

# *Performance Choices for Rotational Molding*

Exxon Mobil Chemical

*Product Technology*

## **Crosslink – HDPE - LLDPE**

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# *Moldability*

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- Part definition with crosslinkable resin is excellent owing to the high flow of the base resin. Typical base mXL is 22MI.
- Overcuring is not an issue with mXL resin. HDPE and LLDPE must be molded within an acceptable window of time and temperature limits.

# *Stress Cracking Resistance*

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- All polyethylene used for rotational molding offers good environmental stress cracking resistance (ESCR)
- mXL resin offers outstanding ESCR performance under the most severe testing conditions

	HDPE	LLDPE	mXL
Bent strip ESCR, 10% Igepal, 50C, F <sub>50</sub> , h	47	72	>1000

# *Impact Strength*

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- Polyethylene offers excellent impact strength
- The cold impact performance and the notched impact strength of mXL resin are outstanding

	HDPE	LLDPE	mXL
$P_{50}, 1/8'' @ -40F, \text{ft-lb}$	56	57	60
Tensile impact, $\text{ft-lb/in}^2$	86	90	92
Notched Izod, $\text{ft-lb}$	3.3	4.1	17

# *Physical Properties*

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- General characteristics of mXL resin are related to fundamental density properties of polyethylene
- Tensile and permeation issues are density driven
- Crosslinking assures consistent elongation

	HDPE	LLDPE	mXL
Density	0.941	0.937	0.941
MI	1.8	2.3	No flow
Tensile, psi	2900	2400	2900
Elongation, %	>800	>800	>800
Permeation resistance	Excellent	Good	Excellent

# *Rotational Molding Resin Performance*

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	Crosslink	HDPE/LLDPE
Moldability	Excellent	Good
Stress cracking resistance	<i>Superior</i>	Good
Notch sensitivity	<i>Superior</i>	Fair
Impact strength	<i>Superior</i>	Excellent
Service temperature	Excellent	Good
Chemical resistance	Excellent	Fair
Permeation resistance	Good	Good
Natural color	Fair	Excellent
Pigmentation	Custom	Broad
Molding hygiene	Fair	Excellent
Cost	Fair	Excellent

# *Summary*

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- For high performance rotational molding applications where impact, containment, or safety are key issues, mXL resin is the material of choice
- For general rotational molding applications where cost is a driving issue, HDPE or LLDPE are the materials of choice