HYDROTECH INX© U100

"High resolution robust hydrogel material!"

HYDROTECH INX© U100 is a synthetic resin for the generation of hydrogel microstructures via multiphoton lithography (MPL) technology.

HYDROTECH INX© U100 is suitable for the fabrication of 3D complex architectures for tissue engineering applications. It is biologically inert however, it can be coated with HYDROTECH INX© COAT solution to allow cell adhesion and proliferation.

SUPERIOR SHAPE FIDELITY

The HYDROTECH INX© U100 ready-to-use formulations can be processed via a MPL-based printer after a short pre-heating process. The resin can be processed at high scanning speeds (up to 100 mm/s, at least) which is favorable for shorter fabrication times.

Figure 1 shows HYDROTECH INX© U100 structures that were printed via MPL technology. Complex and open geometries can easily be printed via HYDROTECH INX© U100 thanks to its mechanical robustness. The scaffolds reveal no structural distortion when incubated in an aqueous medium thanks to its limited water uptake.

BENEFITS

✓ Biocompatibility	Biocompatible with no toxic effect on living cells, according to ISO 10993-5
✓ Stability	Forms a biostable hydrogel that sustain 3D cellular structures. Suitable for long term applications.
✓ Processability	Easy processing into open and complex architectures with minimal deformation.
✓ Mechanical integrity	Very robust hydrogel suitable for stiff tissue engineering applications.
✓ Easy to handle	Provided as ready-to-print formulation in amber vials.
✓ Reproducibility	Production under strict quality control to provide a material that delivers every time.

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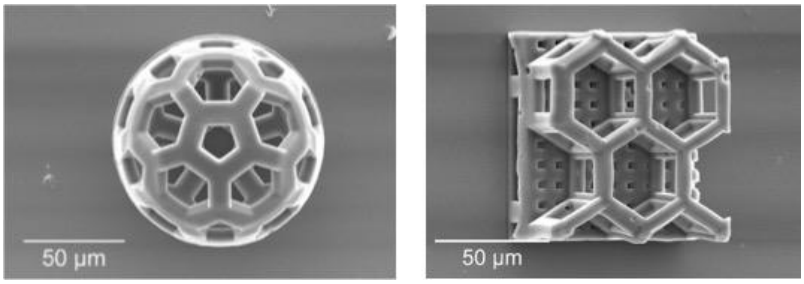

Figure 1: Scanning electron microscope images of the structures printed using HYDROTECH INX© U100 via multiphoton lithography

PROPERTIES & PROCESSING

HYDROTECH INX© U100 is a viscous liquid at room temperature. It provides an easy and fast processing given its wide processing window. Stable structures can be printed with HYDROTECH INX© U100 using laser powers in the range 20-100 mW and scanning speeds up to at least 600 mm/s.

Thanks to the low water absorption capacity of HYDROTECH INX© U100 (60-70% over its dry weight), the printed structures do not undergo structural deformation after being hydrated in aqueous media. In the fully hydrated state, HYDROTECH INX© U100 exhibits a higher stiffness (30-40 MPa) compared to conventional hydrogels based on diacrylated PEGs (PEGDA), making these hydrogels excellent candidates for applications requiring strength and high accuracy.

HYDROTECH INX© U100 is biologically inert however, it can be coated with HYDROTECH INX© COAT solution to allow cell adhesion and proliferation (Figure 2).

Physical Properties	HYDROTECH INX© U100 Properties
Appearance	Yellow - orange liquid
Viscosity (Pa.s)	0.5 - 5
Young's Modulus (MPa)	30 - 40

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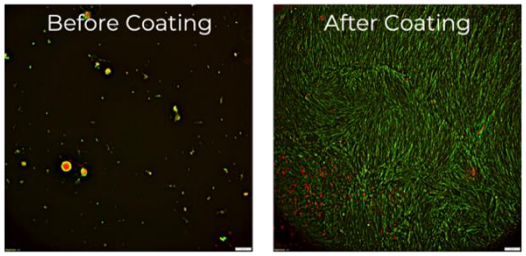

Figure 2: Improved cell adhesion & proliferation on HYDROTECH INX© U100 hydrogels after application of HYDROTECH INX© COAT solution

BENEFITS OF THE HYDROTECH INX© U100 PRODUCT FAMILY

	Organic-Inorganic Hybrids	Conventional hydrogel inks	HYDROTECH INX© U100
Strength	✓	✗	✓
Flexibility	✗	✓	✓
Hydrogel	✗	✓	✓
Biocompatibility	✗	✓	✓
High resolution	✓	✗	✓
High reactivity	✓	✗	✓

3D PRINTER COMPATIBILITY

Our resins have been used repeatedly and successfully with the following printers of Upnano:

- ✓ NanoOne
- ✓ NanoOne Bio

If you would like to discuss your printer's compatibility with our resins, please contact us at info@bioinx.com