

# Technical Specification



UPM Formi 3D

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**Material** UPM Formi 3D is cellulose fiber filled plastic composite. Principal ingredients are specially selected cellulose fibers and native polylactide acid.

**Applications** UPM Formi 3D grades are suitable for production of 3D printing filaments to be used in Fused Granular Fabrication (FGF).

**Environment** UPM Formi 3D is manufactured from renewable cellulose fibers. Material can be recycled or burned for energy. All cellulose fibres are from certificated forests.

Physical and mechanical properties	Property**	Test method	3D 20	3D 20/19	3D 40
	Density, g/cm <sup>3</sup>	EN ISO 1183	1,2	1,2	1,2
Tensile strength, N/mm <sup>2</sup>	ISO 527	28	39	48	
Tensile modulus, N/mm <sup>2</sup>	ISO 527	2600	3600	5400	
Strain (tensile), %	ISO 527	5	4	2	
Impact Strength, Charpy, kJ/m <sup>2</sup>	ISO 179/1eU	24	20	14	
Peak melt temperature, °C	ISO 11357	140-180	140-180	135-180	
Glass transition temperature, °C	ISO 11357	64	65	60	
Melt flow index (granulates)*	ISO 1133	12	16	7	
Fibre content (%)		20	20	40	

\* 190 °C/10kg \*\* Measured from injection moulded test specimens

**Colours** Lignin free fibres enable richer colors which, whilst gently lightening over time. The light color remain bright. In filament extrusion, recommended amount of added PLA-based color masterbatch is 0.75% or lower.

**Blending** UPM Formi 3D 40 can be blended with native PLA plastic or wood plastic composites. Recommended blend ratio: < 25% 3D 40 with PLA.

**Pretreatment** UPM Formi contains cellulose fibres which may absorb moisture if the package is open. Close the package at all times when possible. UPM Formi composite should be dried for minimum of 3 hours at 80 °C (dehumidifying dryer preferred).

**Safety** Maximum recommended processing temperature is 200 °C. Overheating may cause risk for thermal degradation. Auto-ignition of UPM Formi material is possible after purging the moulding machine. Recommended to purge into cool water. Product is non-flammable under normal conditions of storage, manipulation and use. In the case of inflammation as a result of improper manipulation, storage or use preferably use polyvalent powder extinguishers (ABC powder) or water, in accordance with the regulation on fire protection systems.