# DuPont™ Rynite® PET

**thermoplastic polyester resin**

## Rynite® 415HP NC010

Rynite® 415HP NC010 is a 15% glass reinforced modified polyethylene terephthalate improved for easy, fast processing over a broad molding range with excellent balance of strength, stiffness, and temperature resistance.

| Property | Test Method | Units | Value |
|---|---|---|---|
| **Identification** | | | |
| Resin Identification | ISO 1043 | | PET-IGF15 |
| Part Marking Code | ISO 11469 | | >PET-IGF15< |
| **Mechanical** | | | |
| Stress at Break | ISO 527 | MPa (kpsi) | 79 (11.5) |
| Strain at Break | ISO 527 | % | 5 |
| Tensile Modulus | ISO 527 | MPa (kpsi) | 4700 (682) |
| Shear Strength | ASTM D 732 | MPa (kpsi) | 40 (5.8) |
| Poissons Ratio | | | 0.49 |
| Flexural Modulus | ISO 178 | MPa (kpsi) | |
| -40°C (-40°F) | | | 5900 (855) |
| 23°C (73°F) | | | 3550 (515) |
| 93°C (200°F) | | | 1300 (188) |
| 150°C (300°F) | | | 1100 (159) |
| Compressive Strength | ASTM D 695 | MPa (kpsi) | 93 (13.5) |
| Deformation Under Load | ASTM D 621 | % | |
| 23°C (73°F), 27.6MPa (4000psi) | | | 2.2 |
| 50°C (122°F), 27.6MPa (4000psi) | | | 4.4 |

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ISO Mechanical properties measured at 4.0mm, ISO Electrical properties measured at 2.0mm, and all ASTM properties measured at 3.2mm.
Test temperatures are 23°C unless otherwise stated.
Shrinkage generated per ISO 294-4 based on 60 X 60mm end-gated plagues or ASTM D 955 based on 76 X 127mm (3 X 5in) end-gated plaques.



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| **Mechanical** | | | |
| Flexural Fatigue | ASTM D 671 | MPa (kpsi) | |
| Cycles 10E6 | | | 20.7 (3) |
| Flexural Creep Strain | ASTM D 2990 | % | |
| 23°C (73°F), 27.6MPa (4000psi) | | | 1.98 |
| 60°C (140°F), 27.6MPa (4000psi) | | | 2.94 |
| Notched Izod Impact Strength | ISO 180/1A | $kJ/m^2$ | |
| -30°C (-22°F) | | | 7.7 |
| 23°C (73°F) | | | 13 |
| Izod Impact | ASTM D 256 | J/m (ft lb/in) | |
| -40°C (-40°F) | | | 69 (1.3) |
| 23°C (73°F) | | | 133 (2.5) |
| Unnotched Impact | ASTM D 4812 | J/m (ft lb/in) | |
| -40°C (-40°F) | | | 640 (12.0) |
| 23°C (73°F) | | | 855 (16.0) |
| Notched Charpy Impact Strength | ISO 179/1eA | $kJ/m^2$ | |
| -30°C (-22°F) | | | 8 |
| 23°C (73°F) | | | 11 |
| Unnotched Charpy Impact Strength | ISO 179/1eU | $kJ/m^2$ | |
| -30°C (-22°F) | | | 25 |
| 23°C (73°F) | | | 55 |
| **Thermal** | | | |
| Deflection Temperature | ISO 75-1/-2 | °C (°F) | |
| 0.45MPa | | | 238 (460) |
| 1.80MPa | | | 207 (405) |
| Melting Temperature | ISO 11357-1/-3 | °C (°F) | |
| 10°C/min | | | 250 (482) |

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| **Thermal** | | | |
| CLTE, Parallel | ISO 11359-1/-2 | E-4/C (E-4/F) | |
| -40 - 23°C (-40 - 73°F) | | | 0.40 (0.22) |
| 23 - 55°C (73 - 130°F) | | | 0.20 (0.11) |
| 23 - 55°C (73 - 130°F), 2.0mm | | | 0.23 (0.13) |
| 55 - 160°C (130 - 320°F) | | | 0.32 (0.18) |
| CLTE, Normal | ISO 11359-1/-2 | E-4/C (E-4/F) | |
| -40 - 23°C (-40 - 73°F) | | | 0.98 (0.54) |
| 23 - 55°C (73 - 130°F) | | | 1.17 (0.65) |
| 23 - 55°C (73 - 130°F), 2.0mm | | | 1.3 (0.72) |
| 55 - 160°C (130 - 320°F) | | | 1.09 (0.61) |
| Thermal Conductivity | ASTM C 177 | W/m K (Btu in/h ft$^2$ F) | 0.26 (1.8) |
| Vicat Softening Temperature | ISO 306 | °C (°F) | |
| 50N | | | 206 (403) |
| **Electrical** | | | |
| Surface Resistivity | IEC 60093 | ohm | 1E13 |
| Volume Resistivity | IEC 60093 | ohm m | 1E11 |
| Dielectric Strength, Short Time | ASTM D 149 | kV/mm (V/mil) | |
| 23°C (73°F), 500 V/s, in oil, 1.6mm (0.062in) | | | 24.0 (610) |
| 23°C (73°F), 500 V/s, in oil, 3.2mm (0.125in) | | | 18.0 (460) |
| 95°C (200°F), 500 V/s, in oil, 1.6mm (0.062in) | | | 15.5 (395) |
| 95°C (200°F), 500 V/s, in oil, 3.2mm (0.125in) | | | 11.0 (280) |
| 150°C (300°F), 500 V/s, in oil, 1.6mm (0.062in) | | | 8.5 (215) |
| 150°C (300°F), 500 V/s, in oil, 3.2mm (0.125in) | | | 6.5 (170) |
| Dielectric Strength, Step by Step | ASTM D 149 | kV/mm (V/mil) | |
| 3.2mm (0.125in) | | | 16.5 (420) |
| Dielectric Constant | ASTM D 150 | | |
| 1E3 Hz | | | 3.9 |
| 1E6 Hz | | | 3.7 |

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| **Electrical** | | | |
| Dissipation Factor | ASTM D 150 | | |
| 1E3 Hz | | | 0.019 |
| 1E6 Hz | | | 0.022 |
| Arc Resistance | ASTM D 495 | s | 60-120 |
| Arc Resistance | UL 746A | s | |
| Plate 4mm | | | 95 |
| CTI | UL 746A | V | |
| 3.0mm | | | 275 |
| **Flammability** | | | |
| Flammability Classification | IEC 60695-11-10 | | |
| 0.75mm | | | HB |
| Flammability Classification | UL94 | | |
| 0.75mm | | | HB |
| Oxygen Index | ASTM D 2863 | % | 19 |
| Oxygen Index | ISO 4589-1/-2 | % | 19 |
| Glow Wire Flammability Index | IEC 60695-2-12 | °C | |
| 0.75mm | | | 675 |
| 1.5mm | | | 675 |
| 3.0mm | | | 750 |
| Glow Wire Ignition Temperature | IEC 60695-2-13 | °C | |
| 0.75mm | | | 700 |
| 1.5mm | | | 700 |
| 3.0mm | | | 775 |
| High Amperage Arc Ignition Resistance | UL 746A | arcs | |
| 0.75mm | | | 65 |
| 1.5mm | | | 68 |
| 3.0mm | | | 197 |
| High Voltage Arc Tracking Rate | | mm/min | 25-80 |

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| **Flammability** | | | |
| Hot Wire Ignition | UL 746A | s | |
| 0.75mm | | | 22 |
| 1.5mm | | | 40 |
| 3.0mm | | | 120 |
| **Temperature Index** | | | |
| RTI, Electrical | UL 746B | °C | |
| 0.75mm | | | 140 |
| RTI, Impact | UL 746B | °C | |
| 0.75mm | | | 120 |
| RTI, Strength | UL 746B | °C | |
| 0.75mm | | | 140 |
| **Other** | | | |
| Specific Gravity | ASTM D 792 | | 1.39 |
| Density | ISO 1183 | $kg/m^3$ ($g/cm^3$) | 1390 (1.39) |
| Hardness, Rockwell | ASTM D 785 | | |
| Scale M | | | 55 |
| Scale R | | | 110 |
| Hardness, Rockwell | ISO 2039/2 | | |
| Scale M | | | 58 |
| Scale R | | | 111 |
| Coefficient of Friction | ASTM D 1894 | | |
| Self | | | 0.42 |
| Self, static | | | 0.42 |
| Steel | | | 0.27 |
| Steel, static | | | 0.27 |
| Taber Abrasion | ASTM D 1044 | mg | |
| CS-17 Wheel, 1kg, 1000 cycles | | | 35 |
| Water Absorption | ASTM D 570 | % | |
| 50%RH,23°C,24h | | | 0.24 |

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| **Other** | | | |
| Equilibrium 50%RH | | | 0.25 |
| Saturation, immersed | | | 2.5 |
| Molding Shrinkage | ISO 294-4 | % | |
| Normal, 2.0mm | | | 0.85 |
| Normal, Annealed | | | 1.2 |
| Parallel, 2.0mm | | | 0.35 |
| Parallel, Annealed | | | 0.45 |
| Mold Shrinkage | | % | |
| Flow, 1.57mm (0.062in) | | | 0.24 |
| Flow, 3.2mm (0.125in) | | | 0.40 |
| Transverse, 1.57mm (0.062in) | | | 0.67 |
| Transverse, 3.2mm (0.125in) | | | 0.95 |
| **Processing** | | | |
| Melt Temperature Range | | °C (°F) | 270-290 (520-555) |
| Melt Temperature Optimum | | °C (°F) | 280 (535) |
| Mold Temperature Range | | °C (°F) | >95 (>205) |
| Mold Temperature Optimum | | °C (°F) | 110 (230) |
| Drying Time, Dehumidified Dryer | | h | 4 |
| Drying Temperature | | °C (°F) | 120 (250) |
| Processing Moisture Content | | % | <0.02 |
| Snake Flow | | mm | |
| 90MPa, 5x0.30mm | | | 14 |
| 90MPa, 5x0.50mm | | | 48 |
| 90MPa, 5x0.75mm | | | 100 |
| 90MPa, 5x1.00mm | | | 159 |

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