

Vydyne® 21SPF1 polyamide 66



Vydyne 21SPF1 is a general-purpose PA66 resin. Available in natural, it is designed principally for injection-molding applications with the added benefit of improved flow during the molding process. 21SPF1 offers the same 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 21SPF1 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 21SPF1 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 21SPF1 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.

Typical Applications/End Uses:

Vydyne 21SPF1 resin has been used in many molding applications such as terminal blocks, bearings, bushings, cams, electrical connectors and housings, electrical cable ties/tie straps and many other hardware and general industrial parts.

| General | | | |
|---------------------------|---|---|--|
| Material Status | • Commercial: Active | | |
| Availability | • Asia Pacific | • Europe | • North America |
| Additive | • Lubricant | | |
| Features | <ul style="list-style-type: none"> • Fast Molding Cycle • Gasoline Resistance • Good Abrasion Resistance • Good Chemical Resistance | <ul style="list-style-type: none"> • Good Mold Release • Good Toughness • High Rigidity • High Strength | <ul style="list-style-type: none"> • Lubricated • Oil Resistant • Solvent Resistant |
| Uses | <ul style="list-style-type: none"> • Bearings • Bushings | <ul style="list-style-type: none"> • Cams • Connectors | <ul style="list-style-type: none"> • Electrical Housing • Industrial Applications |
| Agency Ratings | <ul style="list-style-type: none"> • ASTM D 4066 PA0111 • ASTM D 6779 PA0111 | <ul style="list-style-type: none"> • FDA 21 CFR 177.1500 • FED L-P-410A | <ul style="list-style-type: none"> • MIL M-20693B |
| RoHS Compliance | • RoHS Compliant | | |
| Automotive Specifications | <ul style="list-style-type: none"> • ASTM D4000 PA111 • ASTM D4066 PA0111 • CHRYSLER MS-DB41 CPN1938 Color: Natural • CHRYSLER MS-DB41 CPN1948 Color: Black | <ul style="list-style-type: none"> • FEDERAL LP410A • FORD WSK-M4D647-A Color: Black • FORD WSK-M4D647-A Color: Natural • GM GMP.PA66.005 | <ul style="list-style-type: none"> • GM GMP.PA66.005 Color: Black • SAE J1639 PA0121 Z6 Color: Black • SAE J1639 PA0121 Z6 Color: Natural |
| 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 : 73°F, 0.0787 in | 2.0 | -- | % | |
| Flow : 73°F, 0.0787 in | 2.0 | -- | % | |
| Water Absorption (73°F, 24 hr) | 1.2 | -- | % | ISO 62 |
| Water Absorption (Equilibrium, 73°F, 50% RH) | 2.4 | -- | % | ISO 62 |
| Mechanical | Dry | Conditioned | Unit | Test Method |
| Tensile Modulus (73°F) | 479000 | 232000 | psi | ISO 527-2 |
| Tensile Stress (Yield, 73°F) | 12800 | 7980 | psi | ISO 527-2 |
| Tensile Stress (Break, 73°F) | 8700 | 6530 | psi | ISO 527-2 |
| Tensile Strain (Yield, 73°F) | 5.0 | 20 | % | ISO 527-2 |
| Nominal Tensile Strain at Break (73°F) | 20 | > 50 | % | ISO 527-2 |
| Flexural Modulus (73°F) | 479000 | 152000 | psi | ISO 178 |
| Flexural Strength (73°F) | 15200 | 4350 | psi | ISO 178 |
| Poisson's Ratio | 0.40 | -- | | ISO 527-2 |
| Impact | Dry | Conditioned | Unit | Test Method |
| Charpy Notched Impact Strength | | | | ISO 179/1eA |
| -22°F | 2.4 | 3.3 | ft·lb/in ² | |
| 73°F | 2.9 | 11 | ft·lb/in ² | |
| Charpy Unnotched Impact Strength | | | | ISO 179/1eU |
| -22°F | No Break | No Break | | |
| 73°F | No Break | No Break | | |
| Notched Izod Impact Strength | | | | ISO 180 |
| -22°F | 2.4 | 3.3 | ft·lb/in ² | |
| 73°F | 2.9 | 11 | ft·lb/in ² | |

| Thermal | Dry | Conditioned | Unit | Test Method |
|--|--------|-------------|----------|-------------|
| Heat Deflection Temperature 66 psi, Unannealed | 410 | -- | °F | ISO 75-2/B |
| Heat Deflection Temperature 264 psi, Unannealed | 162 | -- | °F | ISO 75-2/A |
| Melting Temperature | 500 | -- | °F | ISO 11357-3 |
| CLTE - Flow (73 to 131°F, 0.0787 in) | 5.6E-5 | -- | in/in/°F | ISO 11359-2 |
| CLTE - Transverse (73 to 131°F, 0.0787 in) | 5.6E-5 | -- | in/in/°F | ISO 11359-2 |
| RTI Elec | | | | UL 746 |
| 0.0280 in | 266 | -- | °F | |
| 0.0591 in | 266 | -- | °F | |
| 0.118 in | 266 | -- | °F | |
| RTI Imp | | | | UL 746 |
| 0.0280 in | 167 | -- | °F | |
| 0.0591 in | 167 | -- | °F | |
| 0.118 in | 167 | -- | °F | |
| RTI Str | | | | UL 746 |
| 0.0280 in | 185 | -- | °F | |
| 0.0591 in | 185 | -- | °F | |
| 0.118 in | 185 | -- | °F | |
| Electrical | Dry | Conditioned | Unit | Test Method |
| Dielectric Strength (0.0394 in) | 660 | -- | V/mil | IEC 60243 |
| Arc Resistance (0.118 in) | PLC 5 | -- | | ASTM D495 |
| Comparative Tracking Index (0.118 in) | 600 | -- | V | IEC 60112 |
| High Amp Arc Ignition (HAI) | | | | UL 746 |
| 0.0280 in | PLC 0 | -- | | |
| 0.0591 in | PLC 0 | -- | | |
| 0.118 in | PLC 0 | -- | | |
| High Voltage Arc Tracking Rate (HVTR) | PLC 0 | -- | | UL 746 |
| Hot-wire Ignition (HWI) | | | | UL 746 |
| 0.0280 in | PLC 4 | -- | | |
| 0.0591 in | PLC 3 | -- | | |
| 0.118 in | PLC 3 | -- | | |

| Flammability | Dry | Conditioned | Unit | Test Method |
|--------------------------------|------|-----------------|------|----------------|
| Flame Rating | | | | UL 94 |
| 0.0280 in | V-2 | -- | | |
| 0.0591 in | V-2 | -- | | |
| 0.118 in | V-2 | -- | | |
| Glow Wire Flammability Index | | | | IEC 60695-2-12 |
| 0.0280 in | 1470 | -- | °F | |
| 0.0591 in | 1470 | -- | °F | |
| 0.118 in | 1710 | -- | °F | |
| Glow Wire Ignition Temperature | | | | IEC 60695-2-13 |
| 0.0280 in | 1290 | -- | °F | |
| 0.0591 in | 1290 | -- | °F | |
| 0.118 in | 1290 | -- | °F | |
| Oxygen Index | 26 | -- | % | ISO 4589-2 |
| Injection | | Dry Unit | | |
| Drying Temperature | | < 158 °F | | |
| Drying Time | | 1.0 to 3.0 hr | | |
| Suggested Max Regrind | | 50 % | | |
| Rear Temperature | | 500 to 536 °F | | |
| Middle Temperature | | 518 to 545 °F | | |
| Front Temperature | | 536 to 554 °F | | |
| Nozzle Temperature | | 536 to 572 °F | | |
| Processing (Melt) Temp | | 545 to 572 °F | | |
| Mold Temperature | | 149 to 203 °F | | |

Notes

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