

# TA 1117 HD

## Cross-linkable High Density Polyethylene Compound

TA 1117 HD is for use in industrial applications. Crosslinked TA 1117 HD has a beneficial combination of high density and high gel content which result in excellent chemical, abrasion and heat resistance. The properties of TA 1117 HD make it a preferred choice for oil and gas, and other aggressive industrial applications. TA 1117 HD is suitable for continuous service exposed to hydrocarbons at operating temperatures of 200°F (93°C).

### Description:

TA 1117 HD PEX-b compound, sometimes referred to as graft, is a silane grafted ethylene copolymer. The graft and a masterbatch containing a crosslinking catalyst and various stabilizers are required together to produce crosslinked pipes and other profiles. This system is referred to as the “SIOPLAS-System”.

This system allows crosslinked polyethylene products to be extruded as normal thermoplastic polymers. After the two components are combined and extruded together in the proper proportions, the resulting product is crosslinked by immersion in hot water at 205°F (95°C) or by exposure to low pressure steam.

### Physical Properties:

Property	Test method	Units	Typical Value
Density	ASTM D 792	g/cm <sup>3</sup>	0.947
Bulk Density	ASTM D 1895 (ISO R 60)	g/cm <sup>3</sup>	0.54
Melt Flow Index (190°C/5.0 kg)	ASTM D 1238	g/10 min.	1.0
Volatiles total	SIL 4.3	%	< 0.10
Moisture (water)	Karl Fischer titration (SIL 4.4)	%	< 0.02
Tensile yield strength	ASTM D 638	Mpa	22
Elongation at break	ASTM D 638	%	250
Gel Content	ASTM D 2765	%	75

## Processing TA 1117 HD:

TA 1117 HD may be processed on most modern thermoplastic extruders. High quality products may be expected when TA 1117 HD is processed with an extruder designed for polyethylene. Adequate blending of the catalyst masterbatch and the TA 1117 HD is important to the final properties of the product, so use of a barrier flight or other mixing type screw is preferred.

It is important to accurately blend the graft and catalyst masterbatch in the ratio of 95.0% TA 1117 HD and 5.0% catalyst masterbatch by weight. Use of a gravimetric feeding system is recommended for optimum results.

## Screw Parameters:

- Length to diameter ratio (L/D) : 25 to 1
- Compression ratio : between 3.0 to 1 and 2.5 to 1

## Extrusion Temperature Profile:

The following temperature profile is intended as a starting point. When extruding PEX compound it is important to assure adequate mixing of the catalyst masterbatch with the TA 1117 HD. Poor mixing as a result of low back pressure and low temperature may result in poor surface finish and a lack of homogenous distribution of the catalyst additives through the wall of the pipe. Excessive shear and temperature may result in degradation of the material and the performance of the pipe.

Extruder Zone	Temperature (Fahrenheit)	Temperature (Celsius)
Zone 1	310 – 350	154 - 177
Zone 2	330 – 370	165 - 188
Zone 3	350 – 390	177 - 200
Zone 4	370– 390	188 - 200
Head	390 – 410	200 - 210
Die	375 – 420	190 - 215
Screw*	160 – 195	70 - 90

\* Control of the screw temperature may improve processing results.

## To Optimize Extrusion Performance:

- Pre-dry the catalyst masterbatch for 2 hours at 140°F - 175°F (60°C -80°C).
- Allow the raw material to warm up to ambient factory temperature before opening packaging to avoid moisture condensing on the material.
- The extruder, head and die tooling should be constructed to streamline the flow of the melt and to avoid stagnation of the material anywhere in the system.
- In case of a pause in extrusion longer than 10 or 15 minutes, purge the extruder with HDPE that has a MFI ≤ 2.0 before extruding TA 1117 HD again.

## Crosslinking (Curing):

Crosslinking of TA 1117 HD extruded with catalyst may be completed by immersion in or flushing with hot water at 195°F - 205°F (90°C - 95°C) or exposure to low pressure steam

The time required to obtain the desired gel content depends on the pipe wall thickness, relative humidity, and the temperature. The rate of crosslinking is predominantly influenced by temperature.

## Storage:

Unopened packages of TA 1117 HD have a shelf life of 9 months from the production date. Packages of TA 1117 HD should only be opened immediately before processing. Exposure of TA 1117 HD to direct sunlight, moisture, or atmosphere must be avoided.

Shelf life of opened packages is up to 5 or 6 weeks, provided packages are resealed completely airtight using a tape with strong adhesive and barrier properties (i.e. aluminum tape).

## Packaging:

TA 1117 HD is available in cardboard gaylords of 1322 lb (600 kg). The material is preserved by a moisture resistant multi-layer lining inside the box which is sealed under vacuum. By special request TA 1117 HD may be provided in 55 lb (25 kg) moisture resistant multi-layer bags.

Catalyst masterbatch is available in 55 lb (25 kg) moisture resistant multi-layer bags. By special request catalyst masterbatch may also be provided in cardboard gaylords.

## Catalyst Masterbatches:

A variety of catalyst masterbatches are available in different colors and with different stabilization additives. Please contact your Kafrit NA sales representative for more information about selecting Kafrit NA catalyst masterbatches.

Kafrit NA Ltd. is certified to:  
ISO 9001:2008  
ISO 14001:2004  
OHSAS 18001:2007

ISO 9001:2008  
FM 95799



OHSAS 18001:2007  
OHS 95677

ISO 14001:2004  
EMS 95798

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