point)                              | %         | 3.5               | 3.5               | 4.2               | 4.2               | 4.2               | 4.2               | 4.2               | 5.4               |
| <b>Curative</b>                               |           | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> | <b>TMP / TIPA</b> |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 4.1               | 4.1               | 4.9               | 4.9               | 4.9               | 4.9               | 4.9               | 6.3               |
| NEUTHANE Plasticiser per 100 Parts Resin      | by weight | 0                 | 20                | 0                 | 20                | 0                 | 10                | 20                | 0                 |
| Resin Temperature                             | °C        | 80                | 80                | 90                | 80                | 80                | 80                | 80                | 80                |
| Curative Temperature                          | °C        | 70                | 70                | 70                | 70                | 70                | 70                | 70                | 70                |
| Plasticizer Temperature                       | °C        | -                 | 85                | -                 | 90                | -                 | 90                | 90                | -                 |
| Recommended Mould Temperature                 | °C        | 110               | 110               | 110               | 110               | 110               | 110               | 110               | 110               |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 860 / 1413        | 860 / 1413        | 830 / 1100        | 830 / 1100        | 700 / 1075        | 700 / 1075        | 700 / 1075        | 450 / 1000        |
| Pot life (on a 500g mix)                      | minutes   | 90+               | 90+               | 90+               | 90+               | 90+               | 90+               | 90+               | 90+               |
| Recommended Cure Temperature / Time           | °C / hrs  | 110 / 22          | 110 / 24          | 110/24            | 110 / 24          | 110 / 22          | 110 / 22          | 110 / 22          | 110 / 24          |

|                     |          |                             |                 |                 |                |                 |                 |                |                 |                 |
|---------------------|----------|-----------------------------|-----------------|-----------------|----------------|-----------------|-----------------|----------------|-----------------|-----------------|
| Hardness            | ISO 48-4 | Shore A                     | 50              | 40              | 60             | 53              | 62              | 55             | 42              | 65              |
|                     | ISO 48-4 | Shore D                     | -               | -               | -              | -               | -               | -              | -               | -               |
| 100% Modulus        | ISO 37   | lb/in <sup>2</sup><br>(MPa) | 184<br>(1.26)   | 141<br>(0.97)   | 275<br>(1.9)   | 203<br>(1.40)   | 359<br>(2.47)   | 299<br>(2.06)  | 248<br>(1.71)   | 402<br>(2.77)   |
| 300% Modulus        | ISO 37   | lb/in <sup>2</sup><br>(MPa) | 333<br>(2.29)   | 251<br>(1.73)   | 608<br>(4.2)   | 450<br>(3.10)   | 1078<br>(7.43)  | 841<br>(5.8)   | 631<br>(4.35)   | 3000<br>(20.68) |
| Tensile Strength    | ISO 37   | lb/in <sup>2</sup><br>(MPa) | 2484<br>(17.12) | 2055<br>(14.16) | 5166<br>(35.6) | 2331<br>(16.07) | 5541<br>(38.20) | 3234<br>(22.3) | 2257<br>(15.56) | 4298<br>(29.63) |
| Elongation at Break | ISO 37   | %                           | 567             | 673             | 480            | 491             | 371             | 385            | 408             | 311             |
| Tear (Die C)        | ISO 34-1 | lbf/in<br>(kN/m)            | 153<br>(26.79)  | 125<br>(21.89)  | 175<br>(31.0)  | 143<br>(25.04)  | 219<br>(38.35)  | 197<br>(34.5)  | 178<br>(31.17)  | 175<br>(30.64)  |
| Specific Gravity    |          | g / cm <sup>3</sup>         | 1.19            | 1.18            | 1.20           | 1.19            | 1.20            | 1.19           | 1.19            | 1.19            |

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## NEUTHANE 200 Series

### TDI – Caprolactone Ester Prepolymers

The NEUTHANE 200 Caprolactone series are high performance TDI – ester prepolymers designed to produce items for use in arduous application areas. They offer advantages over conventional ester TDI 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<sup>1</sup>
- improved hydrolysis resistance<sup>1</sup>
- improved dynamic performance<sup>1</sup>
- hardness range from 60 – 95 Shore A

<sup>1</sup> Compared with conventional TDI ester prepolymers

#### Typical

#### Applications

Medium load roller coverings (e.g. steel industry)  
 Roller coverings where lubricants are present (e.g. Dioctyl Sebacate)  
 Mining and quarrying (e.g. screen decks, scraper blades)  
 Oil and gas industry (e.g. gaskets)  
 Metal Finishing (e.g. vibration bowls)

**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
- It is important when processing NEUTHANE 230 that the correct temperatures are maintained. Failure to do so may result in incorrect cured hardness
- Avoid moisture contamination of all materials
- Part used containers should be flushed with dry nitrogen and resealed immediately after use

#### Hand Processing

1. 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).
2. Heat the prepolymer and curative to the recommended temperature
3. Add pigments and Antifoam, as applicable, whilst mixing
4. It is recommended that air be removed from the prepolymer under vacuum prior to addition of the curative
5. 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)
6. Remove air under vacuum
7. Cast into moulds, preheated to the recommended temperature
8. Cure as recommended

#### Alternatives

|                         |                                                  |                                                            |
|-------------------------|--------------------------------------------------|------------------------------------------------------------|
| Abrasion/cut resistance | - Ester based systems                            | NEUTHANE 802 [MDI]                                         |
| Humid/Wet               | - PTMEG ether-based systems should be considered | NEUTHANE 100 [TDI], 600 [MDI],<br>NEUTHANE 500 [Aliphatic] |

## NEUTHANE 200 Series –TDI – Caprolactone Ester Prepolymers (60 - 95 Shore A)

| NEUTHANE GRADE                                |           | 230        | 230        | 232        | 232        | 244       | 244       | 255        | 255        |
|-----------------------------------------------|-----------|------------|------------|------------|------------|-----------|-----------|------------|------------|
| %NCO (mid-point)                              | %         | 3.45       | 3.45       | 3.2        | 3.2        | 4.4       | 4.4       | 5.5        | 5.5        |
| Curative                                      |           | MOCA       | CA6        | MOCA       | CA6        | MOCA      | CA6       | MOCA       | CA6        |
| Recommended Stoichiometry                     | %         | 95         | 95         | 95         | 95         | 95        | 95        | 95         | 95         |
| Mix Ratio Curative per 100 Parts Resin        | by weight | 10.4       | 8.4        | 9.7        | 7.7        | 13.3      | 10.7      | 16.6       | 13.3       |
| Resin Temperature                             | °C        | 80         | 80         | 80         | 80         | 80        | 80        | 80         | 80         |
| Curative Temperature                          | °C        | 105        | 20-25      | 110        | 20-25      | 110       | 20-25     | 110        | 20-25      |
| Recommended Mould Temperature                 | °C        | 90         | 90         | 90         | 90         | 90        | 90        | 90         | 90         |
| Resin Viscosity (100°C / Process Temperature) | cPs       | 650 / 1125 | 650 / 1125 | 710 / 1240 | 710 / 1240 | 500 / n.a | 500 / n.a | 500 / 1238 | 500 / 1238 |
| Pot life (on a 500g mix)                      | minutes   | 18         | 13         | 14         | 6          | 9         | 9         | 9          | 6.5        |
| Recommended Cure Temperature / Time           | °C / hrs  | 90 / 20    | 90 / 20    | 95 / 16    | 95 / 16    | 90 / 18   | 90 / 18   | 90 / 18    | 90 / 18    |

|                     |                |                             |                 |                |                |                |                |                |                |                 |
|---------------------|----------------|-----------------------------|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|-----------------|
| Hardness            | ISO 48-4       | Shore A                     | 59              | 78             | 80             | 80             | 90             | 90             | 95             | 91              |
|                     | ISO 48-4       | Shore D                     | -               | -              | -              | -              | -              | -              | -              | -               |
| 100% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 255<br>(1.76)   | 715<br>(4.93)  | 560<br>(3.9)   | 713<br>(4.9)   | 1200<br>(8.3)  | 1400<br>(9.7)  | 1600<br>(11.0) | 1570<br>(10.82) |
| 300% Modulus        | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 400<br>(2.76)   | 1260<br>(8.68) | 1130<br>(7.8)  | 1310<br>(9.0)  | 2500<br>(17.2) | 3080<br>(21.2) | 3000<br>(20.7) | 3280<br>(22.61) |
| Tensile Strength    | ISO 37         | lb/in <sup>2</sup><br>(MPa) | 2920<br>(20.13) | 5685<br>(39.2) | 5970<br>(41.2) | 6580<br>(45.4) | 6700<br>(46.2) | 6230<br>(43.0) | 7000<br>(48.2) | 8700<br>(59.98) |
| Elongation at Break | ISO 37         | %                           | 475             | 517            | 400            | 521            | 350            | 401            | 300            | 489             |
| Tear (Die C)        | ISO 34-1       | lbf/in<br>(kN/m)            | 172<br>(30.12)  | 392<br>(68.65) | 350<br>(61.4)  | 432<br>(75.8)  | 490<br>(85.7)  | 585<br>(102.3) | 550<br>(96.2)  | 617<br>(108.05) |
| Compression Set     | ISO 815-1      | %                           | 17              | 35             | 39.0           | 26.0           | 40             | n.a            | 45             | 47.7            |
| Abrasion loss       | ISO 4649       | mm <sup>3</sup>             | 38.3            | 54.8           | 49             | 48             | 49             | n.a            | 49             | 58              |
| Resilience          | ASTM D 2632-92 | %                           | 24              | 50             | 42             | 51             | 35             | 37             | 33             | 25              |
| Specific Gravity    |                | g / cm <sup>3</sup>         | 1.12            | 1.11           | 1.14           | 1.10           | 1.14           | n.a            | 1.14           | 1.14            |

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