DIAMOND POLYMERS, INC.

Profile Extrusion Grade

AES Weatherable Polymer

Centrex® 601

Centrex 601 resin is a very high-impact, low-gloss AES (acrylonitrile-ethylene-propylene-styrene) resin with good resistance to weather aging. It has good melt strength for profile extrusion and can be coextruded over polyvinyl chloride (PVC).

Applications
Typical applications for Centrex 601 resin include exterior siding and window frames panels. As with any product, use of Centrex 601 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 350°- 400°F (177°- 204°C). When coextruding over PVC, the melt temperature needs to be closer to 350°F (177°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 ratio (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 350°- 375°F (177°- 191°C). The die should be adjusted to provide uniform polymer melt at the lips.

Regrind Information
Where end-use requirements permit, up to 40% Centrex 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). In 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. Centrex resin and ABS are totally compatible at all ratios. 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.

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.

AES Weatherable Polymer
Profile Extrusion Grade

Centrex® 601

PROPERTIES	ASTM METHOD	UNITS ENGLISH METRIC	
PHYSICAL			
Melt Flow Rate - Procedure A 230°C/10 kg	D-1238	g/10 min	6.0
Specific Gravity	D-792		1.0
Gloss @ 60°, Sheet/Profile	D-523	%	50 -70
IMPACT			
Izod Impact, notched, 0.125" bar	D-256	J/m	
23°C / 73°F			534
-18°C / 0°F			128
-40°C /-40°F			80
Instrumented Impact, Total Energy	D-3763	Joules	
23°C / 73°F			38
-18°C / 0°F			41
-40°C / -40°F			26
FLEXURAL			
Flexural Modulus, tangent, chs 0.05 in/min	D-790	MPa	1,585
Flexural Stress, chs 0.05"/min	D-790	MPa	44.1
TENSILE			
Tensile Stress @ Yield, chs 0.2 in/min	D-638	MPa	28.3
Tensile Stress @ Break, chs 0.2 in/min	D-638	MPa	23.4
Tensile Modulus, chs 0.2 on/min	D-638	MPa	1,722
THERMAL			
Coefficient of Linear Thermal Expansion	D-696	mm/mm/°C	2.8×10^{5}

EAP/07-15-09

DIAMOND POLYMERS, INC.

AES Weatherable Polymer
Profile Extrusion Grade

Centrex® 601

PROPERTIES	ASTM METHOD	UNITS ENGLISH METRIC	
PHYSICAL			
Melt Flow Rate - Procedure A 230°C/10 kg	D-1238	g/10 min	6.0
Specific Gravity	D-792		1.0
Gloss @ 60°, Sheet/Profile	D-523	%	50 -70
IMPACT			
Izod Impact, notched, 0.125" bar	D-256	ft-lb/in	
23°C / 73°F			10.0
-18°C / 0°F			2.4
-40°C /-40°F			1.5
Instrumented Impact, Total Energy	D-3763	Joules	
23°C / 73°F			38
-18°C / 0°F			41
-40°C / -40°F			26
FLEXURAL			
Flexural Modulus, tangent, chs 0.05 in/min	D-790	psi	230,000
Flexural Stress, chs 0.05"/min	D-790	psi	6,400
TENSILE			
Tensile Stress @ Yield, chs 0.2 in/min	D-638	psi	4,100
Tensile Stress @ Break, chs 0.2 in/min	D-638	psi	3,400
Tensile Modulus, chs 0.2 on/min	D-638	psi	250,000
THERMAL			
Coefficient of Linear Thermal Expansion	D-696	in/in/°F	4.3×10^{5}

EAP/07-15-09