

Ultramid® 8281 HS GP

Polyamide 6

Product Description

Ultramid 8281 HS GP is an unreinforced, heat stabilized PA6 rotomolding compound. It is available in natural and black and can be painted. It exhibits excellent balance of engineering properties including strength, stiffness, and toughness combined with excellent abrasion resistance and self lubricating characteristics. In addition, the heat stabilizer system extends its retention of properties at elevated temperatures. Chemical resistance is excellent to greases, oils and hydrocarbons. All data is from injection molded specimens with the exception of Drop Weight Impact.

Applications

Ultramid 8281 HS GP is generally recommended for applications such as fuel tanks, chemical storage tanks, hydraulic oil reservoirs, cyclones, and heat resistance containers.

PHYSICAL	ASTM Test Method	Property Value	
Specific Gravity	D-792	1.13	
Mold Shrinkage (1/8" bar, in/in)		0.02	
Moisture, %	D-570		
(24 Hour)		1.3	
(50% RH)		2.7	
(Saturation)		9.5	
MECHANICAL	ASTM Test Method	Dry	Conditioned
Tensile Strength, Yield, MPa (psi)	D-638		
-40C (-40F)		114 (16,500)	100 (14,500)
23C (73F)		72 (10,400)	33 (4,780)
121C (250F)		20 (2,900)	-
Elongation, Break, %	D-638		
23C (73F)		>100	>100
Flexural Modulus, MPa (psi)	D-790		
-40C (-40F)		2,760 (400,000)	2,260 (328,000)
23C (73F)		2,690 (390,000)	685 (99,300)
65C (149F)		530 (76,800)	-
90C (194F)		360 (52,200)	-
121C (250F)		300 (43,500)	-
Flexural Strength, MPa (psi)	D-790		
-40C (-40F)		154 (22,300)	145 (21,000)
23C (73F)		100 (14,500)	32 (4,640)
65C (149F)		30 (4,350)	-
90C (194F)		20 (2,900)	-
121C (250F)		15 (2,170)	-
Rockwell Hardness, R Scale	D-785	116	-
IMPACT	ASTM Test Method	Dry	Conditioned
Notched Izod Impact, J/M (ft-lbs/in)	D-256		
-40C (-40F)		45 (0.8)	-
23C (73F)		55 (1.0)	-



Drop Weight Impact, ft-lbs, 23C	BASF Drop Weight Impact Test	50	-
THERMAL	ASTM Test Method	Dry	Conditioned
Melting Point, C(F)	D-3418	220 (428)	-
Heat Deflection @ 264 psi (1.8 MPa) C(F)	D-648	60 (140)	-
Coef. of Linear Thermal Expansion, mm/mm C (in/in F)	E-831	0.74 X10-4	-

Processing Guidelines

Material Handling

Max. Water content: 0.2%

Product is supplied in sealed containers and drying prior to molding is not required. If drying becomes necessary, a dehumidifying or desiccant dryer operating at 80 degC (176 degF) is recommended. Drying time is dependent on moisture level, but 2-4 hours is generally sufficient. Further information concerning safe handling procedures can be obtained from the Material Safety Data Sheet. Alternatively, please contact your BASF representative.

Typical Profile

Mold Preparation

Mold Construction: Cast Aluminum, Sheet Aluminum, Sheet Steel, Stainless Steel, or Electroformed Nickel.

Preparation of the mold surface is critical in order to achieve optimum impact performance and in minimizing potential pitting on the surface of the molded part. Proper preparation of the mold requires only a minimum amount of mold release and after baking the coating the mold surface usually must be dry or wet sanded utilizing 100-200 grit emery cloth or equivalent to prevent premature release from the mold during cooling of the part.

Oven Temperature

An oven temperature of 300-355 degC (572-671 degF) is recommended for most applications. Although this product can be molded without an inert atmosphere, it is recommended to prevent some discoloration and to provide optimum properties. This is most conveniently achieved by utilizing a nitrogen or carbon dioxide purge during the heating cycle.

Heating Cycle

The table below illustrates minimum heating cycles versus wall thickness in a mold constructed of 6.35mm aluminum plate. Machines with more efficient heating systems will permit shorter heating cycles. Pellet/powder blends will also result in shorter heating cycles.

Part Thickness Minimum Heating Cycle

Oven Temp. 343 degC (650 degF)

2.5mm 15.5 minutes
3.8mm 19.0 minutes
5.1mm 22.0 minutes
6.4mm 25.5 minutes
7.6mm 29.0 minutes
8.9mm 32.0 minutes
10mm 35.5 minutes

Cooling Cycle

Good contact with the mold during cooling is required for optimum property performance and surface aesthetics. This can be achieved by sanding the mold during preparation or by introducing some pressure (.15-.3 bar) into the mold by nitrogen or air injection during the cooling operation. Cooling cycles are comprised of a 5-10 minute air cool followed by a 5-10 minutes water cool. If internal mold pressure is used the air cool time should be reduced to 1-2 minutes and immediately followed by water cooling to optimize the impact strength of the molded part.

Rotation

The speed of rotation, rotation ratio, venting and other techniques are the same as when rotomolding polyethylenes. Continuous rotation immediately after the heating cycle is necessary to prevent wall sagging especially for thick walled parts.

Note

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