Datasheet

PEI 1010 Material Overview

PEI 1010 features high strength and good thermal stability, making it an ideal choice for advanced manufacturing and prototyping applications in the automotive, aerospace, medical, and food production industries.

With food contact and biocompatibility certifications, 1010 expands the use of additive manufacturing technology into applications, such as customized food production tools and autoclave-sterilizable medical devices.

It ensures consistent overall molding of complex and large prototype parts, with material properties similar to final production parts, guaranteeing accurate and reliable prototype test data.

Mechanical Properties 1	Testing Method	Imperial		Metric	
		XZ Direction	ZX Direction	XZ Direction	ZX Direction
Tensile Yield Strength (Type 1, 0.125", 0.2"/min)	ASTM D638	9,300 psi	5,990 psi	64 MPa	41 MPa
Ultimate Tensile Strength (Type 1, 0.125", 0.2"/min)	ASTM D638	11,700 psi	7,000 psi	81 MPa	48 MPa
Tensile Modulus (Type 1, 0.125", 0.2"/min)	ASTM D638	402,000 psi	322,000 psi	2,770 MPa	2,200 MPa
Elongation at Break (Type 1, 0.125" * 0.2"/min)	ASTM D638	3.3%	2.0%	3.3%	2.0%
Elongation at Yield (Type 1, 0.125", 0.2"/min)	ASTM D638	2.2%	1.5%	2.2%	1.5%
Flexural Strength (Method 1, 0.05"/min)	ASTM D790	21,000 psi	11,100 psi	144 MPa	77 MPa
Flexural Modulus (Method 1, 0.05"/min)	ASTM D790	409,000 psi	324,000 psi	2,820 MPa	2,230 MPa
Flexural Strain at Break (Method 1, 0.05"/min)	ASTM D790	No break	3.5%	No break	3.5%
Notched Izod Impact, XZ Direction (Method A, 23°C)	ASTM D256	0.3 ft-lb/in	0.4 ft-lb/in	41 J/m	24 J/m
Unnotched Izod Impact, XZ Direction (Method A, 23°C)	ASTM D256	6.1 ft-lb/in	2.6 ft-lb/in	326 J/m	138 J/m
Compressive Yield Strength (Method 1, 0.05"/min)	ASTM D695	19.500 psi	15,100 psi	134 MPa	107 MPa
Ultimate Compressive Strength (Method 1, 0.05"/min)	ASTM D695	No break	15,500 psi	No break	1,125 MPa
Compressive Modulus (Method 1, 0.05"/min)	ASTM D695	1,450,000 psi	305,000 psi	10,000 MPa	1,120 MPa

Thermal Properties 2	Testing Method	Imperial	Metric
Heat Deflection Temperature (HDT) @ 66 psi, 0.125" unannealed	ASTM D648	421°F	216°C
Heat Deflection Temperature (HDT) @ 264 psi, 0.125" unannealed	ASTM D648	415°F	213°C
Vicat Softening Temperature	ASTM D1525	416°F	214°C
Glass Transition Temperature (Tg)	DSC (SSYS)	419°F	215°C
Coefficient of Thermal Expansion	ASTM E831	26x10-06 in/(in·°F)	47 µ m/(m·°C)
Coefficient of Thermal Expansion (x-flow)	ASTM E831	23x10-06 in/(in·°F)	41 µ m/(m·°C)
Melting Point	.....	N/A[3]	N/A[1]

Electrical Properties	Testing Method	Value Range
Volume Resistivity	ASTM D257	1.0×10^{14}–8.96×10^{15} Ohm-cm
Dielectric Constant	ASTM D150-98	2.67
Dissipation Factor	ASTM D150-98	.001
Insulation Strength	ASTM D149-09, Method A	240 V/mil

Datasheet

Others[2]	Testing Method	Value
Specific Gravity	ASTM D792	1.27
Rockwell Hardness	ASTM D785	109
Flame Retardant Rating	UL94	V0 (1.5 mm), V0, 5VA (3 mm)
Oxygen Index	ASTM D2863	0.44
Vertical Burn	FAR 25.853 (60s test, pass)	4 sec
OSU Total Heat Release (2 min test, 0.060" thick)	FAR 25.853	35.7 kW min/m^2
UL File Number	----------	E345258
Food Safety Certification[4]	NSF 51	Certification
Biocompatibility Certification[4]	ISO 10993/USP Class VI	Certification

Burn Test		
Horizontal Burn (15 sec)	14 CFR/FAR 25.853	Pass (.060" thick)
Vertical Burn (60 sec)	14 CFR/FAR 25.853	Pass (.060" thick)
Vertical Burn (12 sec)	14 CFR/FAR 25.853	Pass (.060" thick)
45° Ignition	14 CFR/FAR 25.853	Pass (.060" thick)
Heat Release	14 CFR/FAR 25.853	Pass (.060" thick)
NBS Smoke Density (Burning)	ASTM F814/E662	Pass (.060" thick)
NBS Smoke Density (Non-Burning)	ASTM F814/E662	Pass (.060" thick)

System Availability	Layer Thickness Performance	Support Material	Available Colors
Fortus 450 mc	0.010 in (0.254 mm)	Soluble Support	Natural Color
Fortus 900 mc	0.013 in (0.333 mm)		
F900	0.020 in (0.508 mm)		