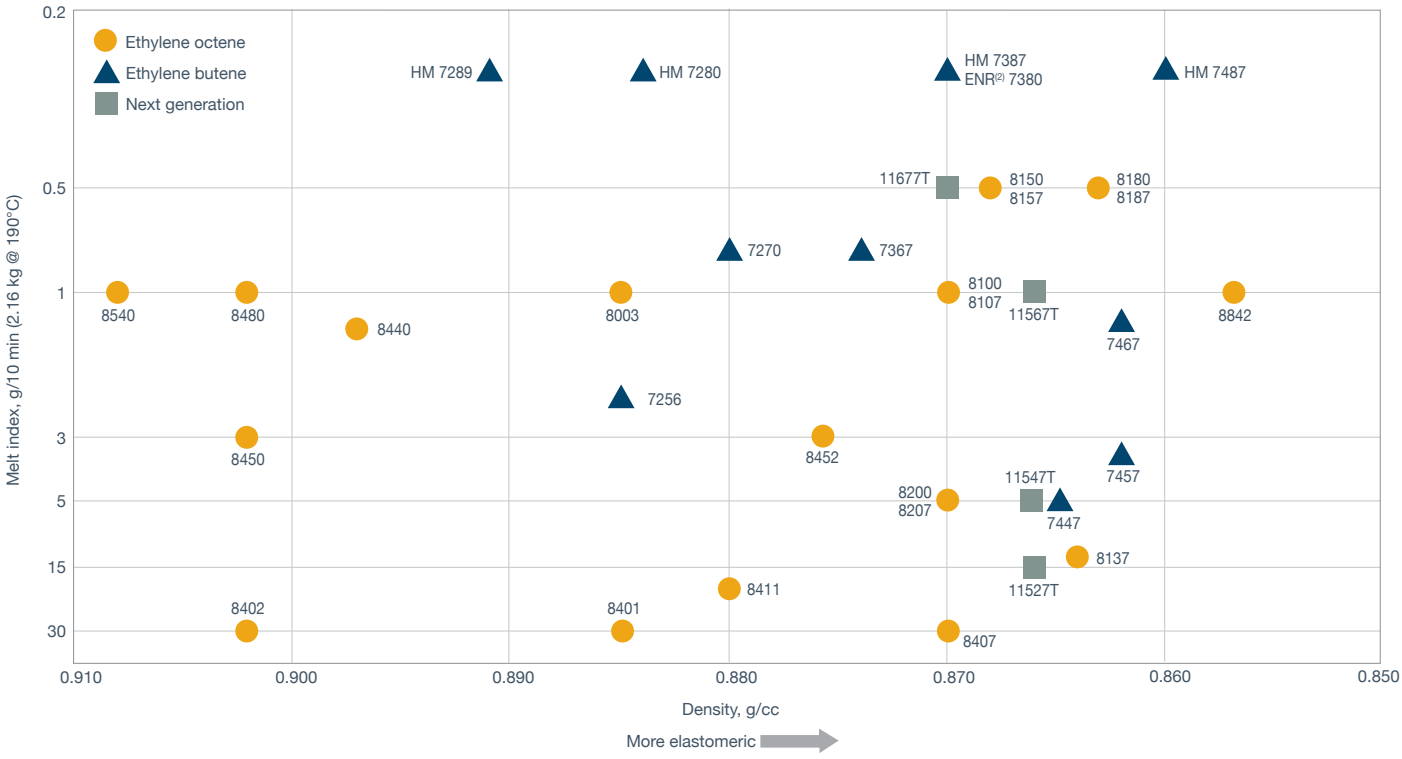
ENGAGE™ Polyolefin Elastomers

Product selection guide for transportation applications

ENGAGE™ Polyolefin Elastomers (POE) are designed to enable thermoplastic olefins (TPO) to meet a variety of performance targets, especially in the areas of low temperature impact, melt flow, melt strength, flexibility, and softness. ENGAGE™ Polyolefin Elastomers are used in both rigid and soft TPO formulations for injection molding, thermoforming, and blow molding applications. They offer exceptional performance and a unique balance of properties when used at various levels in a formulation. The grade breadth includes ethylene octene and ethylene butene copolymers over a wide range of densities and melt flow rates.

In addition, the ENGAGE™ HM POE product line places increased emphasis on high melt strength and toughness. Next generation ENGAGE™ POE grades offer opportunities to produce lighter, thinner TPO parts with increased stiffness, optimal impact strength, improved fit and finish, and reduced cycle times.

Figure 1: ENGAGE™ Polyolefin Elastomers products[1,2]



[1] These are typical properties, not to be construed as specifications.
[2] ENR designates a developmental grade.

Engage™ polyolefin elastomers

Innovative solutions for your processes and applications

Designed to improve impact performance, melt strength, or overall processability, ENGAGE™ Polyolefin Elastomers offer a wide range of grades to meet the most demanding processing and performance needs. They are compatible with most olefinic materials and offer unique capabilities that can enhance your product. Applications include a variety of interior and exterior components, such as bumper fascia, rocker panels, instrument panels, pillar moldings, and more. Next generation ENGAGE™ POE – the 11000 series of grades – are also enabling new, higher performance TPOs with properties that are well suited for body panel applications, including rear lift gates. Some of the features and benefits provided by ENGAGE™ POE in automotive TPO applications include:

- Excellent physical properties including elasticity, toughness, and low temperature ductility
- High melt strength grades that enhance extrusion thermoform processing and reduce surface gloss
- High-efficiency grades, including next generation ENGAGE™ POE, for superior impact performance

Table 1: Typical Properties of ENGAGE™ POE[1]

	Ethylene Octene grades															
Property	**8842[2]**	**8180 8187[2]**	**8137[2]**	**8150 8157[2]**	**8100 8107[2]**	**8200 8207[2]**	**8407[2]**	**8452**	**8411**	**8003**	**8401**	**8440**	**8480**	**8450**	**8402**	**8540**
Density, g/cc ASTM D792	0.857	0.863	0.864	0.868	0.870	0.870	0.870	0.875	0.880	0.885	0.885	0.897	0.902	0.902	0.902	0.908
Melt index, g/10 min (2.16 kg @ 190°C) ASTM D1238	1	0.5	13	0.5	1	5	30	3	18	1	30	1.6	1	3	30	1
Mooney viscosity, MU (ML 1+4 @ 121°C) ASTM D1646	25	37	4	33	24	8	2	11	3	23	2	13	20	10	2	20
Total crystallinity, %[3]	13	16	13	16	18	19	21	20	24	25	25	27	33	29	34	34
Durometer hardness (shore A) ASTM D2240	54	63	63	70	73	66	72	74	81	84	84	86	89	90	88	90
Durometer hardness (shore D) ASTM D2240	11	16	13	20	22	17	20	24	27	31	26	36	42	43	34	47
DSC melting peak, °C Rate 10°C/min[3]	38	47	56	55	60	59	65	66	76	77	80	93	99	97	96	104
Glass transition Temperature, °C DSC inflection point[3]	-58	-55	-55	-52	-52	-53	-54	-51	-50	-46	-47	-33	-31	-32	-36	-32
Haze, % ASTM D1003[4]	N.D.	2	N.D.	4	9	2	N.D.	2	8	10	6	11	17	23	45	56
2% Secant flexural Modulus, MPa ASTM D790	4.0	7.7	7.3	14.4	13.1	10.8	10.5	16.8	20.5	32.6	30.6	54.3	81.5	78.3	72.0	107.8
Ultimate tensile strength, MPa (508 mm/min) ASTM D638	3.0	6.3	2.4	9.5	9.76	5.7	2.8	11.2	7.3	18.2	8.5	20.4	24.8	22.4	11.3	27.9
Ultimate tensile elongation, % (508 mm/min) ASTM D638	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600	>600

[1]These are typical properties, not to be construed as specifications.

(continued)

[2]This grade contains a partitioning agent for improved product handling; properties may be measured before the addition of the partitioning agent.

[3]Dow Method. Additional information available upon request.

[4]Haze measured only for products with no partitioning agent. "N.D." indicates no data available.

Excellent processability

- Differentiated HM grades offer melt strength and shear thinning for extrusion, thermoforming, and blow molding applications
- Next generation ENGAGE™ POE grades help reduce cycle times via improved flow and faster setting
- Compatible with most olefins
- Pellet form for easy handling, mixing, forming, and processing on plastic or rubber equipment
- Recyclable for in-process scrap re-use advantages and for environmental sustainability

Table 2: Typical properties of ENGAGE™ POE – continued[1]

	Ethylene butene grades						HM grades			Next generation grades			
Property	7467[2]	7457[2]	7447[2]	7367[2]	7270	7256	HM 7487[2]	HM 7387[2] ENR[3] 7380	HM 7280	HM 7289	11677T[2]	11567T[2]	11547T[2]	11527T[2]
Density, g/cc ASTM D792	0.862	0.862	0.865	0.874	0.880	0.885	0.860	0.870	0.884	0.891	0.870	0.866	0.866	0.866
Melt index, g/10 min (2.16 kg @ 190°C) ASTM D1238	1.2	3.6	5	0.8	0.8	2.5	<0.5	<0.5	<0.5	<0.5	0.5	1	5	15
Mooney viscosity, MU (ML 1+4 @ 121°C) ASTM D1646	19	9	7	24	24	13	47	54	42[4]	74[4]	45	N.D.	N.D.	N.D.
Total crystallinity, %[5]	12	12	13	16	19	23	13	16	25	28	13	10.6	10.5	8.7
Durometer hardness (shore A) ASTM D2240	52	50	64	65	80	84	58	66	84	88	51	60	60	55
Durometer hardness (shore D) ASTM D2240	12	12	12	23	26	30	14	22	29	31	11	N.D.	N.D.	N.D.
DSC melting peak, °C Rate 10°C/min[5]	34	40	35	51	64	76	37	50	99	99	118	121	119	118
Glass transition temperature, °C DSC inflection point[5]	-58	-56	-53	-51	-44	-42	-57	-52	-46	-52	-65	-62	-62	-62
Haze, % ASTM D1003[6]	N.D.	N.D.	N.D.	N.D.	3	6	N.D.	56	N.D.	N.D.	N.D.	N.D.	N.D.	N.D.
2% Secant flexural modulus, MPa ASTM D790	4	4.7	7.6	14.2	22.1	33.6	1.2	11.5	25.3	43.5	6.3	8.6	9.2	7.6
Ultimate tensile strength, MPa (508 mm/min) ASTM D638	2.0	1.8	2.4	5.2	13.9	9.3	2.4	9.1	5.1	3.7	3.0	5.1	2.9	1.2
Ultimate tensile elongation, % (508 mm/min) ASTM D638	>600	>600	>600	>600	>600	>600	>600	>600	310	200	>1,000	600	1,200	1,200

[1]These are typical properties, not to be construed as specifications.
[2]This grade contains a partitioning agent for improved product handling; properties may be measured before the addition of the partitioning agent.
[3]ENR designates a developmental grade.
[4]Measured at 150°C.
[5]Dow Method. Additional information available upon request.
[6]Haze measured only for products with no partitioning agent. "N.D." indicates no data available.

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