Extrusion Molding

ExxonMobil

ExxonMobil™ high density polyethylene product guide

Europe Asia Pacific Middle East Africa

Blown film extrusion

ExxonMobil™ HDPE resin grades HTA001HD5, HTA001HP5 and HTA002HD5 offer good processability combined with inherent stiffness and toughness. They can be converted into film that looks, feels and handles much like paper, while contributing to its strength for improved product protection. Films are also easily printed, enhancing graphic design opportunities.

For these reasons, paper-like wrapping films are used in a large range of applications in food, industrial and consumer markets. Applications include shopping, grocery and household bags; garbage sacks; bags-on-the-reel; high-strength liners for industrial and domestic use, lamination packaging film, as well as various coextrusion film applications (ExxonMobil HDPE resin grades HTA108 or HTA002HD5).

Non-toxicity

The previously mentioned ExxonMobil HDPE resin grades can, in principle, be used in food contact applications in all EU Member States and in the USA (FDA). Migration or use limitations may apply. Please contact your ExxonMobil Chemical representative for more detailed information and or actual compliance certification documents for the specific grade of interest.

Legal statements

The previously mentioned ExxonMobil HDPE resin grades are not intended for use in medical applications and should not be used in any such applications.

ExxonMobil™ HDPE resin grade	HTA001HD5	HTA001HP5	HTA002HD5	HTA108
Availability*	Middle-East, Africa Asia-Pacific	Europe, Middle-East Africa, Asia-Pacific	Europe, Middle-East Africa, Asia-Pacific	Europe, Middle-East Africa, Asia-Pacific
Product description	High molecular weight	High molecular weight	Medium molecular weight	Homopolymer, medium molecular weight
Key properties	Excellent film strength	Excellent film strength Very good processability	Easy processability	Easy processability Improved stiffness and barrier in coextrusion or in PE blends
Application opportunities	Shopping bag film, freezer film, industrial liners	Shoppers, thin gauged consumer bag film	Lamination packaging film, general packaging film, liners, coextrusion	Collation shrink film, food packaging film, lamination packaging film, general packaging film; as blend partner for LDPE, LLDPE or polymers
Typical resin properties				
Melt index (190°C, 2.16 kg), g/10 min				0.70
Melt flow index (190°C, 5.0 kg), g/10 min	0.32	0.32	0.68	
Melt flow index (190°C, 21.6 kg), g/10 min	9.0	9.5	16	46
Density, g/cm³	0.952	0.952	0.952	0.961
Vicat softening temperature, °C	126	126	126	127
Typical film properties**	**MD/TD**	**MD/TD**	**MD/TD**	**MD/TD**
Tensile strength at yield, MPa	41/30	41/29	29/29	
Tensile strength at break, MPa	60/60	60/48	60/50	60/31
Elongation at break, %	220/430	210/430	320/450	510/2
1% secant modulus, MPa	1200/1200	1200/1200	960/1200	1200/1700
Elmendorf tear strength, g	8/30	7/30	8/60	10/200
Dart drop impact, g	190	190	160	< 30

* Product may not be available in one or more countries in the identified availability regions. Please contact your ExxonMobil Chemical representative for complete country availability.
** The film properties have been measured on 15 µm thick films with a blow-up ratio of 4 : 1 and a frostline height of 9x die diameter (die diameter/gap: 120 mm/1.0 mm; 215°C melt temperature; 70 kg/hr output). For resin grade HTA108 however, the film properties have been measured on 25 µm thick films with a blow-up ratio of 2.5 : 1 and a pocket extrusion at 200°C.

Blow molding

ExxonMobil™ HDPE resin grades HPA020HD5, HYA 600 and HYA 800 are designed for medium-sized and small bottles and containers. They offer an excellent balance of processability and performance for these end products. ExxonMobil HDPE resins for blow molding can be processed on conventional equipment at temperatures in the range of 150°C - 190°C for HDPE resin grades HYA 600 or HYA 800 and 180°C - 210°C for HDPE resin grade HPA020HD5.

Non-toxicity

ExxonMobil HDPE resin grades HYA 600 and HYA 800 can, in principle, be used in food contact applications in all EU Member States and in the USA (FDA). Migration or use limitations may apply. Please contact your ExxonMobil Chemical representative for more detailed information and/or actual compliance certification documents for the specific grade of interest.

Attention: ExxonMobil HDPE resin grade HPA020HD5 is not intended for use in food contact applications.

Legal statements

ExxonMobil HDPE resin grades HPA020HD5, HYA 800 and HYA 600 are not intended for use in medical applications and should not be used in any such applications.

ExxonMobil™ HDPE resin grade	HPA020HD5	HYA 600	HYA 800
Availability*	Europe, Middle-East, Africa Asia-Pacific	Europe, Middle-East, Africa Asia-Pacific	Europe, Middle-East, Africa Asia-Pacific
Product description	High molecular weight	General purpose	High rigidity hollow parts
Key properties	Excellent balance of rigidity, Environmental stress-crack resistance (ESCR) and impact strength	Very good processability Excellent balance of rigidity and impact strength Good ESCR	High rigidity High stiffness, high flow
Application opportunities	Large parts blow molding & containers (20 to 100 liters) for non-food end uses, power cable jacketing, drainage pipes	Household and industrial containers from 0.25 to 30 liters	Liquid food containers for milk, water and juices
Typical resin properties			
Melt index (190°C, 2.16 kg), g/10 min		0.35	0.70
Melt flow index (190°C, 5.0 kg), g/10 min	0.35		
Melt flow index (190°C, 21.6 kg), g/10 min	9.0	29	46
Density, g/cm³	0.952	0.954	0.961
Vicat softening temperature, °C	126	126	127
Molded properties**			
Tensile modulus, MPa	1000	1100	1400
Tensile strength at yield, MPa	21	23	25
Elongation at break, %	> 100	> 100	> 100
Durometer hardness (shore D, 15 sec)	61	62	62
Notched izod impact strength, kJ/m²	18	9.9	9.5
Environmental stress-crack resistance - (F50 10% Igepal, conditions B), hrs - (F50 100% Igepal, conditions B), hrs	 330 > 600	 < 20 < 50	 < 20 < 20

* Product may not be available in one or more countries in the identified availability regions. Please contact your ExxonMobil Chemical representative for complete country availability.
** The molded properties have been measured on compression molded sheets, prepared according to ASTM D4703 and ASTM D 638. ASTM D 638: Speciment type T1 / thickness 3 mm; tensile modulus: speed of testing 5 mm/min; tensile strength at yield and elongation at break: speed of testing 50 mm/min.

Injection molding

ExxonMobil™ HDPE resins provide a combination of toughness and stiffness, and resistance to environmental stress cracking, elevated temperatures and warping. Applications made with these resins can be designed with thin walls, saving material, and their fast-cycling characteristics contribute to cost-effective production.

Applications for ExxonMobil HDPE resin grades HMA 014, HMA 035, HMA 025, HMA 016 and HMA 018 include pails, fish crates and bottle crates, housewares, toys, television housings, automotive components, and other technical and household applications. HMA 706 grade, designed for caps & closures applications, can also be used in housewares, toys and food containers.

Non-toxicity

The previously mentioned ExxonMobil HDPE resin grades can, in principle, be used in food contact applications in all EU Member States and in the USA (FDA). Migration or use limitations may apply. Please contact your ExxonMobil Chemical representative for more detailed information and/or actual compliance certification documents for the specific grade of interest.

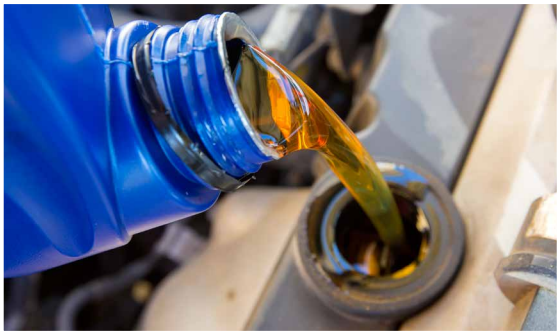
Legal statements

The previously mentioned ExxonMobil HDPE resin grades are not intended for use in medical applications and should not be used in any such applications.

ExxonMobil™ HDPE resin grade	HMA 014	HMA 706	HMA 025 / HMA 035	HMA 016	HMA 018
Availability*	Middle-East, Africa Asia-Pacific	Europe, Middle-East, Africa, Asia-Pacific	Europe, Middle-East Africa, Asia-Pacific	Europe, Middle-East Africa, Asia-Pacific	Europe, Middle-East Africa, Asia-Pacific
Product description	UV stabilized		HMA 035 = UV stabilized		
Key properties	Excellent dimensional stability High impact strength High stiffness	High dimensional stability Good impact strength High gloss Fast cycling	Excellent dimensional stability Good impact strength Very high stiffness	High dimensional stability Good impact strength High gloss Fast cycling	High dimensional stability Easy flow High gloss
Application opportunities	Large containers, wheely bins, heavy duty crates, stadium seats, helmets	Closures, food packaging containers, housewares, toys	Vegetable and bottle crates, pails, buckets, helmets	Housewares, food containers, closures, toys	Multicavity thin-walled housewares, food containers
Typical resin properties					
Melt index (190°C, 2.16 kg), g/10 min	4.0	6.7	8.0	20	30
Density, g/cm³	0.960	0.952	0.964	0.956	0.954
Melting temperature, °C	134	129	135	133	131
Heat deflection temperature, °C****	74	63	66	64	62
Molded properties**					
Tensile stress at yield, MPa	26	23	27	23	23
Tensile strain at yield, %	9	9	9	10	10
Tensile strain at break, %	> 100	> 100	> 100	> 100	> 100
Flexural modulus, MPa	1100	730	1200	970	950
Notched izod impact strength, kJ/m²	10	5.7	6.0	4.0	3.4
Environmental stress-crack resistance*** - (F50 10% Igepal, conditions B), hrs	7	6	4	2	< 1

* Product may not be available in one or more countries in the identified availability regions. Please contact your ExxonMobil Chemical representative for complete country availability.
** The molded properties have been measured on 4 mm thick injection molded specimen based on ISO 294-1.
*** ESCR has been measured on 2 mm thick compression molded plate (F50, 10% Igepal, 50°C).
**** Heat deflection temperature sample preparation, injection based on ISO1872. Tested flatwise position with specimen size of 80 mm x 10 mm x 4 mm.

Our applications in everyday use



Test	ExxonMobil™ HDPE resins - based on test method		
	HTA001HD5, HTA001HP5, HTA002HD5, HTA108	**HPA020HD5, HYA 600, HYA 800**	**HMA 014, HMA 706, HMA 025, HMA 035, HMA 016, HMA 018**
Melt index	ASTM D1238	ASTM D1238	ASTM D1238
Melt flow index	ASTM D1238	ASTM D1238	-
Density	ExxonMobil method	ExxonMobil method	ExxonMobil method
Vicat softening temperature	ASTM D1525	ASTM D1525	-
Melting temperature	-	-	ASTM D3418
Heat deflection temprature	-	-	ISO 75-2B
Tensile modulus	-	ASTM D638	-
Tensile strength at yield	ASTM D882	ASTM D638	-
Tensile strength at break	ASTM D882	-	-
Tensile stress at yield	-	-	ISO 527-2/1A/50
Tensile strain at yield	-	-	ISO 527-2/1A/50
Tensile strain at break	-	-	ISO 527-2/1A/50
Elongation at break	ASTM D882	ASTM D638	-
Secant modulus	ASTM D882	-	-
Flexural modulus	-	-	ISO 178
Elmendorf tear strength	ASTM D1922	-	-
Dart drop impact	ASTM D1709A	-	-
Durometer hardness	-	ASTM D2240	-
Izod impact		ISO 180/1A	ISO 180/1A
Environmental stress-crack resistance	-	ASTM D1693	ASTM D1693

for more information on ExxonMobil™ HDPE resins visit:
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