



Formolene[®] Polypropylene Resins & Applications

Quality, Value and Performance

Random Copolymers

GRADE:	3302B	3310Z	3312B	3312E	3335E	3355O	3355E	3380E	3435E
Melt Flow (12 @ 230° C) ASTM D1238	2.3	10.0	12	12	35	35	55	80	35
Density (g/cm ³) ASTM D1505	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Tensile Strength at Yield (50 mm/min) ASTM D638	4300	4000	4400	4200	4200	4200	4200	4200	3800
Elongation at Yield (50 mm/min) ASTM D638	13	15	13	15	15	15	15	14	16
Flexural Modulus (1.3 mm/min; 1% Secant) ASTM D790	160	130	155	150	150	150	150	160	130
Rockwell Hardness (R Scale) ASTM D785	106	100	110	100	100	94	94	95	100
Notched Izod (Impact @ 73°F) ASTM D256A	3.0	1.5	1.5	1.5	1.2	1.2	1.0	1.1	1.5
FDA ¹	Y	Y	Y	Y	Y	Y	Y	Y	Y
UL Approval ²									
Applications	Thermoformed clear boxes, cups, containers	Cast film	Housewares, packaging, consumer	Housewares, packaging, consumer	Housewares, packaging, consumer	Housewares, packaging, consumer	Housewares, packaging, consumer	Housewares, packaging, consumer	Housewares, packaging, consumer
Other Comments ^{3,4}	Good clarity, neutral tint, fast processability	Barefoot, good clarity, gel free content	Low haze	Good clarity, neutral tint, lower temp processing	Good clarity, neutral tint, lower temp processing	High melt flow, good clarity, neutral tint, antistat	High melt flow, good clarity, neutral tint	High melt flow, good clarity, neutral tint	Improved impact, good clarity, neutral tint

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- Specimens were injection-molded according to the conditions specified in ASTM D4101.

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Impact Copolymers

GRADE:	2306N	2315N	2502A	2510A	2510W	2520A	2520N	2535A	2550A	2550S	2575N
Melt Flow (12 @ 230°C) ASTM D1238	6	15	1.5	10	10	20	20	35	50	50	75
Density (g/cm ³) ASTM D1505	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Tensile Strength at Yield (50 mm/min) ASTM D638	4350	4100	3800	3500	3600	3200	3600	3200	3200	3200	3130
Elongation at Yield (50 mm/min) ASTM D638	9	6	9	7	7	6	6	6	5	5	5
Flexural Modulus (1.3 mm/min; 1% Secant) ASTM D790	210	200	170	150	160	150	175	145	145	145	155
Rockwell Hardness (R Scale) ASTM D785	95	95	95	95	95	90	105	95	95	95	89
Notched Izod (Impact @ 73°F) ASTM D256A	5.0	1.6	14.0	2.1	2.0	2.0	2.5	2.0	1.7	1.7	2.5
FDA ¹	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
UL Approval ²				Y	Y	Y		Y	Y		
Applications	Beverage closures	Housewares, packaging, closures	Extrusion sheet, profile and blow molding, compounding	Battery cases, consumer, light appliances	Battery cases, consumer, light appliances	Consumer, light appliances	Consumer, light appliances	Consumer, packaging - dairy, stadium, deli cups	Consumer, packaging - dairy, stadium, deli cups	Consumer, packaging - dairy, stadium, deli cups	Consumer, packaging - dairy, stadium, deli cups
Other Comments ^{3,4}	Compression and injection moldable	High stiffness, low impact nucleation	High impact, cold temperature performance	Optimized stiffness/impact balance	White pigmented	Medium impact, easy flow	Medium impact, increased stiffness	Optimized stiffness/impact balance	Thin wall injection - high melt flow	High melt flow, medium impact, nucleated	High melt flow, medium impact, nucleated

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Impact Copolymers

2610A	2613N	2620A	2706N	2730N	6144O	6145O	6335N	6375N	6501A	6502A	6507N	6510A
10	12	20	7	30	20	20	35	75	0.7	1.5	7	10
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
2950	3300	2800	2700	2570	3900	4200	4300	4200	3800	3800	3600	3600
6	5	7	7	5	7	6	5	5	10	9	6	7
140	165	120	120	130	175	195	210	200	175	175	180	165
95	90	85	100	80	95	95	100	99	95	95	94	100
11.0	10.0	11.0	14.0	11.0	1.7	1.7	1.3	1.5	17.0	16.0	3.8	2.5
Y	Y	Y	Y	Y				Y	Y	Y		Y
Y			Y		Y	Y						Y
Com- pounding, heavy duty consumer and pack- aging	Com- pounding, industrial injection, material handling	Com- pounding, heavy duty consumer, automotive	Material handling, heavy duty consumer, automotive	Automotive Appliance, lawn & garden	Appli- ance and consumer applica- tions	Appli- ance and consumer applications	Automotive interior trim, material handling, appliances	Auto- motive, packaging, consumer	Extrusion sheet, profile and blow molding, compound- ing	Extrusion sheet, profile and blow molding, compound- ing	Child auto seats, consumer, industrial packaging	House- wares, battery, light appliances, closures
High im- pact, cold tempera- ture perfor- mance	High impact at cold tem- peratures, increased stiffness	High impact, high melt flow, cold temp perfor- mance	Very high impact, cold temperature performance	High melt flow, high impact for cold temp perfor- mance	Long-term heat-aging resistance, UL rating 110°C	Long-term heat-aging resistance, UL rating 110°C	Optimized stiffness / impact balance	Thin wall injection molding, high melt flow	Fractional melt flow, cold temperature perfor- mance	High impact, cold tem- perature perfor- mance	Optimized impact / stiffness balance	General purpose, medium impact

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Impact Copolymers

6510E	6520A	6520N	6535A	6535N	6550A	6575N	6600A	6610A	6613N	6620A	6630A	6730J/ 6730L
10	20	20	35	35	50	75	0.5	10	12	20	30	30
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
3600	3500	3800	3350	3500	3000	3300	3700	3200	3300	3100	2700	2900
7	7	7	7	6	5	6	10	6	5	7.5	6	3
160	165	180	145	165	145	155	170	145	165	140	125	140
100	95	95	95	105	90	89	95	110	90	95	80	85
3.7	3.0	2.5	2.5	2.5	1.7	3.0	17.0	11.0	10.0	10.0	10.0	3.5
	Y	Y	Y		Y	Y	Y	Y	Y	Y		
Y	Y		Y									
Housewares, battery, light appliances, closures	Housewares, small appliances, packaging	Crates, totes, material handling	Packaging, housewares, consumer, automotive	Auto interior trim, material handling, appliances	Packaging, housewares, consumer, automotive	Packaging, housewares, consumer, automotive	Compounding, industrial extrusion, material handling	Compounding, industrial extrusion, material handling	Compounding, industrial, injection, material handling	Compounding, automotive, lawn and garden, material handling	Compounding, automotive, lawn and garden, material handling	Compounding, injection molding
General purpose, medium impact	General purpose, medium impact, higher melt flow	Medium impact, higher stiffness	General purpose, medium impact, higher melt flow	Auto-automotive, interior trim approvals	Thin wall molded applications, GMS / nucleation	Very high melt flow, high impact / stiffness balance	Fractional melt flow, no break impact	High impact at cold temperatures	High impact at cold temperatures, increased stiffness	High impact at cold temperatures, higher melt flow	High impact at cold temperatures, higher melt flow	Heat deflection temp @ 66 psi = 97°C, @ 264 psi = 51°C

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Homopolymers

GRADE:	1102K	1102KR	1102L	1104KR	1203K	4100N	4100P	4100T	4101M	4101O
Melt Flow (12 @ 230°C) ASTM D1238	3	4	5	4.3	3	12	20	35	8	19
Density (g/cm ³) ASTM D1505	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Tensile Strength at Yield (50 mm/min) ASTM D638	5000	5200	5000	5000	5000	5100	5100	5050	5000	5300
Elongation at Yield (50 mm/min) ASTM D638	11	9	8	10	10	9	9	9	9	8
Flexural Modulus (1.3 mm/min; 1% Secant) ASTM D790	200	220	215	200	200	200	200	200	200	220
Rockwell Hardness (R Scale) ASTM D785	105	105	105	105	104	105	105	105	105	105
Notched Izod (Impact @ 73°F) ASTM D256A	1.0	0.7	0.8	0.7	1.0	0.5	0.4	0.4	0.6	0.4
FDA ¹	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y
UL Approval ²						Y	Y	Y		
Applications	BOPP	Raffia	Slit tape	Raffia	Raffia	Closures, toys, small appliances	Closures, toys, small appliances	Closures, toys, small appliances	Staple fiber	Monofila- ment/bulk continuous fiber
Other Comments ^{3,4}	Optimized for process- ing	Low water carryover	Barefoot, good pro- cessability	Low water carryover	Low water carryover	General purpose injection	General purpose injection	General purpose injection	Gas fade resistance	Gas fade resistance

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Homopolymers									
GRADE:	4111T	4140T	4141T	4142N	4142R	4142T	5100H	5100I	5100J
Melt Flow (12 @ 230° C) ASTM D1238	35	35	35	12	20	35	1.2	0.7	0.5
Density (g/cm ³) ASTM D1505	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Tensile Strength at Yield (50 mm/min) ASTM D638	5300	6000	5600	5700	5700	5700	5000	5200	5200
Elongation at Yield (50 mm/min) ASTM D638	8	6	7	7	7	7	10	9	9
Flexural Modulus (1.3 mm/min; 1% Secant) ASTM D790	220	280	240	260	260	260	210	220	220
Rockwell Hardness (R Scale) ASTM D785	100	105	105	110	110	110	105	110	110
Notched Izod (Impact @ 73°F) ASTM D256A	0.4	0.5	0.5	0.8	0.6	0.5	1.0	1.5	1.5
FDA ¹	Y			Y	Y	Y	Y	Y	Y
UL Approval ²				Y	Y	Y			
Applications	Non-wovens, extrusion coating	Compounding, Appliance, Automotive	Compounding, Appliance, Automotive	Packaging closures, toys, small appliances	Packaging closures, toys, small appliances	Packaging, closures, cutlery, toys, small appliances	Strapping	Extrusion sheet, profile and blow molding	Extrusion sheet, profile and blow molding
Other Comments ^{3,4}	Gas fade resistance	Nucleation,	No nucleation	Nucleation and antistat	Nucleation and antistat	Nucleation and antistat	Optimized for processing	Compounding usage	Compounding usage

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Homopolymers

5101M	5102KR	5140H	5140N	5143C	5143H	5143N	5143S	5144H	5144L	5181K
8	4	2.1	12	2.1	2.1	3.2	3	2	5	5
0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
5400	5000	5400	5100	5300	5300	5600	5750	5000	5800	5100
7	9	5	9	6	6	7	7	10	5.5	9
215	200	260	210	250	245	250	290	210	290	200
110	105	114	105	110	110	110	110	105	115	110
0.5	0.8	0.7	0.6	0.7	0.7	0.8	0.9	1.0	0.5	0.7
Y	Y	Y	Y	Y	Y	Y	Y			Y
								Y	Y	Y
Staple fiber	Raffia	Beverage closures	Closures, packaging, toys, small appliances, housewares	Thermo-formed packaging	Thermo-formed packaging	Improved clarity, process thermoforming	High stiffness thermoforming homopolymer	Laundry and kitchen appliances	Laundry and kitchen appliances	Straws, cutlery
Gas fade resistance, U.V. resistance	Low water carryover	Compression molded, excellent organoleptics	Not nucleated, high level of antistat	High clarity, fast processability	Good clarity, fast processability	Higher MF	Good for lightweight due to stiffness	Long-term heat-aging resistance, UL @ 65° C	Long-term heat-aging resistance, UL @ 65° C	Good processability



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