TECHNICAL DATA SHEET

Catalog number: RGMT004 to 006

REGEMAT 3D

Polycaprolactone (PCL)

Polycaprolactone (PCL) is a synthetic, biodegradable polyester, widely used in biomedicine and tissue engineering for its biocompatibility and slow degradation rate. Ease of processing makes it suitable for various manufacturing techniques, including 3D printing and electrospinning. With a low melting point (~60 ºC) and flexibility, PCL is ideal for biodegradable polymers in drug delivery, wound care, and tissue regeneration scaffolds.

Specifications

PARAMETER	SPECIFICATION
Base component	Polycaprolactone
Appearance	Clear-white filament
Tensile modulus	350 MPa
Notched Izod impact	8 kJ/m^2
Printing temperature	Print head: 130-170 °C Bed platform: 30-45 °C

Key properties

Biomechanical properties

The molecular weight of PCL (50 kDa) allows the 3D printing of constructs with good strength and flexibility.

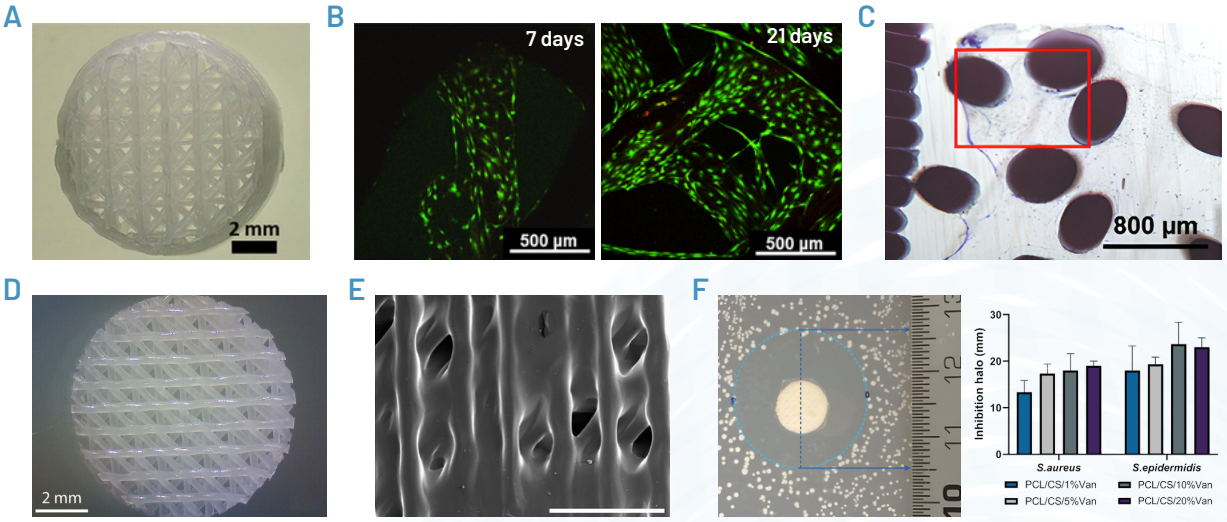
Biocompatibility

PCL has been approved by the FDA for a wide range of medical applications.

Biodegradability

PCL degrades via hydrolysis of its ester bonds under physiological conditions, with in vivo degradation ranging from 2 to 24 months, depending on environmental factors and construct properties.

Supportive Material



(A) Macroscopic view of 3D-printed PCL scaffolds [1]; **(B)** Confocal images of adipose-derived MSCs on PCL scaffolds at days 7 and 21, showing >95% viability upon live/dead staining (calcein/ethidium homodimer, green and red, respectively) [1]; **(C)** Histological analysis of a cell-laden PCL scaffold 3 weeks post-implantation, stained with Toluidine Blue and Masson's Trichrome to assess tissue ingrowth and ECM deposition [1]; **(D)** Macroscopic view of a porous PCL scaffold, printed with the R3D Bio V1 [2]; **(E)** SEM micrograph of a hybrid PCL/Chitosan scaffold loaded with 10% vancomycin (scale bar: 1 mm) [2]; **(F)** Agar diffusion test showing inhibition halos produced by PCL/Chitosan/Vancomycin scaffolds against *S. aureus* and *S. epidermidis* [2].

References

[1] Chocarro-Wrona *et al.*, *Bioeng Transl Med*, 2020;6:e10192.
[2] López-González *et al.*, *Pharmaceutics*, 2023;15,1763.

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.