

Conductive Filaflex

Conductive Filaflex is a flexible, electrically conductive filament based on thermoplastic polyurethane (TPU). This material is fully compatible with both the R3D Bio V1 and REG4Life filament extruders. Its enhanced biocompatibility makes Conductive Filaflex a promising material in biomedicine, particularly for applications in musculoskeletal and neural TE. After printing, cells can be seeded onto the scaffold surface or embedded in a hydrogel that is injected into the scaffold's pores. To promote tissue maturation, the scaffolds can undergo mechanical or electrical stimulation during the post-printing process

Specifications

PARAMETER	SPECIFICATION
Base component	TPU elastomer
Appearance	Black filament
Electrical resistivity	~ 3.5 Ω/cm
Printing temperature	Print head (60A-70A): 245 - 250 °C Bed platform: 50 - 60 °C

Key properties

Biomechanical properties

The elastomeric nature enables deformation even at high tensile strengths without fracture, making it a suitable candidate for the engineering of tissues exposed to constant mechanical stresses

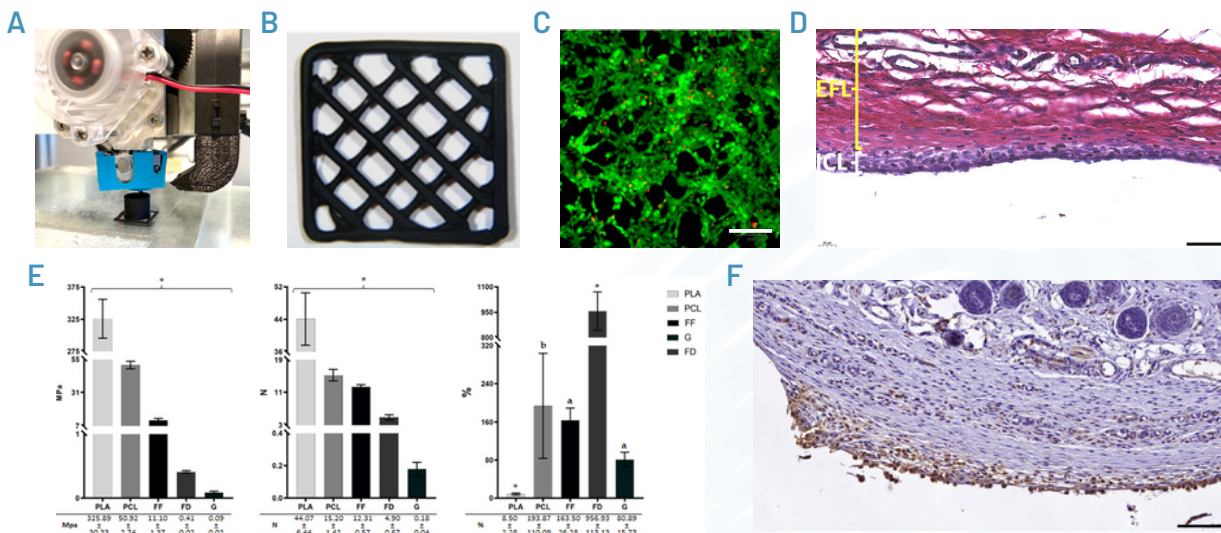
Electroconductive properties

Provides moderate conductivity, enabling electrical stimulation in soft TE applications

Cytocompatibility

Enhanced cell survival and adhesion in a non-cytotoxic environment

Supportive Material



(A) 3D printing of a cylindrical scaffold made of conductive Filaflex using the REGEMAT 3D Bio V1 bioprinter [1]; **(B)** Square (10 x 10 mm) scaffold with a diagonal infill pattern, used for printability tests [2]; **(C)** Live/Dead assay of Filaflex scaffolds seeded with SK-N-AS cells after 7 days in culture. Scale bar 100 µm [2]; **(D)** Picrosirius staining of the *in vivo* samples of Filaflex, showing an external fibrotic layer (EFL) and an inner cellular layer (ICL). Scale bar: 50 µm [2]; **(E)** Graphic representation of tensile test results of Filaflex (FF) compared to PLA, PCL, Flexdym™ (FD), and GeIMA (G). From left to right, Young's modulus (Mpa), charge at fracture (N), and strain at fracture (%) [2]. **(F)** CD45 immunohistochemistry of the *in vivo* samples of Filaflex.

References

- [1] REGEMAT 3D.
- [2] Etayo-Escanilla et al., *Polymers*, 2024; 16(10), 1426.

Intended use

Research Use Only. Not for use in diagnostic procedures or for administration to humans.

Shelf life

The product remains stable when stored and handled according to the recommended conditions.

Storage conditions

Keep container tightly closed. Store in a dry, well-ventilated area, protected from atmospheric agents.

Recommended storage temperature: Below 40 °C.

Printing protocol

3D printing protocol can be downloaded from our website. Scan the QR code to reach the product webpage.

