



DIAMOND POLYMERS, INC.

Sheet Extrusion Grade

ASA Weatherable Polymer

Centrex® 485

Centrex 485 resin is a low-gloss, medium-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. The recommended substrate is ABS (acrylonitrile-butadiene-styrene) resin.

Applications

Typical applications include those requiring weatherability and low gloss such as automotive and truck interiors, exterior siding and trim profiles. As with any product, use of Centrex 485 resin in a given application must be tested (including but not limited to field testing) in advance by the user to determine suitability.

Weatherability

Centrex resins exhibit 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. For optimum performance, appropriate pigments should be used. In coextrusion applications, Centrex resins offer 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% Centrex 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 $\leq 0.03\%$. Typical drying conditions are 3-4 hours at 180°-200°F (82°-93°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 400°- 470°F (204°- 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°- 465°F (210°- 240°C). The die should be adjusted to provide uniform polymer melt at the lips. Suggested polishing roll settings for Centrex 485 resin using a standard S wrap are noted below. Specific settings are dependent on sheet gauge and linear speed.

Polishing Roll	Down Stack	Up stack
Top	200°F (93°C)	200°F (93°C)
Middle	165°F (74°C)	190°F (88°C)
Bottom	200°F (74°C)	180°F (82°C)

Regrind Information

Where end-use requirements permit, up to 40% Centrex 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 Centrex resin is being extruded, up to 40% Centrex resin regrind from 100% Centrex resin sheet or parts is generally acceptable. Where Centrex resin is being coextruded on top of a compatible material, such as ABS, a level of 40% regrind from a mixture of Centrex 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 Centrex 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.

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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.



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PROPERTIES	ASTM METHOD	UNITS ENGLISH METRIC	
PHYSICAL			
Melt Flow Rate - Procedure A 220°C/10 kg	D-1238	g/10 min	7.0
Specific Gravity	D-792		1.05
Gloss @ 60° Sheet Formed	D-523	%	20 10
Rockwell Hardness	D-785	R Scale	79
IMPACT			
Izod Impact, notched, 0.125" bar 23°C / 73°F -18°C / 0°F -40°C / -40°F	D-256	J/m	107 64 43
Instrumented Impact, Total Energy 23°C / 73°F -18°C / 0°F -40°C / -22°F	D-3763	Joules	24 16 6
3FLEXURAL			
Flexural Modulus, tangent, chs 0.05 in/min	D-790	MPa	1,378
Flexural Stress, chs 0.05"/min	D-790	MPa	38.6
TENSILE			
Tensile Yield Strength, chs 0.2 in/min	D-638	MPa	20.7
Tensile Modulus, chs 0.2 on/min	D-638	MPa	1,447
THERMAL			
Heat Deflection Temperature 0.125" bar @ 264 psi	D-648	°F / °C	174 / 79
Coefficient of Linear Thermal Expansion	D-696	in/in/°F mm/mm/°C	5.2 x 10 ⁻⁵ 9.4 x 10 ⁻⁵

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IMPACT			
Izod Impact, notched, 0.125" bar 23°C / 73°F -18°C / 0°F -40°C / -40°F	D-256	ft-lb/in	2.0 1.2 0.8
Instrumented Impact, Total Energy 23°C / 73°F -18°C / 0°F -40°C / -22°F	D-3763	Joules	24 16 6
3FLEXURAL			
Flexural Modulus, tangent, chs 0.05 in/min	D-790	psi	200,000
Flexural Stress, chs 0.05"/min	D-790	psi	5,600
TENSILE			
Tensile Yield Strength, chs 0.2 in/min	D-638	psi	3,000
Tensile Modulus, chs 0.2 on/min	D-638	psi	210,000
THERMAL			
Heat Deflection Temperature 0.125" bar @ 264 psi	D-648	°F / °C	174 / 79
Coefficient of Linear Thermal Expansion	D-696	in/in/°F mm/mm/°C	5.2 x 10 ⁻⁵ 9.4 x 10 ⁻⁵

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