Ingeo™ PLA for SLS Printing

NatureWorks and Jabil collaborate to offer PLA-based powder optimized for powder-bed fusion technologies

From high performance to a low carbon footprint, Ingeo™ PLA grades provide an unmatched portfolio of advantages in 3D printing systems, including fused filament fabrication (FFF), direct pellet to print, and now, powder-bed fusion (PBF) technologies.

NatureWorks collaborated with Jabil Inc., a global manufacturing solutions provider, to launch an Ingeo™ PLA-based powder formulation for powder-bed fusion technologies, including selective laser sintering (SLS) printer platforms. The new product, **PLA 3110P**, offers a cost-effective option with a lower sintering temperature and a smaller carbon footprint compared to the typical incumbent, PA-12. Ingeo PLA is derived entirely from annually renewable resources meeting the demand for a biobased alternative to petrochemical-based powders, like PA-12.

ADVANTAGES

- Biobased alternative to petrochemical based powders like PA-12
- Cost effective prototyping option with lower sintering temperature
- 89% smaller carbon footprint compared to PA-12[1]
- PLA 3110P is easy to work with and has a faster start up compared to conventional powders
- Can support precision geometries needed for thermoforming and compression molds

POTENTIAL APPLICATIONS

- Medical device prototyping for early physical models, such as prosthetics, hearing aids, or surgical tools
- Medical models for training and education
- Investment casting

PROPERTIES

MECHANICAL PROPERTIES	Test Condition	Typical Values
Tensile Modulus (MPa)	XY coupons, Ambient	4100
Tensile Elongation at Break (%)	XY coupons, Ambient	0.7
Ultimate Tensile Strength (MPa)	XY coupons, Ambient	26
Tensile Modulus (MPa)	Z coupons, Ambient	3900
Tensile Elongation at Break (%)	Z coupons, Ambient	0.45
Ultimate Tensile Strength (MPa)	Z coupons, Ambient	15
Flexural Modulus (MPa)	XY coupons, Ambient	3500
Flexural Strength (MPa)	XY coupons, Ambient	27
Compression Modulus (MPa)	XY coupons, Ambient	2700
Compressive Stress at Yield (MPa)	XY coupons, Ambient	110
Izod Impact, notched (J/m)	XY coupons, Ambient	14
Izod impact, un-notched (J/m)	XY coupons, Ambient	70

[1]Comparison between the global warming potential of PA-12 and Ingeo PLA biopolymer.
PA-12 data source: Life cycle assessment of a PA12 powder material for additive manufacturing, Fraunhofer Institute, November 7, 2022. Ingeo PLA biopolymer data source: Life Cycle Inventory and Impact Assessment data for 2014 Ingeo™ Polylactide Production. Industrial Biotechnology, Vol 11, No. 3. Pg. 167-180. June 2015.

THERMAL PROPERTIES	Test Condition	Typical Values	Method
Melt Onset Temperature (°C)	Ambient	160	ASTM D3418
Heat Deflection Temperature (°C)	0.455 Mpa	130	DMA
Heat Deflection Temperature (°C)	1.82 Mpa	65	DMA

OTHER PHYSICAL PROPERTIES	Test Condition	Typical Values	Method
Bulk Density (g/cm^3)	Ambient	0.54	ASTM D1895
Part Density (g/cm3)	Ambient	1.19	ASTM D792
Particle Size Distribution (µm)	D10	29	Laser Diffraction
Particle Size Distribution (µm)	D50	51	Laser Diffraction
Particle Size Distribution (µm)	D90	76	Laser Diffraction

For additional information, visit
jabil.com/additive

NatureWorks

About NatureWorks

Driven by curiosity and obsessed with science, NatureWorks meets the challenges of our partners and a changing world creating more responsible high performance materials for a more sustainable future.

NatureWorks' headquarters and advanced biopolymers research and development facility is located in Plymouth, MN. The full portfolio of Ingeo™ biopolymers are manufactured at a 150,000 MT/yr production facility in Blair, NE with a new 75,000 MT/yr fully integrated manufacturing complex under construction in Thailand, expected to be completed in 2024.

NatureWorks is jointly owned by PTT Global Chemical and Cargill.

About Jabil

Jabil (NYSE: JBL) is a manufacturing solutions provider with over 250,000 employees across 100 locations in 30 countries. The world's leading brands rely on Jabil's unmatched breadth and depth of end-market experience, technical and design capabilities, manufacturing knowhow, supply chain insights and global product management expertise. Driven by a common purpose, Jabil and its people are committed to making a positive impact on their local community and the environment.

JABIL