

A-4422 NL WH829

AMODEL A-4422 NL WH829 resin is a 22% reinforced polyphthalamide (PPA), designed to give **high crystallinity** when molded in **water-cooled molds**. This material exhibits high heat resistance, high strength and stiffness over a broad temperature range, low moisture absorption, excellent chemical resistance, and excellent electrical properties.

AMODEL A-4422 NL WH829 resin processes readily on conventional equipment using water-cooled molds. Its

rapid crystallization rate and high flow can result in short cycles and therefore high molding productivity and lower part cost.

This resin is a light-stabilized, high-reflectivity white grade of AMODEL polyphthalamide.

TYPICAL PROPERTIES OF AMODEL A-4422 NL WH829 RESIN

| Property | ISO Test Method | Typical Values ⁽¹⁾ | | | |
|--|-----------------|-------------------------------|-----------------------|--------------------|-------------------|
| | | U.S. Customary Units | | SI Units | |
| | | DAM ⁽²⁾ | Units | DAM ⁽²⁾ | Units |
| Mechanical | | | | | |
| Tensile Strength | 527 | 14.8 | kpsi | 102 | MPa |
| Tensile Elongation | 527 | 1.3 | % | 1.3 | % |
| Tensile Modulus | 527 | 1,320 | kpsi | 9.1 | GPa |
| Flexural Strength | 178 | 23.2 | kpsi | 160 | MPa |
| Flexural Modulus | 178 | 1,030 | kpsi | 7.1 | GPa |
| Izod Impact, Notched | 180/1A | 1.4 | ft-lb/in ² | 3.0 | kJ/m ² |
| Thermal | | | | | |
| Heat Deflection Temperature | 75af | | | | |
| at 66 psi (0.45 MPa) | | 583 | °F | 306 | °C |
| at 264 psi (1.8 MPa) | | 491 | °F | 255 | °C |
| Coefficient of Thermal Expansion | ASTM E831 | | | | |
| 122° to 212°F (50° to 100°C), FD ⁽³⁾ , TD ⁽⁴⁾ | | 17, 35 | ppm/°F | 31, 64 | ppm/°C |
| 212° to 302°F (100° to 150°C), FD ⁽³⁾ , TD ⁽⁴⁾ | | 21, 58 | ppm/°F | 38, 105 | ppm/°C |
| 302° to 392°F (150° to 200°C), FD ⁽³⁾ , TD ⁽⁴⁾ | | 15, 74 | ppm/°F | 27, 133 | ppm/°C |
| 392° to 482°F (200° to 250°C), FD ⁽³⁾ , TD ⁽⁴⁾ | | 17, 86 | ppm/°F | 30, 154 | ppm/°C |
| Melting Point | 11357-3 | 615 | °F | 324 | °C |
| General | | | | | |
| Optical Reflectivity at 460 nm | E 1331 | >90 | % | >90 | % |
| Optical Reflectivity at 540 nm | | >90 | % | >90 | % |
| Optical Reflectivity at 615 nm | | >90 | % | >90 | % |
| Specific Gravity | 1183A | 1.60 | | 1.60 | |
| Moisture Absorption, 24 hours | ASTM D 570 | 0.20 | % | 0.20 | % |
| Mold Shrinkage | D 955 | | | | |
| Flow Direction | | 0.5 | % | 0.5 | % |
| Transverse Direction | | 0.6 | % | 0.6 | % |

⁽¹⁾ Values shown are based upon limited production. Final specifications may vary. Actual properties of individual batches will vary within specification limits.

⁽²⁾ "dry, as molded".

⁽³⁾ FD = Flow direction.

⁽⁴⁾ TD = Transverse Direction.

Drying

Resin should be dried before molding because excessive moisture will result in nozzle drool, reduced mechanical properties, poor surface appearance, and sprue sticking. Extremely wet resin will result in a foamy extrudate. The target moisture level is 0.03 to 0.06% (300 to 600 ppm) and the maximum recommended drying temperature is 135°C (275°F).

Although AMODEL resins are shipped with less than 0.15% moisture and packaged in moisture-proof foil-lined bags or boxes, the resin should be dried for optimum molding results. The preferred drying condition is 4 hours at 120°C (248°F). Alternatively, the resins can be dried for 8 hours at 90°C (194°F). In either case, a desiccant bed dryer with a dew point below -30°C (-22°F) should be used.

Drying Tips:

- Do not open containers until ready to process.
- Drying at temperatures higher than 125°C (257°F) may result in the darkening of natural colored pellets.
- If a thermogravimetric moisture analyzer is used, it should be set to 170°C (338°F)
- AMODEL resin in an open container needs to be dried as shown in the following table. The recommended drying time depends on how long the container has been open and the estimated relative humidity.

| Drying Time at 120°C (248°F), hours | Elapsed Time From Container Opening, hours | | | | |
|-------------------------------------|--|-----|-----|-----|-----|
| | 0.25 | 0.5 | 1 | 2 | 3 |
| Relative Humidity, % | | | | | |
| 30 | 4.5 | 5.0 | 5.5 | 6.0 | 6.5 |
| 50 | 5.0 | 5.5 | 6.0 | 7.0 | 7.5 |
| 75 | 5.0 | 5.5 | 6.5 | 7.5 | 8.0 |
| 100 | 5.5 | 6.5 | 7.5 | 8.5 | 9.0 |

Injection Molding

AMODEL A-4422 NL WH829 resin can be readily injection molded in most screw injection molding machines. A general purpose screw is recommended, with minimum back pressure.

The melt temperature should be between 625°F and 650°F (329°C and 343°C). Generally this can be achieved with barrel temperatures from 605° to 615°F (318° to 324°C) in the rear zone gradually increasing to 620° to 630°F (327° to 332°C) in the front zone.

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Set injection pressure to give rapid injection, 3 to 4 in./sec (7.6 to 10 cm/sec). Adjust holding pressure to one-half injection pressure. Set hold time to maximize part weight. Transfer from injection to hold pressure at the screw position just before the part is completely filled. A mold temperature between 150°F and 200°F (65°C and 93°C) is high enough to achieve full crystallinity in the typical molded part with this resin.

Standard Packaging and Labeling

AMODEL A-4422 NL WH829 resin is packaged in foil lined, multiwall paper bags containing 25 kg (55.115 pounds) of material. Special packaging can be supplied upon request. Individual packages will be plainly marked with the product number, the color, the lot number, and the net weight.

Product Safety and Emergency Service

For product safety information or a Material Safety Data Sheet on a product of Solvay Advanced Polymers

1 (800) 621-4557
1 (770) 772-8880 outside of U.S.

For information or help in an emergency such as a spill, leak, fire or explosion, call day or night:

Emergency Health Information

1 (800) 621-4590
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collect calls accepted

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