

ABS 433

Acrylonitrile Butadiene Styrene

General-Purpose Injection Molding Grade

Description

ABS 433 is a general-purpose injection molding grade of ABS (acrylonitrile butadiene styrene). It is a high-impact, high-gloss ABS, available only in natural (000000) and black (904000).

Applications

Typical applications include housings, toys, small appliances, and consumer goods. As with any product, use of ABS 433 resin in a given application must be tested (including but not limited to field testing) in advance by the user to determine suitability.

Drying

Drying prior to processing is recommended in a desiccant dehumidifying hopper dryer. An inlet air dew point of -20°F (-29°C) or below is recommended to achieve a moisture content ≤ 0.1%. Typical drying conditions are 2 hours at 180°–190°F (82°–88°C). Drying for 4 hours at 160°–170°F (71°–77°C) is also adequate.

Processing

A reciprocating screw injection molding machine is preferred. 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 0.75 is recommended. A mold temperature of 110°–150°F (43°–66°C) is recommended for development of maximum gloss and strength, with the hotter end of this range preferred.

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	455°–480°F (235°–249°C)
Middle	465°–490°F (241°–254°C)
Front	475°–500°F (246°–260°C)
Nozzle	475°–500°F (246°–260°C)
Melt Temperature	475°–525°F (246°–274°C)
Mold Temperature	110°–150°F (43°–66°C)
Injection Pressure	10,000–16,000 psi
Hold Pressure	50–75% of Injection Pressure
Back Pressure	0–25 psi
Screw Speed	Moderate
Injection Speed	High
Cushion	1/4 in max
Clamp	2–4 ton/in ²

Achieving uniform surface appearance on a molded part requires proper tool design, properly prepared and conditioned tool cavity surfaces, and preventive maintenance. Tool design should include adequate, properly sized, and properly designed vents. Preventive maintenance for tooling requires, but is not limited to, periodic inspection and cleaning of tool surfaces, actual cavity surfaces, and cavity vents.

Additional information on processing may be obtained by contacting a LANXESS Corporation technical service representative.

Regrind Information

Where end-use requirements permit, up to 20% ABS 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 ABS 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)	ABS 433 Resin	
		U.S. Conventional	SI Metric
General Specific Gravity Mold Shrinkage Melt Flow Rate at 230°C/3.8-kg Load	D 792 D 955 D 1238	1.05 0.004–0.006 in/in 0.004–0.006 mm/mm 5 g/10 min	
Mechanical Tensile Stress at Yield Tensile Modulus Tensile Elongation at Break Flexural Stress at Yield Flexural Modulus Impact Strength, Notched Izod ^a : 0.125-in (3.2-mm) Thickness 73°F (23°C) -40°F (-40°C) Rockwell Hardness, R Scale	D 638 D 638 D 638 D 790 D 790 D 256 D 785	6,100 lb/in ² 370,000 lb/in ² 10,500 lb/in ² 380,000 lb/in ² 7.0 ft·lb/in 1.2 ft·lb/in	42 MPa 2.55 GPa 30% 72 MPa 2.6 GPa 375 J/m 64 J/m
Thermal Deflection Temperature Under Load: 0.5-in (12.7-mm) Thickness Unannealed 264 psi (1.82 MPa) 66 psi (0.46 MPa) Annealed 264 psi (1.82 MPa) 66 psi (0.46 MPa) Coefficient of Linear Thermal Expansion Vicat Softening Temperature, Rate B	D 648 D 696 D 1525	185°F 197°F 202°F 211°F 5.0 E-05 in/in/°F 223°F	85°C 92°C 94°C 99°C 9.0 E-05 mm/mm/°C 106°C
Flammability** UL94 Flame Class: 1.5-mm (0.059-in) Thickness 3.0-mm (0.118-in) Thickness	(UL94)	HB Rating HB Rating	

* These items are provided as general information only. They are approximate values and are not part of the product specifications. Type and quantity of pigments or additives used to obtain opaque colors and special effects can affect material properties.

** 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 0.125-in thickness, 0.5-in dart, 3-in clamp, 7.6 mph.

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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