

Vydyne® 21SPF

polyamide 66



Vydyne 21SPF is a general-purpose PA66 resin. Available in natural, it is designed principally for injection-molding fabrication. This grades offer a well-balanced combination of engineering properties characterized by high strength; rigidity; good toughness; high melt point; good surface lubricity; abrasion resistance and resistance to many chemicals, machine and motor oils, solvents and gasoline.

Vydyne 21SPF resin permits production of molded parts with good initial color plus good property and color retention when using regrind. This resin is recognized by Underwriters Laboratories and conforms to the requirements of many industrial, federal and military specifications for premium-quality, general-purpose PA66 resins.

Vydyne 21SPF resin is internally and externally lubricated for improved machine feed and exceptional mold release. It is intended for use in high-productivity applications. In many applications, the molding cycle can be reduced because parts may be removed from the cavity at higher temperatures. In difficult molds where parts have a tendency to stick in the cavity, Vydyne 21SPF can reduce or eliminate the need for mold release sprays. Critical molded part dimensions should be checked against specifications before implementing shorter molding cycles on a routine production basis.

| General | | | |
|---------------------------|--|--|---|
| Material Status | • Commercial: Active | | |
| Availability | • Asia Pacific | • Europe | • North America |
| Additive | • Lubricant | | |
| Features | <ul style="list-style-type: none"> • Abrasion Resistant • Chemical Resistant • Fast Molding Cycle • Gasoline Resistant | <ul style="list-style-type: none"> • General Purpose • Good Mold Release • Good Toughness • High Rigidity | <ul style="list-style-type: none"> • High Strength • Lubricated • Oil Resistant • Solvent Resistant |
| Uses | <ul style="list-style-type: none"> • Bearings • Bushings • Cams • Connectors | <ul style="list-style-type: none"> • Electrical Housing • Electrical/Electronic Applications • Fasteners • General Purpose | <ul style="list-style-type: none"> • Housings • Industrial Applications |
| Agency Ratings | <ul style="list-style-type: none"> • ASTM D4066 PA0111 • ASTM D6779 PA0111 • EC 1935/2004 | <ul style="list-style-type: none"> • EU 10/2011 • EU 2023/2006 • FDA 21 CFR 177.1500 | <ul style="list-style-type: none"> • FED L-P-410A • MIL M-20693B • NSF STD-51 |
| RoHS Compliance | • RoHS Compliant | | |
| Automotive Specifications | <ul style="list-style-type: none"> • CHRYSLER MS-DB-41 CPN1938 | <ul style="list-style-type: none"> • FORD WSK-M4D647-A | <ul style="list-style-type: none"> • GM GMP.PA66.005 |
| UL File Number | • E70062 | | |
| Appearance | • Natural Color | | |
| Forms | • Pellets | | |
| Processing Method | • Injection Molding | | |

| Physical | Dry | Conditioned | Unit | Test Method |
|--|----------|-------------|-------------------|-------------|
| Density | 1.14 | -- | g/cm ³ | ISO 1183 |
| Molding Shrinkage | | | | ISO 294-4 |
| Across Flow : 23°C, 2.00 mm | 2.0 | -- | % | |
| Flow : 23°C, 2.00 mm | 2.0 | -- | % | |
| Water Absorption | | | | ISO 62 |
| 24 hr, 23°C | 1.2 | -- | % | |
| Equilibrium, 23°C, 50% RH | 2.4 | -- | % | |
| Outdoor Suitability (All Colors) | f2 | -- | | UL 746C |
| Mechanical | Dry | Conditioned | Unit | Test Method |
| Tensile Modulus (23°C) | 3300 | 1600 | MPa | ISO 527-2 |
| Tensile Stress | | | | ISO 527-2 |
| Yield, 23°C | 88.0 | 55.0 | MPa | |
| Break, 23°C | 60.0 | 45.0 | MPa | |
| Tensile Strain (Yield, 23°C) | 5.0 | 20 | % | ISO 527-2 |
| Nominal Tensile Strain at Break (23°C) | 20 | > 50 | % | ISO 527-2 |
| Flexural Modulus (23°C) | 3300 | 1050 | MPa | ISO 178 |
| Flexural Strength (23°C) | 105 | 30.0 | MPa | ISO 178 |
| Poisson's Ratio | 0.40 | -- | | ISO 527-2 |
| Impact | Dry | Conditioned | Unit | Test Method |
| Charpy Notched Impact Strength | | | | ISO 179/1eA |
| -30°C | 5.0 | 7.0 | kJ/m ² | |
| 23°C | 6.0 | 23 | kJ/m ² | |
| Charpy Unnotched Impact Strength | | | | ISO 179/1eU |
| -30°C | No Break | No Break | | |
| 23°C | No Break | No Break | | |
| Notched Izod Impact Strength | | | | ISO 180 |
| -30°C | 5.0 | 7.0 | kJ/m ² | |
| 23°C | 6.0 | 23 | kJ/m ² | |

| Thermal | Dry | Conditioned | Unit | Test Method |
|---------------------------------------|---------|-------------|----------|-------------|
| Heat Deflection Temperature | | | | |
| 0.45 MPa, Unannealed | 210 | -- | °C | ISO 75-2/B |
| 1.8 MPa, Unannealed | 72.0 | -- | °C | ISO 75-2/A |
| Melting Temperature | 260 | -- | °C | ISO 11357-3 |
| CLTE | | | | ISO 11359-2 |
| Flow : 23 to 55°C, 2.00 mm | 1.0E-4 | -- | cm/cm/°C | |
| Transverse : 23 to 55°C, 2.00 mm | 1.0E-4 | -- | cm/cm/°C | |
| RTI Elec | | | | UL 746 |
| 0.40 mm | 130 | -- | °C | |
| 0.71 mm | 130 | -- | °C | |
| 1.5 mm | 130 | -- | °C | |
| 3.0 mm | 130 | -- | °C | |
| RTI Imp | | | | UL 746 |
| 0.40 mm | 75.0 | -- | °C | |
| 0.71 mm | 75.0 | -- | °C | |
| 1.5 mm | 75.0 | -- | °C | |
| 3.0 mm | 75.0 | -- | °C | |
| RTI Str | | | | UL 746 |
| 0.40 mm | 75.0 | -- | °C | |
| 0.71 mm | 85.0 | -- | °C | |
| 1.5 mm | 85.0 | -- | °C | |
| 3.0 mm | 85.0 | -- | °C | |
| Electrical | Dry | Conditioned | Unit | Test Method |
| Volume Resistivity (0.750 mm) | 1.0E+13 | -- | ohms-cm | IEC 60093 |
| Dielectric Strength (1.00 mm) | 26 | -- | kV/mm | IEC 60243 |
| Arc Resistance (3.00 mm) | PLC 5 | -- | | ASTM D495 |
| Comparative Tracking Index (3.00 mm) | 600 | -- | V | IEC 60112 |
| High Amp Arc Ignition (HAI) | | | | UL 746 |
| 0.40 mm | PLC 1 | -- | | |
| 0.71 mm | PLC 0 | -- | | |
| 1.5 mm | PLC 0 | -- | | |
| 3.0 mm | PLC 0 | -- | | |
| High Voltage Arc Tracking Rate (HVTR) | PLC 0 | -- | | UL 746 |
| Hot-wire Ignition (HWI) | | | | UL 746 |
| 0.40 mm | PLC 4 | -- | | |
| 0.71 mm | PLC 4 | -- | | |
| 1.5 mm | PLC 3 | -- | | |
| 3.0 mm | PLC 2 | -- | | |

| Flammability | Dry | Conditioned | Unit | Test Method |
|--------------------------------|-----|-----------------|------|----------------|
| Flame Rating | | | | UL 94 |
| 0.40 mm | V-2 | -- | | |
| 0.71 mm | V-2 | -- | | |
| 1.5 mm | V-2 | -- | | |
| 3.0 mm | V-2 | -- | | |
| Glow Wire Flammability Index | | | | IEC 60695-2-12 |
| 0.40 mm | 960 | -- | °C | |
| 0.71 mm | 960 | -- | °C | |
| 1.5 mm | 960 | -- | °C | |
| 3.0 mm | 960 | -- | °C | |
| Glow Wire Ignition Temperature | | | | IEC 60695-2-13 |
| 0.40 mm | 825 | -- | °C | |
| 0.71 mm | 850 | -- | °C | |
| 1.5 mm | 850 | -- | °C | |
| 3.0 mm | 850 | -- | °C | |
| Oxygen Index | 26 | -- | % | ISO 4589-2 |
| Injection | | Dry Unit | | |
| Drying Temperature | | < 70 °C | | |
| Drying Time | | 1.0 to 3.0 hr | | |
| Suggested Max Regrind | | 50 % | | |
| Rear Temperature | | 260 to 280 °C | | |
| Middle Temperature | | 270 to 285 °C | | |
| Front Temperature | | 280 to 290 °C | | |
| Nozzle Temperature | | 280 to 300 °C | | |
| Processing (Melt) Temp | | 285 to 300 °C | | |
| Mold Temperature | | 65 to 95 °C | | |

Notes

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