

# Vydyne® R540H

Polyamide 66

Ascend Performance Materials Operations LLC

Message:

Vydyne R540H is general-purpose, heat-stabilized, hydrolysis-resistant, 40% glass-fiber reinforced PA66 resin. Available in natural, it is specifically designed to maximize the retention of physical properties when exposed to anti-freeze solutions at elevated temperatures. This product is also lubricated for improved flow and offers superior surface appearance.

Glass-reinforced Vydyne resins provide higher heat distortion temperature, resistance to creep and better dimensional stability when compared with unreinforced PA66. These products have good chemical resistance to a broad range of chemicals including gasoline, hydraulic fluids and most solvents. Vydyne R540H is heat-stabilized to minimize oxidative degradation of the polymer when exposed to elevated temperatures in service. This product provides improved retention of physical properties under exposure to long term heat. Also, Vydyne R540H has excellent knit-line strength and fatigue resistance, which is essential for cycle testing with anti-freeze solutions.

Typical Applications/End Uses:

Vydyne R540H is successfully used in a wide range of injection-molding engineering applications. Typical parts include automotive clips, radiator end tanks, parts of the air-conditioning and fuel distribution systems; electrical connectors, housings and bobbins; and industrial applications such as gears, bearing shells, covers and housings.

| General Information    |      |                                  |                   |             |
|------------------------|------|----------------------------------|-------------------|-------------|
| UL YellowCard          |      | E70062-249086                    |                   |             |
| Filler / Reinforcement |      | Glass Fiber,40% Filler by Weight |                   |             |
| Additive               |      | Heat Stabilizer                  |                   |             |
|                        |      | Lubricant                        |                   |             |
| Features               |      | Antifreeze Resistant             |                   |             |
|                        |      | Fatigue Resistant                |                   |             |
|                        |      | Gasoline Resistance              |                   |             |
|                        |      | Good Chemical Resistance         |                   |             |
|                        |      | Good Flow                        |                   |             |
|                        |      | Heat Stabilized                  |                   |             |
|                        |      | Hydrolysis Resistant             |                   |             |
|                        |      | Lubricated                       |                   |             |
|                        |      | Solvent Resistant                |                   |             |
| Uses                   |      | Automotive Under the Hood        |                   |             |
| Agency Ratings         |      | ASTM D 4066 PA012G40             |                   |             |
|                        |      | ASTM D 6779 PA012G40             |                   |             |
| UL File Number         |      | E70062                           |                   |             |
| Appearance             |      | Natural Color                    |                   |             |
| Forms                  |      | Pellets                          |                   |             |
| Processing Method      |      | Injection Molding                |                   |             |
| Physical               | Dry  | Conditioned                      | Unit              | Test Method |
| Density (23°C)         | 1.46 | --                               | g/cm <sup>3</sup> | ISO 1183    |
| Molding Shrinkage      |      |                                  |                   | ISO 294-4   |

|                                  |        |             |                   |             |
|----------------------------------|--------|-------------|-------------------|-------------|
| Across Flow : 23°C, 2.00 mm      | 0.90   | --          | %                 |             |
| Flow : 23°C, 2.00 mm             | 0.40   | --          | %                 |             |
| Water Absorption                 |        |             |                   | ISO 62      |
| 23°C, 24 hr                      | 0.60   | --          | %                 |             |
| Equilibrium, 23°C, 50% RH        | 1.5    | --          | %                 |             |
| Mechanical                       | Dry    | Conditioned | Unit              | Test Method |
| Tensile Modulus (23°C)           | 14100  | 11100       | MPa               | ISO 527-2   |
| Tensile Stress (Break, 23°C)     | 220    | 165         | MPa               | ISO 527-2   |
| Tensile Strain (Break, 23°C)     | 3.0    | 4.0         | %                 | ISO 527-2   |
| Flexural Modulus (23°C)          | 12300  | 9300        | MPa               | ISO 178     |
| Flexural Stress (23°C)           | 335    | 250         | MPa               | ISO 178     |
| Poisson's Ratio                  | 0.40   | --          |                   | ISO 527     |
| Impact                           | Dry    | Conditioned | Unit              | Test Method |
| Charpy Notched Impact Strength   |        |             |                   | ISO 179     |
| -30°C                            | 12     | 11          | kJ/m <sup>2</sup> |             |
| 23°C                             | 12     | 19          | kJ/m <sup>2</sup> |             |
| Charpy Unnotched Impact Strength |        |             |                   | ISO 179     |
| -30°C                            | 80     | 87          | kJ/m <sup>2</sup> |             |
| 23°C                             | 90     | 92          | kJ/m <sup>2</sup> |             |
| Notched Izod Impact Strength     |        |             |                   | ISO 180     |
| -30°C                            | 13     | 13          | kJ/m <sup>2</sup> |             |
| 23°C                             | 14     | 19          | kJ/m <sup>2</sup> |             |
| Thermal                          | Dry    | Conditioned | Unit              | Test Method |
| Heat Deflection Temperature      |        |             |                   |             |
| 0.45 MPa, Unannealed             | 260    | --          | °C                | ISO 75-2/B  |
| 1.8 MPa, Unannealed              | 252    | --          | °C                | ISO 75-2/A  |
| Melting Temperature              | 260    | --          | °C                | ISO 11357-3 |
| CLTE                             |        |             |                   | ISO 11359-2 |
| Flow : 23 to 55°C, 2.00 mm       | 1.7E-5 | --          | cm/cm/°C          |             |
| Transverse : 23 to 55°C, 2.00 mm | 1.0E-4 | --          | cm/cm/°C          |             |
| RTI Elec                         |        |             |                   | UL 746      |
| 0.750 mm                         | 140    | --          | °C                |             |
| 1.50 mm                          | 140    | --          | °C                |             |
| 3.00 mm                          | 140    | --          | °C                |             |
| RTI Imp                          |        |             |                   | UL 746      |
| 0.750 mm                         | 125    | --          | °C                |             |
| 1.50 mm                          | 125    | --          | °C                |             |

|                                            |            |             |         |                |
|--------------------------------------------|------------|-------------|---------|----------------|
| 3.00 mm                                    | 125        | --          | °C      |                |
| RTI Str                                    |            |             |         | UL 746         |
| 0.750 mm                                   | 140        | --          | °C      |                |
| 1.50 mm                                    | 140        | --          | °C      |                |
| 3.00 mm                                    | 140        | --          | °C      |                |
| Electrical                                 | Dry        | Conditioned | Unit    | Test Method    |
| Volume Resistivity (3.00 mm)               | 1.0E+13    | --          | ohms·cm | IEC 60093      |
| Dielectric Strength (1.00 mm)              | 20         | --          | kV/mm   | IEC 60243      |
| Arc Resistance (3.00 mm)                   | PLC 6      | --          |         | ASTM D495      |
| Comparative Tracking Index (3.00 mm)       | 250 to 399 | --          | V       | IEC 60112      |
| High Amp Arc Ignition (HAI)                |            |             |         | UL 746         |
| 0.750 mm                                   | PLC 0      | --          |         |                |
| 1.50 mm                                    | PLC 0      | --          |         |                |
| 3.00 mm                                    | PLC 0      | --          |         |                |
| High Voltage Arc Tracking Rate (HVTR)      | PLC 1      | --          |         | UL 746         |
| Hot-wire Ignition (HWI)                    |            |             |         | UL 746         |
| 0.750 mm                                   | PLC 4      | --          |         |                |
| 1.50 mm                                    | PLC 3      | --          |         |                |
| 3.00 mm                                    | PLC 4      | --          |         |                |
| Flammability                               | Dry        | Conditioned | Unit    | Test Method    |
| Flame Rating                               |            |             |         | UL 94          |
| 0.750 mm                                   | HB         | --          |         |                |
| 1.50 mm                                    | HB         | --          |         |                |
| 3.00 mm                                    | HB         | --          |         |                |
| Glow Wire Flammability Index               |            |             |         | IEC 60695-2-12 |
| 0.750 mm                                   | 675        | --          | °C      |                |
| 1.50 mm                                    | 675        | --          | °C      |                |
| 3.00 mm                                    | 675        | --          | °C      |                |
| Glow Wire Ignition Temperature             |            |             |         | IEC 60695-2-13 |
| 0.750 mm                                   | 700        | --          | °C      |                |
| 1.50 mm                                    | 700        | --          | °C      |                |
| 3.00 mm                                    | 700        | --          | °C      |                |
| Additional Information                     | Dry        | Conditioned |         | Test Method    |
| Automotive Materials - (thickness d = 1mm) | +          | --          |         | FMVSS 302      |
| Injection                                  | Dry        | Unit        |         |                |
| Drying Temperature                         | 80.0       |             | °C      |                |
| Drying Time                                | 4.0        |             | hr      |                |

|                        |              |    |
|------------------------|--------------|----|
| Suggested Max Regrind  | 25           | %  |
| Rear Temperature       | 280 to 310   | °C |
| Middle Temperature     | 280 to 310   | °C |
| Front Temperature      | 280 to 310   | °C |
| Nozzle Temperature     | 280 to 310   | °C |
| Processing (Melt) Temp | 285 to 305   | °C |
| Mold Temperature       | 65.0 to 95.0 | °C |

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