Comparison of Crosslink Polyethylene Resins to New High Density Linear Polyethylene Resins

Linear HDPE has been going through a continuing evolution and improvement while crosslink PE technology has been static. Great advances have been made in the last 20 years. Back in the 80’s crosslink was superior to linear, however, times have changed. New linear HDPE tanks out perform crosslink PE tanks when using aggressive chemicals and Linear HDPE tanks can use long-lasting high-performance welded fittings and can be repaired by welding where crosslink can not.

Here are some additional facts:

- Over 900 million pounds of all resins were used last year industry-wide
  - Less than 5% of that was crosslink
  - Half of that 5% was used to molds tank and bladders for oil, hydraulic fluid and gasoline which is the main use for crosslink

- Crosslink resin is declining every year as people switch to linear HDPE. The expected market for crosslink is mainly in auto and tractor industry to contain petroleum products.

- Chemical storage tanks do not require crosslink and with few exceptions, all chemical tank applications have gone to linear (a more cost-effective material).

- Sulfuric Acid and Sodium Hypochlorite are two of the most commonly stored chemicals in PE tanks. Crosslink tanks lose impact resistance, tensile strength and ductility when used with these chemicals.

- New linear resins have much greater UV resistance than crosslink and the expected life of a linear tank should be much longer than that of a crosslink tank

<table>
<thead>
<tr>
<th>Chemical Tank Comparison Crosslink vs. Linear</th>
<th>Crosslink PE</th>
<th>New Linear HDPE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, gm/cc, molded part</td>
<td>.945</td>
<td>.942</td>
</tr>
<tr>
<td>Yield Stress, psi</td>
<td>2430</td>
<td>2950</td>
</tr>
<tr>
<td>Break Stress, psi</td>
<td>1785</td>
<td>1879</td>
</tr>
<tr>
<td>Break elongation, %</td>
<td>230</td>
<td>324</td>
</tr>
<tr>
<td>Heat Distortion Temp, °C</td>
<td>56</td>
<td>67</td>
</tr>
</tbody>
</table>

See more information about Peabody Linear HDPE tanks at www.etanks.com
ExxonMobil HDPE

HD 8660
Rotational Molding Resin

Description
HD 8660 is a high density hexene copolymer designed to offer superior toughness and stiffness. This resin is ideally suited for applications that require the optimum balance of low temperature toughness, creep resistance, stiffness, ESCR, and tear properties.

Applications
- Large Agricultural Tanks
- Intermediate Bulk Containers
- Industrial Products

Additive Package | Form | Stabilizer
--- | --- | ---
HD 8660.29 | Pellet | Long Term UV 8 Stabilization
HDP8660.29 | 35 US Mesh Powder | Long Term UV 8 Stabilization

Resin Properties | Test Based On | Typical Value / Unit
--- | --- | ---
Melt Index | ASTM D 1238 | 2 g/10 min
Density | ASTM D 4883 | 0.942 g/cm³
Melting Point | ASTM D 3418 | 129 (264) °C (°F)

Molded Properties
- Tensile Strength at Yield | ASTM D 638 | 20.3 (2,950) MPa (psi)
- Tensile Elongation at Yield | ASTM D 638 | 16.2 %
- Flexural Modulus 1% Secant | ASTM D 790 Procedure B | 888 (129,000) MPa (psi)
- Impact Strength @ - 40°C 1/8” (3.17 mm) thickness | ARM | 108 (80) J (ft-lbs)
1/4” (6.35 mm) thickness | | 244 (180) J (ft-lbs)
- Environmental Stress Crack Resistance, F50 | ASTM D 1693 Condition. A 100% Igepal | 550 hr
10% Igepal | 48 hr
- Deflection Temperature | ASTM D 648 | @ 66 psi (455 Kpa) 67 (153) °C (°F)
@ 264 psi (1820 Kpa) 41 (106) °C (°F)

1. All physical properties were measured on 3 mm. rotomolded samples unless a different value is shown, except for ESCR, which was measured on compression molded samples.
2. Tensile testing was conducted at a crosshead speed of 50 mm/min. The tensile strength reported refers to the maximum stress reached during the test.
3. Test procedures may be modified to accommodate operating conditions or facility limitations.

HD 8660 grade can - in principle - be used in food contact applications in the USA (FDA) and in Canada (HPB). Migration or use limitations may apply. Please contact your ExxonMobil Chemical representative for more detailed information and/or actual compliance certification documents for the specific grade of interest.

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