

Physical Properties of Polyethylene

Raw Material Properties	Typical	Unit	Test Method
Density			
-Compound or Hdpe Pipe PE 80	0.958 - 0.966	g/cm ³	ISO 1183
-Compound or Hdpe Pipe PE 100	0.957 - 0.961	g/cm ³	ISO 1183
Melt Flow Index			
-MFR Compound 80 PE(190 °C,5 kg)	0.3 – 0.5	g/10 min	ISO1133
-MFR Compound 100 PE(190 °C,5 kg)	0.2 – 0.3	g/10 min	ISO1133
Carbon Black Content	2.0 – 2.5	% WT	ISO 6964
Thermal Stability (OIT) (@ 200 °C)	> 20	minute	ISO/TR10837
Mechanical Properties			
-Tensile Strength at Yield	22	MPa	ISO 527
-Tensile Strength at Break	33	MPa	SO 527
-Elongate at Break	>350	%	ISO 527
-Tensile Modulus	800	Mpa	ASTM D790
-Resistance to Slow Crack Growth	>500	Hrs	ISO13479
-Rapid Crack Propagation	≥12	Bar	ISO13477
-Resistance to Gas Constituents	>20	Hrs	ISO1167
Thermal Properties			
-Brittleness Temperature	<-70	°C	ASTM D746
-Linear Thermal Expansion	1.90	mm/m. °C	ASTM D696
Average Value over temperature range 20-90 °C			
-Thermal Conductivity (20 °C)	0.42	W/m.K	DIN 52612 (20 °C)
-Specific Heat , Cp	2.00	Kj/kg.K	DSC, at 20 °C
-Specific Heat , Cp	2.70	Kj/kg.K	DSC, at 200 °C
-Crystalline Melting Range	125-130	°C	DSC
-Thermal Stability			
Induction Temp	254	°C	ASTM 3350
Induction Time	15	Mm	Isothermal in Oxygen at 210 °C
-Vicar Softening Temperature	122	°C	ISO 306 A-50

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Electrical Properties			
-Volume Resistivity	$>10^{16}$	$\Omega \cdot \text{cm}$	DIN 53482 VDE 0303, part 3
-Surface Resistance	$>10^{13}$	Ω	DIN 53482 VDE 0303, part 3
-Dielectric Strength	700	kV/cm	DIN 53481 VDE 0303, part 2
-Dielectric Constant			DIN 53484, VDE 0303, part 5
At 2×10^6	2.50	-	(Immersion method)
-Dielectric loss factor tan			
At 50Hz	6×10^{-4}	-	DIN 53483, VDE 0303, part 4
At 10^3 Hz	5×10^{-4}	-	DIN 53483, VDE 0303, part 4
At 10^4 Hz	5×10^{-4}	-	DIN 53483, VDE 0303, part 4
At 10^5 Hz	6×10^{-4}	-	DIN 53483, VDE 0303, part 4
-Tracking Resistance	KA 3c KC>600	Stage	DIN 53480, VDE 0303, part 1
-Arc Resistance	L4	Stage	DIN 53484, VDE 0303, part 5