

# TECHNICAL DATA SHEET

V2.11

**Product Name:** PLA (Polylactic Acid)

**Product Use:** Filament for material extrusion used in Fused Filament Fabrication (FFF) and Fused Deposition Modelling (FDM).

**Manufacturer:** 3D Print Works, Nasmyth Building, Nasmyth Avenue, East Kilbride, Scotland, UK

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Elefilament is a premium brand PLA which gives a shiny, superior finish. It is easy to print with, sticks well to the bed and has low warping. It is supplied in a range of colours in 1.75mm and 2.85mm thicknesses and comes in 1kg and 750g reels.

It has been manufactured using high grade PLA by NatureWorks. The raw material has been thoroughly dried out before manufacturing using a desiccant air dryer to eliminate bubbles. High quality manufacturing techniques ensure it is perfectly round and within a 0.05mm tolerance.

All our reels are made by a dedicated team of staff who care about the quality of their work and who take an interest in trying out new things. The result of their experiments is often for sale as “pot luck” – it is produced to the same high standards but something went wrong with the colour, so you can save on the price if you are not concerned about colour.

Elefilament is manufactured in the UK from resin made in USA.

## OPERATING INSTRUCTIONS

<b>Extruder Temperature</b>	190 – 220 ° C For best results, start at 200 - 210 ° C and adjust from there. If the temperature is too low, the layers will not stick well and you should increase the temperature. Stringiness is caused when the temperature is too high. Adjust in 5° increments either way.
<b>Bed Temperature</b>	50 – 60 ° C depending on model
<b>Fan</b>	For best results, use fan to prevent drooping on overhangs.
<b>For Elefilament Sparkle Range only</b>	Avoid retracting the filament and use the lowest retraction setting. This may cause minor stringing in island areas.

## MATERIAL PROPERTIES

Property	Test Method	Value
Density / g/cm <sup>3</sup>	ASTM D792	1.24
Melt Flow Index / g/10 mins	ASTM D1238	12
Glass Transition Temperature / ° C	ASTM D3418	55 - 60
Melt Temperature / ° C	ASTM D3418	170 - 180

## MECHANICAL PROPERTIES

Test Specimens were printed with a Makerbot 2X with extruder temperature 210° C; Bed temperature at 60 ° C; 100% infill; print speed at 60 mm/s; 2 shells.

Property	Test Method	Value
Tensile Strength, vertical print, Z axis / MPa	ISO 527	21.1 – 22.03
Tensile Strength, horizontal print, X,Y axis / MPa	ISO 527	46.9 – 48.2
Force at break, vertical print, Z axis / MPa	ISO 527	20.5 – 21.2
Force at break, horizontal print, X,Y axis / MPa	ISO 527	9.2 – 9.5
Elongation at break, vertical print, Z axis / %	ISO 527	0.9 - 1
Elongation at break, horizontal print, X,Y axis / %	ISO 527	18.7 – 21.2
Impact Strength, Impact from top / KJ / m <sup>2</sup>	ISO 179	18.9 – 20.8
Impact Strength, side impact / KJ / m <sup>2</sup>	ISO 179	20.0 – 20.8
Flexural Modulus, bending from top / MPa	ISO 178	2721 - 2973
Flexural Modulus, bending from side / MPa	ISO 178	2251 - 2461