



## Product Data Sheet

# HEX4460 PE80+

High Density Polyethylene

### Product Description

HEX4460 PE80+ is a high molecular weight, high density polyethylene (HDPE) with high melt viscosity for extrusion. This grade, which is produced by 1-hexene co-monomer, is classified as PE 80+ and provides excellent stress crack resistance properties (ESCR) combined with very good long-term hydrostatic strength and good processability. Typical customer applications are underfloor heating and multilayer pipe for heating and plumbing. HEX4460 PE80+ has been manufactured under Basell license.

### General Information

<b>Status</b>	Commercial: Active	
<b>Application</b>	Drinking water pipe, drainage pipe, plumbing, heating & cooling	
<b>Form(s)</b>	Pellet	
<b>Attribute</b>	Outstanding ESCR Good Creep Strength Good Chemical Resistance	Good Resistance to SCG & RCP Good Processability Very Good Low Temp. Impact Resistance
<b>Additives</b>	Processing Aid: No Antioxidant: Yes	Antiblock: No Slip Agent: No

Typical Properties	Typical Value <sup>1</sup>	Unit	Test Method
<b>Physical</b>			
High Load Melt Flow Index (190°C/ 21.6 kg)	6.0	g/10 min	ISO 1133
Melt Flow Index (190°C/ 5.0 kg)	0.33	g/10 min	ISO 1133
Density <sup>2</sup>	0.944	g/cm <sup>3</sup>	ISO 1183
<b>Mechanical <sup>3</sup></b>			
Tensile Strength at Yield	25	MPa	ISO 527-1, -2
Elongation at Yield	11	%	ISO 527-1, -2
Elongation at Break	> 1000	%	ISO 527-1, -2
Tensile Strength at Break	40	MPa	ISO 527-1, -2
Tensile Modulus of Elasticity	700	MPa	ISO 527-1, -2



Flexural Modulus - 1% Secant	> 1000	MPa	ASTM D790
ESCR F <sub>10</sub> (10% Igepal, Method B)	> 1000	hrs	ASTM D1693
FNCT (3.5 MPa, 2% Arkopal N100, 80°C)	> 150	hrs	ISO 16770

#### Conformance Testing <sup>4</sup>

Minimum Required Strength (20°C)	> 8.0	MPa	ISO 12162
Hydrostatic Pressure Test (9.0 MPa @ 20°C)	> 100	hrs	ISO 1167
Hydrostatic Pressure Test (4.0 MPa @ 80°C)	> 1000	hrs	ISO 1167
Resistance to Slow Crack Growth (4.6 MPa @ 80°C)	> 1000	hrs	ISO 13479
Resistance to Rapid Crack Propagation (P <sub>c</sub> @ 0°C)	> 6.0	bar	ISO 13477

#### Impact

Tensile Impact Strength (Notched, Type 1, Method A, -30°C)	167	kJ/m <sup>2</sup>	ISO 8256
Izod Impact Strength (Notched, Method A, 23°C)	26	kJ/m <sup>2</sup>	ISO 180

#### Thermal

Melting Temperature	129	°C	ISO 3146
Oxidation Induction Time (200°C)	> 30	min	ISO 11357
Vicat Softening Temperature (Method A/ 10N)	126	°C	ISO 306
Deflection Temperature Under Load (0.45 MPa)	68	°C	ISO 75
Deflection Temperature Under Load (1.8 MPa)	50	°C	ISO 75

#### Recommended Process Conditions <sup>5</sup>

Processing Method: Pipe Extrusion; Sheet Extrusion

Extruder Barrel Temperature: 200-230 °C

Melt Temperature: 205-240 °C

1. Typical values: these are not to be construed as specifications.
2. The density parameter was determined on compression-molded specimens, which were prepared in accordance with procedure C of ASTM D4703, Annex A1.
3. Properties are based on compression-molded specimens, which were prepared in accordance with procedure B of ASTM D4703, Annex A1, using 100% HEX4460 PE80+ resin.
4. Values were obtained on 110 mm, SDR11 pipe made with HEX4460 PE80+ and an approved masterbatch.
5. Please note that, these processing conditions are recommended by manufacturer only for 100% HEX4460 PE80+ resin (not in the case of blending with any other compatible material), therefore because of the many particular factors which are outside our current knowledge and control and may affect the use of product, no warranty is given for the foregoing data. Moreover, the specific recommendations for resin type and processing conditions can only be made when the end use, required properties and fabrication equipment are known.

#### Further Information

#### Health and Safety

The resin is manufactured to the highest standards, but special requirements apply to certain applications such as food end-use contact and direct medical use. Specific information on regulatory compliance can be requested via customer.

Molten polymer may be degraded if it is exposed to air during any of the processing and off-line operations. The products of degradation may have an unpleasant odor. In higher concentrations they may cause irritation of the mucus membranes. Fabrication areas should be ventilated to carry away fumes or vapors. Legislation on the control of emissions and pollution prevention should be observed. Workers should be protected from the possibility of skin or eye contact with molten polymer.

The resin will burn when supplied with excess heat and oxygen. It should be handled and stored away from contact with direct flames and/or ignition sources. While burning, the resin contributes high heat and may generate a dense black smoke.

Recycled resins may have previously been used as packaging for, or may have otherwise been in contact with, hazardous goods. Converters are responsible for taking all necessary precautions to ensure that recycled resins are safe for continued use.

The detailed information about safety, handling, individual protection and waste disposal is provided in the relevant Safety Data Sheet. Additional specific information can be requested via customer.

## Conveying

Conveying equipment should be designed to prevent accumulation of fines and dust particles. These particles can, under certain conditions pose an explosion hazard. We recommend that the conveying system will be equipped with adequate filters and be operated and maintained in the way that ensure no leaks develop.

## Storage

Polyethylene resins should be protected from direct sunlight and/or heat during storage. The storage location should also be dry, dust free and the storage temperature should not exceed 50°C. It is also advisable to process polyethylene resins (in pelletized or powder form) within 6 months after delivery, because excessive aging of polyethylene can lead to a deterioration in quality. Arya Sasol Polymer Company would not give any warranty to bad storage conditions which may lead to quality deterioration such as color change, bad smell and inadequate product performance.

The information provided in this Product Data Sheet has been based upon the current level of knowledge and experience. They are not to be interpreted as a warranty for specific product characteristics. In view of the many factors that may affect processing and application, these data do not relieve processors of the responsibility of carrying out their own tests and experiments; neither do they imply any legally binding assurance of certain properties or of suitability for a specific purpose. Customer is responsible for determining whether the products and the information in this document are appropriate for customer's use and for ensuring that customer's workplace and disposal practices are in compliance with applicable laws and other governmental enactments. Seller assumes no obligation or liability for the information in this document.

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