Alathon

L4904

High Density Polyethylene
Pressure Pipe Extrusion Grade
High Load Melt Index **7.0** Density **0.949**

Applications

Alathon L4904 is a bimodal, high molecular weight, high density polyethylene resin with excellent processing characteristics. L4904 is selected by customers for the high performance requirements of demanding pressure pipe applications including gas distribution, industrial piping, mining, oil & gas gathering, municipal water service lines and sewers. Customers typically use L4904 in applications requiring high resistance to pipe failure by rapid crack propagation and slow crack growth mechanisms. When L4904 is combined with an Equistar approved black at the correct loading (see page 2), this compound meets the following standards:

- Plastics Pipe Institute (PPI) PE 4710 per PPI TR-3
- PE 100 per PPI TR-3
- ASTM D3350 Cell Classification **PE445574C** and **PE445576C**
- NSF Standard 14 and Standard 61 for Potable Water Pipe and Fittings
- NSF Standard 358-1 for PE Pipe and Fittings for “Geothermal” Heat Pump Systems
- CSA B137.1 for pipe, tubing, and fittings for cold-water pressure services
- ASTM D2513 for PE gas pressure pipe, tubing and fittings
- CSA B137.4 for PE piping systems for gas services

Processing Techniques

Specific recommendations for processing L4904 can only be made when the processing conditions, equipment and end use are known.

Conformance

Test[1]	Nominal Value	Units	Test Method
PENT at 2.4 MPa and 80 °C	>2,000	hours	ASTM F1473
Hydrostatic Design Basis, 73 °F (23 °C)	1,600	psi	ASTM D2837
Hydrostatic Design Basis, 140 °F (60 °C)	1,000	psi	ASTM D2837
Minimum Required Strength, 68 °F (20 °C)	10	MPa	ISO 12162
Creep Rupture Strength, 20 °C, 12.4 MPa	>200	hours	ASTM D1598
Resistance to Rapid Crack Propagation, P_c @ 32 °F [2]	>12	bar	ISO 13477
Resistance to Rapid Crack Propagation, T_c @ 5 bar [2]	<20	°F	ISO 13477
Notched Pipe Test, 80 °C, 4.6 MPa [2]	>2,500	hours	ISO 13479

Typical Properties

Property[3]	Nominal Value	Units	Test Method
High Load Melt Index	7.0	g/10 min	ASTM D1238
Melt Index	0.04	g/10 min	ASTM D1238
Density	0.949	g/cc	ASTM D1505
DSC Induction Temperature	250	°C	ASTM D3350
2% Secant Modulus	146,000	psi	ASTM D790
Tensile Stress @ Yield	3,500	psi	ASTM D638
Tensile Stress @ Break	5,100	psi	ASTM D638
Elongation @ Break	800	%	ASTM D638
Brittleness Temperature	<-76	°C	ASTM D746

[1] Values were obtained from L4904 compounded with an approved black masterbatch.
[2] Pipe diameter of 4” and SDR 11.
[3] Values were determined on natural resin.

See page 2 for approved masterbatches, formulation and chemical resistance.

PLASTICS·PIPE·INSTITUTE®

Alathon

L4904

Approved Masterbatches

The following masterbatches are approved for use with *Alathon* L4904:

Manufacturer	Masterbatch Code
Ampacet	190872, 190872A
CP Chemicals	M151, M368
Ingenia	IPBK019A
Modern Dispersions	PE 535-42
PolyOne Corp.	2107 Black PEC, 2107M, 2107M-PPA, B60054, B60054C

Formulation

The amount of black concentrate added should be adjusted to maintain a carbon black level between 2.0 and 2.5 wt% in the final pipe. This will typically require the use of between 6.0 and 6.8 wt% of black concentrate when the concentrate contains 35 wt% of carbon black. Addition levels may need to be adjusted due to variation in the certified carbon black level in the black concentrate.

Chemical Resistance

Chemical resistance was conducted in accordance with ASTM D2513-01a, Section 5.4 on L4904 Black. Results can be found in the table below.

	Weight Change		Change in Tensile Strength	
Reagent	% Change	Requirements	% Change	Requirements
100% Mineral Oil	0.05	0.5% max.	-5.00	± 12% max.
5% t-Butyl Mercaptan in Mineral Oil	0.04	0.5% max.	-4.91	± 12% max.
100% Ethylene Glycol	0.01	0.5% max.	-2.54	± 12% max.
15% Toluene in Methanol	0.01	1.0% max.	-1.94	± 12% max.