

TRIAX[®] 1120

ABS/Nylon Alloy

Injection Molding Grade

Description

Triax 1120 resin is an ABS (Acrylonitrile Butadiene Styrene)/Nylon 6 alloy for injection molding. It is a semicrystalline thermoplastic with excellent processibility, good chemical resistance, good fatigue performance, and excellent abrasion characteristics. Triax 1120 resin exhibits a good balance of impact strength and flow properties.

Applications

Typical applications include housings, shrouds and handles for components of lawn and garden equipment, power tools, appliances, and sporting goods. Automotive applications include fasteners and interior functional components, housings, and shrouds. As with any product, use of Triax 1120 resin in a given application must be tested (including but not limited to field testing) in advance by the user to determine suitability.

Drying

Triax ABS/Nylon alloy resins absorb moisture and must be dried prior to processing. The moisture level of the dried resin should be between 0.15 and 0.35%. A desiccant dehumidifying hopper dryer with a maximum inlet air dew point of -20°F (-29°C) is recommended. Typical drying conditions are 2 to 4 hours at 190°F (88°C) and should not exceed 200°F (93°C).

Processing

A reciprocating screw injection molding machine is recommended for Triax 1120 resin. A general-purpose screw with a 2.5:1 compression ratio is suggested. A minimum L/D ratio of 20:1 will ensure melt homogeneity.

For best part quality, use the lower range of the recommended melt temperature with minimum barrel residence time. To avoid excessive residence time in the barrel, volume and weight of the shot should be balanced against barrel capacity and injection stroke. A shot weight-to-machine capacity ratio of 0.5 to 0.7 is recommended; ratios below 0.3 should definitely be avoided.

Typical processing parameters are noted below. Actual processing conditions will depend on machine size, mold design, material residence time, shot size, etc.

Typical Injection Molding Conditions	
Barrel Temperatures:	
Rear.....	450° – 510°F (232° – 266°C)
Middle.....	450° – 510°F (232° – 266°C)
Front.....	450° – 510°F (232° – 266°C)
Nozzle.....	480° – 500°F (249° – 260°C)
Melt Temperature.....	460° – 520°F (238° – 271°C)
Mold Temperature.....	100° – 150°F (38° – 66°C)
Injection Pressure.....	6,000 – 12,000 psi
Hold Pressure.....	30 – 50% of Injection Pressure
Back Pressure.....	50 – 100 psi
Screw Speed.....	Moderate
Injection Speed.....	Fast
Cushion	1/8 in max
Clamp.....	3 – 5 ton/in ²

Additional information on processing may be obtained by contacting an INEOS ABS technical service representative.

Regrind Information

Where end-use requirements permit, up to 20% Triax resin regrind may be used with virgin material during injection molding, provided that the material is kept free of contamination and is properly dried (see section on Drying). Any regrind used must be generated from properly molded parts, sprues, and/or runners. All regrind used must be clean, uncontaminated, and thoroughly blended with virgin resin prior to drying and processing. Under no circumstances should degraded, discolored, or contaminated material be used for regrind. Materials of this type should be properly discarded.

Improperly mixed and/or dried regrind may diminish the desired properties of Triax ABS/Nylon alloy resin. It is critical that you test finished parts produced with any amount of regrind to ensure that your end-use performance requirements are fully met. Regulatory or testing organizations (e.g., UL) may have specific requirements limiting the allowable amount of regrind. Because third party regrind generally does not have a traceable heat history, or offer any assurance that proper temperatures, conditions, and/or materials were used in processing, extreme caution must be exercised in buying and using regrind from third parties.

The use of regrind material should be avoided entirely in those applications where resin properties equivalent to virgin material are required, including but not limited to color quality, impact strength, resin purity, and/or load-bearing performance.

Health and Safety Information

Appropriate literature has been assembled which provides information concerning the health and safety precautions that must be observed when handling the INEOS ABS products mentioned in this publication. For materials mentioned which are not INEOS ABS products, appropriate industrial hygiene and other safety precautions recommended by their manufacturers should be followed. Before working with any of these products, you must read and become familiar with the available information on their hazards, proper use, and handling. This cannot be overemphasized. Information is available in several forms, e.g., *material safety data sheets and product labels*. Consult your INEOS ABS representative or contact the Product Safety and Regulatory Affairs Department at INEOS ABS.

Typical Properties* for Natural Resin	ASTM Test Method (Other)	Units U.S. Conventional (SI Metric)	Triax® 1120 Resin	
			Dry as Molded	Conditioned
General				
Specific Gravity	D 792		1.06	
Density	D 792	lb/in ³ (g/cm ³)	0.038 (1.06)	
Specific Volume	D 792	in ³ /lb (cm ³ /g)	26.1 (0.94)	
Mold Shrinkage	D 955	in/in (mm/mm)	0.01	
Water Absorption, Immersion at 73°F (23°C):	D 570			
24 Hours		%	1.1	
Equilibrium		%	4.3	
Gloss: 20° Angle	D 523	%	78	
60° Angle		%	91	
Mechanical				
Tensile Stress at Yield	D 638	lb/in ² (MPa)	6,300 (43)	5,800 (40)
Tensile Elongation at Break	D 638	%	140	290
Tensile Modulus	D 638	lb/in ² (GPa)	295,000 (2.0)	
Flexural Stress at Yield	D 790	lb/in ² (MPa)	10,900 (75)	8,250 (57)
Flexural Modulus	D 790	lb/in ² (GPa)	300,000 (2.0)	170,000 (1.2)
Impact Strength, Notched Izod:	D 256			
0.125-in Thickness, 73°F (23°C)		ftlb/in (J/m)	15 (801)	15 (801)
0.125-in Thickness, -40°F (-40°C)		ftlb/in (J/m)	1.5 (80)	1.5 (80)
0.250-in Thickness, 73°F (23°C)		ftlb/in (J/m)	14 (747)	14 (747)
0.250-in Thickness, -40°F (-40°C)		ftlb/in (J/m)	1.3 (69)	1.4 (75)
Instrumented Impact, Total Energy: ^a	D 3763			
73°F (23°C)		ftlb (J)	31 (42)	36 (49)
-40°F (-40°C)		ftlb (J)	35 (47)	44 (60)
Rockwell Hardness	D 785	R Scale	105	90
Thermal				
Deflection Temperature, Unannealed:	D 648			
0.125-in Thickness, 264 psi		°F (°C)	149 (65)	144 (62)
0.125-in Thickness, 66 psi		°F (°C)	194 (90)	190 (88)
0.250-in Thickness, 264 psi		°F (°C)	165 (74)	162 (72)
0.250-in Thickness, 66 psi		°F (°C)	207 (97)	205 (96)
Coefficient of Linear Thermal Expansion:	D 696			
-40 to 71°F (-40 to 22°C)		in/in/°F (mm/mm/°C)	5.5 (10) E-05	6.3 (11.3) E-05
71 to 181°F (22 to 83°C)		in/in/°F (mm/mm/°C)	8.2 (14.8) E-05	7.8 (14.0) E-05
Relative Temperature Index:	(UL746B)			
0.062-in (1.57 mm) Thickness				
Electrical		°F (°C)	230 (110)	
Mechanical with Impact		°F (°C)	149 (65)	
Mechanical without Impact		°F (°C)	221 (105)	
Vicat Softening Temperature:	D 1525			
1-kg Load, 120°C/hr		°F (°C)	387 (197)	338 (170)
Flammability**				
UL94 Flame Class:	(UL94)			
0.062-in (1.57-mm) Thickness		Rating		HB
0.125-in (3.18-mm) Thickness		Rating		HB
Electrical				
Volume Resistivity (Tinfoil Electrodes)	D 257	ohm-cm	9.7 E+15	9.0 E+12
Surface Resistivity	D 257	ohm	8.3 E+15	3.2 E+13
Dielectric Strength (Short Time Under Oil at 73°F [23°C] and 0.062-in Thickness)	D 149	V/mil (kV/mm)	425 (16.7)	380 (15.0)
Dielectric Constant (Tinfoil Electrodes), 1 MHz	D 150		3.5	3.5
Dissipation Factor (Tinfoil Electrodes), 1 MHz	D 150		0.024	0.039

* These items are provided as general information only. They are approximate values and are not part of the product specifications.

** Flammability results are based on small-scale laboratory tests for purposes of relative comparison and are not intended to reflect the hazards presented by this or any other material under actual fire conditions.

^a 0.100-in thickness, 0.5-in dart, 1.6-in clamp, 7.6 mph.

Dry as Molded: Refers to a moisture content of less than 0.2% by weight.

Conditioned: Refers to an equilibrium moisture content in a standard laboratory atmosphere of 73°F (23°C) and 50% relative humidity.

Note: The information contained in this publication is current as of October 2009. Please contact INEOS ABS to determine whether this publication has been revised.

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