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SolutionPartner

The introduction of POP

Sep. 2017

Elastomer Sales Team.
PO Division.



Technical Data Sheet of POP

Copolymer	Test Method	Unit	EOR(Ethylene Octene Copolymer)			Developing Grade					
						EOR(Ethylene Octene Copolymer)					
Typical properties ⁽¹⁾	ASTM	Unit	LF180 ⁽⁴⁾	LF100 ⁽⁴⁾	LF100A ⁽⁵⁾	LF161	LF170	LF670	LF300*	LF600*	LF090
Melt Index (190°C, 2.16kg)	D1238	g/10min	1.2	1.2	1.2	0.5	1.1	5.0	3.0	7.5	0.5
Density	D1505	g/cm ³	0.885	0.902	0.902	0.868	0.870	0.870	0.902	0.902	0.890
Melting Temp.	LG	°C	73	96	92	-	-	-	-	-	-
Tensile Strength ⁽³⁾ (MD/TD)	D638	MPa	39/43	45/48	45/48	-	-	-	-	-	-
Elongation ⁽³⁾ (MD/TD)	D638	%	580 /650	570 /650	570 /650	-	-	-	-	-	-
Elmendorf tear (MD/TD)	D1922	Kgf/mm	2.4 /7.5	12.8 /19.3	6.2 /17.3	-	-	-	-	-	-
Haze	D1003	%	1.8	3.4	7.0	-	-	-	-	-	-
Application	-	-	Film & Packaging								

(1) The data in this table are considered as typical values, and not guaranteed specification from LG Chem.

(2) Typical resin property values are measured on a standard compression molded specimens, Speed of 500mm/min

(3) Typical film property values are measured on 60 μ m blown film specimens(BUR 2.3), Speed of 500mm/min

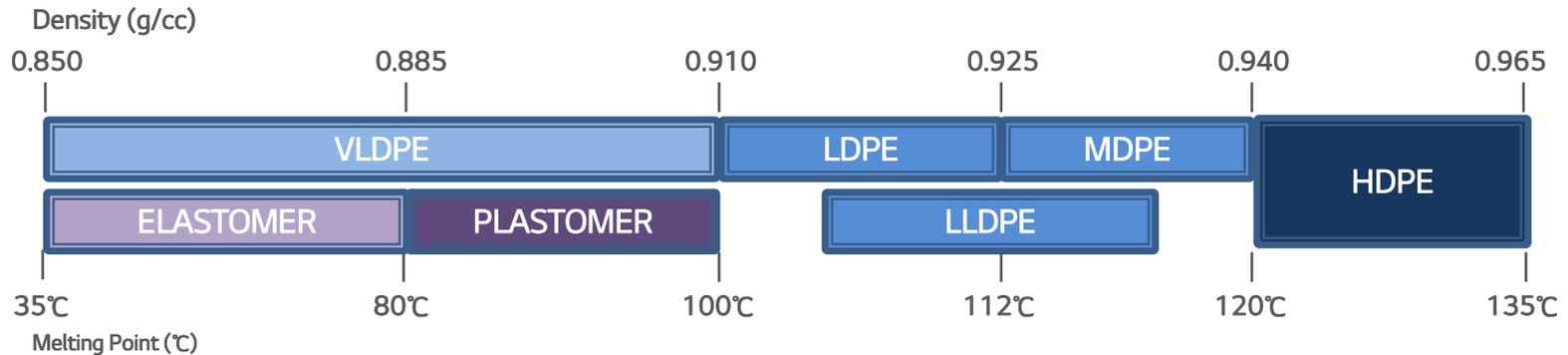
(4) LF100 contain antioxidant.

(5) LF100A contain slip and antiblocking agent and antioxidant.

* 1st products will be released starting Oct, 2017.

What are Polyolefin Plastomers ?

Polyolefin plastomers are ethylene- α olefin copolymers that have intermediated properties between elastomers and thermoplastics.



Polyolefin elastomers(POE) with densities between 0.857 and 0.885 are used in the manufacture of TPOs, which are used for automotive, recreational goods appliances, house-wares, and other miscellaneous applications.

For Automotive applications, POE are used in polypropylene-based compounds for both exteriors and interior applications.

Key advantages are :

- Low temperature impact strength
- Flexibility and Elasticity
- Good Optics
- Low density and light weight
- Good dispersion and Filler Acceptance
- Cost advantage over EPDM as less amount is used for required properties
- Low Extractable

Polyolefin plastomers (POP) with densities between 0.885 and 0.910 are used mostly in packaging applications, especially for food products.

POP are typically used in combination with m-LLDPE to improve the seal strength, reduce the SIT(seal initiation temperature), enhance clarity, and toughness. Flexible packaging companies can optimize final properties using various percentages of POP with other polyethylene.

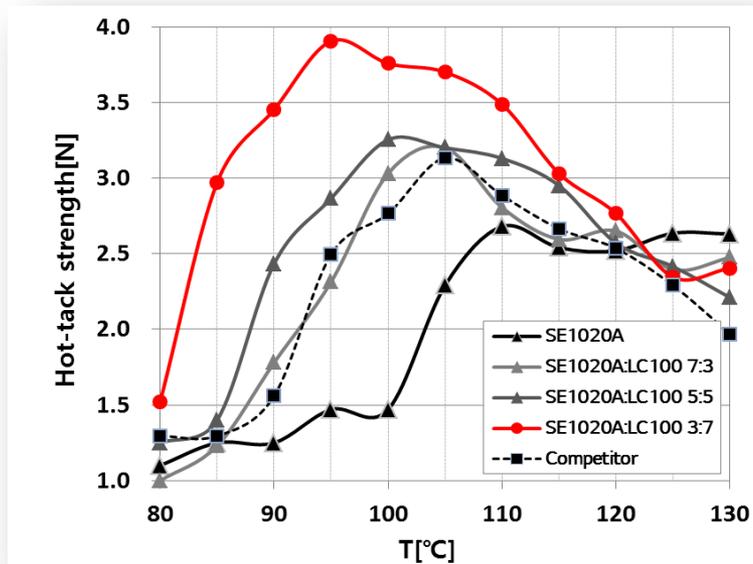
Main Application :

- Food packaging
 - Improve the breathability or as heat seal layer
 - Better hot tack strength and low SIT
- Stretch & Shrink films
 - Improve toughness
 - Clinginess : Low density and high melt index resin is used

POP enhances the toughness, clarity and sealing performance of flexible packaging films.

Sealing : Lower peak melting points and narrow melting ranges providing controlled sealing performance and superior sealing through contaminations.

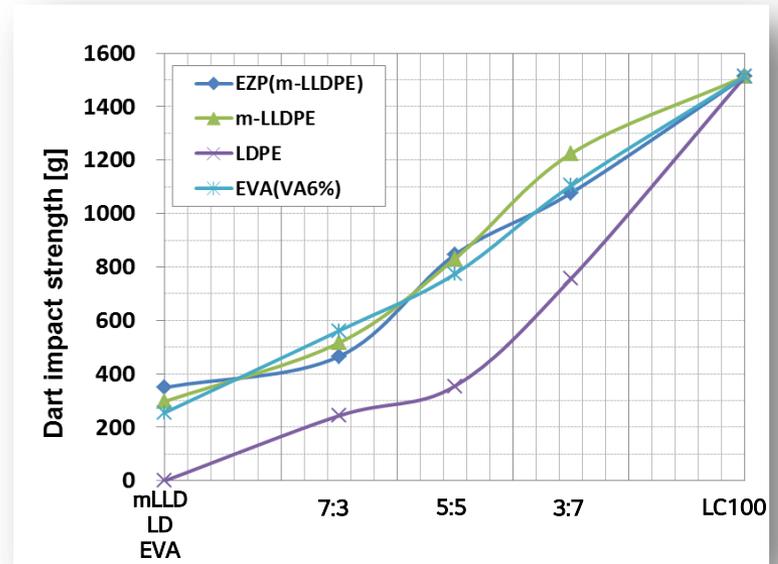
A broad seal range helps to overcome some of the normal machine variations encountered in a product filling environment . A broad seal range can compensate for machine variations and results in a more robust packaging process.



▲ With EZP (Easy-processing m-LLDPE) LC100 make it possible to enhance sealing performance of EZP(SE1020A) and provide an improved-strength and toughness.

Toughness : In order to be tough, a material must be both strong and ductile.

POP is advantageously used in both monolayer and multilayer, either neat or together with LDPE, m-LLDPE, EVA blending. POP delivers improved mechanical properties of blending materials which are also valuable in demanding industrial applications with higher impact, puncture resistance , and good clarity.



▲ Falling Dart impact strength LC100 makes it possible to enhance impact resistance of other material. LC100 is characterized by outstanding impact resistance.

Application of POP



Food PKG / Vacuum packaging film sealing layer

- The sealing layer is a key element in vacuum pkg film structures dedicated to fast vacuum process and perfect vacuum status.
- 7 layer or (3 to 5 layer) / POP blend with LDPE or LLDPE
- Lower seal initiation temperature



Agriculture film / Greenhouse

- Balanced strength in the MD and TD is needed.
- 3 layer / POP blend with EVA or LDPE/LLDPE.
- High impact strength and puncture resistance

Application of POP



Industrial film / Adhesive film

- Modified POP with functional groups to bond firmly to common polyolefins, polyamides, EVOH, wood and metals. It gives not only excellent adhesive performance for polymer, metal and wood but also easy processing
- Grafting of MAH on POP



CPP

- CPP Film can get brittle under low temperatures when the package is handled roughly or put under stress.
- Using POP under 30% with PP make it possible to enhance cold resistance of CPP film.