

Product Data

ET-1001 L

AMODEL ET-1001 L resin is an impact modified polyphthalamide (PPA) with exceptional impact strength and practical toughness. AMODEL PPA resins offer high fatigue strength, and good chemical resistance combined with good mechanical property retention over a broad temperature/humidity range.

Possible applications for AMODEL ET-1001 L resin include anti-friction and wear resistant components, and

components of chemical and oil processing equipment, sporting goods, automobiles, household appliances, power tools, and safety equipment, where exceptional impact strength and high modulus are required.

AMODEL ET-1001 L resin contains a lubricant for easier processing with conventional equipment and methods.

Table 1 Typical Properties of AMODEL ET-1001 L Resin - ASTM Test Methods (See Table 2 for Properties by ISO Methods)

Property	ASTM Test Method	Typical Values ⁽¹⁾					
		U. S. Customary Units			SI Units		
		DAM ⁽²⁾	50% RH ⁽³⁾	Units	DAM ⁽²⁾	50% RH ⁽³⁾	Units
Mechanical							
Tensile Strength	D 638	11.0	9.0	kpsi	76	62	MPa
Tensile Elongation	D 638						
at Yield		6	6	%	6	6	%
at Break		30	30	%	30	30	%
Tensile Modulus	D 638	350	340	kpsi	2.4	2.3	GPa
Flexural Strength	D 790	18.5	16.0	kpsi	128	110	MPa
Flexural Modulus	D 790	380	380	kpsi	2.6	2.6	GPa
Shear Strength	D 732	7.7		kpsi	53		MPa
Izod Impact, Notched	D 256	18	18	ft-lb/in	960	960	J/m
Penetration Impact (Dynatup ⁽⁴⁾)	D 3763						
at 73°F (23°C)							
Maximum Load		1,260		lbs	5,600		N
Energy to Maximum Load		32		ft-lbs	43		J
Total Energy Absorbed		47		ft-lbs	64		J
at -10°F (-23°C)							
Maximum Load		1,460		lbs	6,500		N
Energy to Maximum Load		34		ft-lbs	46		J
Total Energy Absorbed		49		ft-lbs	66		J
Poisson's Ratio		0.35			0.35		
Thermal							
Deflection Temperature ⁽⁵⁾	D 648	248		°F	120		°C
at 264 psi (1.8 MPa)							
Melting Point	D 3418	590		°F	310		°C
General							
Specific Gravity	D 792	1.15			1.15		
Moisture Absorption, 24 hours	D 570	0.7		%	0.7		%
Mold Shrinkage							
Flow Direction	D 955	1.1-1.5		%	1.1-1.5		%
Transverse Direction		1.5-2.0		%	1.5-2.0		%

⁽¹⁾ Properties are typical of uncolored resin. Actual properties of individual batches will vary within specification limits. Colorants or other additives will alter values.

⁽²⁾ DAM = "dry, as molded".

⁽³⁾ Conditioned to 50% Relative Humidity in accordance with ISO-1110, Accelerated Method.

⁽⁴⁾ "Dynatup" is a registered trademark of General Research Corporation.

⁽⁵⁾ 0.125 inch (3.2 mm) thick specimens annealed in air for 2 hours at 320°F (160°C).

Table 2 Typical Properties of AMODEL ET-1000 HS Resin - ISO Test Methods

Property	Temp., °C	ISO Test Method	Typical Values ⁽¹⁾			
			U.S. Customary Units		SI Units	
			Value	Units	Value	Units
Mechanical						
Tensile Stress at Yield	23	527	8.4	kpsi	58	MPa
Tensile Stress at Break	23	527	8.0	kpsi	55	MPa
Tensile Stress at Yield	100	527	4.6	kpsi	32	MPa
Tensile Stress at Break	100	527	4.5	kpsi	31	MPa
Tensile Strain at Yield	23	527	6.0	%	6.0	%
Tensile Strain at Break	23	527	15.0	%	15.0	%
Tensile Strain at Yield	100	527	3.1	%	3.1	%
Tensile Strain at Break	100	527	54.3	%	54.3	%
Tensile Modulus	23	527	330	kpsi	2.3	GPa
	100	527	260	kpsi	1.8	GPa
Flexural Strength	23	178	9.6	kpsi	66	MPa
	100	178	6.1	kpsi	42	MPa
Flexural Modulus	23	178	270	kpsi	1.9	GPa
	100	178	190	kpsi	1.3	GPa
Izod Impact, Notched	23	180/1A	38.1	ft-lb/in ²	80	kJ/m ²
Izod Impact, Unnotched	23	180/1U	no break	ft-lb/in ²	no break	kJ/m ²
Charpy Impact, Notched	23	179/1eA	no break	ft-lb/in ²	no break	kJ/m ²
Charpy Impact, Unnotched	23	179/1eU	no break	ft-lb/in ²	no break	kJ/m ²
Thermal						
Melting Point		11357-3	590	°F	310	°C
Heat Deflection Temperature at 1.8 MPa		75Af	235	°F	113	°C
General						
Specific Gravity		1183A	1.13		1.13	

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

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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 for most AMODEL resins 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 for this grade is 4 hours at 110°C (230°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 this grade at temperatures higher than 110°C (230°F) may result in pellet clumping.
- If a thermogravimetric moisture analyzer is used, it should be set to 170°C (338°F)

Injection Molding

AMODEL ET-1001 L resin can be readily injection molded in most screw injection molding machines. A general purpose screw is recommended, with minimum back pressure.

Barrel temperatures generally should range from 580° to 605°F (304° to 318°C) in the rear zone and gradually increase to 600° to 625°F (315° to 329°C) in the front zone. These conditions should give melt temperatures of 610° to 650°F (321° to 343°C).

Mold temperatures from 158° to 194°F (70-90°C) are recommended.

Standard Packaging and Labeling

AMODEL ET-1001 L 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 the toxicological, physical, and chemical properties of AMODEL ET-1001 L 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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