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High-Performance Polyolefin and Styrenic Compounds for Extrusion and Thermoforming Applications

A Premium Surface Finish

Your customers won't worry about chips and scratches when you use LyondellBasell's enhanced polyolefin and styrenic compounds. Our innovative solutions enable paintable and paint-free applications that look as good as they last – even in the harshest outdoor environments. And last they will, with fade-resistant color retention and stain resistance, combined with a strength that goes right through to the core.

The flexibility and the versatility of these remarkable materials make them a cost-effective replacement for many traditional materials, allowing you to differentiate and customize your applications.

The Secret Is in the Science

These weatherable polymers are the future of surface finish technology and an innovative approach to Class "A" decorative surfaces. This patented thermoplastic olefin technology is suitable for a variety of processes, including thermoforming, film and sheet extrusion, and profile extrusion. Parts formed from these resins exhibit high resistance to bubbling, chipping, staining and fading and provide superior color and product protection.

These materials are based on TPO, ASA, ASA/PC and ASA/AES polymers and offer a broad range of engineered properties that can be customized for your unique application needs. They offer exceptional UV resistance, lasting durability, extreme toughness, paintability and excellent color retention, and they are available in a broad range of gloss levels and custom colors.

Your Materials of Choice

LyondellBasell's polyolefin and styrenic compounds offer superior advantages over conventional materials including painted metal or plastic, laminated paint films, acrylic laminates and coatings:

- High-quality appearance with mold-in-color technology and paintable applications for class "A" finishes
- No chipping or cracking – even in extreme temperatures or high-stretch thermoforming processes
- Process versatility
- Customized color and color-matching
- Cost-effective performance
- Recyclability

Enhanced Polyolefin and Styrenic Polymer Systems

Markets/Applications

Agriculture and Heavy Equipment

Resistance to fading from environmental exposure, as well as protection from fertilizers, pesticides and other chemicals, make these polymers perfect for combines, tractors and other large farm machinery. Another added benefit is a higher tolerance toward cracking under vibrational loads. Enhanced polyolefins can be applied to a variety of applications including roof, hood, fender and other body panels.

RV, Heavy Truck and Bus

Enhanced polyolefins are suitable for large transportation applications such as heavy trucks, buses and RVs. Side and roof panels, bumper covers, fender skirts, AC shrouds, propane tank covers, nose cones and interior decorative finishes are just some of the many applications in this market.

Power Sports

Snowmobiles, ATVs, jet skis and motorcycles are all perfect applications for enhanced polyolefins which are not only impact-resistant, flexible, durable and ductile under sub-zero temperatures but also lightweight and fade-resistant. Side panels, wheel covers, hood panels and other areas are a great fit for these polymers.

Industrial Components

Stiffness, ductility and resistance to weather, chemicals, stress and vibrational cracking make enhanced polyolefins ideal for shrouds, housings and panels in high abuse environments.

Personal Watercraft

Power and pontoon boats along with kayaks all benefit from enhanced polyolefins which are lightweight, durable and can withstand constant environmental exposure. Applications can range from interior consoles and headliners to rail skirts and storage compartments.

Lawn and Garden

Personal use lawn and garden equipment, such as mowers and garden tractors, gains added resistance from chipping, cracking and bubbling by using enhanced polyolefins. These polymers are ideal for applications like wheel wells, vehicle hoods and body panels.

Automobile

Enhanced polyolefins with impact resistance, extreme durability, flexibility and ductility are the superior material for exterior and interior auto applications. LyondellBasell's Color Technology Center has the capability to match a variety of colors in the auto market and provides a wide selection from solids to pearlescent and metallic. Applications include bumper fascias, rocker panels and other decorative finishes.

Select the LyondellBasell Capstock Grade That's Right for You

These capstock resins provide many exciting benefits in performance and appearance with a broad range of gloss levels depending on your application requirements

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			Capstock Grades				
			Polytrope STR	*Polytrope STR*	*Sequel*	*Polytrope STR*	*HIFAX*
Properties	**Method**	**Units**	3035EU-01UV Natural	3571EU-01 UV Natural	E1500HG UV NAT	3566EU-01 UV Natural	ETA4161 UV NAT
GENERAL							
Melt Flow Rate (230°C, 2.16 kg)	ISO 1133	g/10 min	0.4	3.9	2.0	2.5	0.5
Specific Gravity	ISO 1183	--	1.06	0.92	0.90	0.90	0.91
Hardness	ISO 868	Shore D	74	70	70	74	70
THERMAL							
Heat Deflection Temperature	ISO 75						
@ 0.45 MPa		°C	75	76	72	77	80
@ 1.80 MPa		°C	50	50	48	50	54
MECHANICAL							
Flexural Modulus	ISO 178	MPa	1900	750	1014	1000	1200
Tensile Yield Strength	ISO 527	MPa	24	21	30	24	38
Tensile Elogation at Break	ISO 527	%	410	510	500	500	250
Gloss Gardner Gloss, 60°, Smooth Sheet, After Forming			2-10	<20	85-95	85-95	30-40
		Key Attributes	Durable, Low Gloss, Hard Mar Resistant Surface	Excellent Clarity, Low Gloss, Durable	High Gloss Polyolefinic Cap Layer	High Clarity, Gloss, Improved Durability, Non-Blush	Cap Layer To Promote Reduced Stress Whitening

Select the LyondellBasell TPO Grade That's Right for You

Offering a broad product portfolio that has been designed to meet property performance balance through a diverse offering of stiffness, impact and thermal expansion properties.

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			Sheet Extrusion Grades										
			Polytrope STR	*Polytrope STR*	*Sequel*	*Sequel*	*Sequel*	*Sequel*	*Polytrope STR*	*Polytrope STR*	*Polytrope STR*	*Sequel*	*Polytrope STR*
Properties	**Method**	**Units**	1025 UV Natural	1026EU-01 UV Natural	E3400 UV NAT	E3400 N0N UV NAT	E3200 UV NAT	E3200 NON UV NAT	1050EU-01 UV Natural	1050EP-01 NON UV Natural	1060EU-01 UV Natural	E3400FR Natural	2030 V0 Natural
GENERAL													
Melt Flow Rate (230°C, 2.16 kg)	ISO 1133	g/10 min	1	0.7	0.7	0.65	0.75	0.75	0.5	0.5	0.7	1.0	0.7
Specific Gravity	ISO 1183	--	0.99	0.99	1.12	1.12	1.08	1.08	1.14	1.14	1.16	1.26	1.31
Hardness	ISO 868	Shore D		71	67	66	66	66	68	68	70	65	
Flame rating type, all colors		Internal	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	HB @ 0.125 in	V1 @ 3.0 mm. V0 @ 6.0MM	HB @ 0.125 in VO @ 0.0625 in 5VA @ 0.0625
THERMAL													
Heat Deflection Temperature	ISO 75												
@ 0.45 MPa		°C	94	98	102	95	85	85	114	114	117	103	91
@ 1.80 MPa		°C		54	56	52	49	49	57	57	57	56	
CLTE (-30°C to 80°C)	ASTM E228	10-5 /°C	9.9		4.8	4.0	5.5	5.5	4.0	4	5.4	5.3	5.4
MECHANICAL													
Flexural Modulus	ISO 178	MPa	1,725	1,650	2,100	2,250	1,450	1,450	2,400	2,400	3,000	2,400	2,100
Tensile Yield Strength	ISO 527	MPa	21	26	21	22	21	21	24	24	27	20	19
Tensile Elogation at Break	ISO 527	%	>200	>500	>200	>500	>500	>500	300	300	175	>150	430
IMPACT													
Izod Impact Strength	ISO 180												
@ 23°C (73°F)		kJ/m^2	82	54	82	64	67	67				38	
@ -30°C (-22°F)		kJ/m^2	7	4	7	6.5	4.8	4.8				4	
Multi-Axial Impact (2.2 m/s) -15°C	ASTM D3763												
Total Energy		J		17	51	48	40	40	44	44		26	35
Failure Mode (D-Ductile; B-Brittle)		D/B		100% brittle	100% ductile	100% ductile	partially ductile	partially ductile	100% ductile	100% ductile		partially ductile	100% ductile
Multi-Axial Impact (2.2 m/s) -30°C	ASTM D3763												
Total Energy		J	47.4		57	39	28	28				37	
Failure Mode (D-Ductile; B-Brittle)		D/B	100% D		100% ductile	100% ductile	brittle	brittle				brittle	
	Key Attributes		For Applications requiring lower stiffness and high impact.	For applications requiring lower stiffness . Commercially approved for Automotive trim applications.	Excellent balance of high stiffness and high impact; improved melt strength for thermoforming.	Excellent balance of high stiffness and high impact; improved melt strength for thermoforming. Adjusted for full paint applications.	Adjusted for cost sensitive applications requiring less impact and Thermoformability.	Adjusted for cost sensitive applications requiring less impact and Thermoformability. listed. Modified for full paint applications.	Designed for High Modulas and Toughness	Designed for High Modulas and Toughness, Modified for Full paint applications	Balances toughness and exceptional high stiffness and Low Temperature impact.	For applications requiring UL 94 V-1 flame retardancy.	For applications requiring UL 94 V-0 flame retardancy.

Select the Weatherable Polymer Systems That's Right for You

Our broad portfolio of ABS, ASA, ASA/PC and ASA/AES polymers can be customized to fit your sheet extrusion and thermoforming processes.

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Properties	ASTM Standard	Units	Conditions	Co-Extrusion Sheet Grades					
				Centrex 485 CS	*Centrex* 825A	*Centrex* 833A	*Centrex* ST4800	*Diamond* 9501-1001S	*Diamond* ABS 9501
GENERAL									
Resin Type				ASA - Low Gloss	ASA -High Gloss	ASA / AES	ASA / TPE		
Melt Flow Rate	D 1238	g/10 min	200°C, 5 kg	N/A	N/A	N/A	N/A	0.40 to 1.2 g/10 min	0.40 g/10 min
Melt Flow Rate	D 1238	g/10 min	220°C, 10 kg	5	12	10	N/A	N/A	N/A
Melt Flow Rate	D 1238	g/10 min	230°C, 3.8 kg	1.5	3.5	1.8	15	N/A	N/A
THERMAL									
Vicat	D 1525	°F	1 kg, 120°C/hr	212	215	195	N/A	221	284
Deflection Temperature under Load, Unannealed	D 648	°F	66 psi, 0.125"	188	198	185	N/A	195	253
Deflection Temperature under Load, Unannealed	D 648	°F	264 psi, 0.125"	155	172	160	N/A	168	223
MECHANICAL									
Tensile Modulus	D 638	psi	73°F, 0.2 in/min	210,000	330,000	295,000	N/A	N/A	N/A
Tensile Stress at Yield	D 638	psi	73°F, 0.2 in/min	3,850	6,400	5,100	N/A	6,240	6,070
Tensile Stress at Break	D 638	psi	73°F, 0.2 in/min	2,285	4,800	4,100	N/A	4,930	N/A
Tensile Elongation at Break	D 638	%	73°F, 0.2 in/min	50	36	35	N/A	20	N/A
Flexural Modulus	D 790	psi	73°F, 0.05 in/min	200,000	305,000	250,000	N/A	333,000	317,000
Flexural Stress at Yield	D 790	psi	73°F, 0.05 in/min	50,600	7,800	7,500	N/A	N/A	N/A
IMPACT									
Izod Notched Impact Strength	D 256	ft - lb/in	73°F, 0.125"	2.5	2.5	9	N/A	9.7	2.9
Hardness	D 785	scale		97 R	104 R	89 R	46 D	101	104
Instrumented Impact, Total Energy	D 3763	joules	73°F, 0.125"	24	38	43	8	N/A	N/A
Instrumented Impact, Total Energy	D 3763	joules	-30°F	6	12	30	N/A	N/A	N/A
Specific Gravity	D 792		23°C	1.06	1.05	1.05	1.08	1.04	1.07
Gloss, Sheet/Profile*	D 523		60°	20	95	95	10	N/A	N/A
Gloss, Formed Sheet*	D 523		60°	10	90	90	8	N/A	N/A
			Key Attributes	Low Gloss 10 @ at 60 degrees	High Gloss 90+ @ at 60 degrees	High Gloss 90+ @ at 60 degrees	Low Gloss 10 @ at 60 degrees	Ultra High Impact Resistance	Ultra High Impact Restistance

* Gloss data will vary with processing conditions.

ABOUT US

LyondellBasell (NYSE: LYB) is one of the largest plastics, chemicals and refining companies in the world. Driven by its employees around the globe, LyondellBasell produces materials and products that are key to advancing solutions to modern challenges like enhancing food safety through lightweight and flexible packaging, protecting the purity of water supplies through stronger and more versatile pipes, improving the safety, comfort and fuel efficiency of many of the cars and trucks on the road, and ensuring the safe and effective functionality in electronics and appliances. LyondellBasell sells products into more than 100 countries and is the world's largest producer of polymer compounds and the largest licensor of polyolefin technologies. More information about LyondellBasell can be found at www.LyondellBasell.com.

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