

Alathon®

M4612

High Density Polyethylene
Injection Molding Grade

Melt Index: 1.2 Density: 0.946



Applications

ALATHON M4612 is a copolymer that provides outstanding stress crack resistance and low temperature impact strength. Typical applications include food containers, seat hinges, tube headers and parts requiring high ESCR.

Regulatory Status

Alathon M4612 meets the requirements of the Food and Drug Administration regulation 21 CFR 177.1520. This regulation allows the use of this olefin polymer in "...articles or components of articles intended for use in contact with food..." Specific limitations or conditions of use may apply. Contact your Equistar sales representative for more information about the use of specific products for specific application.

Processing Techniques

Specific recommendations for processing M4612 can only be made when the processing conditions, equipment and end use application are known. For further information please contact your Equistar Sales Representative or refer to the [Start-up Conditions for HDPE](#) on the Lyondell web site. Additional [Injection Molding Technical Topics](#) can also be found on the Lyondell web site.

Suggested Start-up Conditions

Extruder Zone	Rear	Center	Front	Nozzle
Cylinder Temperature, °F (°C)	450 (232)	470 (243)	475 (246)	475 (246)

Physical Properties

Resin Properties	Nominal Values		Test Method
	English Units	SI Units	
Melt Index, 190°C, 2.16 kg		1.2 g/10 min	ASTM D 1238
Spiral Flow ¹	7.7 in	19.6 (cm)	Equistar
Density		0.946 g/cc	ASTM D 1505
Bulk Density	37-39 lb/ft ³	593-625 kg/m ³	ASTM D 1895
Molded Properties			ASTM D 4796
Tensile Stress, Yield	3,350 psi	23.1 MPa	ASTM D 638*
Elongation, Yield		12 %	ASTM D 638*
Tensile Stress, Break	3,470 psi	23.9 MPa	ASTM D 638*
Elongation, Break		550 %	ASTM D 638*
Flexural Modulus, 1% Secant	135,000 psi	931 MPa	ASTM D 790**
Izod Impact, 23 °C	1.4 ft-lbs/in	74.7 J/m	ASTM D 256
Unnotched Impact, -18 °C	No Break	No Break	ASTM D 4812
Vicat Softening Point	255 °F	124 °C	ASTM D 1525
Heat Deflection Temperature, 66 psi ²	144 °F	62 °C	ASTM D 648
Low Temperature Brittleness, F ₅₀ ²	<-105 °F	< -76 °C	ASTM D 746

See Page 2 for Other Properties

¹ Measures the number of inches of flow produced when molten resin is injected into a long, spiral channel (0.0625" insert), at a constant injection pressure of 1000 psi with a melt temperature of 440°F.

² Data are for control and development work and not intended for use in design or predicting performance at elevated or sub-ambient temperatures.

* Conditions: 50 mm/min, Type IV

** Conditions: 12.5 mm/min

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Other Properties

Thermal Properties

Melting Temperature
Crystallization Temperature

Nominal Values

English Units

261.9 °F
235.8 °F

SI Units

127.7 °C
113.2 °C

Test Method

ASTM D 3418
ASTM D 3418

Molded Properties

Flexural Modulus, 2% Secant
Flexural Young's Modulus
Tensile Modulus, 1% Secant
Tensile Young's Modulus
ESCR, 100% Igepal®
ESCR, 10% Igepal®

English Units

112,000 psi
146,000 psi
92,200 psi
117,000 psi

SI Units

772 MPa
1,010 MPa
636 MPa
807 MPa
23 Days
1.4 Days

Test Method

ASTM D 4976
ASTM D 790**
ASTM D 790**
ASTM D 638***
ASTM D 638***
ASTM D 1693
ASTM D 1693

** Conditions: 12.5 mm/min

*** Conditions: 50 mm/min, Type I

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