DIAMOND POLYMERS, INC.

Sheet Extrusion Grade

Diamaloy GLY 9020

High Gloss ASA Weatherable Polymer

Diamaloy GLY 9020 resin is a high-gloss,low impact grade of ASA (acrylonitrile-styrene-acrylate) with good resistance to weather aging. It has good melt strength for extrusion and thermoforming, and it can be easily coextruded. This product is supplied in various colors.

Applications

Typical applications include those requiring weatherability and high gloss such as body panels for tractors, recreational vehicles, etc. As with any product, use of Diamaloy GLY 9020 resin in a given application must be tested (including but not limited to field testing) in advance by the user to determine suitability.

Weatherability

Diamaloy GLY 9020 exhibits good resistance to weather aging in unpainted outdoor applications. Color changes may occur in certain colors but are minimal in comparison with ABS (acrylonitrile butadiene styrene) under similar exposure conditions. In coextrusion applications Diamaloy GLY 9020 offers UV (ultraviolet) protection only if the cap layer is at least 15 mils thick after thermoforming. In most cases, this requires at least a 20% Diamaloy GLY 9020 cap. Since weatherability is dependent on certain variables, such as resin color, end-use environment, and length of exposure, users need to determine whether color, appearance, and property shifts are acceptable for their intended applications. Please consult your DIAMOND POLYMERS ASA representative for further information.

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 of $\leq$ 0.04%. Typical drying conditions are 3-4 hours at 180°-190°F (82°-88°C).

Processing

To obtain optimum balance of sheet gloss and mechanical properties, the extruder profile should be set to deliver polymer at a melt temperature between 430°- 470°F (221°- 243°C). Single- or two-state screws can be used, although a two-stage screw is preferred. For two-stage screw, a first-stage compression ratio (feed depth to metering depth) of 2.5 - 2.7 and a pump ration (second-stage metering to first-stage metering) of 1.5 - 2.0 are recommended. This is similar to an ABS screw. Die temperatures settings are between 410°- 470°F (210°- 243°C). The die should be adjusted to provide uniform polymer melt at the lips. Suggested polishing roll settings for Diamaloy GLY 9020 resin using a standard S wrap are noted below. Specific settings are dependent on sheet gauge and linear speed.

Polishing Roll	Roll Stack
Top	160 - 210°F (71- 93°C)
Middle	160 - 200°F (71 - 93°C)
Bottom	150 - 190°F (66 - 88°C)

Regrind Information

Where end-use requirements permit, up to 40% Diamaloy GLY 9020 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). In most cases where monolayer Diamaloy GLY 9020 resin is being extruded, up to 40% Diamaloy GLY 9020 resin regrind from 100% Diamaloy GLY 9020 resin sheet or parts is generally acceptable. Where Diamaloy GLY 9020 resin is being coextruded on top of a compatible material, such as ABS, a level of 40% regrind from a mixture of Diamaloy GLY 9020 resin and substrate is generally acceptable, but in this case the regrind must go only into the substrate. Other thermoplastics, such as polystyrene, polyethylene, and polypropylene, to mention a few, are not compatible, and mixing will result in appearance and property degradation. Any regrind used must be generated from properly molded parts and/or thermoformed parts and trim scrap. 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. Material of this type should be discarded. Improperly mixed and/or dried resin may diminish the desired properties of Diamaloy GLY 9020 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 materials 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.

DIAMOND POLYMERS, INC.

Preliminary Data Sheet

Sheet Extrusion Grade

Diamaloy GLY 9020

PROPERTIES	ASTM METHOD	UNITS ENGLISH METRIC	
PHYSICAL			
Melt Flow Rate- Procedure A 220°C/10 kg	D-1238	g/10 min	7.5
Specific Gravity	D-792		1.08
Mold Shrinkage	D-955	%	0.4 - 0.7
IMPACT			
Izod Impact, notched (0.125")	D-256	ft-lb/in	2.0
Instrumented Impact Total Energy	D-3763	in-lb	289
FLEXURAL			
Flexural Modulus, 0.125 inch bar chs 0.05 in/min	D-790	psi MPa	399,000 2,749
Flexural Strength, 0.125" bar chs 0.05 in/min	D-790	psi MPa	11,900 82
TENSILE			
Tensile Strength @ Yield Type 1 bar, chs 2 in/min	D-638	psi MPa	8,100 56
Tensile Strength @ Break Type 1 bar, chs 2 in/min	D-638	psi MPa	5,600 38
% Elongation @ Yeild, Type 1 bar, chs 2 in/min	D-638	%	3
% Elongation @ Break Type 1 bar, chs 2 in/min	D-638	%	15
THERMAL			
Heat Deflection Temperature 0.125" bar @ 1.8 MPa (264 psi)	D-648	°F °C	182 83
Heat Deflection Temperature 0.125" bar @ 0.455 MPa (66 psi)	D-648	°F °C	205 94
CTE, flow, -40°F to100°F CTE, Xflow, -40°F to100°F	E831	1/°F	5.3 E-05 6.0 E-05

EAP/11-24-09

DIAMOND POLYMERS, INC.

Preliminary Data Sheet

Sheet Extrusion Grade

Diamaloy GLY 9020

PROPERTIES	ISO METHOD	UNITS ENGLISH METRIC	
PHYSICAL			
Melt Flow Rate 220°C/10 kg	ISO 1133	g/10 min	8.0
IMPACT			
Izod Impact, notched, 80x10x4mm, 23°C	ISO 180/1A	kJ/m^2	8.0
Charpy Impact, notched, 23°C	ISO 179	kJ/m^2	9
FLEXURAL			
Flexural Modulus, chs 2 mm/min	ISO 178	MPa	2,700
Flexural Strength, chs 2 mm/min	ISO 178	MPa	78
TENSILE			
Tensile Strength @ Yield chs 50 mm/min	ISO 527	MPa	55
Tensile Modulus, chs 1 mm/min	ISO 527	MPa	2,800
THERMAL			
Heat Deflection Temperature @ 1.8 MPa, Flatw, 80x10x4 mm sp=64 mm	ISO 75/Af	°C	83
Vicat, Rate B/50	ISO 306	°C	99

EAP/09-02-09