

AF-4133 V0

AMODEL AF-4133 V0 is a 33% glass reinforced grade of polyphthalamide (PPA) resin that was designed specifically to process with water-cooled molds and meet the requirements of most electrical/electronic interconnect devices.

These components often consist of thin-walled, intricate designs, and frequently need to withstand IR solder reflow temperatures, pin insertions or other mechanical

assembly, and may be exposed to potential ignition sources. Therefore, the material has good mechanical strength, high deflection temperature, flame retardancy, and good flow.

This material processes readily using conventional injection molding equipment and methods. The processing window is relatively broad, and mold temperatures as low as 150°F (65°C) can be used.

Typical Properties of AMODEL AF-4133 V0 Resin

Property	ASTM Test Method	Typical Values ⁽¹⁾			
		U.S. Customary Units		SI Units	
		Value	Units	Value	Units
Mechanical					
Tensile Strength	D 638	25.8	kpsi	178	MPa
Tensile Elongation	D 638	1.8	%	1.8	%
Tensile Modulus	D 638	2,000	kpsi	13.8	GPa
Flexural Strength	D 790	37.0	kpsi	255	MPa
Flexural Modulus	D 790	1,800	kpsi	12.4	GPa
Izod Impact, Notched	D 256	1.2	ft-lb/in	65	J/m
Thermal					
Deflection Temperature at 264 psi (1.8 MPa)	D 648	560	°F	294	°C
Melting Point	D 3418	630	°F	332	°C
Flammability ⁽²⁾ 1/32" (0.8 mm) bar	UL-94	V0		V0	
Electrical					
Dielectric Strength ⁽³⁾ , 1/8" (3.2 mm)	D 149	524	V/mil	21	kV/mm
Volume Resistivity	D 257	1 x 10 ¹⁵	ohm-cm	1 x 10 ¹⁵	ohm-cm
Surface Resistivity		5 x 10 ¹³	ohm	5 x 10 ¹³	ohm
Special Electrical Properties per UL 746A [Performance Level Class] ⁽⁴⁾ 0 = best					
High Voltage Arc Resistance to Ignition, 1/32" (0.8 mm)	§31	>300 [0]	sec	>300 [0]	sec
Comparative Tracking Index	§21	500 [1]	volts	500 [1]	volts
Hot Wire Ignition	§29	>150 [0]	sec	>150 [0]	sec
High-Current Arc Ignition, 1/16" (1.5 mm)	§30	>150[0]	arcs	>150[0]	arcs
High-Current Arc Ignition, 1/32" (0.8 mm)		>150 [0]	arcs	>150 [0]	arcs
General					
Specific Gravity	D 792	1.68	g/cc	1.68	
Mold Shrinkage, Flow Direction	D 955	0.3-0.4	%	0.3-0.4	%
Mold Shrinkage, Transverse Direction		0.5-0.7	%	0.5-0.7	%
Moisture Absorption, 24 hr	D 570	0.18	%	0.18	%

⁽¹⁾ Actual properties of individual batches will vary within specification limits.

⁽²⁾ These flammability ratings are not intended to reflect hazards presented by these or any other materials under actual fire conditions.

⁽³⁾ Measured in oil.

⁽⁴⁾ Performance Level Class values are UL listed.

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 AF-4133 V0 resin can be readily injection molded in most screw injection molding machines. Barrel temperatures generally range from 605° to 645°F (318° to 340°C), depending on mold design and the type of equipment used. These conditions should give melt temperatures of 625° to 665°F (330° to 352°C). A general purpose screw is recommended, with minimum back pressure. A

mold temperature of at least 150°F (65°C) is preferred for optimum dimensional stability and surface appearance.

Standard Packaging and Labeling

AMODEL AF-4133 V0 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.

Precautionary Labeling

On the basis of toxicological, physical, and chemical properties of AMODEL AF-4133 V0 resin, labeling used on containers is as follows:

Caution: Handling and/or processing this material may generate a dust which can cause mechanical irritation of the eyes, skin, nose, and throat.

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

1 (770) 772-5177 outside of U.S.

Emergency Spill Information

CHEMTREC 1 (800) 424-9300

1 (703) 527-3887 outside of U.S.

collect calls accepted

For Additional Information

Technical Service

1 (800) 621-4557

Customer Service

1 (800) 848-9744

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