



BIOESIS

MATERIAL DESIGN

Technical Data Sheet - PLA+Hemp

Material: PLA+Hemp for 3d-printing

Laboratory: Superlab SRL - Via Ruini, 3 - 42013 Salvaterra (RE)

Properties	Conditions	Standard	Units	Values	
				48 hours @ 23 C° 50% R.H.	3 hours at 100 C° conditioned

Physical Properties

Specific Gravity	@ 23 C°	ISO 1183	g/cc	1,2593	-
Molding Shrinkage - Longitudinal	@ 23 C°	ASTM D 995	%	0,23	-
Fluidity - MVR Melt Volume Rate	190 C°	ISO 1133	cc/10'	21,3	-
Fluidity - MFR Melt Flow Rate	2,16 kg		g/10'	24,0	-

Mechanical Properties

Yield Stress	@ 23 C°	ISO 527	Mpa	41,8	39,0
Elongation at Yield	@ 23 C°		%	1,5	1,4
Stress at Break	@ 23 C°		MPa	33,6	33,1
Elongation at Break	@ 23 C°		%	3,5	2,4
Tensile Modulus	@ 23 C°		MPa	4420	4539
Flexural Maximum Strenght	@ 23 C°	ISO 178	MPa	69,7	67,2
Flexural Modulus	@ 23 C°		MPa	3833	4396
IZOD Impact Resistance - notched	@ 23 C°	ISO 180	KJ/m^2	2,4	2,2

Thermal Properties

Heat Deflection temperature under load	1,8 Mpa	ISO 75	C°	50,8	66,2
Melting Temperature	DSC	ISO 11357	C°	145,0	150,5
Glass Transition Temperature (Tg)	DSC	ISO 11357	C°	57,4	54,5

Injection Parameters

Drying Granules	10 hours in vacuum stove at 90 C°
Barrel Temperature Profile	150 - 160 - 170 - 180 C°
Mould Temperatures	30 C°
Screw Speed	300 rpm
Injection Speed	slow