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# Product Range

Product characteristics   Applications   Typical values



**Styrenic plastics,  
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| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method  | Cond.     | B3S  |
|--|-------------------------|--|-----------|--|
| <b>Properties</b>  |                         |  |           |  |
| Symbol   | -                       | ISO 1043   | -         | PA6  |
| Density  | g/cm <sup>3</sup>       | ISO 1183   | -         | 1.13   |
| Viscosity number (solution 0.0005 g/ml sulfuric acid)  | ml/g                    | ISO 307  | -         | 145  |
| Color: natural (n), colored (c), black (bk)  | -                       | -  | -         | c  |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62   | -         | 9.00-10.00   |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62   | -         | 2.60-3.40  |
| <b>Processing</b>  |                         |  |           |  |
| Melting temperature, DSC   | °C                      | ISO 3146   | -         | 220  |
| Melt volume rate MVR 275/5   | cm <sup>3</sup> /10 min | ISO 1133   | -         | 175  |
| Melt temperature, injection molding/extrusion  | °C                      | -  | -         | 250-270  |
| Mold temperature, injection molding  | °C                      | -  | -         | 40-80  |
| Molding shrinkage, constrained <sup>4)</sup>   | °C                      | -  | -         | 0.55   |
| <b>Flammability</b>  |                         |  |           |  |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94  | -         | V-2  |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302  | -         | +  |
| <b>Mechanical Properties</b>   |                         |  |           |  |
| Tensile modulus  | MPa                     | ISO 527-2  | dry/cond. | 3400/1200  |
| Yield stress (v = 50 mm/min), Stress at break (v = 5 mm/min)*  | MPa                     | ISO 527-2  | dry/cond. | 90/45  |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2  | dry/cond. | 4.0/20.0   |
| Nominal strain at break (v = 50 mm/min), Strain at break (v = 5 mm/min)*   | %                       | ISO 527-2  | dry/cond. | 10.0/>50.0   |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1  | cond.     | 1100   |
| Flexural modulus   | MPa                     | ISO 178  | dry/cond. | 3000/  |
| Flexural strength  | MPa                     | ISO 178  | dry/cond. |  |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU  | dry/cond. | 250/N  |
| Charpy unnotched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU  | dry       | 200  |
| Charpy notched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA  | dry/cond. | 4.0/50.0   |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA  | dry       | 3.0  |
| Izod notched impact strength <sup>3)</sup> 1A +23 °C   | kJ/m <sup>2</sup>       | ISO 180/A  | dry/cond. | 4.0/N  |
| Izod notched impact strength 1A -30 °C   | kJ/m <sup>2</sup>       | ISO 180/A  | dry       | 3.0  |
| Ball indentation hardness H 358/30, H 961/30*  | MPa                     | ISO 2039-1   | dry/cond. | 160/*  |
| <b>Thermal Properties</b>  |                         |  |           |  |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2   | -         | 65   |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2   | -         | 180  |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -  | -         | >180   |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1  | -         | 87/97  |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)   | 10 <sup>-4</sup> /K     | DIN 53752  | -         | 0.7-1/   |
| Thermal conductivity   | W/(m · K)               | DIN 52612  | -         | 0.33   |
| Specific heat capacity   | J/(kg · K)              | -  | -         | 1700.00  |
| <b>Electrical Properties</b>   |                         |  |           |  |
| Dielectric constant at 1 MHz   | -                       | IEC 60250  | dry/cond. | 3.3/7.0  |
| Dissipation factor at 1 MHz  | 10 <sup>-4</sup>        | IEC 60250  | dry/cond. | 300/3000   |
| Volume resistivity   | Ω · m                   | IEC 60093  | dry/cond. | 10 <sup>13</sup> /10 <sup>10</sup>   |
| Surface resistivity  | Ω                       | IEC 60093  | dry/cond. | 10 <sup>13</sup> /10 <sup>10</sup>   |
| CTI, solution A  | -                       | IEC 60112  | cond.     | 600  |
| <b>Footnotes</b>   |                         |  |           | <b>B3S:</b> Easy flowing, rapidly freezing, for thin-walled parts, e.g. housings, fittings, handles<br><b>B3S HP:</b> improved demoldability for reduced cycle times |
| 1) For uncolored product, unless defined otherwise in the product name.  |                         | 3) N = no break  |           |  |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations. |                         | 4) Test box with central gating, dimensions of base (107 · 47 · 1.5) mm processing conditions: T <sub>M PAG</sub> = 260 °C, T <sub>M PAGE</sub> = 290 °C, mold surface temp. MST = 60 °C for unreinforced, MST = 80 °C for reinforced. |           |  |
|  |                         |  |           |  |

| B3WG6   | B3ZG6   |
|---|---|
| PA6-GF30  | PA6-I GF30  |
| 1.36  | 1.33  |
| 140   |   |
| n, bk   | c   |
| 6.30-6.90   | 5.90-6.50   |
| 1.90-2.30   | 1.80-2.20   |
| 220   | 220   |
| 50  | 25  |
| 270-290   | 270-290   |
| 80-90   | 80-90   |
| 0.35  | 0.50  |
| HB  | HB  |
| +   | +   |
| 9500/6200   | 9000/5300   |
| 185*/115*   | 150*/100*   |
| 3.5*/8.0*   | 3.6/10.0*   |
|   | 3000  |
| 8600/5000   | 7900/4700   |
| 270/180   | 200/130   |
| 95/110  | 90/110  |
| 80  | 85  |
| 15.0/30.0   | 20.0/35.0   |
| 11.0  | 15.0  |
| 15.0/20.0   | 20.0/32.0   |
|   | 10.0  |
| 220*/110  | 180*/100  |
| 210   | 210   |
| 220   | 220   |
| 200   | 180   |
| 145/175   |   |
| 0.2-0.25/0.6-0.7  | 0.2-0.25/0.6-0.7  |
| 0.36  | 0.35  |
| 1500.00   |   |
| 3.8/6.8   | 3.8/6.8   |
| 230/2200  | 200/2000  |
| 10 <sup>13</sup> /10 <sup>10</sup>  | 10 <sup>13</sup> /10 <sup>10</sup>  |
| 10 <sup>12</sup> /10 <sup>10</sup>  | 10 <sup>12</sup> /10 <sup>10</sup>  |
| 450   | 550   |
| <b>B3WG6:</b> Parts with high stiffness and good dimensional stability<br><b>B3WG6 BGWV, B3WG6 GP:</b> optimized for vibration welding, e.g. for air intake manifolds<br><b>B3WG5, B3WG7, B3WG10:</b> 25%, 35% and 50% GF<br><b>B3G8:</b> 40% GF, optimized for pedals (no additional heat stabilization) | <b>B3ZG6:</b> Parts with high toughness (dry impact strength) and stiffness subjected to high dynamic loads, e.g. airbag housings<br><b>B3ZG3, B3ZG8:</b> 15 and 40% GF |

| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method | Cond.     | A3W   |
|--|-------------------------|-------------|-----------|---|
| <b>Properties</b>  |                         |             |           |   |
| Symbol   | -                       | ISO 1043    | -         | PA66  |
| Density  | g/cm <sup>3</sup>       | ISO 1183    | -         | 1.13  |
| Viscosity number (solution 0.0005 g/ml sulfuric acid)  | ml/g                    | ISO 307     | -         | 150   |
| Color: natural (n), colored (c), black (bk)  | -                       | -           | -         | SP  |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62      | -         | 8.00-9.00   |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62      | -         | 2.50-3.10   |
| <b>Processing</b>  |                         |             |           |   |
| Melting temperature, DSC   | °C                      | ISO 3146    | -         | 260   |
| Melt volume rate MVR 275/5   | cm <sup>3</sup> /10 min | ISO 1133    | -         | 100   |
| Melt temperature, injection molding/extrusion  | °C                      | -           | -         | 280-300   |
| Mold temperature, injection molding  | °C                      | -           | -         | 40-80   |
| Molding shrinkage, constrained <sup>4)</sup>   | °C                      | -           | -         | 0.85  |
| <b>Flammability</b>  |                         |             |           |   |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94       | -         | V-2   |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302   | -         | +   |
| <b>Mechanical Properties</b>   |                         |             |           |   |
| Tensile modulus  | MPa                     | ISO 527-2   | dry/cond. | 3000/1100   |
| Yield stress (v = 50 mm/min), Stress at break (v = 5 mm/min)*  | MPa                     | ISO 527-2   | dry/cond. | 85/50   |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2   | dry/cond. | 4.4/20.0  |
| Nominal strain at break (v = 50 mm/min), Strain at break (v = 5 mm/min)*   | %                       | ISO 527-2   | dry/cond. | 25.0/>50.0  |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1   | cond.     | 700   |
| Flexural modulus   | MPa                     | ISO 178     | dry/cond. | 3100/   |
| Flexural strength  | MPa                     | ISO 178     | dry/cond. |   |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU | dry/cond. | N/N   |
| Charpy unnotched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU | dry       | N   |
| Charpy notched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA | dry/cond. | 6.0/20.0  |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA | dry       | 5.0   |
| Izod notched impact strength <sup>3)</sup> 1A +23 °C   | kJ/m <sup>2</sup>       | ISO 180/A   | dry/cond. | 5.5/N   |
| Izod notched impact strength 1A -30 °C   | kJ/m <sup>2</sup>       | ISO 180/A   | dry       | 6.0   |
| Ball indentation hardness H 358/30, H 961/30*  | MPa                     | ISO 2039-1  | dry/cond. | 160/100   |
| <b>Thermal Properties</b>  |                         |             |           |   |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2    | -         | 75  |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2    | -         | 220   |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -           | -         | >200  |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1   | -         | 121/147   |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)   | 10 <sup>-4</sup> /K     | DIN 53752   | -         | 0.7-1/  |
| Thermal conductivity   | W/(m · K)               | DIN 52612   | -         | 0.33  |
| Specific heat capacity   | J/(kg · K)              | -           | -         | 1700.00   |
| <b>Electrical Properties</b>   |                         |             |           |   |
| Dielectric constant at 1 MHz   | -                       | IEC 60250   | dry/cond. | 3.2/5.0   |
| Dissipation factor at 1 MHz  | 10 <sup>-4</sup>        | IEC 60250   | dry/cond. | 250/2000  |
| Volume resistivity   | Ω · m                   | IEC 60093   | dry/cond. | 10 <sup>13</sup> /10 <sup>9</sup>   |
| Surface resistivity  | Ω                       | IEC 60093   | dry/cond. | 10 <sup>13</sup> /10 <sup>9</sup>   |
| CTI, solution A  | -                       | IEC 60112   | cond.     | 500   |
| <b>Footnotes</b>   |                         |             |           | <b>A3W:</b> Heat aging resistant and rapidly processable grade for bearing elements, coil formers |
| 1) For uncolored product, unless defined otherwise in the product name.  |                         |             |           | <b>A3K:</b> colorable, improved electrical properties   |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations.         |                         |             |           | <b>A4H:</b> high heat stability and wear resistance   |
| 3) N = no break  |                         |             |           |   |
| 4) Test box with central gating, dimensions of base (107 · 47 · 1.5) mm processing conditions: T <sub>M PAGE</sub> = 260 °C, T <sub>M PAGE</sub> = 290 °C, T <sub>M PAGE/ET</sub> = 330 °C, mold surface temp. MST = 60 °C for unreinforced, MST = 80 °C for reinforced. |                         |             |           |   |

| A3HG5   | A3WG7  | T KR 4357 G6  | T KR 4355 G7  |
|---|--|---|---|
| PA66 - GF25   | PA66-GF35  | PA6/6T-I GF30   | PA6/6T GF35   |
| 1.32  | 1.41   | 1.37  | 1.43  |
| 145   | 145  | 130   | 130   |
| n, bk   | n, bk  | n, bk   | n, bk   |
| 5.70-6.30   | 4.70-5.30  | 4.00-5.00   | 4.30-5.30   |
| 1.70-2.10   | 1.40-1.80  | 0.60-1.00   | 0.80-1.20   |
|   |  |   |   |
| 260   | 260  | 295   | 295   |
| 50  | 40   |   |   |
| 280-300   | 280-300  | 320-350   | 320-350   |
| 80-90   | 80-90  | 80-120  | 80-120  |
| 0.55  | 0.50   | 0.60  | 0.35  |
|   |  |   |   |
| HB  | HB   | HB  | HB  |
| +   | +  | +   | +   |
|   |  |   |   |
| 8600/6500   | 11500/8500   | 9300/9000   | 12000/12000   |
| 170*/120*   | 210*/150*  | 165*/145*   | 210*/200*   |
|   |  |   |   |
| 3.0*/6.0*   | 3.0*/5.0*  | 3.5*/   | 3.0*/   |
| 4300  | 6600   | 6500  | 8700  |
| 7600/6000   | 10000/8000   |   |   |
| 260/200   | 300/240  |   |   |
| 65/90   | 95/110   | 95/   | 100/  |
| 55  | 75   |   |   |
| 10.0/18.0   | 14.0/22.0  | 19.0/   | 17.0/   |
| 9.0   | 12.0   |   |   |
| 9.5/15.0  | 13.0/18.0  | 23.0/   |   |
|   |  |   |   |
| 240*/190*   | 260*/200*  | 200*/*  | 270*/*  |
|   |  |   |   |
| 250   | 250  | 270   | 270   |
| 250   | 250  |   |   |
| 240   | 240  | 270   | 270   |
| 140/170   | 145/175  | 130/160   | 135/160   |
| 0.25-0.35/0.6-0.7   | 0.15-0.2/0.6-0.7   | 0.25/0.5-0.6  | 0.15/0.5-0.6  |
| 0.34  | 0.35   | 0.25  | 0.28  |
| 1600.00   | 1500.00  | 1400  | 1300  |
|   |  |   |   |
| 3.5/5.5   | 3.5/5.7  | 4.3/4.5   | 4.2/4.4   |
| 140/1600  | 200/3000   | 300/400   | 200/300   |
| 10 <sup>13</sup> /10 <sup>10</sup>  | 10 <sup>13</sup> /10 <sup>10</sup>   | 10 <sup>14</sup> /10 <sup>13</sup>  | 10 <sup>13</sup> /10 <sup>12</sup>  |
| 10 <sup>12</sup> /10 <sup>10</sup>  | 10 <sup>12</sup> /10 <sup>10</sup>   | 10 <sup>13</sup> /  | 10 <sup>13</sup> /  |
| 550   | 450  | 600   | 600   |
| <b>A3HG5:</b> Heat aging resistant, good electrical properties, high stiffness and dimensional stability e.g. for bearing cages as well as for electrical insulating parts<br><b>A3HG6 HR:</b> enhanced hydrolysis resistance for applications in the cooling system like radiator tanks and valve housings | <b>A3WG7:</b> Heat aging resistant for parts with high stiffness and good dimensional stability, e.g. valve covers, gear boxes, fuel rails, air intake manifolds (lost core technology), oil pans<br><b>A3WG3, A3WG5, A3WG6, A3WG10:</b> 15, 25, 30 and 50% GF | Glass fiber-reinforced, impact-modified product for injection molding; high toughness, strength and stiffness, low water absorption, high melting point (295 °C [563 °F]). The mechanical properties remain constant after moisture absorption up to a temperature of 60 °C [140 °F]. | Glass fiber-reinforced product for injection molding; high toughness, strength and stiffness, low water absorption, high melting point (295 °C [563 °F]). The mechanical properties remain constant after moisture absorption up to a temperature of 60 °C [140 °F].<br><b>T KR 4355 G5:</b> 25% GF<br><b>T KR 4350:</b> unreinforced |

| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method     | Cond.     | B 4520                |
|--|-------------------------|-----------------|-----------|-----------------------|
| <b>Properties</b>  |                         |                 |           |                       |
| Symbol   | -                       | ISO 1043        | -         | PBT                   |
| Density  | g/cm <sup>3</sup>       | ISO 1183        | -         | 1.3                   |
| Viscosity number (solution 0.05 g/ml phenol/1.2-dichlorobenzene (1:1))   | ml/g                    | ISO 307         | -         | 130                   |
| Color: natural (n), colored (c), black (bk)  | -                       | -               | -         | n, c, bk              |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62          | -         | 0.5                   |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62          | -         | 0.25                  |
| <b>Processing</b>  |                         |                 |           |                       |
| Melting temperature, DSC   | °C                      | ISO 3146        | -         | 220-225               |
| Melt volume rate MVR 275/5   | cm <sup>3</sup> /10 min | ISO 1133        | -         | 19 (250/2.16)         |
| Melt temperature, injection molding/extrusion  | °C                      | -               | -         | 250-275               |
| Mold temperature, injection molding  | °C                      | -               | -         | 40-70                 |
| Molding shrinkage, parallel/normal   | %                       | ISO 2577, 294-4 | -         |                       |
| <b>Flammability</b>  |                         |                 |           |                       |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94           | -         | 94 HB                 |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302       | -         | +                     |
| <b>Mechanical Properties</b>   |                         |                 |           |                       |
| Tensile modulus  | MPa                     | ISO 527-2       | dry/cond. | 2500                  |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)   | MPa                     | ISO 527-2       | dry/cond. | 60 (Y)                |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2       | dry/cond. | 3.7                   |
| Nominal strain at break (N) (v = 50 mm/min), Strain at break (B) (v = 5 mm/min)  | %                       | ISO 527-2       | dry/cond. | >50 (B)               |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1       | cond.     | 1200                  |
| Flexural modulus   | MPa                     | ISO 178         | dry/cond. | 2400                  |
| Flexural strength  | MPa                     | ISO 178         | dry/cond. | 85                    |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | dry/cond. | NB                    |
| Charpy unnotched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | dry       |                       |
| Charpy notched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | dry/cond. | 6                     |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | dry       |                       |
| Izod notched impact strength <sup>3)</sup> 1A +23 °C   | kJ/m <sup>2</sup>       | ISO 180/A       | dry/cond. |                       |
| Izod notched impact strength 1A -30 °C   | kJ/m <sup>2</sup>       | ISO 180/A       | dry       |                       |
| Ball indentation hardness H 358/30, H 961/30*  | MPa                     | ISO 2039-1      | dry/cond. | 130 (1)               |
| <b>Thermal Properties</b>  |                         |                 |           |                       |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2        | -         | 65                    |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2        | -         | 165                   |
| Vicat B  | °C                      | -               | -         |                       |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -               | -         | 200                   |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1       | -         | 140/120               |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)   | 10 <sup>-4</sup> /K     | DIN 53752       | -         | 1.3-1.6/              |
| Thermal conductivity   | W/(m · K)               | DIN 52612       | -         | 0.27                  |
| Specific heat capacity   | J/(kg · K)              | -               | -         | 1.5                   |
| <b>Electrical Properties</b>   |                         |                 |           |                       |
| Dielectric constant at 1 MHz   | -                       | IEC 60250       | dry/cond. | 3.3                   |
| Dissipation factor at 1 MHz  | 10 <sup>-4</sup>        | IEC 60250       | dry/cond. | 200                   |
| Volume resistivity   | Ω · m                   | IEC 60093       | dry/cond. | 10 <sup>16</sup>      |
| Surface resistivity  | Ω                       | IEC 60093       | dry/cond. | 10 <sup>13</sup>      |
| CTI, solution A  | -                       | IEC 60112       | cond.     | 550                   |
| <b>Footnotes</b>   |                         |                 |           | General-purpose grade |
| 1) For uncolored product, unless defined otherwise in the product name.  |                         |                 |           |                       |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations. |                         |                 |           |                       |
| 3) N = no break  |                         |                 |           |                       |

| B 4560           | B 4300 G6        | B 4040 G10   | S 4090 G6                             |
|------------------|------------------|--|---------------------------------------|
| PBT              | PBT-GF30         | PBT+PET-GF50   | PBT+ASA-GF30                          |
| 1.3              | 1.53             | 1.73   | 1.47                                  |
| 115              | 102              | 90   | 105                                   |
| n, c, bk         | n, c, bk         | bk   | n, c, bk                              |
| 0.5              | 0.4              | 0.4  | 0.4                                   |
| 0.25             | 0.2              | 0.2  | 0.2                                   |
| 220-225          | 220-225          | 220-250  | 220-225                               |
| 35               | 11 (250/2.16)    | 6 (275/2.16)   | 20 (275/2.16)                         |
| 250-275          | 250-275          | 250-275  | 250-275                               |
| 40-70            | 60-100           | 60-100   | 60-100                                |
|                  | 0.34/1.07        | 0.24-0.77  | 0.29-0.75                             |
| 94 HB            | 94 HB            | 94 HB  | 94 HB                                 |
| +                | +                | +  | +                                     |
| 2500             | 10000            | 18700  | 9700                                  |
| 60               | 135 (B)          | 165 (B)  | 125 (B)                               |
| 3.7              |                  |  |                                       |
| >50              | 2.5 (B)          | 1.5 (B)  | 2.2 (B)                               |
|                  | 7500             |  | 6700                                  |
| 2400             | 8800             |  | 8700                                  |
| 85               | 200              |  | 183                                   |
| 170              | 67               | 52   | 59                                    |
| 131              | 74               | 58   | 50                                    |
| 5                | 11               | 10   | 9                                     |
| 5                |                  |  |                                       |
|                  | 190 (2)          |  | 164 (2)                               |
| 55               | 215              | 205  | 175                                   |
| 135              | 210              | 221  | 210                                   |
| 165              |                  |  |                                       |
| 200              | 220              | 210  | 170                                   |
| 140/120          | 140/160          | 140/160  | 110/140                               |
| 1.3-1.6/         | 0.2-0.3/         | 0.2-0.3/   | 0.3/                                  |
| 0.27             | 0.27             |  | 0.29                                  |
| 1.5              | 1.5              | 1.6  | 1.5                                   |
| 3.3              | 3.8              | 4.5  | 3.7                                   |
| 200              | 150              | 150  | 180                                   |
| 10 <sup>16</sup> | 10 <sup>16</sup> | 10 <sup>16</sup>   | 3* 10 <sup>15</sup>                   |
| 10 <sup>13</sup> | 10 <sup>13</sup> | 10 <sup>14</sup>   | 10 <sup>14</sup>                      |
| 550              | 375              | 225  | 500                                   |
|                  | Reinforced       | Highly reinforced, good surface finish, weathering resistant | Reinforced, easy flowing, low warpage |

| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method     | Cond.     | B 4300 G3 High Speed |
|--|-------------------------|-----------------|-----------|----------------------|
| <b>Properties</b>  |                         |                 |           |                      |
| Symbol   | -                       | ISO 1043        | -         | PBT-GF15             |
| Density  | g/cm <sup>3</sup>       | ISO 1183        | -         | 1.41                 |
| Viscosity number (solution 0.05 g/ml phenol/1.2-dichlorobenzene (1:1))   | ml/g                    | ISO 307         | -         | 100                  |
| Color: natural (n), colored (c), black (bk)  | -                       | -               | -         | n, bk                |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62          | -         | 0.5                  |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62          | -         | 0.25                 |
| <b>Processing</b>  |                         |                 |           |                      |
| Melting temperature, DSC   | °C                      | ISO 3146        | -         | 220-225              |
| Melt volume rate MVR 275/5   | cm <sup>3</sup> /10 min | ISO 1133        | -         | 25                   |
| Melt temperature, injection molding/extrusion  | °C                      | -               | -         | 250-275              |
| Mold temperature, injection molding  | °C                      | -               | -         | 60-100               |
| Molding shrinkage, parallel/normal   | %                       | ISO 2577, 294-4 | -         |                      |
| <b>Flammability</b>  |                         |                 |           |                      |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94           | -         | 94 HB                |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302       | -         | +                    |
| <b>Mechanical Properties</b>   |                         |                 |           |                      |
| Tensile modulus  | MPa                     | ISO 527-2       | dry/cond. | 5500                 |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)   | MPa                     | ISO 527-2       | dry/cond. | 100                  |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2       | dry/cond. |                      |
| Nominal strain at break (N) (v = 50 mm/min), Strain at break (B) (v = 5 mm/min)  | %                       | ISO 527-2       | dry/cond. | 3.4                  |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1       | cond.     |                      |
| Flexural modulus   | MPa                     | ISO 178         | dry/cond. |                      |
| Flexural strength  | MPa                     | ISO 178         | dry/cond. | 150                  |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | dry/cond. |                      |
| Charpy unnotched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | dry       |                      |
| Charpy notched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | dry/cond. | 3.5                  |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | dry       |                      |
| Izod notched impact strength <sup>3)</sup> 1A +23 °C   | kJ/m <sup>2</sup>       | ISO 180/A       | dry/cond. |                      |
| Izod notched impact strength 1A -30 °C   | kJ/m <sup>2</sup>       | ISO 180/A       | dry       |                      |
| Ball indentation hardness H 358/30, H 961/30*  | MPa                     | ISO 2039-1      | dry/cond. |                      |
| <b>Thermal Properties</b>  |                         |                 |           |                      |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2        | -         | 200                  |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2        | -         | 220                  |
| Vicat B  | °C                      | -               | -         |                      |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -               | -         | 200                  |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1       | -         | 140/120              |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)   | 10 <sup>-4</sup> /K     | DIN 53752       | -         | 0.3-0.4/             |
| Thermal conductivity   | W/(m · K)               | DIN 52612       | -         | 0.27                 |
| Specific heat capacity   | J/(kg · K)              | -               | -         | 1.6                  |
| <b>Electrical Properties</b>   |                         |                 |           |                      |
| Dielectric constant at 1 MHz   | -                       | IEC 60250       | dry/cond. | 3.6                  |
| Dissipation factor at 1 MHz  | 10 <sup>-4</sup>        | IEC 60250       | dry/cond. | 120                  |
| Volume resistivity   | Ω · m                   | IEC 60093       | dry/cond. | 10 <sup>16</sup>     |
| Surface resistivity  | Ω                       | IEC 60093       | dry/cond. | 10 <sup>13</sup>     |
| CTI, solution A  | -                       | IEC 60112       | cond.     | 300                  |
| <b>Footnotes</b>   |                         |                 |           |                      |
| 1) For uncolored product, unless defined otherwise in the product name.  |                         |                 |           |                      |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations. |                         |                 |           |                      |
| 3) N = no break  |                         |                 |           |                      |

| B 4300 G4 High Speed | B 4300 G6 High Speed | B 4090 G4 High Speed | S 4040 G6 High Speed |
|----------------------|----------------------|----------------------|----------------------|
| PBT-GF20             | PBT-GF30             | PBT+ASA-GF20         | PBT+PET-GF30         |
| 1.3                  | 1.53                 | 1.38                 | 1.55                 |
| 95                   | 90                   | 95                   | 85                   |
| n, bk                | n, bk                | n, bk                | n, bk                |
| 0.5                  | 0.5                  | 0.5                  | 0.5                  |
| 0.25                 | 0.25                 | 0.25                 | 0.25                 |
| 220-225              | 220-225              | 220-225              | 220-250              |
| 35                   | 35                   | 48                   | 40 (275°C/2.16 kg)   |
| 250-275              | 250-275              | 250-275              | 250-275              |
| 60-100               | 60-100               | 60-100               | 60-100               |
| 94 HB                | 94 HB                | 94 HB                | 94 HB                |
| +                    | +                    | +                    | +                    |
| 7000                 | 10000                | 7000                 | 10500                |
| 115                  | 145                  | 100                  | 130                  |
| 3.2                  | 2.5                  | 2.1                  | 1.9                  |
|                      | 7500                 | 4700                 |                      |
|                      | 8800                 |                      |                      |
| 185                  | 200                  | 150                  |                      |
|                      | 60                   |                      |                      |
| 7                    | 10                   | 6                    | 7.5                  |
| 205                  | 215                  | 160                  | 200                  |
| 220                  | 210                  | 205                  | 220                  |
|                      | 220                  |                      |                      |
| 200                  | 200                  | 200                  | 200                  |
| 140/140              | 140/160              | 140/160              | 140/160              |
| 0.2-0.3/             | 0.2-0.3/             | 0.4/                 | 0.2-0.3/             |
| 0.27                 | 0.27                 | 0.27                 | 0.27                 |
| 1.6                  | 1.5                  | 1.5                  | 1.6                  |
| 3.7                  | 3.8                  | 3.7                  | 3.8                  |
| 120                  | 150                  | 300                  | 160                  |
| 10 <sup>16</sup>     | 10 <sup>16</sup>     | 10 <sup>16</sup>     | 10 <sup>16</sup>     |
| 10 <sup>13</sup>     | 10 <sup>13</sup>     | 10 <sup>14</sup>     | 10 <sup>13</sup>     |
| 350                  | 400                  | 450                  | 250                  |

| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method     | H2320 006  |
|--|-------------------------|-----------------|--|
| <b>Properties</b>  |                         |                 |  |
| Symbol   | -                       | ISO 1043        | POM  |
| Density  | g/cm <sup>3</sup>       | ISO 1183        | 1.4000   |
| Color: natural (n), colored (c), black (bk)  | -                       | -               |  |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62          | 0.8  |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62          | 0.2  |
| <b>Processing</b>  |                         |                 |  |
| Melting temperature, DSC   | °C                      | ISO 3146        | 166  |
| Melt Volume Rate MVR (temperature °C, weight kg)   | cm <sup>3</sup> /10 min | ISO 1133        | 2.9  |
| Melt temperature, injection molding/extrusion  | °C                      | -               | 190-230  |
| Mold temperature, injection molding  | °C                      | -               | 60-100   |
| Molding shrinkage, parallel/normal   | %                       | ISO 2527, 294-4 | 2.1/2.1  |
| <b>Flammability</b>  |                         |                 |  |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94           | HB   |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302       | +  |
| <b>Mechanical Properties</b>   |                         |                 |  |
| Tensile modulus  | MPa                     | ISO 527-2       | 2600   |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)   | MPa                     | ISO 527-2       | 64   |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2       | 11   |
| Nominal strain at break (v = 50 mm/min), Strain at break (B) (v = 5 mm/min)  | %                       | ISO 527-2       | 30   |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1       | 1300   |
| Flexural modulus   | MPa                     | ISO 178         | 2600   |
| Flexural strength  | MPa                     | ISO 178         |  |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | 260  |
| Charpy unnotched impact strength <sup>3)</sup> -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | 200  |
| Charpy notched impact strength +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | 6  |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | 5.5  |
| Izod notched impact strength +23 °C  | kJ/m <sup>2</sup>       | ISO 180/A       | 6.5  |
| Izod notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 180/A       | 7  |
| Ball indentation hardness H 358/30 (1), H 961/30 (2)   | MPa                     | ISO 2039-1      | 135 (1)  |
| <b>Thermal Properties</b>  |                         |                 |  |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2        | 95   |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2        | 156  |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -               | 100  |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1       |  |
| Thermal coefficient of linear expansion, long./trans. (23-55 °C)   | 10 <sup>-4</sup> /K     | DIN 53752       | 1.2  |
| Thermal conductivity   | W/(m · K)               | DIN 52612       | 0.25   |
| Specific heat capacity   | J/(kg · K)              | -               | 1500   |
| <b>Electrical Properties</b>   |                         |                 |  |
| Dielectric constant at 100 Hz/1 MHz  |                         | IEC 60250       | 3.8/3.8  |
| Dissipation factor at 100 Hz/1 MHz   |                         | IEC 60250       | 0.001/0.005  |
| Volume resistivity   | Ω · m                   | IEC 60093       | 10 <sup>13</sup>   |
| Surface resistivity  | Ω                       | IEC 60093       | 10 <sup>13</sup>   |
| CTI, solution A  | -                       | IEC 60112       | CTI600   |
| <b>Footnotes</b>   |                         |                 | High-molecular-weight grade with increased flowability for injection molding of relatively thick-walled moldings |
| 1) For uncolored products  |                         |                 |  |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations. |                         |                 |  |
| 3) N = no break  |                         |                 |  |

| N2320 003  | N2320 003 LEV  | S1320 003   | S1320 0021   |
|--|--|---|--|
| POM  | POM  | POM   | POM  |
| 1.4000   | 1.4000   | 1.4100  | 1.4100   |
| 0.8  | 0.8  | 0.8   | 0.8  |
| 0.2  | 0.2  | 0.2   | 0.2  |
| 167  | 166  | 171   | 171  |
| 7.5  | 7.5  | 11  | 11   |
| 190-230  | 190-220  | 190-220   | 190-220  |
| 60-100   | 60-100   | 60-100  | 60-100   |
| 2.1/2.1  | 2.3/2.3  | 2.1/2.1   | 2.1/2.1  |
| HB   | HB   | HB  | HB   |
| +  | +  | +   | +  |
| 2700   | 2600   | 3000  | 3000   |
| 65   | 62   | 68  | 66   |
| 9.4  | 10   | 9   | 9  |
| 27   | 30   | 25  | 30   |
| 1400   |  | 1450  | 1450   |
| 2500   |  | 3000  | 2800   |
| 210 C  | 210 C  | 170 C   | 170 C  |
| 190 C  |  | 170 C   | 170 C  |
| 6  | 6.5  | 5.5   | 5.5  |
| 5.5  |  | 5.5   | 5.5  |
| 6  |  | 5.5   | 5.5  |
| 5.5  |  | 5   |  |
| 145 (1)  |  | 165 (1)   | 155 (1)  |
| 100  | 90   | 100   | 100  |
| 156  |  | 159   | 159  |
| 100  | 100  | 100   | 100  |
| 1.1  | 1.5  | 1.1   | 1.1  |
| 0.25   | 0.25   |   |  |
| 1500   | 1500   | 1500  | 1500   |
| 3.8/3.8  | 3.8/3.8  | 3.7/3.7   | 3.7/3.7  |
| 0.001/0.005  | 0.001/0.005  | 0.002/0.005   | 0.002/0.005  |
| 10 <sup>13</sup>   | 10 <sup>13</sup>   | 10 <sup>13</sup>  | 10 <sup>12</sup>   |
| 10 <sup>13</sup>   | 10 <sup>13</sup>   | 10 <sup>15</sup>  | 10 <sup>13</sup>   |
| CTI600   | CTI600   | CTI600  | CTI600   |
| Rapidly solidifying standard grade for injection molding<br><b>S2320 003:</b> free-flowing grade for moldings having low wall thickness<br><b>W2320 003:</b> very free-flowing grade<br><b>W2320 U03:</b> very free-flowing, UV-stabilized grade | Standard grade for injection molding with improved emission performance<br><b>W2320 003 LEV:</b> very free-flowing grade with improved emission performance<br><b>W2320 U03 LEV:</b> very free-flowing, UV-stabilized grade with improved emission performance | Free-flowing, rapidly solidifying grade for moldings difficult to produce by injection molding and having low wall thicknesses, increased stiffness and heat resistance | Free-flowing and rapidly solidifying grade with enhanced stiffness and dimensional stability under heat, highly stabilized against aggressive fuels and hot diesel oil |

| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method     | N2640 Z2   |
|--|-------------------------|-----------------|--|
| <b>Properties</b>  |                         |                 |  |
| Symbol   | -                       | ISO 1043        | POM+PUR  |
| Density  | g/cm <sup>3</sup>       | ISO 1183        | 1.3700   |
| Color: natural (n), colored (c), black (bk)  | -                       | -               |  |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62          | 0.8  |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62          | 0.2  |
| <b>Processing</b>  |                         |                 |  |
| Melting temperature, DSC   | °C                      | ISO 3146        | 167  |
| Melt Volume Rate MVR (temperature °C, weight kg)   | cm <sup>3</sup> /10 min | ISO 1133        | 7  |
| Melt temperature, injection molding/extrusion  | °C                      | -               | 190-215  |
| Mold temperature, injection molding  | °C                      | -               | 60-80  |
| Molding shrinkage, parallel/normal   | %                       | ISO 2527, 294-4 | 1.9/1.9  |
| <b>Flammability</b>  |                         |                 |  |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94           | HB   |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302       | +  |
| <b>Mechanical Properties</b>   |                         |                 |  |
| Tensile modulus  | MPa                     | ISO 527-2       | 2000   |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)   | MPa                     | ISO 527-2       | 50   |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2       | 12   |
| Nominal strain at break (v = 50 mm/min), Strain at break (B) (v = 5 mm/min)  | %                       | ISO 527-2       | 45   |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1       | 1050   |
| Flexural modulus   | MPa                     | ISO 178         | 2000   |
| Flexural strength  | MPa                     | ISO 178         |  |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | N (C)  |
| Charpy unnotched impact strength <sup>3)</sup> -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | 230 C  |
| Charpy notched impact strength +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | 11   |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | 6.5  |
| Izod notched impact strength +23 °C  | kJ/m <sup>2</sup>       | ISO 180/A       | 10   |
| Izod notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 180/A       | 7  |
| Ball indentation hardness H 358/30 (1), H 961/30 (2)   | MPa                     | ISO 2039-1      | 110 (1)  |
| <b>Thermal Properties</b>  |                         |                 |  |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2        | 85   |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2        | 150  |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -               | 100  |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1       |  |
| Thermal coefficient of linear expansion, long./trans. (23-55 °C)   | 10 <sup>-4</sup> /K     | DIN 53752       | 1.3  |
| Thermal conductivity   | W/(m · K)               | DIN 52612       |  |
| Specific heat capacity   | J/(kg · K)              | -               | 1500   |
| <b>Electrical Properties</b>   |                         |                 |  |
| Dielectric constant at 100 Hz/1 MHz  |                         | IEC 60250       | 4/4  |
| Dissipation factor at 100 Hz/1 MHz   |                         | IEC 60250       | 0.010/0.014  |
| Volume resistivity   | Ω · m                   | IEC 60093       | 10 <sup>12</sup>   |
| Surface resistivity  | Ω                       | IEC 60093       | 10 <sup>14</sup>   |
| CTI, solution A  | -                       | IEC 60112       | CTI600   |
| <b>Footnotes</b>   |                         |                 | Elastomer-modified injection-molding grade with high impact strength for clips, snap and fastening elements, also for components subject to impact stress<br><b>N2640 E2:</b> Elastomer-modified injection-molding grade with enhanced toughness and high weld line strength |
| 1) For uncolored products  |                         |                 |  |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations. |                         |                 |  |
| 3) N = no break  |                         |                 |  |

| N2640 Z4   | N2640 Z6   | N2200 G53  | N2720 M63  |
|--|--|--|--|
| POM+PUR  | POM+PUR  | POM - GF25   | POM - M  |
| 1.3500   | 1.3300   | 1.5800   | 1.6500   |
| 0.8  | 0.8  | 0.9  | 0.9  |
| 0.2  | 0.2  | 0.15   | 0.15   |
| 167  | 166  | 168  | 166  |
| 5.5  | 4.5  | 4  | 3.8  |
| 190-215  | 190-215  | 190-230  | 190-230  |
| 60-80  | 60-80  | 60-120   | 60-120   |
| 1.8/1.8  | 1.6/1.6  | 0.7/1.4  | 1.2/1.5  |
| HB   | HB   | HB   | HB   |
| +  | +  | +  | +  |
| 1700   | 1300   | 8800   | 7000   |
| 44   | 37   | 130 (B)  | 75   |
| 14   | 17   |  | 5  |
| >50  | >50  | 3 (B)  | 6  |
| 1000   | 575  | 5800   | 2750   |
| 1700   | 1300   | 8400   | 7000   |
| N  | N  | 55 C   | 55 C   |
| 300 C (N)  | N (C)  | 60 C   | 55 C   |
| 13   | 18   | 9  | 3.5  |
| 8  | 9  | 8.5  | 3  |
| 13   | 15   | 9  | 3.5  |
| 8  | 10   | 9  |  |
| 85 (1)   | 65 (1)   | 190 (2)  | 190 (2)  |
| 75   | 70   | 163  | 140  |
| 140  | 130  | 165  | 160  |
| 100  | 100  | 110  | 110  |
| 1.3  | 1.4  | 0.4  | 0.45   |
| 0.25   |  |  |  |
| 1500   | 1500   |  |  |
| 4.2/4.2  | 4.5/4.3  | 4/4  | 4.0/4.2  |
| 0.011/0.019  | 0.010/0.025  | 0.004/0.007  | 0.007/0.005  |
| 10 <sup>11</sup>   | 10 <sup>11</sup>   | 10 <sup>12</sup>   | 10 <sup>12</sup>   |
| 10 <sup>14</sup>   | 10 <sup>12</sup>   | 10 <sup>14</sup>   | 10 <sup>14</sup>   |
| CTI600   | CTI600   | CTI600   | CTI600   |
| Elastomer-modified injection-molding grade with high impact strength for clips, snap and fastening elements, also for components subject to impact stress<br><b>N2640 E4:</b> Elastomer-modified injection-molding grade with high toughness and high weld line strength | Elastomer-modified injection-molding grade for applications requiring the highest impact strength together with low stiffness<br><b>N2640 Z9:</b> super soft (impact modified) grade | Injection-molding grade for parts requiring high stiffness and strength together with good mold release<br><b>N2200 G43:</b> lower stiffness and strength than N2200 G53 | Mineral-reinforced for low-warping moldings with high stiffness, strength and hardness<br><b>N2720 M210:</b> increased stiffness and strength as well as good wear characteristics, e.g. for sliding chains and conveyor systems |

| Typical values at 23 °C <sup>1)</sup>  | Unit                    | Test Method     | Cond.     | E 2010  |
|--|-------------------------|-----------------|-----------|---|
| <b>Properties</b>  |                         |                 |           |   |
| Symbol   | -                       | ISO 1043        | -         | PES   |
| Density  | ml/g                    | ISO 307         | -         | 1.37  |
| Color: natural (n), colored (c), black (bk)  | -                       | -               | -         | n, bk   |
| Water absorption, equilibrium in water at 23 °C  | %                       | ISO 62          | -         | 2.10  |
| Moisture absorption, equilibrium 23 °C/50% r.h.  | %                       | ISO 62          | -         | 0.70  |
| <b>Processing</b>  |                         |                 |           |   |
| Melting temperature, DSC   | °C                      | ISO 3146        | -         |   |
| Melt volume rate MVR (temperature/mass weight)   | cm <sup>3</sup> /10 min | ISO 1133        | -         | 77 (360/10)                                       |
| Melt temperature, injection molding/extrusion  | °C                      | -               | -         | 340-390   |
| Mold temperature, injection molding  | °C                      | -               | -         | 140-180   |
| Molding shrinkage, parallel/normal   | %                       | ISO 2577, 294-4 | -         | 0.79/0.85   |
| <b>Flammability</b>  |                         |                 |           |   |
| UL 94 rating at 1.6 mm thickness   | class                   | UL 94           | -         | VO  |
| Automotive materials (thickness d ≥ 1 mm)  | -                       | FMVSS 302       | -         |   |
| <b>Mechanical Properties</b>   |                         |                 |           |   |
| Tensile modulus  | MPa                     | ISO 527-2       | dry/cond. | /2700   |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)*  | MPa                     | ISO 527-2       | dry/cond. | /90 (Y)   |
| Yield strain (v = 50 mm/min)   | %                       | ISO 527-2       | dry/cond. | /6.7 (Y)  |
| Nominal strain at break, Strain at break*  | %                       | ISO 527-2       | dry/cond. | 40  |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C   | MPa                     | ISO 899-1       | cond.     | 2700  |
| Flexural modulus   | MPa                     | ISO 178         | dry/cond. |   |
| Flexural strength  | MPa                     | ISO 178         | dry/cond. |   |
| Charpy unnotched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | dry/cond. | /NB   |
| Charpy unnotched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eU     | dry       | /NB   |
| Charpy notched impact strength <sup>3)</sup> +23 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | dry/cond. | 7   |
| Charpy notched impact strength -30 °C  | kJ/m <sup>2</sup>       | ISO 179/1eA     | dry       | 7   |
| Izod notched impact strength <sup>3)</sup> 1A +23 °C   | kJ/m <sup>2</sup>       | ISO 180/A       | dry/cond. | 7   |
| Izod notched impact strength 1A -30 °C   | kJ/m <sup>2</sup>       | ISO 180/A       | dry       |   |
| Ball indentation hardness H 358/30 (1), H 961/30 (2)*  | MPa                     | ISO 2039-1      | dry/cond. | 150 (1)   |
| <b>Thermal Properties</b>  |                         |                 |           |   |
| Deflection temperature 1.8 MPa (HDT A)   | °C                      | ISO 75-2        | -         | 195   |
| Deflection temperature 0.45 MPa (HDT B)  | °C                      | ISO 75-2        | -         | 218   |
| Max. service temperature (short cycle operation) <sup>2)</sup>   | °C                      | -               | -         | 220   |
| Temp. index at 50% loss of tensile strength after 20000/5000 h   | °C                      | IEC 216-1       | -         | 180/  |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)   | 10 <sup>-4</sup> /K     | DIN 53752       | -         | 0.52/   |
| Thermal conductivity   | W/(m · K)               | DIN 52612       | -         | 0.18  |
| Specific heat capacity   | J/(kg · K)              | -               | -         | 1950  |
| <b>Electrical Properties</b>   |                         |                 |           |   |
| Dielectric constant at 1 MHz   | -                       | IEC 60250       | dry/cond. | 3.8   |
| Dissipation factor at 1 MHz  | 10 <sup>-4</sup>        | IEC 60250       | dry/cond. | 140   |
| Volume resistivity   | Ω · m                   | IEC 60093       | dry/cond. | >10 <sup>14</sup>                                 |
| Surface resistivity  | Ω                       | IEC 60093       | dry/cond. | >10 <sup>14</sup>                                 |
| CTI, solution A  | -                       | IEC 60112       | cond.     | 100   |
| <b>Footnotes</b>   |                         |                 |           | General purpose grade,<br>transparent (amorphous) |
| 1) For uncolored product, unless defined otherwise in the product name.  |                         |                 |           |   |
| 2) Empirical values determined on articles repeatedly subjected to the temperature concerned for several hours at a time over a period of several years. The proviso is that the articles were properly designed and processed according to our recommendations. |                         |                 |           |   |
| 3) N = no break  |                         |                 |           |   |

| E 2010 G6         | KR 4113  |
|-------------------|--|
| PES-GF30          | PES-CF10-PTFE10  |
| 1.6               | 1.5  |
| n, bk             | bk   |
| 1.50              |  |
| 0.5               |  |
|                   |  |
| 30 (360/10)       | 10 (360/10)  |
| 350-390           | 360-390  |
| 150-190           | 160-190  |
| 0.29/0.58         | 0.31/0.46  |
|                   |  |
| VO                |  |
|                   |  |
| /10200            | /10100   |
| /140 (B)          | /102 (B)   |
| /1.9 (B)          | /1.3 (B)   |
| 8300              |  |
|                   |  |
| /45               | /19  |
| /45               |  |
| /8                | /4   |
| 8                 | 3  |
| /8                |  |
| 224 (2)           | 180 (2)  |
|                   |  |
| 212               | 212  |
| 224               | 216  |
| 220               | 220  |
| 190/              |  |
| 0.15/             | 0.11/  |
| 0.23              | 0.28   |
| 913               |  |
|                   |  |
| 4.3               |  |
| 100               |  |
| >10 <sup>14</sup> | 8500   |
| >10 <sup>14</sup> | 4 · 10 <sup>3</sup>  |
| 125               |  |
| Reinforced        | Reinforced, contains 10%<br>PTFE giving extr. low<br>friction and wear |

| Typical values at 23 °C  | Unit                    | Test Method     | 778 T                     |
|--|-------------------------|-----------------|---------------------------|
| <b>Properties</b>  |                         |                 | ASA                       |
| Symbol   | -                       | ISO 1043        |                           |
| Density  | g/cm <sup>3</sup>       | ISO 1183        | 1070                      |
| Reinforcing filler content: Glass fibers (GF)                    | %                       | -               |                           |
| Moisture absorption, equilibrium 23 °C/50% r.h.                  | %                       | ISO 62          | 0.35                      |
| <b>Processing</b>  |                         |                 |                           |
| Method: Injection molding (M), Extrusion (E)                     | -                       | -               | M                         |
| Melting temperature, DSC   | °C                      | ISO 3146        |                           |
| Melt Volume Rate MVR (°C/kg)                                     | cm <sup>3</sup> /10 min | ISO 1133        | 5 (220/10)                |
| Pre-drying: °C/h   |                         |                 | 80/2-4                    |
| Melt temperature, injection molding/extrusion                    | °C                      | -               | 240-280                   |
| Mold temperature, injection molding                              | °C                      | -               | 40-80                     |
| Molding shrinkage, parallel/normal                               | %                       | ISO 2577, 294-4 | 0.4-0.7                   |
| <b>Flammability</b>  |                         |                 |                           |
| UL 94 rating at 1.6 mm thickness                                 | class                   | UL 94           | HB                        |
| UL 94 rating at 0.8 mm thickness                                 | class                   | UL 94           |                           |
| Automotive materials (thickness d≥1 mm)                          | -                       | FMVSS 302       | +                         |
| <b>Mechanical Properties</b>                                     |                         |                 |                           |
| Tensile modulus  | MPa                     | ISO 527-2       | 2500                      |
| Yield stress (v=50 mm/min), Stress at break (B) (v=5 mm/min)     | MPa                     | ISO 527-2       | 54 (Y)                    |
| Yield strain (v=50 mm/min)                                       | %                       | ISO 527-2       |                           |
| Nominal strain at break, Strain at break                         | %                       | ISO 527-2       | 3.4 (Y)                   |
| Tensile creep modulus, 1000 h, strain ≤0.5%, +23 °C              | MPa                     | ISO 899-1       | 1250                      |
| Flexural modulus   | MPa                     | ISO 178         |                           |
| Flexural strength  | MPa                     | ISO 178         | 80                        |
| Charpy unnotched impact strength +23 °C                          | kJ/m <sup>2</sup>       | ISO 179/1eU     | 250                       |
| Charpy notched impact strength +23 °C                            | kJ/m <sup>2</sup>       | ISO 179/1eA     | 15                        |
| Charpy notched impact strength -30 °C                            | kJ/m <sup>2</sup>       | ISO 179/1eA     | 4                         |
| Izod notched impact strength +23 °C                              | kJ/m <sup>2</sup>       | ISO 180/A       |                           |
| Ball indentation hardness H 358/30 (1), H 961/30 (2)             | MPa                     | ISO 2039-1      | 85 (1)                    |
| <b>Thermal Properties</b>  |                         |                 |                           |
| Deflection temperature 1.8 MPa (HDT A)                           | °C                      | ISO 75-2        | 103                       |
| Deflection temperature 0.45 MPa (HDT B)                          | °C                      | ISO 75-2        | 106                       |
| Vicat softening temperature VST B50                              | °C                      | ISO 306         | 104                       |
| Max. service temperature (short cycle operation)                 | °C                      | -               | 90                        |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C) | 10 <sup>-4</sup> /K     | DIN 53752       | 0.8-1.1                   |
| Thermal conductivity   | W/(m·K)                 | DIN 52612       | 0.17                      |
| <b>Electrical Properties</b>                                     |                         |                 |                           |
| Relative permittivity at 100 Hz                                  |                         | IEC 60250       |                           |
| Relative permittivity at 1 MHz                                   |                         | IEC 60250       |                           |
| Dissipation factor at 100 Hz                                     | 10 <sup>-4</sup>        | IEC 60250       |                           |
| Dissipation factor at 1 MHz                                      | 10 <sup>-4</sup>        | IEC 60250       |                           |
| Volume resistivity   | Ω·m                     | IEC 60093       | 10 <sup>12</sup>          |
| Surface resistivity  | Ω                       | IEC 60093       | 10 <sup>13</sup>          |
|  |                         |                 | Standard automotive grade |

| 777 K            | 797 S                                  | KR 2861/1 C      | KR 2863 C                    | KR 2864 C             |
|------------------|--|------------------|------------------------------|-----------------------|
| ASA              | ASA                                    | ASA/PC           | ASA/PC                       | ASA/PC                |
| 1070             | 1070                                   | 1150             | 1160                         | 1150                  |
| 0.35             | 0.35                                   | 0.25             | 0.16                         | 0.18                  |
| M                | M                                      | M, E             | M, E                         | M                     |
| 15 (220/10)      | 5.5 (220/10)                           | 14 (260/5)       | 18 (260/5)                   | 25 (260/5)            |
| 80/2-4           | 80/2-4                                 | 100-110/2-4      | 100-110/2-4                  | 100-110/2-4           |
| 240-280          | 240-280                                | 260-300          | 260-300                      | 260-300               |
| 40-80            | 40-80                                  | 60-100           | 60-100                       | 60-100                |
| 0.4-0.7          | 0.4-0.7                                | 0.3-0.7          | 0.3-0.7                      | 0.3-0.7               |
| HB               | HB                                     | HB               | HB                           | HB                    |
| +                | +                                      | +                | +                            | +                     |
| 2300             | 2000                                   | 2300             | 2500                         | 2600                  |
| 48 (Y)           | 42 (Y)                                 | 53 (Y)           | 62 (Y)                       | 63 (Y)                |
| 3.3 (Y)          | 3.5 (Y)                                | 4.9 (Y)          | 4.9 (Y)                      | 4.6 (Y)               |
| 1400             | 1100                                   | 1600             |                              |                       |
| 70               | 60                                     | 78               | 93                           | 100                   |
| 250              | 250                                    | NB               | NB                           | NB                    |
| 17               | 33                                     | 60               | 60                           | 70                    |
| 4                | 9                                      | 20               | 17                           | 11                    |
| 80 (1)           | 65 (1)                                 | 95 (1)           | 110 (1)                      | 110 (1)               |
| 97               | 95                                     | 106              | 109                          | 105                   |
| 101              | 100                                    | 125              | 130                          | 124                   |
| 97               | 90                                     | 120              | 130                          | 120                   |
| 85               | 80                                     | 105              | 115                          | 105                   |
| 0.8-1.1          | 0.8-1.1                                | 0.7-0.9          | 0.7-0.9                      | 0.7-0.9               |
| 0.17             | 0.17                                   | 0.19             | 0.19                         | 0.19                  |
| 10 <sup>12</sup> | 10 <sup>12</sup>                       | 10 <sup>12</sup> | 10 <sup>13</sup>             | 10 <sup>12</sup>      |
| 10 <sup>13</sup> | 10 <sup>13</sup>                       | 10 <sup>13</sup> | 10 <sup>14</sup>             | 10 <sup>13</sup>      |
| High flow grade  | High impact grade<br>Light colors only | Standard grade   | Very high<br>heat resistance | Very high flowability |

| Typical values at 23 °C   | Unit                    | Test Method     | 358 N   |
|---|-------------------------|-----------------|---|
| <b>Properties</b>   |                         |                 |   |
| Symbol  | -                       | ISO 1043        | SAN   |
| Density   | g/cm <sup>3</sup>       | ISO 1183        | 1.08  |
| Reinforcing filler content: Glass fibers (GF)                       | %                       | -               |   |
| Moisture absorption, equilibrium 23 °C/50% r.h.                     | %                       | ISO 62          | 0.2   |
| <b>Processing</b>   |                         |                 |   |
| Method: Injection molding (M), Extrusion (E)                        | -                       | -               | M   |
| Melting temperature, DSC  | °C                      | ISO 3146        |   |
| Melt Volume Rate MVR (°C/kg)  | cm <sup>3</sup> /10 min | ISO 1133        | 22 (220/10)   |
| Pre-drying: °C/h  |                         |                 | 80/2-4  |
| Melt temperature, injection molding/extrusion                       | °C                      | -               | 220-260   |
| Mold temperature, injection molding                                 | °C                      | -               | 40-80   |
| Molding shrinkage, parallel/normal                                  | %                       | ISO 2577, 294-4 | 0.3-0.7   |
| <b>Flammability</b>   |                         |                 |   |
| UL 94 rating at 1.6 mm thickness                                    | class                   | UL 94           | HB  |
| <b>Mechanical Properties</b>  |                         |                 |   |
| Tensile modulus   | MPa                     | ISO 527-2       | 3700  |
| Yield stress (v=50 mm/min), Stress at break (B) (v=5 mm/min)        | MPa                     | ISO 527-2       | -/72  |
| Yield strain (v=50 mm/min)  | %                       | ISO 527-2       |   |
| Nominal strain at break (v=50 mm/min), Strain at break (v=5 mm/min) | %                       | ISO 527-2       | -/3   |
| Tensile creep modulus, 1000 h, strain ≤0.5%, 23 °C                  | MPa                     | ISO 899-1       |   |
| Flexural modulus  | MPa                     | ISO 178         |   |
| Flexural strength   | MPa                     | ISO 178         | 120   |
| Charpy unnotched impact strength +23 °C                             | kJ/m <sup>2</sup>       | ISO 179/1eU     | 16  |
| Charpy notched impact strength +23 °C                               | kJ/m <sup>2</sup>       | ISO 179/1eA     | 2   |
| Ball indentation hardness H 358/30 (1), H 961/30 (2)                | MPa                     | ISO 2039-1      | 165 (1)   |
| <b>Thermal Properties</b>   |                         |                 |   |
| Deflection temperature 1.8 MPa (HDT A)                              | °C                      | ISO 75-2        | 86  |
| Deflection temperature 0.45 MPa (HDT B)                             | °C                      | ISO 75-2        | 99  |
| Vicat softening temperature VST B50                                 | °C                      | ISO 306         | 106   |
| Max. service temperature (short cycle operation)                    | °C                      | -               | 85  |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)    | 10 <sup>-4</sup> /K     | DIN 53752       | 0.7   |
| Thermal conductivity  | W/(m·K)                 | DIN 52612       | 0.17  |
| <b>Electrical Properties</b>  |                         |                 |   |
| Relative permittivity at 100 Hz                                     |                         | IEC 60250       | 3   |
| Relative permittivity at 1 MHz                                      |                         | IEC 60250       | 2.7   |
| Dissipation factor at 100 Hz  | 10 <sup>-4</sup>        | IEC 60250       | 40  |
| Dissipation factor at 1 MHz   | 10 <sup>-4</sup>        | IEC 60250       | 70  |
| Volume resistivity  | Ω·m                     | IEC 60093       | 10 <sup>14</sup>  |
| Surface resistivity   | Ω                       | IEC 60093       | >10 <sup>15</sup>   |
| Electrical strength k20/P50, d=1 mm                                 | kV/mm                   | IEC 60243-1     |   |
|   |                         |                 | Easy-flow grade, suitable for moldings with very thin walls |

| 368 R   | 378 P   | 378 P G7  | 348 Q   |
|---|---|---|---|
| SAN   | SAN   | SAN - GF35  | SAN   |
| 1.08  | 1.08  | 1.36  | 1.08  |
|   |   | 35  |   |
| 0.2   | 0.3   | 0.25  | 0.2   |
| M, E  | M   | M, E  | M   |
| 10 (220/10)   | 20 (220/10)   | 4 (220/10)  | 19 (220/10)                                       |
| 80/2-4  | 80/2-4  | 80/2-4  | 80/2-4  |
| 220-260   | 220-260   | 220-260   | 220-260   |
| 40-80   | 40-80   | 60-80   | 40-80   |
| 0.3-0.7   | 0.3-0.7   | 0.1   | 0.3-0.7   |
| HB  | HB  | HB  | HB  |
| 3700  | 3800  | 12000   | 3600  |
| -/75  | -/75  | -/110   | -/70  |
| -/3   | -/3.5   | -/2   | -/2.5   |
| 125   | 135   | 150   | 115   |
| 18  | 19  | 17  | 14  |
| 2   | 2   | 4   | 1.5   |
| 165 (1)   | 175 (1)   | 240 (1)   | 160 (1)   |
| 88  | 89  | 104   | 86  |
| 100   | 101   | 108   | 99  |
| 106   | 107   | 109   | 105   |
| 85  | 85  | 90  | 85  |
| 0.7   | 0.7   | 0.25  | 0.7   |
| 0.17  | 0.17  | 0.19  | 0.17  |
| 3   | 3   | 3.5   | 2.9   |
| 2.7   | 2.7   | 3.2   | 2.8   |
| 40  | 50  | 70  | 40  |
| 70  | 80  | 100   | 70  |
| 10 <sup>14</sup>  | 10 <sup>14</sup>                                      | 10 <sup>14</sup>  | 10 <sup>14</sup>                                  |
| >10 <sup>15</sup>   | >10 <sup>15</sup>                                     | >10 <sup>15</sup>   | >10 <sup>15</sup>                                 |
| General-purpose grade with well-balanced properties, suitable for injection molding and extrusion | Easy-flow grade with enhanced resistance to chemicals | Glass-reinforced grade with very high stiffness and low thermal coefficient of linear expansion | Highly transparent grade with light natural color |

| Typical values at 23 °C   | Unit                    | Test Method     | GP 22  |
|---|-------------------------|-----------------|--|
| <b>Properties</b>   |                         |                 |  |
| Symbol  | -                       | ISO 1043        | ABS  |
| Density   | g/cm <sup>3</sup>       | ISO 1183        | 1.04   |
| Reinforcing filler content: Glass fibers (GF)                           | %                       | -               |  |
| Water absorption, equilibrium in water at 23 °C                         | %                       | ISO 62          | 1  |
| Moisture absorption, equilibrium 23 °C/50% r.h.                         | %                       | ISO 62          | 0.22   |
| <b>Processing</b>   |                         |                 |  |
| Method: Injection molding (M), Extrusion (E)                            | -                       | -               | M  |
| Melting temperature, DSC  | °C                      | ISO 3146        |  |
| Melt Volume Rate MVR (°C/kg)  | cm <sup>3</sup> /10 min | ISO 1133        | 19 (220/10)  |
| Pre-drying: °C/h  |                         |                 | 80/2-4   |
| Melt temperature, injection molding/extrusion                           | °C                      | -               | 220-260  |
| Mold temperature, injection molding                                     | °C                      | -               | 30-60  |
| Molding shrinkage, parallel/normal                                      | %                       | ISO 2577, 294-4 | 0.4-0.7  |
| <b>Flammability</b>   |                         |                 |  |
| UL 94 rating at 1.6 mm thickness  | class                   | UL 94           | HB   |
| UL 94 rating at 0.8 mm thickness  | class                   | UL 94           |  |
| Automotive materials (thickness d ≥ 1 mm)                               | -                       | FMVSS 302       | +  |
| <b>Mechanical Properties</b>  |                         |                 |  |
| Tensile modulus   | MPa                     | ISO 527-2       | 2300   |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)        | MPa                     | ISO 527-2       | 45/-   |
| Yield strain (v = 50 mm/min)  | %                       | ISO 527-2       | 2.6  |
| Nominal strain at break (v = 50 mm/min), Strain at break (v = 5 mm/min) | %                       | ISO 527-2       | 10/-   |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C                    | MPa                     | ISO 899-1       |  |
| Flexural modulus  | MPa                     | ISO 178         |  |
| Flexural strength   | MPa                     | ISO 178         | 65   |
| Charpy unnotched impact strength +23 °C                                 | kJ/m <sup>2</sup>       | ISO 179/1eU     | 180  |
| Charpy unnotched impact strength -30 °C                                 | kJ/m <sup>2</sup>       | ISO 179/1eU     | 100  |
| Charpy notched impact strength +23 °C                                   | kJ/m <sup>2</sup>       | ISO 179/1eA     | 22   |
| Charpy notched impact strength -30 °C                                   | kJ/m <sup>2</sup>       | ISO 179/1eA     | 8  |
| Izod notched impact strength +23 °C                                     | kJ/m <sup>2</sup>       | ISO 180/A       | 26   |
| Izod notched impact strength -30 °C                                     | kJ/m <sup>2</sup>       | ISO 180/A       | 8  |
| Ball indentation hardness H 358/30 (1), H 961/30 (2)                    | MPa                     | ISO 2039-1      | 97 (1)   |
| <b>Thermal Properties</b>   |                         |                 |  |
| Deflection temperature 1.8 MPa (HDT A)                                  | °C                      | ISO 75-2        | 80   |
| Deflection temperature 0.45 MPa (HDT B)                                 | °C                      | ISO 75-2        | 92   |
| Vicat softening temperature VST B50                                     | °C                      | ISO 306         | 96   |
| Max. service temperature (short cycle operation)                        | °C                      | -               | 80   |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)        | 10 <sup>-4</sup> /K     | DIN 53752       | 0.8-1.1  |
| Thermal conductivity  | W/(m · K)               | DIN 52612       | 0.17   |
| <b>Electrical Properties</b>  |                         |                 |  |
| Relative permittivity at 100 Hz   |                         | IEC 60250       | 2.9  |
| Relative permittivity at 1 MHz  |                         | IEC 60250       | 2.8  |
| Dissipation factor at 100 Hz  | 10 <sup>-4</sup>        | IEC 60250       | 48   |
| Dissipation factor at 1 MHz   | 10 <sup>-4</sup>        | IEC 60250       | 79   |
| Volume resistivity  | Ω · m                   | IEC 60093       | 10 <sup>13</sup>   |
| Surface resistivity   | Ω                       | IEC 60093       | 10 <sup>13</sup>   |
| Electrical strength k20/P50, d = 1 mm                                   | kV/mm                   | IEC 60243-1     |  |
| <b>Footnotes</b>  |                         |                 | GP 22 Q459,<br>Standard grade for<br>interior applications |
| 1) = thickness 0.6-0.8 mm instead of 1 mm                               |                         |                 |  |

# Terluran® HH

ABS grades

| GP 35                                  | HH 106                                   | HH 112                                   |
|--|--|--|
| ABS                                    | ABS                                      | ABS                                      |
| 1.04                                   | 1.05                                     | 1.05                                     |
| 0.95                                   |  |  |
| 0.24                                   |  |  |
| M                                      | M  | M  |
| -                                      | -  | -  |
| 34 (220/10)                            | 7 (220/10)                               | 6 (220/10)                               |
| 80/2-4                                 | 80/2-4                                   | 80/2-4                                   |
| 220-260                                | 230-270                                  | 230-270                                  |
| 30-60                                  | 30-60                                    | 30-60                                    |
| 0.4-0.7                                | 0.4-0.7                                  | 0.4-0.7                                  |
| HB                                     | HB                                       | HB                                       |
| +                                      | +  | +  |
| 2300                                   | 2400                                     | 2700                                     |
| 44/-                                   | 51/-                                     | 58/-                                     |
| 2.4                                    | 3  | 3.1                                      |
| 12/-                                   | 9/-                                      | 8/-                                      |
| 65                                     | 72                                       | 81                                       |
| 125                                    | 190                                      | 140                                      |
| 90                                     | 100                                      | 80                                       |
| 19                                     | 17                                       | 12                                       |
| 7                                      | 7  | 5  |
| 22                                     | 19                                       | 12                                       |
| 7                                      | 7  | 5  |
| 99 (1)                                 | 102 (1)                                  | 114 (1)                                  |
| 78                                     | 106                                      | 109                                      |
| 89                                     | 111                                      | 113                                      |
| 95                                     | 106                                      | 112                                      |
| 80                                     | 85                                       | 90                                       |
| 0.8-1.1                                | 0.8-1.1                                  | 0.7-1.1                                  |
| 0.17                                   | 0.17                                     | 0.17                                     |
| 10 <sup>13</sup>                       | 10 <sup>13</sup>                         | 10 <sup>13</sup>                         |
| Easy flowing grade,<br>electroplatable | 39 <sup>1)</sup><br>Heat resistant grade | 41 <sup>1)</sup><br>Heat resistant grade |

| Typical values at 23 °C   | Unit                    | Test Method     | NM-11/19           |
|---|-------------------------|-----------------|--------------------|
| <b>Properties</b>   |                         |                 |                    |
| Symbol  | -                       | ISO 1043        | ABS/PA             |
| Density   | g/cm <sup>3</sup>       | ISO 1183        | 1070               |
| Reinforcing filler content: Glass fibers (GF)                           | %                       | -               | -                  |
| Moisture absorption, equilibrium 23 °C/50% r.h.                         | %                       | ISO 62          | 1.4                |
| <b>Processing</b>   |                         |                 |                    |
| Method: Injection molding (M), Extrusion (E)                            | -                       | -               | M                  |
| Melting temperature, DSC  | °C                      | ISO 3146        |                    |
| Melt Volume Rate MVR (240 °C, 10 kg)                                    | cm <sup>3</sup> /10 min | ISO 1133        | 30                 |
| Pre-drying: °C/h  |                         |                 | 80/4               |
| Melt temperature, injection molding/extrusion                           | °C                      | -               | 240-280            |
| Mold temperature, injection molding                                     | °C                      | -               | 40-80              |
| Molding shrinkage, parallel/normal                                      | %                       | ISO 2577, 294-4 | 0.6-0.8            |
| <b>Flammability</b>   |                         |                 |                    |
| UL 94 rating at 1.6 mm thickness  | class                   | UL 94           | HB                 |
| UL 94 rating at 0.8 mm thickness  | class                   | UL 94           | HB                 |
| Automotive materials (thickness d ≥ 1 mm)                               | -                       | FMVSS 302       | +                  |
| <b>Mechanical Properties</b>  |                         |                 |                    |
| Tensile modulus   | MPa                     | ISO 527-2       | 2000               |
| Yield stress (v = 50 mm/min), Stress at break (B) (v = 5 mm/min)        | MPa                     | ISO 527-2       | 43                 |
| Yield strain (v = 50 mm/min)  | %                       | ISO 527-2       | 3.5                |
| Nominal strain at break (v = 50 mm/min), Strain at break (v = 5 mm/min) | %                       | ISO 527-2       | 35                 |
| Tensile creep modulus, 1000 h, strain ≤ 0.5%, +23 °C                    | MPa                     | ISO 899-1       | -                  |
| Flexural modulus  | MPa                     | ISO 178         | 1800               |
| Flexural strength   | MPa                     | ISO 178         | 62                 |
| Charpy unnotched impact strength +23 °C                                 | kJ/m <sup>2</sup>       | ISO 179/1eU     | NB                 |
| Charpy unnotched impact strength -30 °C                                 | kJ/m <sup>2</sup>       | ISO 179/1eU     | NB                 |
| Charpy notched impact strength +23 °C                                   | kJ/m <sup>2</sup>       | ISO 179/1eA     | 65                 |
| Charpy notched impact strength -30 °C                                   | kJ/m <sup>2</sup>       | ISO 179/1eA     | 15                 |
| Izod notched impact strength +23 °C                                     | kJ/m <sup>2</sup>       | ISO 180/A       | 65                 |
| Izod notched impact strength -30 °C                                     | kJ/m <sup>2</sup>       | ISO 180/A       | 15                 |
| Ball indentation hardness H 358/30 (1), H961/30 (2)                     | MPa                     | ISO 2039-1      | 86 (1)             |
| Rockwell  | class                   | ISO 2039-2      | 103                |
| <b>Thermal Properties</b>   |                         |                 |                    |
| Deflection temperature 1.8 MPa (HDT A)                                  | °C                      | ISO 75-2        | 65                 |
| Deflection temperature 0.45 MPa (HDT B)                                 | °C                      | ISO 75-2        | 85                 |
| Vicat softening temperature VST B50                                     | °C                      | ISO 306         | 102                |
| Max. service temperature (short cycle operation)                        | °C                      | -               | -                  |
| Thermal coefficient of linear expansion, long./trans. (23-80 °C)        | 10 <sup>-4</sup> /K     | DIN 53752       | 1                  |
| Thermal conductivity  | W/(m · K)               | DIN 52612       | -                  |
| <b>Electrical Properties</b>  |                         |                 |                    |
| Relative permittivity at 100 Hz   |                         | IEC 60250       | 3.3                |
| Relative permittivity at 1 MHz  |                         | IEC 60250       | 2.9                |
| Dissipation factor at 100 Hz  | 10 <sup>-4</sup>        | IEC 60250       | -                  |
| Dissipation factor at 1 MHz   | 10 <sup>-4</sup>        | IEC 60250       | 150                |
| Volume resistivity  | Ω · m                   | IEC 60093       | > 10 <sup>13</sup> |
| Surface resistivity   | Ω                       | IEC 60093       | 10 <sup>14</sup>   |
| CTI, solution A   | -                       | IEC 60112       | 600                |
| Electrical Strength k20/P50, d = 1 mm                                   | kV/mm                   | IEC 60243-1     | -                  |

| NG-02            | NG-04            |
|------------------|------------------|
| ABS/PA           | ABS/PA           |
| 1120             | 1200             |
| 8                | 20               |
| 1.3              | 1.1              |
| M                | M                |
| 25               | 15               |
| 80/4             | 80/4             |
| 240-280          | 240-280          |
| 40-80            | 40-80            |
| 0.3-0.5          | 0.1-0.3          |
| HB               | HB               |
| HB               | HB               |
| +                | +                |
| 3200             | 5400             |
| 45               | 60               |
| 2.7              | 2.3              |
| 3.5              | 3.2              |
| -                | -                |
| 2800             | 4500             |
| 80               | 115              |
| 35               | 30               |
| 25               | 25               |
| 8                | 8                |
| 3                | 5                |
| 6                | 9                |
| 3                | 5                |
| 95 (1)           | 107 (1)          |
| 103              | 108              |
| 80               | 100              |
| 105              | 164              |
| 108              | 114              |
| -                | -                |
| 0.6              | 0.4              |
| -                | -                |
| 3.4              | 3.6              |
| 2.9              | 2.9              |
| -                | -                |
| 130              | 130              |
| 10 <sup>13</sup> | 10 <sup>13</sup> |
| 10 <sup>14</sup> | 10 <sup>14</sup> |
| 600              | 600              |
| -                | -                |

| Properties                          | Unit              | Test Method   | Basotect® G |
|-------------------------------------|-------------------|---------------|-------------|
| Density                             | kg/m <sup>3</sup> | EN ISO 845    | 8-11        |
| Sound absorption at 50 mm and 200Hz | %                 | ISO 10534     | ≥90         |
| Application temperature             | °C                |               | up to 240   |
| Flammability at 11 mm thickness     |                   | FMVSS 302     | fulfilled   |
| Compressive strength, 40%           | kPa               | EN ISO 3386-1 | 6-11        |

| Properties  | Unit                                  | Test Method                   | Core Density kg/m <sup>3</sup> |
|---|---------------------------------------|-------------------------------|--------------------------------|
|   |                                       |                               | <b>20</b>                      |
| Tensile strength  | kPa                                   | DIN EN ISO 1798               | 300                            |
| Elongation at break   | %                                     | DIN EN ISO 1798               | 40                             |
| Compressive stress  | kPa                                   | According to ISO 844          |                                |
| 10% deformation   |                                       |                               | 70                             |
| 25% deformation   |                                       |                               | 80                             |
| 50% deformation   |                                       |                               | 150                            |
| Compression set (50%, 22 h, 23 °C) 24 h after stress release          | %                                     | DIN EN ISO 1856 (Procedure C) | 30                             |
| Cushioning elasticity   | %                                     | DIN 53512                     | 46                             |
| Compressive stress CV <sub>40</sub>                                   | kPa                                   | DIN EN ISO 3386               | 50                             |
| Cushioning performance  | -                                     | ISO 4651                      | 2.8                            |
| Spec. Absorption with h/d=10  | kNm/m <sup>3</sup>                    | ISO 4651                      | 90                             |
| Static surface loading 5%/100 d                                       | kPa                                   | DIN 53421                     | 12                             |
| Head distortion temperature (after 4 d/110 °C)                        | %                                     | According to DIN ISO 2796     | <2                             |
| Thermal conductivity  | W · m <sup>-1</sup> · K <sup>-1</sup> | DIN 52612                     | 0.036                          |
| Water absorbance by 1 day   | Vol.-%                                | According to DIN 53428        | <1                             |
| Surface resistance (23°C/50 %)  | Ω                                     | DIN IEC 6093                  | ≤10 <sup>12</sup>              |
| <b>Flammability</b>   |                                       |                               |                                |
| Neopolen® P board   | 10 mm                                 | DIN 4102 T1                   | B3                             |
| Neopolen® P board   | 20 mm                                 | DIN 4102 T1                   | B3                             |
| Neopolen® P board   | 30 mm                                 | DIN 4102 T1                   | B3/B2 <sup>1)</sup>            |
| Neopolen® P board   | 13 mm                                 | FMVSS 302                     | -                              |
| Neopolen® P board   | 8.4 mm                                | UL 94                         | -                              |
| Neopolen® P board   | 13 mm                                 | UL 94                         | -                              |
| <b>Footnotes</b>  |                                       |                               |                                |
| 1) B3 (easily flammable)<br>B2 (flammable): in the edges of the board |                                       |                               |                                |

**Basotect® TG**

flexible, open cell foam

7-11

≥90

up to 240

fulfilled

4-6

| Core Density kg/m <sup>3</sup> | Core Density kg/m <sup>3</sup> | Core Density kg/m <sup>3</sup> | Core Density kg/m <sup>3</sup> |
|--------------------------------|--------------------------------|--------------------------------|--------------------------------|
| 40                             | 60                             | 80                             | 100                            |
| 600                            | 880                            | 1150                           | 1410                           |
| 33                             | 27                             | 23                             | 20                             |
| 180                            | 310                            | 480                            | 680                            |
| 220                            | 370                            | 550                            | 750                            |
| 330                            | 550                            | 810                            | 1100                           |
| 28                             | 26                             | 25                             | 25                             |
| 31                             | 30                             | -                              | -                              |
| 200                            | 400                            | -                              | -                              |
| 2.7                            | 2.6                            | -                              | -                              |
| 320                            | 700                            | -                              | -                              |
| 23                             | 92                             | -                              | -                              |
| <2                             | <2                             | <2                             | <2                             |
| 0.038                          | 0.040                          | 0.043                          | 0.046                          |
| <1                             | <1                             | <1                             | <1                             |
| ≤10 <sup>12</sup>              | ≤10 <sup>12</sup>              | ≤10 <sup>12</sup>              | ≤10 <sup>12</sup>              |
| B3                             | B3/B2 <sup>1)</sup>            | B2                             | B2                             |
| B2                             | B2                             | B2                             | B2                             |
| B2                             | B2                             | B2                             | B2                             |
| fulfilled                      | fulfilled                      | fulfilled                      | fulfilled                      |
| -                              | -                              | HBF                            | HBF                            |
| -                              | HBF                            | HBF                            | HBF                            |

| Property   | Unit                 | Test Method                          | 1710/1712    |
|--|----------------------|--------------------------------------|--------------|
| Color  |                      |                                      | white/black  |
| Density  | kg/m <sup>3</sup>    | DIN EN ISO 845                       | 32 +/- 4     |
| Tensile strength   | kPa                  | DIN 53571                            | 160          |
| Elongation at break  | %                    | DIN 53571                            | 55           |
| Resilience   | %                    | DIN 53512                            | 45           |
| Compressive stress   |                      |                                      |              |
| 25% strain at 23 °C  | kPa                  | DIN 53577                            | 45           |
| 50% strain at 23 °C  | kPa                  | DIN 53577                            | 110          |
| Compression set at 23 °C after maintenance of 25% strain for 22 hours (25%/23 °C/22 h) | %                    | analogous to DIN EN ISO 1865         |              |
| immediately after removal of load  |                      |                                      | 16           |
| 30 min after removal of load   |                      |                                      | 13           |
| 6 h after removal of load  |                      |                                      | 9            |
| 24 h after removal of load   |                      |                                      | 6            |
| Compression set at 23 °C after maintenance of 50% strain for 22 hours (25%/23 °C/22 h) | %                    | analogous to DIN EN ISO 1865         |              |
| immediately after removal of load  |                      |                                      | 35           |
| 30 min after removal of load   |                      |                                      | 32           |
| 6 h after removal of load  |                      |                                      | 27           |
| 24 h after removal of load   |                      |                                      | 22           |
| Fatigue test, 80000 load cycles  | %                    | DIN EN ISO 3385                      |              |
| Change in thickness  |                      |                                      | 2.4          |
| Relative increase in indentation hardness  |                      |                                      | 2.3          |
| Heat distortion temperature  | °C                   | BASF method                          | 85           |
| Dynamic stiffness of 20 min specimen   | MN/m <sup>3</sup>    | DIN EN 29052 Part 1                  | <30          |
| Permeability to water vapor<br>(relative water vapor resistivity)                      | g/m <sup>2</sup> · d | DIN 52615<br>measured on 60 mm board | 0.15<br>4000 |
| Water absorption (volume fraction)   | %                    | DIN 53428                            |              |
| after 1 day  |                      |                                      | 0.6          |
| after 7 days   |                      |                                      | 2.3          |
| Water absorption (volume fraction)   | %                    | ASTM-C 272                           |              |
| after 1 day  |                      |                                      | 1.0          |
| after 7 days   |                      |                                      | 1.5          |
| Thermal conductivity at 10 °C  | W/m · K              | DIN 52612                            | 0.04         |

1700/1702

white/black

22 +/- 4

110

43

-

30

80

23

19

14

4

49

42

37

19

-

-

85

-

-

-

0.4

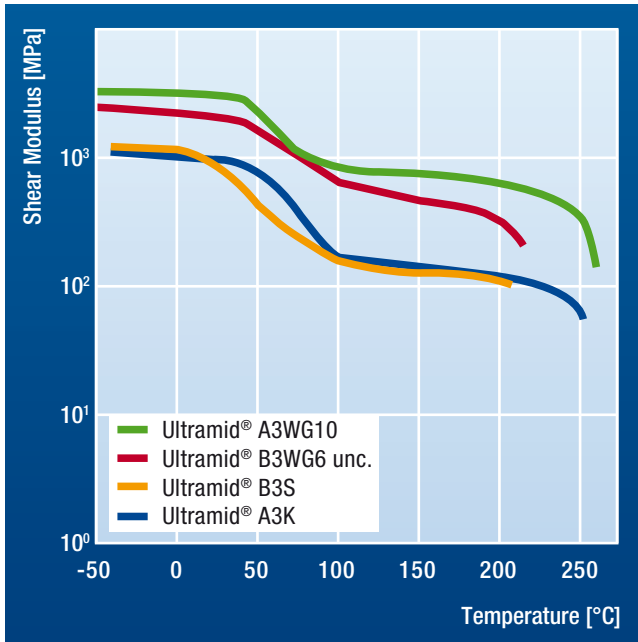
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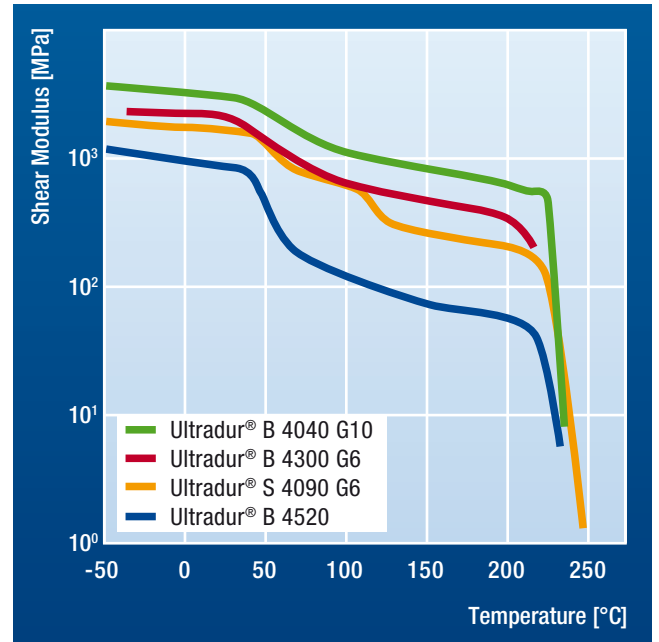
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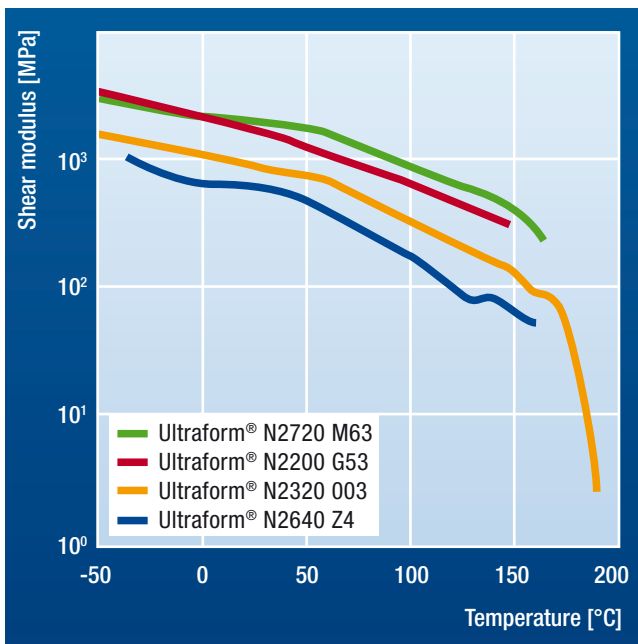
# Shear modulus versus temperature



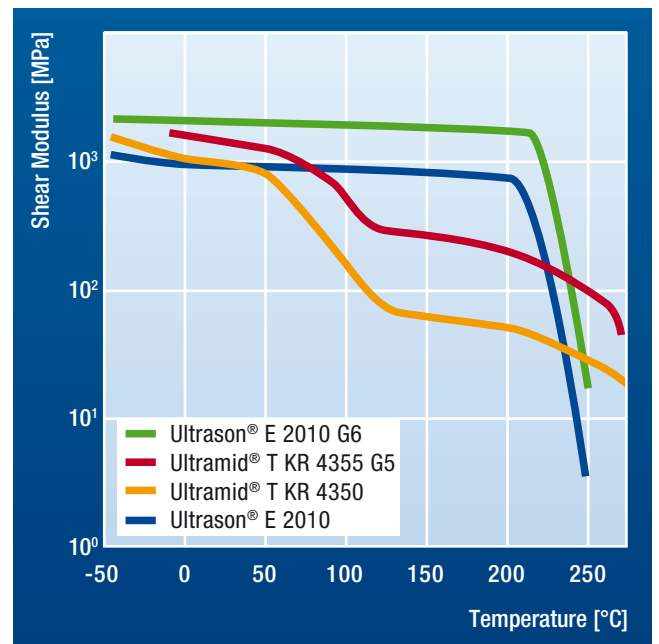
Ultramid®



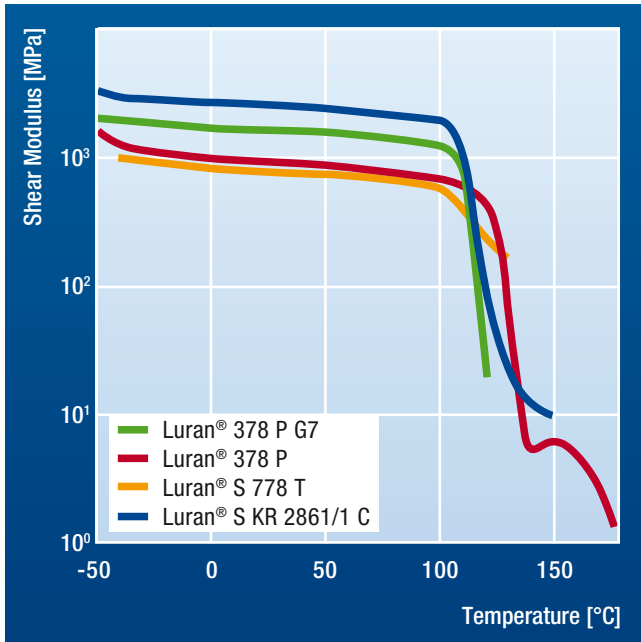
Ultradur®



Ultraform®

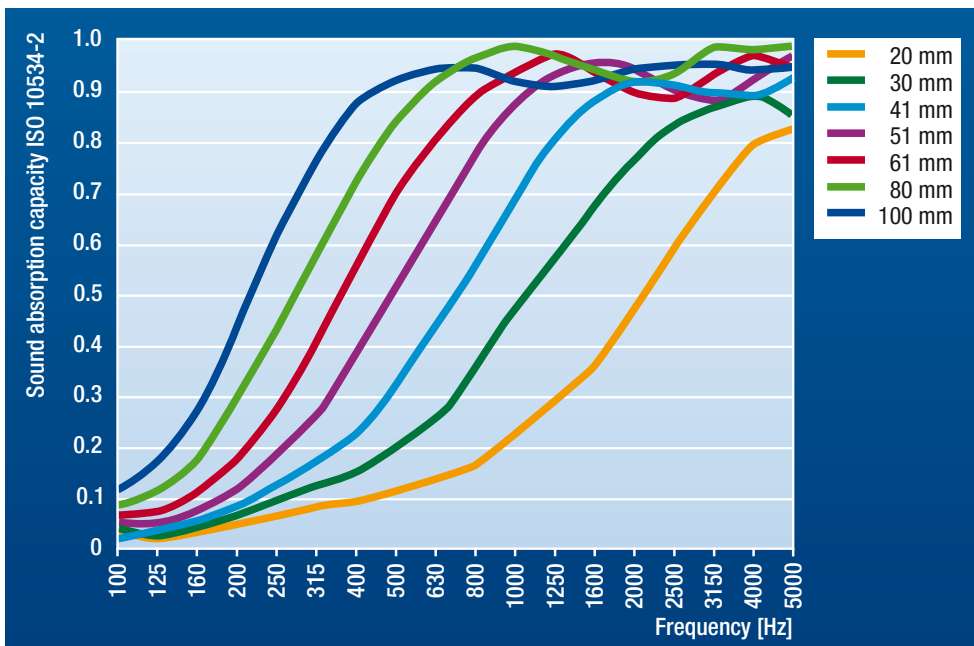


Ultrason® and Ultramid® T



Luran® and Luran® S

Sound absorption capacity



Basotect®

# List of Applications

|   |  |
|---|--|
| Air nozzles                                     | Terblend® N NM-19/NM-11, Luran® S KR 2863 C  |
| Air intake manifolds                            | Ultramid® B3WG6 bk 564 BGWV, B3WG6 bk 23210 GP/A3WG7 bk 23210                                      |
| Airbag housings (reaction cans)                 | Ultramid® B3ZG6 bk B3ZG8, 30564 bk 20560   |
| Arm rest  | Neopolen® P  |
| Ball sockets (for gear selector lever)          | Ultramid® T KR 4350  |
| Ball sockets shells                             | Ultraform® N2320 003 unc., bk  |
| Battery cover                                   | Neopolen® P  |
| Bearing elements                                | Ultramid® A3W unc., Ultraform® N2320 003 unc., bk  |
| Blower wheels (heating/air-conditioning system) | Ultraform® N2720 M63 unc.  |
| Brush holders (for alternators/electric motors) | Ultramid® T KR 4355 G5   |
| Bumber core                                     | Neopolen® P  |
| Bumpers, ready-colored or off-line painted      | Terblend® N NM-13  |
| Cab-step trim                                   | Luran® S 797 S   |
| Cable binders                                   | Ultramid® A3W unc.   |
| Cable ducts                                     | Ultramid® B3ZG3 bk 30564   |
| Central-locking housings                        | Ultradur® S 4090 G6  |
| Centre consoles                                 | Terluran® GP-22/HH-106/HH-112, Terblend® N NM-11/NM-19   |
| Chain guides                                    | Ultramid® A3W bk 464   |
| Charge air intercooler                          | Ultramid® A3WG10 HS bk 20560   |
| Clips   | Ultraform® N2320 003 unc., bk/N2640Z4 unc.   |
| Coil formers                                    | Ultramid® A3W unc.   |
| Connector                                       | Ultramid® T KR 4355 G5/T KR 4357 G6  |
| Control-unit housings                           | Ultradur® B 4300 G6/S4090 G6   |
| Cowl vent grills, painted                       | Terluran® HH-106/HH-112  |
| Cowl vent grills, unpainted (ready-colored)     | Luran® S 778 T/S 777 K/S KR 2861/1 C/S KR 2863 C   |
| Cylinder-head covers                            | Ultramid® A3WG7 20560, A3WGM53 bk 20560, B3WG7 bk 564  |
| Defrost grill, defrost panel (interior)         | Terblend® N NG-02  |
| Direction indicator housings                    | Luran® S 778 T/S 777 K   |
| Door extensions                                 | Luran® S KR 2861/1 C/KR 2863 C/KR 2864 C   |
| Door extensions (truck cab-door)                | Luran® S 797 S/S KR 2861/1 C/KR 2836 C/KR 2861 C   |
| Door handles                                    | Ultradur® B 4040 G6, Ultramid® B3WGM24 bk 23228  |
| Door-mirror bases/mirror-glass carriers         | Ultradur® B 4040 G6, B4040 G 10 bk 15029/Luran® S KR 2861/1 C                                      |
| Door-mirror gaskets                             | Neopolen® E  |
| Door-mirror housing, painted                    | Terluran® HH-106/HH-112, Ultramid® B3WGM24 bk 23228  |
| Door-mirror housings, unpainted (ready-colored) | Luran® S 778 T/S 777 K/S KR 2861/1 C/S KR 2863 C   |
| Draught deflectors (truck cab)                  | Luran® S 797 S   |
| Dunnage trays                                   | Neopolen® P  |
| Emblems   | Luran® S 778 T   |
| Engine covers                                   | Ultramid® B3WGM24 bk 23228, B3GM24 alusilv. 32108, Basotect® G/TG                                  |
| Fan shrouds                                     | Ultramid® B3WG6 bk 564, BG40GM45 HS bk 130   |
| Fan wheels (engine cooling)                     | Ultramid® A3WG6, bk 564, B3WG6 unc., B3WG5 unc.  |
| Fasteners                                       | Ultraform® N2320 003 unc., bk/N2640Z4 unc.   |
| Floor spacer                                    | Neopolen® P  |
| Fog lamp reflectors                             | Ultrason® E 2010 Q26 unc./E 2010 bk Q31  |
| Friction bearings                               | Ultramid® A3W unc.   |
| Fuel filler caps                                | Ultraform® N2320 003 unc., bk/S1320 003 unc./S2320 003 unc., bk                                    |
| Fuel filter housings                            | Ultraform® N2320 003 unc., bk/S1320 003 unc./S2320 003 unc., bk                                    |
| Fuel level indicators                           | Ultraform® N2320 003 unc., bk/S1320 003 unc./S2320 003 unc., bk                                    |
| Fuel rails                                      | Ultramid® A3WG6 unc., bk 564/B3ZG6 bk 30564  |
| Fuel-pump impellers                             | Ultraform® N2720 M63 unc.  |
| Fuel pump reservoir                             | Ultraform® N2320 003 unc., bk/S1320 003 unc./S2320 003 unc., bk/<br>S1320 0021 unc./N2200 G53 unc. |
| Fuel tank modules                               | Ultraform® S1320 003 unc./S2320 003 unc., bk/S1320 0021 unc./N2200 G53 unc.                        |
| Fuse encapsulation                              | Ultrason® E 2010 unc.  |
| Fuseboxes                                       | Ultradur® B 4300 G6  |

# List of Applications

|  |  |
|--|--|
| Gear selector housings                         | Ultramid® A3WG6, bk 564/B3WG6, bk 564  |
| Gear wheels                                    | Ultraform® N2320 003 unc., bk  |
| Glove compartments                             | Terluran® GP-22/HH-106, Luran® 378 P, Terblend® N NM-11/NM-19  |
| Connector                                      | Ultramid® T KR 4355 G5/T KR 4357 G6  |
| Hat tack                                       | Neopolen® P  |
| Headlamp bezels                                | Ultradur® B 4520, B 4560, Ultrason® E unc./bk  |
| Headlamp housings                              | Ultramid® B3WG6, bk 564, Luran® 378 P G7, Ultrason® E 2010 bk 10018 Q25                                    |
| Headlamp reflectors                            | Ultrason® E 2010 Q26 unc./E 2010 unc.  |
| Head liner                                     | Neopolen® P  |
| Head rest                                      | Neopolen® P  |
| Heat shields                                   | Basotect® G/TG   |
| Heating and air-conditioning system parts      | Terluran® HH-112, Terblend® N NM-19  |
| Hood liners                                    | Basotect® G/TG   |
| Instrument panel parts/trim (unpainted)        | Terblend® N NM-19/NG-02  |
| Instrument panel parts/trim (painted)          | Terluran® GP-22/HH-106/HH-112/HI-10, Terblend® N NM-11   |
| Instrument panel carrier                       | Ultradur® S 4090 GX,   |
| Instrument surrounds                           | Terluran® HH-112, Terblend® N NM-19  |
| Intake manifolds                               | Ultramid® B3WG6 bk 564 BGWV, B3WG6 bk 23210 GP, A3WG7 bk 23210   |
| Intake-air sensors                             | Ultramid® T KR 4357 G6   |
| Interior door-trim                             | Terluran® HI-10/GP-22, Terblend® N NM-11/NM-19   |
| Interior trim                                  | Terluran® GP-22, Terblend® N NM-19/NM-11   |
| Intermediate flange (cylinderhead-to-manifold) | Ultramid® A3EG10 unc., A3WG7 bk 20560  |
| Knee bolster                                   | Neopolen® P  |
| Lamp housings                                  | Luran® S 778 T/777 K   |
| Lamp modules (interior)                        | Terblend® N NM-19  |
| Levers   | Ultramid® B3S unc., bk 464   |
| Loudspeaker grills                             | Ultraform® W 2320 003 unc., bk/W 2320 U03 unc./W2320 003 LEV unc./W2320 U03 LEV unc.,<br>Terblend® N NM-19 |
| Mirror housings (exterior)                     | Luran® S 778 T, KR 2861/1 C, Terluran® HH-106/HH-112, Ultradur® S  |
| Mirror housings (interior)                     | Luran® S KR 2863 C, Terblend® N NM-19  |
| Mirror actuators                               | Ultraform® N2320 003 unc., bk  |
| Mood liners                                    | Basotect® T/TG   |
| Motorcycle fairing parts                       | Luran® S 777 K, Terblend® N NM-19  |
| Oil pans (sumps)                               | Ultramid® A3WG7 bk 20560, A3HG7 bk 20560 Q17   |
| Oil-flow control pistons (hydraulic systems)   | Ultrason® KR 4113/E 2010 G6 unc.   |
| Panels (exterior)                              | Luran® S KR 2863 C   |
| Pedals   | Ultramid® B3G8 bk 564  |
| Pillar liner                                   | Neopolen® P  |
| Pillar trim (exterior), A/B/C pillars          | Luran® S 778 T/S 777 K   |
| Pillar trim (interior), A/B/C pillars          | Terluran® HH-106/HH-112/HI-10, Terblend® N NM-11/NM-19   |
| Plug connectors                                | Ultramid® A3K unc., bk 464, Ultradur® B 4520/B 4300 G6   |
| Pump housings (window washer systems)          | Ultramid® T KR 4355 G7   |
| Radiator grills                                | Luran® S 778 T/777 K/KR 2861/1 C/KR 2863 C   |
| Radiator grills, painted                       | Terluran® HH-106, Ultramid® B3EG6 bk 564   |
| Radiator grills, unpainted (ready-colored)     | Luran® S 778 T/S 777 K/S KR 2861/1 C UV/S KR 2863 CUV  |
| Radiator tanks                                 | Ultramid® A3HG6 HR bk 23591  |
| Rear lamp housings (exterior)                  | Terluran® HH-112/HH-106, Luran® S 778 T  |
| Rear seat                                      | Neopolen® P  |
| Rear spoiler                                   | Luran® S KR 2864 C   |
| Rear trim panels, unpainted (ready-colored)    | Luran® S 778 T/S 777 K/S KR 2861/1 C UV/KR 2863C UV  |
| Reflectors                                     | Luran® 378 P (see also "Headlamp reflectors")  |
| Retaining clips                                | Ultramid® B3S unc., bk 464/B3L unc., sw 464, Ultraform® N2320 003 unc., w, bk/N 2640 Z4 unc.               |
| Rocker cover                                   | Ultramid® A3WGM53/A3WG7 bk 20560   |
| Roller bearing cages                           | Ultramid® A3HG6 HR bk 23591/A3W unc.   |
| Roll over valves                               | Ultraform® S1320 003 unc./S2320 003 unc., bk   |

# List of Applications

|  |  |
|--|--|
| Roofbox carrier                              | Terblend® N NG-04  |
| Roof boxes (interior)                        | Terblend® N NM-19/NM-11/NG-02, Luran® S KR 2863 C            |
| Safety belt parts                            | Ultraform® N2320 003 unc., bk/S2320 003 unc., bk             |
| Sealing pillars                              | Neopolen® E  |
| Seat adjustment levers and rails             | Ultraform® N2320 003 unc., bk/S2320 003 unc., bk             |
| Seat backs                                   | Ultramid® B3G10 SI bk, Terblend® N NM-19/NG-02               |
| Seat bases                                   | Terluran® HI-10  |
| Seat reinforcement                           | Neopolen® P  |
| Seat trim parts                              | Terblend® N NM-11/19   |
| Servo-motor housings                         | Ultradur® B 4300 G6  |
| Shock absorber system                        | Neopolen® P  |
| Side impact protection                       | Neopolen® P  |
| Sliding elements                             | Ultraform® N2320 003 unc., bk                                |
| Sockets                                      | Neopolen® E  |
| Snap-fits, snap-fitting elements             | Ultraform® N2320 003 unc., bk/N2640 Z4 unc.                  |
| Speed sensors (wheel)                        | Ultramid® T KR 4357 G6                                       |
| Splash baffles (in fuel tank)                | Ultraform® S1320 003 unc./S1320 0021 unc.                    |
| Spring elements                              | Ultraform® N2320 003 unc., bk                                |
| Stabilizer links                             | Ultraform® N2200 G53 unc.                                    |
| Steering column cover                        | Terluran® GP-22, Terblend® N NM-11/NM-19                     |
| Steering column controls                     | Ultramid® B3 EG3 bk 564                                      |
| Steering column pads                         | Neopolen® P  |
| Steering wheel                               | Neopolen® P  |
| Sun visor                                    | Neopolen® P  |
| Tail-lamp housings                           | Terluran® HH-112/HH-106, Luran® S 778 T                      |
| Tail-lamp lenses                             | Luran® 378 P   |
| Tailgate spoilers, unpainted (ready-colored) | Luran® S KR 2861/1 C/S KR 2863 C                             |
| Thermostat housings                          | Ultramid® A3HG6 HR bk 23591                                  |
| Tool caddy                                   | Neopolen® P  |
| Transmission parts                           | Ultrason® E 2010 G6  |
| Transmission tunnels                         | Basotect® G/TG   |
| Truck exterior parts (driving cab)           | Luran® S 797 S   |
| Trunk panel                                  | Neopolen® P  |
| Tunnel cover                                 | Neopolen® P  |
| Valve bodies                                 | Ultramid® T KR 4355 G5                                       |
| Valve covers                                 | Ultramid® A3WGM53 bk 20560/A3WG7 bk 20560                    |
| Wheel covers                                 | Ultramid® B3M4Q94 gr. 22319, Terluran® 949, Terluran® HH-112 |
| Wheel house liner                            | Neopolen® P, Neopolen® E                                     |
| Window lifter-motor housings                 | Ultradur® B 4300 G4/G6                                       |
| Windscreen wiper arms and blades             | Ultradur® B 4040 G6  |
| Windscreen wiper-drive housings              | Ultradur® B 4040 G10   |

# Plastics from BASF

## The product range at a glance

|                             |   |                      |
|-----------------------------|---|----------------------|
| Autofroth®*                 | Polyurethane system   | PU                   |
| Basotect®                   | Foam from melamine resin  | MF                   |
| Capron®                     | Polyamide   | PA                   |
| Cellasto®*                  | Components made from microcellular PU elastomers                        | PU                   |
| CeoDS®*                     | Multifunctional composites made from Cellasto components                | PU                   |
| Colorflex®                  | Service for the self-coloring of polystyrene and ABS                    |                      |
| CosyPUR®*                   | PU soft foam system   | PU                   |
| Ecoflex®                    | Biodegradable plastic/polyester   |                      |
| Ecovio®                     | Biodegradable plastic/polyester on the basis of renewable raw materials |                      |
| Elastan®*                   | Systems for sports field surfaces                                       | PU                   |
| Elastoclear®*               | PU system   | PU                   |
| Elastocoat®*                | PU systems as coating and casting compounds                             | PU                   |
| Elastocoast®*               | PU systems as coating and casting compounds                             | PU                   |
| Elastocore®*                | PU cast system  | PU                   |
| Elastoflex®*                | Soft polyurethane foam systems  | PU                   |
| Elastofoam®*                | Soft integral polyurethane foam systems                                 | PU                   |
| Elastollan®*                | Thermoplastic polyurethane elastomers                                   | PU                   |
| Elastolit®*                 | Rigid integral polyurethane foam systems and RIM systems                | PU                   |
| Elastonat®*                 | Flexible integral polyurethane systems                                  | PU                   |
| Elastopan®*                 | Polyurethane shoe foam systems  | PU                   |
| Elastopir®*                 | Rigid polyurethane foam systems   | PU                   |
| Elastopor®*                 | Rigid polyurethane foam systems   | PU                   |
| Elastoskin®*                | Flexible integral polyurethane systems                                  | PU                   |
| Elastospray®*               | PU spray foam system  | PU                   |
| Elasturan®*                 | Systems as cold curing cast elastomers                                  | PU                   |
| Lupranat®*                  | Diisocyanates   | PU                   |
| Lupranol®*                  | Polyether polyols   | PU                   |
| Lupranol®* Balance          | Polyether polyols   | PU                   |
| Lupraphen®*                 | Polyether polyols   | PU                   |
| Luran®                      | Styrene/acrylonitrile copolymer   | SAN                  |
| Luran® S                    | Acrylonitrile/styrene/acrylate polymer                                  | ASA                  |
| Luran® SC                   | Acrylonitrile/styrene/acrylate polymer and polycarbonate                | ASA+PC               |
| Miramid®                    | Polyamide   | PA 6, PA 66          |
| Neopolen® E                 | Polyethylene foam   | EPE                  |
| Neopolen® P                 | Polypropylene foam  | EPP                  |
| Neopor®                     | Expandable polystyrene  | PS-E                 |
| Palusol®                    | Alkali silicate   |                      |
| PERMASKIN®                  | System for coating components   |                      |
| Peripor®                    | Expandable polystyrene  | PS-E                 |
| PlasticsPortal™             | Web-based e-Commerce platform for solutions and information             |                      |
| Pluracol®**                 | Polyether polyols   | PU                   |
| Polystyrol, impact-modified | Polystyrene HIPS  | PS-I                 |
| Polystyrol, standard        | Polystyrene GPPS  | PS                   |
| SPS™*                       | Steel-polyurethane systems  | PU                   |
| Styrodur® C                 | Extruded rigid polystyrene foam   | XPS                  |
| Styroflex®                  | Styrene/butadiene block copolymer                                       | SB                   |
| Styrolux®                   | Styrene/butadiene block copolymer                                       | SB                   |
| Styropor®                   | Expandable polystyrene  | PS-E                 |
| Terblend® N                 | Acrylonitrile/butadiene/styrene polymer and polyamide                   | ABS+PA               |
| Terluran®                   | Acrylonitrile/butadiene/styrene polymer                                 | ABS                  |
| Terluran® HH                | Acrylonitrile/butadiene/styrene polymer                                 | ABS                  |
| Terlux®                     | Methyl methacrylate/acrylonitrile/butadiene/styrene polymer             | MABS                 |
| Ultradur®                   | Polybutylene terephthalate  | PBT, (PBT+ASA)       |
| Ultraform®                  | Polyoxymethylene  | POM                  |
| Ultramid®                   | Polyamide   | PA 6, 66, 6/66, 6/6T |
| Ultrason® E                 | Polyethersulfone  | PESU                 |
| Ultrason® S                 | Polysulfone   | PSU                  |

### Please visit our websites:

#### BASF Plastics:

[www.plasticsportal.com](http://www.plasticsportal.com) (World)  
[www.plasticsportal.eu](http://www.plasticsportal.eu) (Europe)

#### Additional information on specific products:

[www.plasticsportal.eu/name of product](http://www.plasticsportal.eu/name_of_product)  
 e.g. [www.plasticsportal.eu/ultramid](http://www.plasticsportal.eu/ultramid)

#### Polyurethanes:

[www.basf.com/polyurethanes](http://www.basf.com/polyurethanes)  
[www.elastogran.de](http://www.elastogran.de)

#### PVC and PVCD:

[www.solvinpvc.com](http://www.solvinpvc.com)

### Note

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