

DURETHAN[®] B 30 S and B 31 SK

Polyamide 6

General-Purpose Grades

Product Information

ISO: 1874-PA6, MR, 14-030, N

Description

Durethan B 30 S and B 31 SK thermoplastic resins are unreinforced, general-purpose grades of polyamide 6. These injection molding grades are fast-cycling materials with good impact strength. Both B 30 S and B 31 SK have excellent flowability and easy mold release. B 31 SK is additionally modified to provide a more uniform and fine-grained crystallinity.

Applications

Typical applications in the consumer market include power tool components, appliances, and lawn and garden equipment. Industrial/mechanical applications include castors, hardware fittings, furniture hinges, and frames and mountings. There are also various applications in the electrical/electronic market, such as connectors, switches, and housings. As with any product, use of Durethan B 30 S or B 31 SK resin in a given application must be tested (including field testing, etc.) in advance by the user to determine suitability.

Drying

Durethan polyamide resins are supplied in moisture-tight packaging, dry and ready for processing. However, resin that has absorbed moisture (i.e., regrind, material in opened or damaged bags, and/or color concentrates) must be dried to a moisture content of less than 0.1% prior to processing, in order to optimize property performance and appearance in molded parts. A desiccant dehumidifying hopper dryer is recommended with a maximum dew point of 0°F (-18°C) and an inlet air temperature of 175°F (80°C). Higher drying temperatures could result in discoloration of resin and pigment systems and therefore should be avoided.

Processing

Durethan B 30 S and B 31 SK resins can be processed on all conventional injection molding machines. When processing on reciprocating screw machines, the injection pressure should be at least 11,600 psi (800 bar). A three-zone or short-compression screw should be used. Optimum properties are achieved by keeping the melt temperature between 480–520°F (250–270°C). Melt temperatures above 535°F (280°C) can cause thermal degradation and loss of properties.

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	470–480°F (245–250°C)
Middle	480–500°F (250–260°C)
Front	500–520°F (260–270°C)
Nozzle	500–520°F (260–270°C)
Melt Temperature	480–520°F (250–270°C)
Mold Temperature	175–250°F (75–120°C)
Injection Pressure	10,000–20,000 psi
Hold Pressure	50% of Injection Pressure
Back Pressure	50–150 psi
Screw Speed	60–100 rpm
Injection Speed	Moderate to Fast
Cushion	1/8–1/4 in
Clamp	2–4 ton/in ²

Additional information on processing may be obtained by consulting the LANXESS publication *Durethan Polyamide — A Processing Guide for Injection Molding* and by contacting a LANXESS technical service representative.

Regrind Usage

Where end-use requirements permit, up to 10% Durethan resin regrind may be used with virgin material, 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 discarded.

Improperly mixed and/or dried regrind may diminish the desired properties of Durethan 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, nor 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 LANXESS products mentioned in this publication. For materials mentioned which are not LANXESS 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 LANXESS Corporation representative or contact the Product Safety and Regulatory Affairs Department at LANXESS.

Typical Physical Properties* for Natural Resin	ASTM Test Method (Other)	Units		Durethan® B 30 S & B 31 SK Resins	
		U.S. Conventional	(SI Metric)	Dry as Molded	Conditioned
General					
Specific Gravity	D 792			1.14	
Density	D 792	lb/in ³	(g/cm ³)	0.041	(1.14)
Specific Volume	D 792	in ³ /lb	(cm ³ /g)	24.3	(0.88)
Mold Shrinkage	(LANXESS)				
Flow Direction		in/in	(mm/mm)	0.012	
Cross-Flow Direction		in/in	(mm/mm)	0.011	
Water Absorption (0.125-in [3.2-mm] Thickness):					
24-Hour Immersion	D 570		%	1.6	
Equilibrium (73°F [23°C])	(DIN 53495)				
In Air (50% RH)			%	3.0	
In Water			%	10.0	
Mechanical					
Tensile Stress at Yield	D 638	lb/in ²	(MPa)	11,600	(80)
Tensile Stress at Break	D 638	lb/in ²	(MPa)	7,250	(50)
Tensile Elongation at Yield	D 638		%	4	20
Tensile Elongation at Break	D 638		%	35	>200
Tensile Modulus	D 638	lb/in ²	(GPa)	464,000	(3.2)
Flexural Stress at 5% Strain	D 790	lb/in ²	(MPa)	16,700	(115)
Flexural Modulus	D 790	lb/in ²	(GPa)	392,000	(2.7)
Impact Strength, Notched Izod:	D 256				
0.125-in (3.2-mm) Thickness					
73°F (23°C)		ft.lb/in	(J/m)	1.1	(60)
14.0					(750)
Thermal					
Deflection Temperature, Unannealed:	D 648				
0.157-in (4.0-mm) Thickness					
264-psi (1.82-MPa) Load			°F (°C)	140	(60)
66-psi (0.46-MPa) Load			°F (°C)	356	(180)
Relative Temperature Index:	(UL746B)				
0.059-in (1.5-mm) Thickness					
Electrical			°F (°C)	221	(105)
Mechanical with Impact			°F (°C)	149	(65)
Mechanical without Impact			°F (°C)	167	(75)
Flammability**					
UL94 Flame Class:	(UL94)				
0.016-in (0.40-mm) Thickness			Rating	V-2 ^a	
0.059-in (1.5-mm) Thickness			Rating	V-2	
0.118-in (3.0-mm) Thickness			Rating	V-2	
Weatherability					
UV Light Exposure and Hot Water	(UL746C				
Immersion Tests	Sections 61 & 62)		Rating	Pass, f1	(B 30 S only)
Electrical					
Volume Resistivity (Tinfoil Electrodes)	(IEC 93)	ohm·cm		1.0 E+15	1.0 E+12
Surface Resistivity	(IEC 93)	ohm		1.0 E+13	1.0 E+12
Dielectric Strength:	(IEC 243)				
0.118-in (3.0-mm) Thickness		V/mil	(kV/mm)	762	(30)
Dielectric Constant (Tinfoil Electrodes): 50 Hz	(IEC 250)			3.8	20
1 MHz				3.4	4.6
Dissipation Factor (Tinfoil Electrodes): 50 Hz	(IEC 250)			0.05	2.30
1 MHz				0.07	0.40
Comparative Tracking Index	D 3638		V		600

* 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 Natural color.

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

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

Note: The information contained in this publication is current as of May 2005. Please contact LANXESS Corporation to determine whether this publication has been revised.

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