

# Vydyne® R535H NT

Polyamide 66

Ascend Performance Materials Operations LLC

Message:

Vydyne R535H NT is general-purpose, heat-stabilized, 35% glass-fiber reinforced PA66 resin. 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 R535H NT 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 R535H NT has excellent knit-line strength and fatigue resistance, which is essential for cycle testing with anti-freeze solutions.

Typical Applications/End Uses:

Vydyne R535H NT has been used successfully in a wide range of injection-molding engineering applications, including 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 reinforced material, 35% filler by weight |
| Additive               | heat stabilizer                                       |
|                        | Lubricant                                             |
| Features               | frost resistance                                      |
|                        | Solvent resistance                                    |
|                        | High liquidity                                        |
|                        | Good chemical resistance                              |
|                        | Fatigue resistance                                    |
|                        | Gasoline resistance                                   |
|                        | Thermal Stability                                     |
|                        | Lubrication                                           |
| Uses                   | Parts under the hood of a car                         |
| Agency Ratings         | ASTM D 4066 PA012G35                                  |
|                        | ASTM D 6779 PA012G35                                  |
|                        | EC 1935/2004                                          |
|                        | EU 2023/2006                                          |
|                        | FDA 21 CFR 177.1500                                   |
|                        | Europe 10/1/2011 12:00:00 AM                          |
| UL File Number         | E70062                                                |
| Appearance             | Natural color                                         |
| Forms                  | Particle                                              |
| Processing Method      | Injection molding                                     |

| Physical                             | Dry    | Conditioned | Unit              | Test Method |
|--------------------------------------|--------|-------------|-------------------|-------------|
| Density                              | 1.41   | --          | g/cm <sup>3</sup> | ISO 1183    |
| Molding Shrinkage                    |        |             |                   | ISO 294-4   |
| Transverse flow: 2.00mm              | 0.90   | --          | %                 | ISO 294-4   |
| Flow: 2.00mm                         | 0.40   | --          | %                 | ISO 294-4   |
| Water Absorption                     |        |             |                   | ISO 62      |
| 23°C, 24 hr                          | 0.80   | --          | %                 | ISO 62      |
| Equilibrium, 23°C, 50% RH            | 1.6    | --          | %                 | ISO 62      |
| Mechanical                           | Dry    | Conditioned | Unit              | Test Method |
| Tensile Modulus (23°C)               | 11600  | 8500        | MPa               | ISO 527-2   |
| Tensile Stress (Break, 23°C)         | 210    | 150         | MPa               | ISO 527-2   |
| Tensile Strain (Break, 23°C)         | 3.0    | 5.0         | %                 | ISO 527-2   |
| Flexural Modulus (23°C)              | 10500  | 7000        | MPa               | ISO 178     |
| Flexural Stress (23°C)               | 300    | 205         | MPa               | ISO 178     |
| Poisson's Ratio                      | 0.40   | --          |                   | ISO 527     |
| Impact                               | Dry    | Conditioned | Unit              | Test Method |
| Charpy Notched Impact Strength       |        |             |                   | ISO 179/1eA |
| -30°C                                | 11     | 12          | kJ/m <sup>2</sup> | ISO 179/1eA |
| 23°C                                 | 12     | 14          | kJ/m <sup>2</sup> | ISO 179/1eA |
| Charpy Unnotched Impact Strength     |        |             |                   | ISO 179/1eU |
| -30°C                                | 70     | 85          | kJ/m <sup>2</sup> | ISO 179/1eU |
| 23°C                                 | 80     | 90          | kJ/m <sup>2</sup> | ISO 179/1eU |
| Notched Izod Impact                  |        |             |                   | ISO 180     |
| -30°C                                | 11     | 12          | kJ/m <sup>2</sup> | ISO 180     |
| 23°C                                 | 12     | 14          | kJ/m <sup>2</sup> | ISO 180     |
| Thermal                              | Dry    | Conditioned | Unit              | Test Method |
| Heat Deflection Temperature          |        |             |                   |             |
| 0.45 MPa, not annealed               | 260    | --          | °C                | ISO 75-2/B  |
| 1.8 MPa, not annealed                | 250    | --          | °C                | ISO 75-2/A  |
| Melting Temperature                  | 260    | --          | °C                | ISO 11357-3 |
| Linear thermal expansion coefficient |        |             |                   | ISO 11359-2 |
| Flow: 23 to 55°C                     | 2.0E-5 | --          | cm/cm/°C          | ISO 11359-2 |
| Lateral: 23 to 55°C                  | 1.1E-4 | --          | cm/cm/°C          | ISO 11359-2 |
| RTI Elec                             |        |             |                   | UL 746      |
| 0.75 mm                              | 140    | --          | °C                | UL 746      |
| 1.5 mm                               | 140    | --          | °C                | UL 746      |
| 3.0 mm                               | 140    | --          | °C                | UL 746      |
| RTI Imp                              |        |             |                   | UL 746      |
| 0.75 mm                              | 125    | --          | °C                | UL 746      |

|                                            |           |             |           |                |
|--------------------------------------------|-----------|-------------|-----------|----------------|
| 1.5 mm                                     | 125       | --          | °C        | UL 746         |
| 3.0 mm                                     | 125       | --          | °C        | UL 746         |
| RTI                                        |           |             |           | UL 746         |
| 0.75 mm                                    | 140       | --          | °C        | UL 746         |
| 1.5 mm                                     | 140       | --          | °C        | UL 746         |
| 3.0 mm                                     | 140       | --          | °C        | UL 746         |
| Electrical                                 | Dry       | Conditioned | Unit      | Test Method    |
| Volume Resistivity (0.750 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 - 399 | --          | V         | IEC 60112      |
| High Amp Arc Ignition (HAI)                |           |             |           | UL 746         |
| 0.75 mm                                    | PLC 0     | --          |           | UL 746         |
| 1.5 mm                                     | PLC 0     | --          |           | UL 746         |
| 3.0 mm                                     | PLC 0     | --          |           | UL 746         |
| High Voltage Arc Tracking Rate (HVTR)      | PLC 1     | --          |           | UL 746         |
| Hot-wire Ignition (HWI)                    |           |             |           | UL 746         |
| 0.75 mm                                    | PLC 4     | --          |           | UL 746         |
| 1.5 mm                                     | PLC 3     | --          |           | UL 746         |
| 3.0 mm                                     | PLC 4     | --          |           | UL 746         |
| Flammability                               | Dry       | Conditioned | Unit      | Test Method    |
| Flame Rating                               |           |             |           | UL 94          |
| 0.75 mm                                    | HB        | --          |           | UL 94          |
| 1.5 mm                                     | HB        | --          |           | UL 94          |
| 3.0 mm                                     | HB        | --          |           | UL 94          |
| Glow Wire Flammability Index               |           |             |           | IEC 60695-2-12 |
| 0.75 mm                                    | 700       | --          | °C        | IEC 60695-2-12 |
| 1.5 mm                                     | 700       | --          | °C        | IEC 60695-2-12 |
| 3.0 mm                                     | 875       | --          | °C        | IEC 60695-2-12 |
| Glow Wire Ignition Temperature             |           |             |           | IEC 60695-2-13 |
| 0.75 mm                                    | 725       | --          | °C        | IEC 60695-2-13 |
| 1.5 mm                                     | 725       | --          | °C        | IEC 60695-2-13 |
| 3.0 mm                                     | 750       | --          | °C        | IEC 60695-2-13 |
| Additional Information                     | Dry       | Conditioned |           | Test Method    |
| Automotive Materials - (thickness d = 1mm) | +         | --          |           | FMVSS 302      |
| Injection                                  | Dry       | Unit        |           |                |
| Drying Temperature                         | 80        |             | °C        |                |

|                        |           |    |
|------------------------|-----------|----|
| Drying Time            | 4.0       | hr |
| Suggested Max Regrind  | 25        | %  |
| Rear Temperature       | 280 - 310 | °C |
| Middle Temperature     | 280 - 310 | °C |
| Front Temperature      | 280 - 310 | °C |
| Nozzle Temperature     | 280 - 310 | °C |
| Processing (Melt) Temp | 285 - 305 | °C |
| Mold Temperature       | 65 - 95   | °C |

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