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(Pty) LTD. 2008/013832/07

Manufacturers of standard and specialty grades of engineering nylons.

Material Properties Chart

The chart below represents the various physical properties of our nylons.

These nylons are manufactured through anionic polymerisation and are all Polyamide 6 with various fillers as listed.

This data should not be used as design data without the appropriate addition of safety factoring and suitable specific application testing.

This chart is a comprehensive collection of data supplied to us by our principal suppliers as well as from our own and independent tests conducted on our materials.

Conditioned material refers to nylon that has been allowed to saturate itself with air moisture at 23 degrees C at 50% RH (Relative Humidity).

| Property: | Test Method | Units | Standard | Solid lube. | Liquid lube. | Solid lube. | Heat stabilised | Liquid + Solid Lube | Anti Static |
|---|--------------|--------------|---------------|---------------|---------------|---------------|-----------------|---------------------|-------------------|
| Advanced Nylons Material: | | | Natural | Moly Filled | Nylcoil Green | SL - Red | HS -Blue | Moly + Oil | ESD |
| Equivalent to: | | | 6PLA/6M | GSM | Oilon | Nylube | MC901 | GSM Blue | Proprietary |
| Colour | | | Ivory | Grey Black | Green | Red | Blue | Grey/Black/Blue | Black |
| Density | | g/cubic cm | 1.17 | 1.15 - 1.17 | 1.135 | 1.13 - 1.15 | 1.15 - 1.17 | 1.14 | ≤1,2 |
| Water Absorption | | | | | | | | | |
| at saturation in 23 deg. C at 50% RH | | % | 2.2 | 2.4 | 2 | 2 | 2.3 | 2 | 2.4 |
| at saturation immersed in water at 23 deg. C | | % | <7 | <7 | <6,5 | <6,5 | <7 | <6,5 | <7 |
| after 24/96 hours immersed in water at 23 deg. C | | % | 0.66/1.25 | 0.78/1.42 | 0.67/1.25 | 0.55/1.14 | 0.73/1.41 | 0.67/1.25 | 0.78/1.42 |
| THERMAL PROPERTIES: | | | | | | | | | |
| Melting Temperature | | Celsius | 220 - 225 | 220 - 225 | 220 - 225 | 220 - 225 | 220 - 225 | 220 - 225 | 220 - 225 |
| Thermal Conductivity @ 23 C | | W/(K.m) | 0.29 | 0.30 | 0.28 | 0.29 | 0.29 | 0.28 | 0.31 |
| Coeff. Of linear thermal expansion | | | | | | | | | |
| ave. value between 23 and 100 C | | m/(m.K) | 90 x 10 (P-6) | 90 x 10 (P-6) | 90 x 10 (P-6) | 95 x 10 (P-6) | 90 x 10 (P-6) | 90 x 10 (P-6) | 90 x 10 (P-6) |
| Temperature of deflection under load | | | | | | | | | |
| Unconditioned | | Celsius | 80 | 80 | 75 | 75 | 80 | 75 | 80 |
| Heat deflection temperature at: | | | | | | | | | |
| 0.5N/squaremm | D648 | Celsius | 204 | 204 | 150 | 150 | 204 | 150 | 204 |
| 1.8N/square mm | D648 | Celsius | 93 | 93 | 91 | 92 | 93 | 91 | 93 |
| Max. allowable service temperature | | | | | | | | | |
| in air: - for short periods (few minutes) | | | | | | | | | |
| under low load | | Celsius | 170 | 170 | 165 | 165 | 180 | 165 | 170 |
| - continuously for 5000+ hours | | | | | | | | | |
| under low load | | Celsius | 105 | 105 | 100 | 100 | 120 | 100 | 105 |
| Minimum service temperature | | | | | | | | | |
| without shock or impact load | | Celsius | -30 | -30 | -30 | -30 | -30 | -30 | -20 |
| Flammability | D635 | | self | self | self | self | self | self | self |
| According to UL94 6mm thickness | | | extinguishing | extinguishing | extinguishing | extinguishing | extinguishing | extinguishing | extinguishing |
| | | | HB | HB | HB | HB | HB | HB | HB |
| MECHANICAL PROPERTIES (unconditioned): | | | | | | | | | |
| Tensile strength | D638 | N/square mm | 75-85 | 74 - 96 | 68 | 70 | 74 -96 | 68 | 78-90 |
| Tensile modulus | D638 | Mpa | 3050 | 3100 | 2900 | 2950 | 3050 | 2900 | 3080 |
| Elongation at break | D638 | % | >60 | 10 - 100 | >50 | >50 | 10 - 100 | >50 | 8 - 40 |
| Ball indentation hardness | ISO 2039 - 1 | N/square mm | 160 | 155 | 145 | 149 | 160 | 145 | 155 |
| Hardness Rockwell R | D785 | - | 112 | 105 | 106 | 108 | 112 - 120 | 106 | 105 |
| Hardness Rockwell M | ISO2039-2 | - | 88 | 84 | 82 | 81 | 85 | 82 | 84 |
| Hardness Shore D | D2240 | - | 80 | 75-85 | 74 | 74 | 75 - 85 | 74 | 75 - 85 |
| Flexural Strength | D790 | N/square mm | 97 - 99 | 100 - 109 | 96 | 97 | 100 - 109 | 96 | 105 - 110 |
| Shear strength | D790 | N/square mm | 70 -73 | 72 - 79 | 68 - 70 | 69 - 70 | 72 - 79 | 68 - 70 | 73 - 76 |
| Compressive strength at 5% yield | - | N/square mm | 77 | 78 | 69 | 70 | 78 | 69 | 82 |
| Creep test in tension | | | | | | | | | |
| stress to produce 1% strain in 1000 hours (unconditioned) | ISO 899 | N/square mm | 22 | 21 | 18 | 18 | 21 | 18 | 21 |
| Deformation under load: | | | | | | | | | |
| 14N/square mm at 50 C after 24 hours | D621 | % | 0.4 - 1 | 0.5 - 1 | 1 | 0.9 | 0.5 - 1 | 1 | 0.3 - 0.8 |
| Izod impact strength - notched dry/ conditioned | ISO 180/2A | kJ/square m | 3,5/ 7 | 3,5/ 7 | 4/ 7 | 4/ 7 | 3,5/ 7 | 4/ 7 | 3/ 6 |
| Coefficient of friction dry vs. steel | | | | | | | | | |
| 0.85N/square mm at 1m/s on ground steel | | | 0.40 | 0.30 - 0.35 | 0.18 - 0.22 | 0.12 - 0.2 | 0.40 | 0.18 - 0.22 | 0.30 |
| ELECTRICAL PROPERTIES: | | | | | | | | | |
| Volume Resistivity (conditioned) | D257 | Ohm.cm | >10 (P12) | >10 (P12) | >10 (P12) | >10 (P12) | >10 (P12) | >10 (P12) | - |
| Dielectric strength (conditioned) | D149 | kV/square mm | >20 | >20 | >20 | >20 | >20 | >20 | - |
| Surface resistivity (conditioned) | ISO 93 | Ohms | >10 (P12) | >10 (P12) | >10 (P12) | >10 (P12) | >10 (P12) | >10 (P12) | <300 kΩ |
| Dielectric dissipation factor tan theta | | | | | | | | | |
| at 100 Hz (conditioned) | ISO 250 | | 0.14 | 0.14 | 0.15 | 0.14 | 0.14 | 0.15 | - |
| at 1 MHz (conditioned) | ISO 250 | | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | 0.05 | - |
| Relative Permittivity Sigma r : at 100 Hz | | | | | | | | | |
| (conditioned) | ISO 250 | | 6.6 | 6.6 | 6.5 | 6.6 | 6.6 | 6.5 | - |
| Sigma r : at 1 MHz | | | | | | | | | |
| (conditioned) | ISO 250 | | 3.7 | 3.7 | 3.6 | 3.7 | 3.7 | 3.6 | - |
| Resistance to tracking | ISO112 | | CTI - 600 | CTI - 600 | CTI - 600 | CTI - 600 | CTI - 600 | CTI - 600 | will track easily |