PolymerLink

TECHNICAL DATA SHEET

POLYLINK XL-828

Crosslink XLPE Rotational Moulding Powder

PRODUCT DESCRIPTION

High performance and stiffness for fuel tanks, storage tanks and applications requiring good ESCR and impact. Available in black, natural and custom colours.

PROPERTY	TEST METHOD [1]	UNIT	TYPICAL VALUE [2]
Density	ASTM D 1505	g/cm^3	0.949
Melt Flow Index (MFI) [3]	ASTM D 1238	g/10 min	N/A
Tensile Strength[4]	ASTM D 638	MPa	23
Flexural Modulus [5]	ASTM D 790	MPa	717
HDT (0.45MPa)	ASTM D 648	°C	68
Impact Strength (6.35 mm) [6]	ARM Standard	J (ft.lbs)	271 (200)
ESCR F_{50} [7] (10% IGEPAL)	ASTM D 1693	h (F50)	>1000
ESCR F_{50} [7] (100% IGEPAL)	ASTM D 1693	h (F50)	>1000

DENSITY	0.949
MELT INDEX	N/A

KEY FEATURES

Excellent Strength
Superior Low Temperature Impact Strength
Chemical Resistance

TYPICAL APPLICATONS

Fuel Tanks
Hydraulic Tanks
IBC Chemical Tanks
Storage Tanks

COMPLIANCE

TUV approved (protocol 205XS0145-00 according to International UN Regulation No. 34, Annex 5 (ECE-R 34).

[1] *Properties designated have been determined using methods which are in accordance with the specified testing standards.*
[2] *Typical Values represent average laboratory values for the base resin and are intended as guides only, not as specifications.*
[3] *Condition 190°C/2.16 kg.*
[4] *ASTM Type 2, 2 inch per minute test speed, 6.0 mm thickness rotomoulded samples.*
[5] *0.5 inch per minute test speed, 6.0 mm thickness rotomoulded samples.*
[6] *-40°C on rotomoulded samples.*
[7] *Condition A, 50°C, F50 values using rotomoulded specimens.*

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INTRODUCTION

POLYLINK XL-828

What is Crosslinkable PE?

Cross-linkable polyethylene (also referred to as XLPE) is a polyethylene grade with specific features and properties which is modified by advanced compounding methods using additives that help initiate the chemical reaction of cross-linking at certain temperatures during the rotational moulding process. The cross-link chemical reaction creates strong molecular bonds between molecules that are irreversible and help provide enhanced properties in the final moulded part.

What are the Benefits of XLPE over other PEs?

Parts moulded with XLPE exhibit the following features when compared with a same/similar moulded part produced using a standard polyethylene.

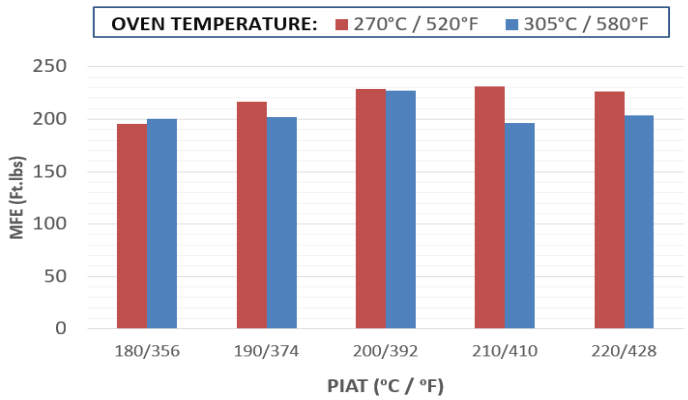
- Improved strength
- High Impact resistance
- Good chemical resistance in general
- Excellent ESCR (please refer our TDS for standard test result values)
- Resistance to Higher Temperatures
- Meets Fuel Permeability Standards (e.g., TUV/ECE R34)
- Can replace conventional materials like sheet metal, cement concrete etc. in select applications

What are the Typical Applications for XLPE?

- Automotive Fuel Tanks
- Under-the-Hood parts (air-ducts, engine manifolds etc.)
- AdBlue tanks (Def Tanks)
- Automotive exteriors
- Off-road Fuel Storage
- Large storage tanks
- Chemical Tanks
- Large underground tanks
- Parts that require high impact resistance
- Freezer doors and Refrigeration cabinets

What are the Features of PolyLink XL-828?

PolyLink XL-828 was designed and developed keeping in mind the requirements of the industry gathered over many years of experience and feedback from customers. PolyLink XL-828 comes with a combination of the best features that make it very process-friendly; it has a low-odour formulation which makes the material very operator friendly and better for an improved work environment; and offers easy de-moulding combined with high flow characteristics during the rotational moulding process. PolyLink XL828 has a broad processing window and potentially shorter cycle times due to developing full properties at lower PIAT values.



Impact Properties of 6.35mm Rotomoulded Samples of PolyLink XL-828
(Ferry E1-80 Machine / 8mm Aluminium Test Cube at Oven Temperatures of 270°C & 305°C)

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PROCESSING GUIDELINES

POLYLINK XL-828

Safety First

- Operators should be aware that the crosslinking chemical reaction during the process can generate gases that may cause an odour.
- Operators are advised not to smell the moulded parts and particularly should be cautioned against bringing the open vents/mouths of the moulded parts near the face.
- Operators should wear appropriate PPE when moulding.
- Open space, good airflow and sufficient clearance around the machine is ideal.

Mould

- Standard materials used for rotomoulding moulds can be used for PolyLink XL-828 also. Adequate mould venting is essential. However, steel wool is not recommended as a vent-tube filling material.

Machine

- All standard types of rotomoulding machines can be employed for processing PolyLink XL-828. However, a biaxial hot-air-oven machine with good temperature control is most suitable.

Process Parameters

- **Cooking Time**

  A major benefit of XL-828 is that it can be processed at shorter cycles (lower PIAT) than standard XL cycles which are often 20% longer. XL-828 can develop excellent physical properties across a wide window.

- **Oven Temperature**

  Recommended between 250-275°C for standard cycles but XL-828 can also be processed at higher temperatures depending on the mould and oven. XL-828 is formulated to reduce the likelihood of coining (pockmarking) compared to other XL grades.

- **Rotation Ratio**

  Standard rotation ratios used for regular PE can be used without any alteration.

- **PIAT**

  The Peak Internal Air Temperature (PIAT) is an excellent guide to the final physical properties of a moulded part. XL-828 is formulated to develop full physical properties earlier in the cycle at lower PIAT values than standard XL grades as can be seen in the figure above. A target of 200°C is a good starting point but should be confirmed through low-temperature impact testing of moulded parts. Higher PIAT values (up to 220°C) can also be used for XL828 if desired.

Quality Tests

- **Online Tests**

  i. Impact test using a mallet hammer at room temperature. A properly crosslinked part ideally should resist heavy impact with a mallet hammer.

  ii. Internal Surface Gloss: a shiny internal surface indicating degradation and full use of the crosslink chemicals is a common reference point for standard XL grades. XL-828 can be moulded at similar cycles and exhibit a glossy internal surface. However, XL-828 can also be moulded at lower temperatures and develop full physical properties without the need for overcuring the material to create a shiny surface. Moulders should perform tests at a range of PIAT values to determine a balance between cycle time, visual appearance and performance.

- **Offline Tests**

  i. Gel Content: A gel content test by Xylene Extraction Method can be used to determine the degree of cross-linking. Typical gel levels of a properly cross-linked part range from 60% - 80%.

  ii. Cold Impact Strength Test: Properly cross-linked parts should exhibit fully ductile failure at -40°C (-40°F), however, occasional brittle failures can occur in a batch of samples. The ARM Low Temperature Drop Weight Impact Test Standard is recommended.

  iii. Bent Strip Test: A fully and properly cross-linked part should not show any initiation of crack or failure of a 25mm (1") wide strip of material which has been lightly scored at the inside surface and fully bent to 180°.

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