

DURETHAN® BC 304

Polyamide 6

Impact-Modified Grade

ISO: 1874-PA6, MPR, 14-020, N

Product Information

Description

Durethan BC 304 thermoplastic resin is an impact modified, injection molding grade polyamide 6, resulting in an extremely high notched Izod impact strength. Because of their toughness, parts molded from Durethan BC 304 resin can be used dry-as-molded without previous conditioning. Though moisture absorption occurs, there is less water absorption (in amount and rate) than in an unmodified grade.

Applications

Applications include high-impact and semiflexible parts in many market areas. Typical applications in the sporting goods market include ski bindings and accessories, ice skate blade supports, roller skates, and sailboard components. Examples of other applications are heavy-duty castors, tool handles, and electrical components subjected to low-temperature impact conditions. As with any product, use of Durethan BC 304 resin in a given application must be tested (including but not limited to field testing) 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 BC 304 resin can be processed on all conventional injection molding machines. Optimum properties are achieved by keeping the melt temperature at about 500°F (260°C). Higher melt temperatures 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	490°–500°F (255°–260°C)
Middle	500°–520°F (260°–270°C)
Front	500°–520°F (260°–270°C)
Nozzle	500°–520°F (260°–270°C)
Melt Temperature	490°–510°F (255°–265°C)
Mold Temperature	130°–150°F (55°–65°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, 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 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 Properties* for Natural Resin	ASTM Test Method (Other)	Durethan® BC 304 Resin	
		U.S. Conventional	SI Metric
General Specific Gravity Density Specific Volume Mold Shrinkage Flow Direction Cross Direction Water Absorption (0.125-in [3.2-mm] Thickness): 24-Hour Immersion Equilibrium (73°F [23°C]) In Air (50% RH) In Water	D 792 D 792 D 792 (LANXESS) D 570	1.07 0.038 lb/in ³ 26.1 in ³ /lb 0.015 in/in 0.016 in/in	1.06 g/cm ³ 0.94 cm ³ /g 0.015 mm/mm 0.015 mm/mm 1.6% 2.0% 7.5%
Thermal Deflection Temperature, Unannealed: 0.157-in (4.0-mm) Thickness 264-psi (1.82-MPa) Load 66-psi (0.46-MPa) Load Relative Temperature Index: 0.030-in (0.75-mm) Thickness Electrical Mechanical with Impact Mechanical without Impact	D 648 (UL746B)	122°F 194°F 149°F 149°F 149°F	50°C 90°C 65°C 65°C 65°C
Flammability** UL94 Flame Class: 0.030-in (0.75-mm) Thickness	(UL94)	HB Rating	

Typical Properties* for Natural Resin	ASTM Test Method (Other)	Durethan® BC 304 Resin			
		Dry as Molded ^a		Conditioned ^b	
		U.S. Conventional	(SI Metric)	U.S. Conventional	(SI Metric)
Mechanical Tensile Stress at Yield Tensile Elongation at Yield Tensile Elongation at Break Tensile Modulus Flexural Stress at 5% Strain Flexural Modulus Impact Strength, Notched Izod: 0.125-in (3.2-mm) Thickness 73°F (23°C) -40°F (-40°C)	D 638 D 638 D 638 D 638 D 790 D 790 D 256	6,520 lb/in ²	45 MPa 4% >200%	5,080 lb/in ²	35 MPa 30% >200%
Electrical Volume Resistivity (Tinfoil Electrodes) Surface Resistivity Dielectric Strength: 0.118-in (3.2-mm) Thickness Dielectric Constant (Tinfoil Electrodes); 50 Hz 1 MHz Dissipation Factor (Tinfoil Electrodes): 50 Hz 1 MHz Comparative Tracking Index	(IEC 93) (IEC 93) (IEC 243) (IEC 250) (IEC 250) D 3638	1.0 E+15 ohm-cm 1.0 E+14 ohm 914 V/mil	1,800 MPa 55 MPa 1,600 MPa 640 J/m 640 J/m	1.0 E+13 ohm-cm 1.0 E+13 ohm 914 V/mil 3.3 3.1 0.01 0.01	800 MPa 30 MPa 750 MPa 920 J/m 640 J/m 9.6 3.5 0.15 0.06 600V

* 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 Dry as Molded refers to a moisture content less than 0.2% by weight.

^b 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.

The manner in which you use and the purpose to which you put and utilize our products, technical assistance and information (whether verbal, written or by way of production evaluations), including any suggested formulations and recommendations are beyond our control, therefore, it is imperative that you test our products, technical assistance and information to determine to your own satisfaction whether they are suitable for your intended uses and applications. This application-specific analysis must at least include testing to determine suitability from a technical as well as health, safety, and environmental standpoint. Such testing has not necessarily been done by us. Unless we otherwise agree in writing, all products are sold strictly pursuant to the terms of our standard conditions of sale. All information and technical assistance is given without warranty or guarantee and is subject to change without notice. It is expressly understood and agreed that you assume and hereby expressly release us from all liability, in tort, contract or otherwise, incurred in connection with the use of our products, technical assistance, and information. Any statement or recommendation not contained herein is unauthorized and shall not bind us. Nothing herein shall be construed as a recommendation to use any product in conflict with patents covering any material or its use. No license is implied or in fact granted under the claims of any patent



LANXESS Corporation
111 RIDC Park West Drive
Pittsburgh, PA 15275-1112
800-LANXESS

www.us.lanxess.com