



Filazoo Filament

Technical Data Sheet V1.0



PLA UV Color-Changing

Photochromic Polylactic Acid — sunlight-reactive filament

DOCUMENT NO.	REVISION	ISSUE DATE	DIAMETER	NET WEIGHT
FZ-TDS-PLAUVCC-001	V1.0	01/09/26	1.75 mm	1 kg

1 Description

Filazoo PLA UV Color-Changing contains a photochromic pigment that shifts from a pale, near-neutral shade indoors to a vivid, saturated colour in direct sunlight or UV light, reverting once removed from UV exposure. The colour-change chemistry is heat-sensitive, so keeping print and drying temperatures moderate preserves the effect over repeated cycles.

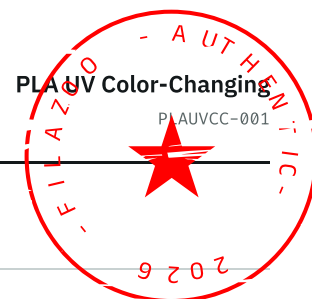
Typical applications — novelty and interactive prints, sun-exposure indicators, toys and jewellery, and any piece meant to visibly react to sunlight.

Processing summary — avoid excessive nozzle or drying temperatures, which can degrade the photochromic pigment over time; otherwise this filament processes like standard PLA.

2 Product Specification

Table 1 — Filament and packaging specification

PARAMETER	UNIT	VALUE
Filament diameter	mm	1.75
Diameter tolerance	mm	± 0.02
Net filament weight	kg	1
Spool material	—	ABS (heat resistance 70 °C)
Spool dimensions (ø × H)	mm	ø 200 × 67 mm
Colour range	—	Blue, Purplish Red



3 Recommended Printing Parameters

Table 2 — Recommended starting parameters

PARAMETER	UNIT	VALUE
Drying before printing	°C / h	45 °C for 6 h
Printing and storage humidity	—	Dry storage; sealed with desiccant
Nozzle size	mm	≥ 0.4
Nozzle type	—	Brass or hardened steel
Nozzle temperature	°C	190 – 215
Build plate type	—	Cool Plate, Engineering Plate or Textured PEI
Bed surface preparation	—	Clean; no adhesive typically needed
Bed temperature	°C	35 – 45
Part cooling fan	—	High (80 – 100 %)
Printing speed	mm/s	50 – 150
Enclosed chamber	—	Not required
Chamber temperature	°C	Ambient
Retraction length / speed	mm / mm·s ⁻¹	0.4 – 0.8 mm / 20 – 40 mm·s ⁻¹
Max overhang angle	°	~ 50
Max bridging length	mm	~ 25

Values are starting points. Keep nozzle and drying temperatures at the lower end of the range to preserve the photochromic effect over repeated UV cycles.

4 Material Properties

Values are typical results measured on standard printed specimens and are intended for design reference and comparison. They are not guaranteed minima.

4.1 Physical and thermal properties

Table 3 — Physical and thermal properties

PROPERTY	TEST METHOD	UNIT	TYPICAL VALUE
Density	ISO 1183	g/cm ³	~ 1.25
Melt flow rate (MFR)	210 °C, 2.16 kg	g/10 min	~ 8 ± 1
Melting temperature	DSC	°C	~ 155
Glass transition temperature	DSC	°C	~ 58
Vicat softening temperature	ISO 306	°C	~ 58
Heat deflection temperature	ISO 75, 0.45 MPa	°C	~ 52
Heat deflection temperature	ISO 75, 1.8 MPa	°C	~ 46
Saturated water absorption	25 °C, 55 % RH	%	~ 0.5



4.2 Mechanical properties

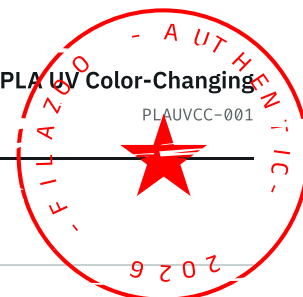
Table 4 — Mechanical properties

PROPERTY	TEST METHOD	UNIT	TYPICAL VALUE
Young's modulus (X–Y)	ISO 527 / GB/T 1040	MPa	~ 2300 ± 150
Young's modulus (Z)	ISO 527 / GB/T 1040	MPa	~ 2000 ± 150
Tensile strength (X–Y)	ISO 527 / GB/T 1040	MPa	~ 43 ± 4
Tensile strength (Z)	ISO 527 / GB/T 1040	MPa	~ 37 ± 4
Elongation at break (X–Y)	ISO 527 / GB/T 1040	%	~ 5
Elongation at break (Z)	ISO 527 / GB/T 1040	%	~ 3
Flexural modulus	ISO 178 / GB/T 9341	MPa	~ 2350 ± 140
Flexural strength	ISO 178 / GB/T 9341	MPa	~ 68 ± 5
Impact strength, notched	ISO 179 / GB/T 1043	kJ/m ²	~ 3
Impact strength, unnotched	ISO 179 / GB/T 1043	kJ/m ²	~ 9

4.3 Chemical and physical characteristics

Table 5 — General characteristics of PLA UV Color-Changing

PARAMETER	VALUE
Composition	Poly(lactic acid (PLA) with photochromic pigment
Odour	Mild, faintly sweet odour when printing
Skin hazard	No hazard in solid filament form
Chemical stability	Colour-change pigment fades gradually over many UV cycles
Solubility	Insoluble in water
UV and weathering resistance	Reactive by design – colour intensity fades with pigment ageing
Acid resistance	Limited resistance
Alkali resistance	Limited resistance
Organic solvent resistance	Softened or dissolved by some solvents
Oil and grease resistance	Limited resistance
Flammability	Flammable
Combustion products	Carbon oxides



5 Test Conditions

5.1 Specimen printing conditions

Table 6 — Conditions used to produce test specimens

PARAMETER	UNIT	VALUE
Nozzle temperature	°C	205
Bed temperature	°C	40
Printing speed	mm/s	100
Infill density	%	100
Layer height	mm	0.2
Specimen conditioning / annealing	°C / h	23 °C / 50 % RH for 24 h (ISO 291)

5.2 Specimen geometry

Test specimens follow the geometry defined by the referenced standards. All dimensions in millimetres.

Figure 1 — Tensile specimen

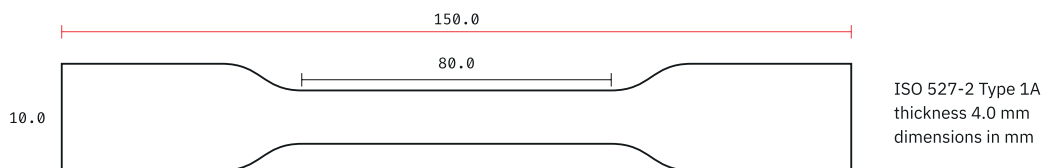


Figure 2 — Flexural specimen

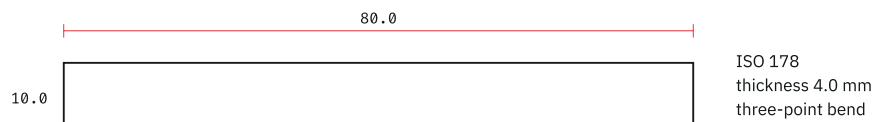
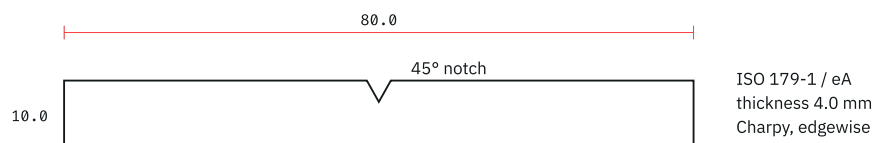


Figure 3 — Impact specimen



6 Disclaimer

The performance values in this document are typical values obtained from standard printed specimens. They are provided for design reference and comparison only and do not constitute a specification or a warranty of performance. Actual printed part performance depends on many further factors, including the printer, hotend and nozzle, slicer settings, part geometry, wall count and infill, build orientation, and ambient conditions.

Users are responsible for the legality, safety and suitability of anything they print. Filazoo accepts no responsibility for the use of its materials in any particular application, or for any damage arising in the course of using them.