



Technical Information

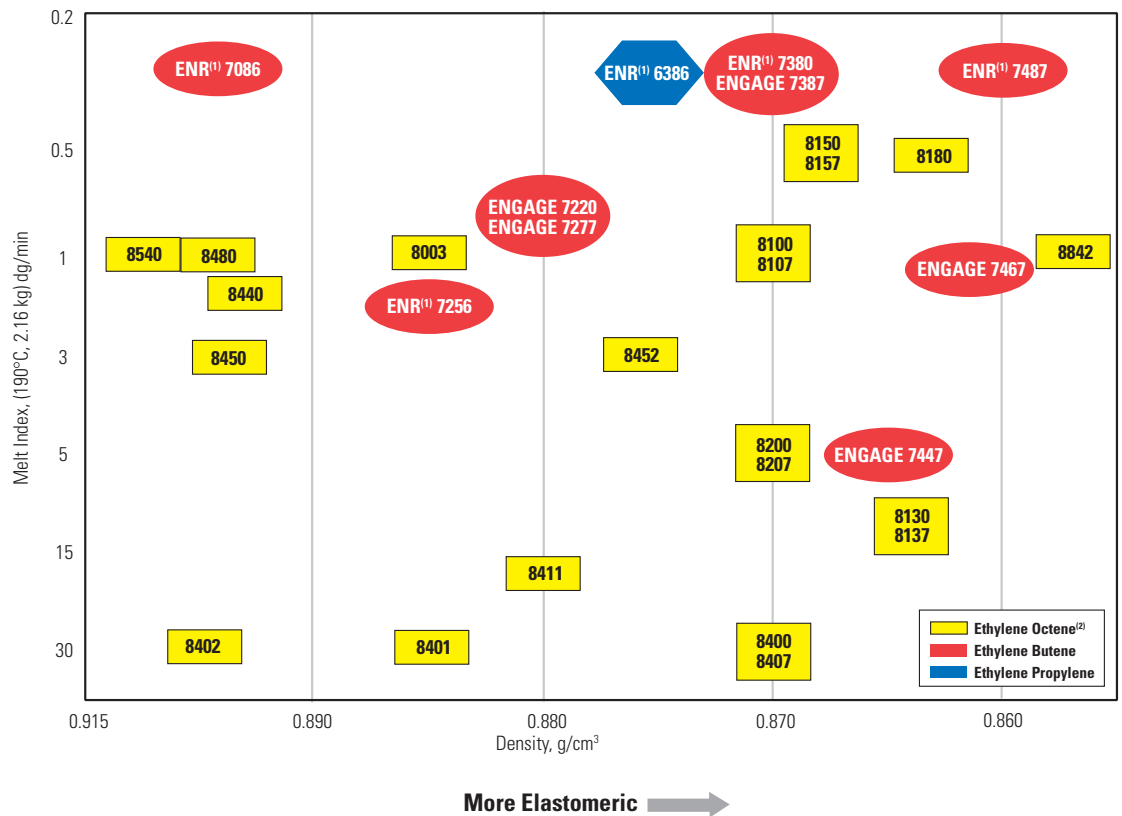
Product Selection Guide

ENGAGE™ Polyolefin Elastomers (POE) and ENR<sup>(1)</sup> developmental products offer customers many options for replacing or modifying materials across a broad spectrum of markets and applications. They can offer exceptional performance and a unique balance of properties when used alone or in blends and compounds. The grade breadth extends from

commercialized ethylene butene and ethylene octene copolymers to several ENR products – including next generation high melt strength grades.



Product Chart for ENGAGE™ Polyolefin Elastomers



<sup>(1)</sup>Note: ENR designates a developmental grade. When using developmental products, customers are reminded that: quality specifications may not be fully determined; hazards may not be fully known; and Dow reserves the right to change specifications and/or discontinue production of the product at any time.

<sup>(2)</sup>All ethylene octene grades are commercialized ENGAGE™ Polyolefin Elastomer products.

## Typical Properties for Ethylene Octene Grades

Ethylene Octene Grades <sup>(1)</sup>																
ENGAGE™ POE Grade <sup>(2)</sup>	8842 <sup>(3)</sup>	8180	8130 8137 <sup>(3)</sup>	8150 8157 <sup>(3)</sup>	8100 8107 <sup>(3)</sup>	8200 8207 <sup>(3)</sup>	8400 <sup>(4)</sup> 8407 <sup>(3,4)</sup>	8452	8411	8003	8401	8440	8480	8450	8402	8540
Density, g/cm <sup>3</sup> ASTM D 792	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, dg/min ASTM D 1238 190°C, 2.16 kg	1	0.5	13	0.5	1	5	30	3	18	1	30	1.6	1	3	30	1
Mooney Viscosity, ASTM D 1646 ML 1+4 at 121°C	25	37	4	33	24	8	2	11	3	23	2	13	20	10	2	20
Total Crystallinity, % <sup>(5)</sup>	13	16	13	16	18	19	21	20	24	25	25	27	33	29	34	34
Durometer Hardness, Shore A, ASTM D 2240	54	63	63	70	73	66	72	74	81	84	84	86	89	90	88	90
Durometer Hardness, Shore D, ASTM D 2240	11	16	13	20	22	17	20	24	27	31	26	36	42	43	34	47
DSC Melting Peak, °C Rate 10°C/min <sup>(5)</sup>	38	47	56	55	60	59	65	66	76	77	80	93	99	97	96	104
Glass Transition Temperature, °C DSC Inflection Point <sup>(5)</sup>	-58	-55	-55	-52	-52	-53	-54	-51	-50	-46	-47	-33	-31	-32	-36	-32
Flexural Modulus, MPa ASTM D 790 2% Secant	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 ASTM D 638 508 mm/min	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

<sup>(1)</sup>All ethylene octene grades are commercialized ENGAGE™ Polyolefin Elastomer products.

<sup>(2)</sup>Ultimate elongation for all grades exceeds 600%.

<sup>(3)</sup>This grade is talc dusted for improved product handling; properties may be measured before the addition of talc.

<sup>(4)</sup>ENGAGE™ 8400 Polyolefin Elastomer is available in the European region. ENGAGE™ 8407 Polyolefin Elastomer is available globally.

<sup>(5)</sup>Dow Method for DSC and Glass Transition Temperature.

### Innovative Solutions for Your Processes and Applications

Designed to improve impact performance, melt strength, or overall processability, ENGAGE™ Polyolefin Elastomers and ENR products are available in 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: automotive thermoplastic olefins (TPO); plastics modification; thermoplastic elastomers (TPE); wire and cable coatings; consumer goods; foams; footwear; noise vibration harshness (NVH) applications; and extrusion or injection molded goods. Some of the features and benefits relative to these applications follow.

#### Soft and Hard TPO Compounds

- Excellent physical properties including elasticity, toughness, and low temperature ductility
- High melt strength grades that enhance extrusion thermoform processing and reduce surface gloss

#### Wire and Cable

- Enhances physical properties when combined with fillers or when peroxide- or irradiation-crosslinked

#### General Purpose

- Improves look and feel of soft and hard goods
- Lighter weight, more flexible parts
- Improves resiliency for foam applications
- Excellent filler acceptance for masterbatch applications

## Typical Properties for Ethylene Butene and Ethylene Propylene Grades

Product Grade <sup>(1)</sup>	Ethylene Butene Grades					Ethylene Propylene		
	ENR <sup>(2)</sup> 7487	ENGAGE <sup>™</sup> 7467 <sup>(3)</sup>	ENGAGE <sup>™</sup> 7447 <sup>(3)</sup>	ENR <sup>(2)</sup> 7380 ENGAGE <sup>™</sup> 7387 <sup>(3)</sup>	ENGAGE <sup>™</sup> 7270 ENGAGE <sup>™</sup> 7277 <sup>(3)</sup>	ENR <sup>(2)</sup> 7256	ENR <sup>(2)</sup> 7086	ENR <sup>(2)</sup> 6386
Density, g/cm <sup>3</sup> ASTM D 792	0.860	0.862	0.865	0.870	0.880	0.885	0.901	0.875
Melt Index, dg/min ASTM D 1238 190°C, 2.16 kg	<0.5	1.2	5	<0.5	0.8	2	<0.5	<0.5
Mooney Viscosity, ASTM D 1646 ML 1+4 at 121°C	47	19	7	54	24	13	28	26
Total Crystallinity, % <sup>(4)</sup>	13	12	13	16	19	23	29	21
Durometer Hardness, Shore A, ASTM D 2240	58	52	64	66	80	82	90	75
Durometer Hardness, Shore D, ASTM D 2240	14	12	12	22	26	28	41	17
DSC Melting Peak, °C Rate 10°C/min <sup>(4)</sup>	37	34	35	50	64	75	95	55
Glass Transition Temperature, °C DSC Inflection Point <sup>(4)</sup>	-57	-58	-53	-52	-44	-45	-33	-41
Flexural Modulus, MPa ASTM D 790 2% Secant	1.2	4	7.6	11.5	22.1	27.2	75.3	22
Ultimate Tensile Strength, MPa ASTM D 638 508 mm/min	2.4	2.0	2.4	9.1	13.9	11.2	23.3	4.5

<sup>(1)</sup>Ultimate elongation for all grades exceeds 600%.

<sup>(2)</sup>Note: ENR designates a developmental grade. When using developmental products, customers are reminded that: quality specifications may not be fully determined; hazards may not be fully known; and Dow reserves the right to change specifications and/or discontinue production of the product at any time.

<sup>(3)</sup>This grade is talc dusted for improved product handling; properties may be measured before the addition of talc.

<sup>(4)</sup>Dow Method for DSC and Glass Transition Temperature.

### Extrusion Grades

- Tough yet flexible
- Several extrusion grades are available for faster extrusion rates for more parts production per cycle
- Extrusion grades also provide excellent clarity
- High melt strength grades available for improved forming capability

### Injection Molding

- Better impact resistance properties and performance
- Excellent adhesion to other polyolefins for overmolding

### Excellent Processability

- Versatility for use in thermoplastic and thermoset applications
- Can be used as a "neat" polymer or as a value-enhancing ingredient in compound formulations
- Differentiated high melt strength and extrusion grades for improved processing
- 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

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