ENTEC

DOW®

DOW UNIVAL™ HDPE

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DOW UNIVAL™ HDPE

Dow UNIVAL™ HDPE resin is designed for high-speed production of blow molded containers and offers high impact strength, high melt strength, and excellent stress crack resistance. UNIVAL™ 6400-series homopolymer grades offer superior taste and odor, high stiffness, low ESCR and are commonly used for food applications like dairy and water bottles. UNIVAL™ 6200-series copolymer grades offer a good balance of stiffness and ESCR, along with good impact performance. UNIVAL™ copolymer products are commonly used for chemicals, detergents, shampoos, and agricultural chemical bottles. UNIVAL™ 6100-series copolymers are ideal for the production of large blow molded parts where its increased melt strength and toughness are ideal for these types of applications. UNIVAL™ products can be used with all standard blow molding processes such as continuous wheel, continuous shuttle, accumulator head, intermittent reciprocating and injection and injection stretch blow molding. Dow UNIVAL™ products comply with the requirements of the U.S. FDA 21 CFR 177.1520 (c) 3.2a and some grades have additional certifications.

Because the Dow UNIVAL™ resins are produced using the UNIPOL process, they will behave differently on converters equipment compared to resins produced using the Slurry Loop process. In general, head pressures may increase, and temperatures could go up 5 °F to 25 °F, which can cause more swell and increased flash. To compensate for this, converters can lower the extruder temperatures. However, UNIVAL™ resins offer superior taste and odor performance compared to Slurry Loop resins.

PROCESSING

Dow UNIVAL™ High Density Polyethylene blow molding resins are produced using the UNIPOL Gas Phase process. This results in a polyethylene resin with excellent product consistency and low taste-and-odor characteristics. However, these products process differently than resins produced via the Slurry Loop process. Within the extruder, temperatures can go up 5°F to 15°F, so processors may need to lower extruder barrel temperature settings to compensate. UNIPOL resins, like DOW UNIVAL™, will likely see higher swell which can result in increased flash, decreased parison formation time, and increased head pressure. The typical melt temperature range for DOW UNIVAL™ is 170°C to 220°C.

TYPICAL APPLICATIONS

Bleach Bottles

Detergent Bottles

Fabric Softener Bottles

Shampoo Bottles

Lotion Bottles

Large Drums & Pails

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PROPERTY	ASTM TEST METHOD	UNITS	DMDA-6200 NT 7	DMDA-6220 NT 7	DMDA-6230 NT 7	DMDA-6320 NT 7	DMDA-6400 NT 7	DMDB-6200 NT 7
Density	D 792	g/cm³	0.953	0.953	0.949	0.953	0.961	0.953
Melt Flow Rate, 190°C/2.16kg	D 1238	g/10 min.	0.38	0.38	0.25	0.46	0.8	0.38
Melt Flow Rate, 190°C/21.6kg	D 1238	g/10 min.	33	33	25	39	57	33
ESCR, 50°C, 100% Igepal, F50	D 1693	hr.	80	60	180	40	20	80
Shore D Hardness	D 2240	---	61	62	57	64	66	61
Tensile Strength at Yield	D 638	MPa	27	27	23	26	32	27
Tensile Strength at Break	D 638	MPa	31	32	31	34	24	34
Elongation at Yield	D 638	%	7	7	8	8	7	7
Elongation at Break	D 638	%	1000	1000	900	1000	1000	1000
Flexural Modulus, 2% Secant	D 790B	MPa	1000	1050	910	1010	1300	1000
HDT at 0.45 MPa, Unannealed	D 648	°C	73	67	32	70	76	73
Vicat Softening Temperature	D 1525	°C	129	129	127	128	131	129
Melting Temperature	Internal	°C	131	131	130	131	133	131
FDA 21 CFR 177.1520 (c) 3.2a	---	---	Yes	Yes	Yes	Yes	No	Yes
FDA 21 CFR 177.1520 (c) 2.2a	---	---	No	No	No	No	Yes	No
Typical Applications	---	---	Household & Industrial Chemicals, Personal Care, Food Packaging	Household & Industrial Chemicals, Personal Care, Food Packaging	Household & Industrial Chemicals, Personal Care, Agricultural Chemicals, High ESCR	Household & Industrial Chemicals, Personal Care, Food Packaging	Water, Juice, Dairy	Household & Industrial Chemicals, Personal Care, Food Packaging

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PROPERTY	ASTM TEST METHOD	UNITS	DMDB-6240 NT 7	DMDB-6400 NT 7	DMDC-6143 NT 7	DMDC-6145 NT 7	DMDC-6150 NT 7	DMDD-6200 NT 7
Density	D 792	g/cm³	0.946	0.963	0.952	0.951	0.954	0.953
Melt Flow Rate, 190°C/2.16kg	D 1238	g/10 min.	0.4	0.8	---	---	---	0.25
Melt Flow Rate, 190°C/21.6kg	D 1238	g/10 min.	43	57	14	14	5.3	23
ESCR, 50°C, 100% Igepal, F50	D 1693	hr.	400	20	1100	>1500	>1000	50
Shore D Hardness	D 2240	---	62	66	65	62	62	59
Tensile Strength at Yield	D 638	MPa	24	32	23	26	26	26
Tensile Strength at Break	D 638	MPa	17	24	38	35	31	26
Elongation at Yield	D 638	%	11	7	10	7	---	6
Elongation at Break	D 638	%	770	1000	900	1000	800	900
Flexural Modulus, 2% Secant	D 790B	MPa	814	1300	1020	903	1170	1020
HDT at 0.45 MPa, Unannealed	D 648	°C	63	76	67	65	71	70
Vicat Softening Temperature	D 1525	°C	121	131	129	129	130	129
Melting Temperature	Internal	°C	126	133	131	131	132	132
FDA 21 CFR 177.1520 (c) 3.2a	---	---	Yes	No	Yes	Yes	Yes	Yes
FDA 21 CFR 177.1520 (c) 2.2a	---	---	No	Yes	No	No	No	No
Typical Applications	---	---	Household & Industrial Chemicals, Agricultural Chemicals, Food Packaging	Water, Juice, Dairy, Thin Walled Parts	5 to 30 Gallon Containers, Other Large Parts, High ESCR	5 to 15 Gallon Containers, 30 Gallon Drums, High ESCR	5 to 55 Gallon Containers, Other Large Parts, High ESCR	Household & Industrial Chemicals, Personal Care, Food Packaging

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PROPERTY	ASTM TEST METHOD	UNITS	DMDD-6230 NT 7	DMDF-6230 NT	DMDG-6200 NT 7	DMDG-6240 NT 7	DMDH-6400 NT 7
Density	D 792	g/cm³	0.949	0.949	0.953	0.946	0.961
Melt Flow Rate, 190°C/2.16kg	D 1238	g/10 min.	0.25	0.25	0.38	0.40	0.80
Melt Flow Rate, 190°C/21.6kg	D 1238	g/10 min.	25	25	41	43	57
ESCR, 50°C, 100% Igepal, F50	D 1693	hr.	180	180	40	400	20
Shore D Hardness	D 2240	---	60	57	59	62	66
Tensile Strength at Yield	D 638	MPa	23	23	25	24	32
Tensile Strength at Break	D 638	MPa	34	31	23	17	24
Elongation at Yield	D 638	%	8	8	4	11	7
Elongation at Break	D 638	%	1000	900	570	770	1000
Flexural Modulus, 2% Secant	D 790B	MPa	889	910	814	814	1300
HDT at 0.45 MPa, Unannealed	D 648	°C	66	62	68	63	76
Vicat Softening Temperature	D 1525	°C	127	127	129	121	131
Melting Temperature	Internal	°C	130	130	131	126	133
FDA 21 CFR 177.1520 (c) 3.2a	---	---	Yes	21 CFR 175.105	Yes	Yes	No
FDA 21 CFR 177.1520 (c) 2.2a	---	---	No	No	No	No	Yes
Typical Applications	---	---	Household & Industrial Chemicals, Personal Care, Agricultural Chemicals, High ESCR	Household & Industrial Chemicals, Personal Care, Agricultural Chemicals, High ESCR	Household & Industrial Chemicals, Personal Care, Food Packaging	Household & Industrial Chemicals, Personal Care, Agricultural Chemicals, High Speed Production	Water, Juice, Dairy

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