# Formolene® HP4000

### High Density Polyethylene

Formosa Plastics Corporation, U.S.A.

#### Message:

Formolene® HP4000 is a high performance copolymer that is designed for the most demanding requirements of nonpressure pipe applications. It has good long-term hoop strength performance, very high melt strength, and outstanding toughness even at low temperatures. Formolene® HP4000 meets all requirements of ASTM D4976 - PE 235 Formolene® HP4000 meets the requirements of ASTM F 2160 for use in solid wall HDPE conduit based pipe.

General Information			
Features	Copolymer		
	Good Melt Strength		
	Good Toughness		
	High Density		
	Low Temperature Toughness		
Uses	Conduit		
	Piping		
Agency Ratings	ASTM D 4976-PE235		
	ASTM F 2160		
	EC 1907/2006 (REACH)		
Forms	Pellets		
Processing Method	Compression Molding		
Physical	Nominal Value	Unit	Test Method
Physical Density	Nominal Value 0.944	Unit g/cm³	Test Method ASTM D1505
Density Melt Mass-Flow Rate (MFR) (190°C/2.16	0.944	g/cm³	ASTM D1505
Density Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)			
Density Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) Environmental Stress-Cracking Resistance	0.944	g/cm³ g/10 min	ASTM D1505 ASTM D1238
Density Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) Environmental Stress-Cracking Resistance 100% Igepal, Compression Molded, F50	0.944 0.16 > 1000	g/cm³ g/10 min hr	ASTM D1505 ASTM D1238 ASTM D1693A
Density Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) Environmental Stress-Cracking Resistance 100% Igepal, Compression Molded, F50 100% Igepal, Compression Molded, F50	0.944 0.16 > 1000 > 1000	g/cm <sup>3</sup> g/10 min hr hr	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B
Density Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) Environmental Stress-Cracking Resistance 100% Igepal, Compression Molded, F50 100% Igepal, Compression Molded, F50	0.944 0.16 > 1000 > 1000 > 1000	g/cm <sup>3</sup> g/10 min hr hr hr	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C
Density Melt Mass-Flow Rate (MFR) (190°C/2.16 kg) Environmental Stress-Cracking Resistance 100% Igepal, Compression Molded, F50 100% Igepal, Compression Molded, F50 100% Igepal, Compression Molded, F50 Mechanical	0.944 0.16 > 1000 > 1000	g/cm <sup>3</sup> g/10 min hr hr	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method
DensityMelt Mass-Flow Rate (MFR) (190°C/2.16 kg)Environmental Stress-Cracking Resistance100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50Tensile Strength 1	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value	g/cm <sup>3</sup> g/10 min hr hr Unit	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C
DensityMelt Mass-Flow Rate (MFR) (190°C/2.16 kg)Environmental Stress-Cracking Resistance100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50100% Igepal, Compression Molded, F50Tensile Strength 1Yield, Compression Molded	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value 22.1	g/cm <sup>3</sup> g/10 min hr hr Unit MPa	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method
Density         Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)         Environmental Stress-Cracking Resistance         100% Igepal, Compression Molded, F50         Tensile Strength <sup>1</sup> Yield, Compression Molded         Break, Compression Molded	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value	g/cm <sup>3</sup> g/10 min hr hr Unit	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method
Density         Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)         Environmental Stress-Cracking Resistance         100% Igepal, Compression Molded, F50         Mechanical         Tensile Strength <sup>1</sup> Yield, Compression Molded         Break, Compression Molded         Tensile Elongation <sup>2</sup> (Break, Compression	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value 22.1 34.5	g/cm <sup>3</sup> g/10 min g/10 min hr hr Unit MPa MPa	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method ASTM D638
Density         Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)         Environmental Stress-Cracking Resistance         100% Igepal, Compression Molded, F50         Mechanical         Tensile Strength <sup>1</sup> Yield, Compression Molded         Break, Compression Molded         Tensile Elongation <sup>2</sup> (Break, Compression Molded)	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value 22.1	g/cm <sup>3</sup> g/10 min hr hr Unit MPa	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method
Density         Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)         Environmental Stress-Cracking Resistance         100% Igepal, Compression Molded, F50         Mechanical         Tensile Strength <sup>1</sup> Yield, Compression Molded         Break, Compression Molded         Tensile Elongation <sup>2</sup> (Break, Compression Molded)         Flexural Modulus	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value 22.1 34.5 > 500	g/cm <sup>3</sup> g/10 min g/10 min hr hr Unit MPa MPa %	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method ASTM D638
Density         Melt Mass-Flow Rate (MFR) (190°C/2.16 kg)         Environmental Stress-Cracking Resistance         100% Igepal, Compression Molded, F50         Mechanical         Tensile Strength <sup>1</sup> Yield, Compression Molded         Break, Compression Molded         Tensile Elongation <sup>2</sup> (Break, Compression Molded)	0.944 0.16 > 1000 > 1000 > 1000 Nominal Value 22.1 34.5	g/cm <sup>3</sup> g/10 min g/10 min hr hr hr Unit MPa MPa	ASTM D1505 ASTM D1238 ASTM D1693A ASTM D1693B ASTM D1693C Test Method ASTM D638

Thermal	Nominal Value	Unit	Test Method
Brittleness Temperature	< -90.0	°C	ASTM D746
NOTE			
1.	Type IV, 51 mm/min		
2.	Type IV, 51 mm/min		

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