Bayer MaterialScience

BAYBLEND® T45, T65, and T85

Product Information

Polycarbonate/ABS Blends

General-Purpose Grades

Description

Bayblend T45, T65, and T85 resins are thermoplastic blends of Makrolon® polycarbonate and Lustran® acrylonitrile butadiene styrene (ABS) resins, which combine the desirable properties of both polymers. Due to their unique morphology, these grades exhibit excellent creep behavior. Stiffness and hardness are comparable with polycarbonate up to the softening range. Depending on the grade selected, the Vicat softening temperature (ISO 306, B120) ranges from 230° to 268°F (110° to 131°C)*.

The Bayblend T resins provide good flow for improved productivity together with a useful combination of mechanical and thermal properties, especially rigidity; hardness; heat resistance; low moisture absorption; dimensional stability; and impact strength, even at low temperatures. These resins are supplied in pellet form for injection molding applications. They are naturally opaque and are available in custom colors and with special visual effects.

Applications

Typical of amorphous thermoplastics, Bayblend T resins exhibit high dimensional stability in service. Total shrinkage and shrinkage differential are low, while postmolding shrinkage is negligible, thus providing Bayblend T resins the ability to help meet narrow tolerances. Molded parts with high gloss or textured surfaces can be produced in a variety of colors. Foil stamping, electroless plating, and coating are achievable with standard methods.

These general-purpose Bayblend T resins are used in a wide variety of end-use markets. Automotive applications include both interior parts (decorative trim, instrument panels, mirror housings) and exterior parts (wheel covers, headlamp surrounds, taillight housings). These grades are also used in numerous consumer applications, such as household appliances, smoke detectors, lawn and garden equipment, power tools, sporting goods, and recreational equipment. As with any product, use of Bayblend T45, T65, or T85 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 essential to ensure desired appearance and property performance. A desiccant dehumidifying hopper dryer is recommended. To achieve a moisture content of less than 0.02%, hopper inlet air temperature should be 230°F (110°C) and hopper inlet air dew point should be -20°F (-29°C) or lower. The hopper capacity should be sufficient to provide a minimum residence time of 4 hours. Additional information on drying procedures is available in the Bayer brochure *General Drying Guide*.

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Processing

Bayblend T45, T65, and T85 resins may be easily processed on conventional injection molding equipment. 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	460°–500°F (238°–260°C)
Middle	480°–520°F (249°–271°C)
Front	500°–530°F (260°–277°C)
Nozzle	480°–510°F (249°–266°C)
Melt Temperature	465°–540°F (241°–282°C)
Mold Temperature	155°–210°F (68°–99°C)
Injection Pressure	10,000–20,000 psi
Hold Pressure	50–75% of Injection Pressure
Back Pressure	50–100 psi
Screw Speed	40–70 rpm
Injection Speed	Moderate
Cushion	1/8–1/4 in
Clamp	3–5 ton/in^2

Additional information on processing may be obtained by consulting the Bayer publication *Bayblend Polycarbonate/ABS Blend — Injection Molding Guidelines* and by contacting a Bayer MaterialScience technical service representative.

Regrind Usage

Where end-use requirements permit, up to 20% Bayblend 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). 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 Bayblend 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 Bayblend resins described in this bulletin. Before working with 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 Bayer MaterialScience representative or contact Bayer MaterialScience's Product Safety and Regulatory Affairs Department in Pittsburgh, Pa.

Typical Properties* for Natural Resin	ASTM Test Method (Other)	Bayblend® T45 Resin U.S. Conventional	Bayblend® T45 Resin SI Metric
General			
Specific Gravity	D 792	1.10	
Density	D 792	0.040 lb/in^3	1.10 g/cm^3
Specific Volume	D 792	25.2 in^3/lb	0.91 cm^3/g
Moisture Absorption:	(Based on ISO 62)		
To Saturation at 73°F (23°C) and 50% RH		0.2%	
Mold Shrinkage	D 955	0.005–0.007 in/in	0.005–0.007 mm/mm
Melt Flow Rate at 260°C/5-kg Load	D 1238	12 g/10 min	
Spiral Flow Length:	(Bayer)		
0.100-in (2.54-mm) Thickness			
490°F (254°C) Melt Temperature		24 in	610 mm
Mechanical			
Tensile Stress at Yield	D 638	7,100 lb/in^2	49 MPa
Tensile Stress at Break	D 638	5,800 lb/in^2	40 MPa
Tensile Elongation at Yield	D 638	4%	
Tensile Elongation at Break	D 638	>50%	
Tensile Modulus	D 638	305,000 lb/in^2	2.1 GPa
Flexural Stress at 5% Strain	D 790	12,000 lb/in^2	83 MPa
Flexural Modulus	D 790	310,000 lb/in^2	2.1 GPa
Impact Strength, Notched Izod:	D 256		
0.125-in (3.2-mm) Thickness			
73°F (23°C)		10 ft·lb/in	534 J/m
Instrumented Impact, Total Energy:[a]	D 3763		
73°F (23°C)		32 ft·lb	43 J
-22°F (-30°C)		27 ft·lb	37 J
Thermal			
Deflection Temperature, Unannealed:	D 648		
0.250-in (6.4-mm) Thickness			
264-psi (1.82-MPa) Load		205°F	96°C
66-psi (0.46-MPa) Load		230°F	110°C
Coefficient of Linear Thermal Expansion	D 696	5.1 E-05 in/in/°F	9.2 E-05 mm/mm/°C
Relative Temperature Index:	(UL746B)		
1.5-mm (0.059-in) Thickness			
Electrical		140°F	60°C
Mechanical with Impact		140°F	60°C
Mechanical without Impact		140°F	60°C
Vicat Softening Temperature, B/120	(ISO 306)	234°F	112°C
Flammability**			
Oxygen Index	D 2863	21%	
UL94 Flame Class:	(UL94)		
1.5-mm (0.059-in) Thickness		HB Rating	
3.0-mm (0.118-in) Thickness		HB Rating	
Electrical			
Volume Resistivity	(IEC 112)	1.0 E+14 ohm·cm	
Surface Resistivity	(IEC 93)	1.0 E+16 ohm	
Dielectric Strength	(IEC 243)	890 V/mil	35 kV/mm
Relative Permittivity: 100 Hz	(IEC 250)	3.1	
1 MHz		3.0	
Dissipation Factor: 100 Hz	(IEC 250)	0.004	
1 MHz		0.009	
Comparative Tracking Index	(IEC 112)	275 V	

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*** 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, 15 mph.

Typical Properties* for Natural Resin	ASTM Test Method (Other)	Bayblend® T65 Resin U.S. Conventional	Bayblend® T65 Resin SI Metric
General			
Specific Gravity	D 792	1.13	
Density	D 792	0.041 lb/in^3	1.13 g/cm^3
Specific Volume	D 792	24.5 in^3/lb	0.88 cm^3/g
Moisture Absorption:	(Based on ISO 62)		
To Saturation at 73°F (23°C) and 50% RH		0.2%	
Mold Shrinkage	D 955	0.005–0.007 in/in	0.005–0.007 mm/mm
Melt Flow Rate at 260°C/5-kg Load	D 1238	12 g/10 min	
Spiral Flow Length:	(Bayer)		
0.100-in (2.54-mm) Thickness			
490°F (254°C) Melt Temperature		22 in	559 mm
Mechanical			
Tensile Stress at Yield	D 638	7,500 lb/in^2	52 MPa
Tensile Stress at Break	D 638	6,500 lb/in^2	45 MPa
Tensile Elongation at Yield	D 638	4%	
Tensile Elongation at Break	D 638	>50%	
Tensile Modulus	D 638	320,000 lb/in^2	2.2 GPa
Flexural Stress at 5% Strain	D 790	13,400 lb/in^2	92 MPa
Flexural Modulus	D 790	350,000 lb/in^2	2.4 GPa
Impact Strength, Notched Izod:	D 256		
0.125-in (3.2-mm) Thickness			
73°F (23°C)		11 ft·lb/in	587 J/m
Instrumented Impact, Total Energy:[a]	D 3763		
73°F (23°C)		33 ft·lb	45 J
-22°F (-30°C)		31 ft·lb	42 J
Thermal			
Deflection Temperature, Unannealed:	D 648		
0.250-in (6.4-mm) Thickness			
264-psi (1.82-MPa) Load		221°F	105°C
66-psi (0.46-MPa) Load		250°F	121°C
Coefficient of Linear Thermal Expansion	D 696	4.9 E-05 in/in/°F	8.8 E-05 mm/mm/°C
Relative Temperature Index:	(UL746B)		
1.5-mm (0.059-in) Thickness			
Electrical		140°F	60°C
Mechanical with Impact		140°F	60°C
Mechanical without Impact		140°F	60°C
Vicat Softening Temperature, B/120	(ISO 306)	248°F	120°C
Flammability**			
Oxygen Index	D 2863	23%	
UL94 Flame Class:	(UL94)		
1.5-mm (0.059-in) Thickness		HB Rating	
3.0-mm (0.118-in) Thickness		HB Rating	
Electrical			
Volume Resistivity	(IEC 112)	1.0 E+14 ohm·cm	
Surface Resistivity	(IEC 93)	1.0 E+16 ohm	
Dielectric Strength	(IEC 243)	890 V/mil	35 kV/mm
Relative Permittivity: 100 Hz	(IEC 250)	3.1	
1 MHz		3.0	
Dissipation Factor: 100 Hz	(IEC 250)	0.003	
1 MHz		0.009	
Comparative Tracking Index	(IEC 112)	250 V	

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[a] 0.125-in thickness, 0.5-in dart, 3-in clamp, 15 mph.

Typical Properties* for Natural Resin	ASTM Test Method (Other)	Bayblend® T85 Resin U.S. Conventional	Bayblend® T85 Resin SI Metric
General			
Specific Gravity	D 792	1.15	
Density	D 792	0.042 lb/in^3	1.15 g/cm^3
Specific Volume	D 792	24.1 in^3/lb	0.87 cm^3/g
Moisture Absorption:	(Based on ISO 62)		
To Saturation at 73°F (23°C) and 50% RH		0.2%	
Mold Shrinkage	D 955	0.005–0.007 in/in	0.005–0.007 mm/mm
Melt Flow Rate at 260°C/5-kg Load	D 1238	12 g/10 min	
Spiral Flow Length:	(Bayer)		
0.100-in (2.54-mm) Thickness			
490°F (254°C) Melt Temperature		20 in	508 mm
Mechanical			
Tensile Stress at Yield	D 638	8,000 lb/in^2	55 MPa
Tensile Stress at Break	D 638	7,000 lb/in^2	48 MPa
Tensile Elongation at Yield	D 638	5%	
Tensile Elongation at Break	D 638	>50%	
Tensile Modulus	D 638	335,000 lb/in^2	2.3 GPa
Flexural Stress at 5% Strain	D 790	13,000 lb/in^2	90 MPa
Flexural Modulus	D 790	335,000 lb/in^2	2.3 GPa
Impact Strength, Notched Izod:	D 256		
0.125-in (3.2-mm) Thickness			
73°F (23°C)		13 ft·lb/in	694 J/m
Instrumented Impact, Total Energy:[a]	D 3763		
73°F (23°C)		33 ft·lb	45 J
-22°F (-30°C)		34 ft·lb	46 J
Thermal			
Deflection Temperature, Unannealed:	D 648		
0.250-in (6.4-mm) Thickness			
264-psi (1.82-MPa) Load		226°F	108°C
66-psi (0.46-MPa) Load		260°F	127°C
Coefficient of Linear Thermal Expansion	D 696	4.6 E-05 in/in/°F	8.3 E-05 mm/mm/°C
Relative Temperature Index:	(UL746B)		
1.5-mm (0.059-in) Thickness			
Electrical		140°F	60°C
Mechanical with Impact		140°F	60°C
Mechanical without Impact		140°F	60°C
Vicat Softening Temperature, B/120	(ISO 306)	268°F	131°C
Flammability**			
Oxygen Index	D 2863	24%	
UL94 Flame Class:	(UL94)		
1.5-mm (0.059-in) Thickness		HB Rating	
3.0-mm (0.118-in) Thickness		HB Rating	
Electrical			
Volume Resistivity	(IEC 112)	1.0 E+14 ohm·cm	
Surface Resistivity	(IEC 93)	1.0 E+16 ohm	
Dielectric Strength	(IEC 243)	890 V/mil	35 kV/mm
Relative Permittivity: 100 Hz	(IEC 250)	3.1	
1 MHz		3.0	
Dissipation Factor: 100 Hz	(IEC 250)	0.002	
1 MHz		0.009	
Comparative Tracking Index	(IEC 112)	200 V	

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[a] 0.125-in thickness, 0.5-in dart, 3-in clamp, 15 mph.