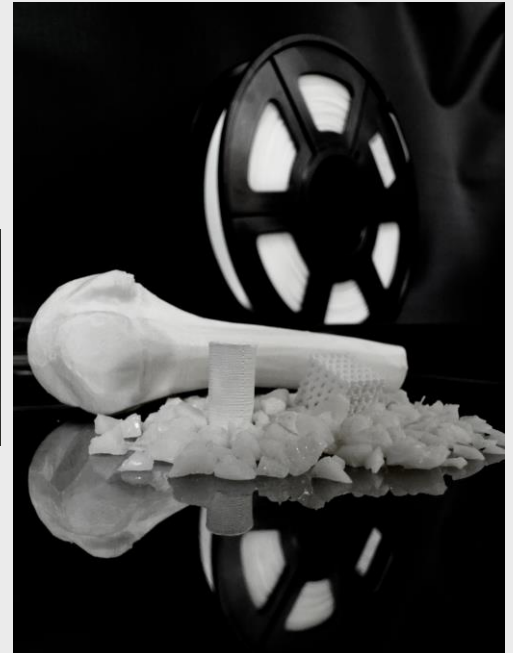
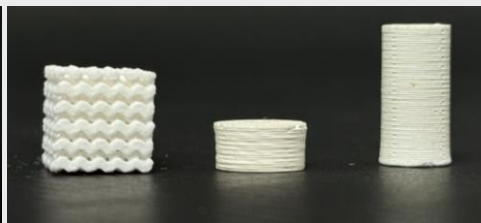


OSTEOPRINT

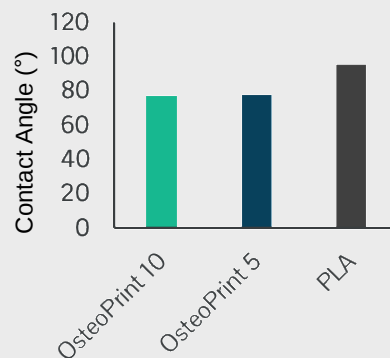
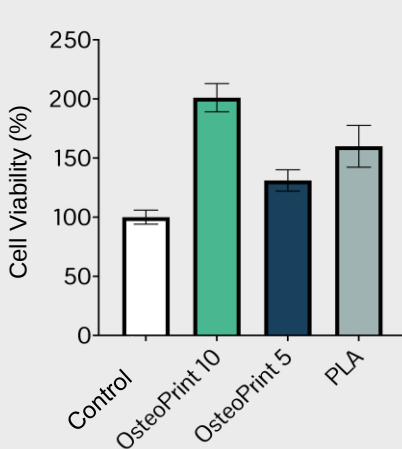
PLA filaments with **Hydroxyapatite with Strontium Ions**

Promotes optimized **Bone Growth**

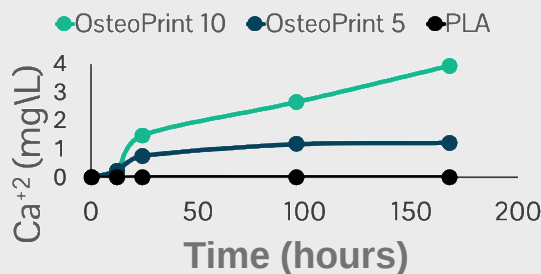


High **Biocompatibility**,
Greater **Cell Adhesion**
and **Enhanced Hydrophilicity**

Customizable
3D Printing of
Frameworks (FFF)



Ca Release



Developed with
UFRJ, CBPF and RedeNano Saúde



Approved for Laboratory Testing →
In Vitro tests already performed



OsteoPrint[®] 1005 and 1010 Technical Data Sheet

R&D PLA Filament with Sr modified Hydroxyapatite for 3D Printing in Tissue Tissue Engineering

1. Product Overview

OsteoPrint is a biodegradable and bioresorbable PLA-based filament specifically engineered for medical, pharmaceutical, and veterinary 3D printing applications. This advanced material is reinforced with hydroxyapatite (HA) modified with 2% strontium ions (HA-Sr), enhancing its osteoconductivity, biocompatibility, and ability to promote bone regeneration and contains ~3% D-isomer PLA polymer. Available in two formulations—OsteoPrint 1005, containing 5% HA-Sr, and OsteoPrint 1010, containing 10% HA-Sr—the material offers tailored performance for different biomedical needs. OsteoPrint combines the ease of printing characteristic of PLA with improved mechanical strength, controlled degradation rate, and enhanced hydrophilicity, making it ideal for the fabrication of customized implants, scaffolds, and tissue engineering structures.

1.1. General Properties

Property	Test Method	Value	Unit
Material Type	-	PLA Filament	-
Diameter	Micrometer	1.75 ± 0.1	mm
Density	ASTM D792	1.33 (1005) / 1.42 (1010)	g/cm ³
Color	-	White	-
Odor	-	None	-
Number Average Molecular Weight(M _n)	GPC	~ 145.000	g/mol
Weight Average Molecular Weight(M _w)	GPC	~ 236.000	g/mol
M _w /M _n	GPC	~ 1.6	-

1.2. Thermal Properties

Property	Test Method	Value	Unit
Melting Temperature	DTA	155-165	°C
Maximum Temperature	TG/DTA	320	°C

1.3. 3D Printing Parameters

- Recommended Nozzle Temperature: 210–218 °C
- Bed Temperature: 50–60 °C
- Print Speed: 20–40 mm/s

- Cooling: Fan On
- Retraction: 1–2 mm at 20–40 mm/s

1.4. Advantages

- Biodegradable and bioresorbable: Based on renewable PLA, ensuring sustainable and environmentally responsible use.
- Enhanced mechanical performance: Improved toughness and reduced brittleness compared to standard PLA, providing greater strength and reliability in functional parts.
- Bioactive reinforcement: Incorporation of Sr-modified Hydroxyapatite enhances osteoconductivity, biocompatibility, and bone regeneration potential.
- Improved thermal stability: Maintains shape and integrity at higher processing temperatures than conventional PLA.
- Low warpage and dimensional stability: Ensures accurate printing of complex or large geometries with minimal deformation.
- Excellent print quality: Smooth surface finish and high detail resolution suitable for precision biomedical components.
- Customizable formulations: Available in 5% and 10% HA–Sr loadings (OsteoPrint 1005 and 1010) to meet specific application requirements.

1.5. Storage and Handling

- Store in a cool, dry environment away from direct sunlight and heat sources.
- Keep filament sealed in moisture-proof packaging to prevent hydrolytic degradation.
- Use desiccant packs during long-term storage to maintain filament quality.
- Pre-dry the filament (e.g., 50 °C for 4–6 h) before printing if exposed to ambient humidity.

1.6.Safety Information

- No toxic or hazardous fumes are generated under standard printing conditions.
- Operate in a well-ventilated workspace or use localized fume extraction.
- Avoid direct contact with molten filament to prevent burns.
- Dispose of printing residues and waste material in accordance with local regulations for biodegradable plastics.

1.7.Applications

- Biomedical and tissue engineering: Scaffolds, bone substitutes, and regenerative medicine prototypes.
- Research and development: Experimental studies in biomaterials and biofabrication.
- Educational and demonstrative models: Anatomical or functional prototypes for training and academic use.
- Custom implants and biocompatible devices: Low-load-bearing structural components.
- Design and prototyping: For bioinspired structures and customized 3D printed components.

1.8.Disclaimer

The data provided above is for reference purposes only. Actual values may vary depending on printer settings, model geometry, and environmental conditions. Users are advised to conduct their own tests to ensure suitability for specific applications. Further analysis may be requested if needed.

This product is intended exclusively for research and development (R&D) purposes. It is not approved for human or pharmaceutical use, nor for clinical or implantable medical applications. The material is currently being evaluated for potential veterinary applications, and its use should remain strictly within laboratory or pre-clinical research contexts.