SULAPAC

TECHNICAL DATA SHEET

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Version 1.6

SULAPAC PREMIUM – IM1001

MATERIAL FEATURES

Sulapac Premium is a sustainable, beautiful and functional biocomposite for injection molding. The material is 100% bio-based: the main components are wood from industrial side streams and biodegradable biopolymers. All raw materials are sourced according to a strict sustainability policy and the wood originates from certified forests. The material is recyclable via industrial composting[1].

Sulapac Premium is safe for both people and the planet: The ecotoxicity and threshold values for heavy metals have been tested according to EN 13432 / ASTM D6400. It has low carbon footprint[2] and it does not leave permanent microplastics behind[3]. The raw materials comply with the food contact requirements of the EU and FDA legislation. They are also REACH and Proposition 65 compliant and meet the framework regulation (EC) No. 1223/2009 for cosmetic products. The material is GMO-free.

For more details, visit www.sulapac.com/key-features

MECHANICAL PROPERTIES		
MATERIAL	SULAPAC PREMIUM	POLYPROPYLENE
PHYSICAL PROPERTIES		
Hardness (Shore D)	70-80	55-75
Material density (g/cm^3)	1.27	0.90
TENSILE PROPERTIES (ISO 527-1)		
Tensile strength (MPa)	45-50	20
Tensile modulus (GPa)	5-6	1.20
Tensile strain (%)	1.2-1.4	100-600 (typical)
FLEXURAL PROPERTIES (ISO 178)		
Flexural strength (MPa)	80-90	25
Flexural modulus (GPa)	4-5	1.25
Flexural strain (%)	2.0-2.4	-
IMPACT PROPERTIES (Unnotched, ISO 179-1)		
Charpy impact strength (kJ/m^2)	6-7	165

[1] The compostability has been tested according to EN 13432 / ASTM D6400. BPI certification in progress.

[2] 0,7 kg CO2eq/kg for Sulapac Universal compared to 1,7 for polypropylene (Cradle-to-gate LCA screening performed by an independent third-party consultancy.)

[3] Biodegradation of 48%–59% in 280 days in the marine environment (30°C/86°F) (ASTM D6691). Tested according to ASTM 5511 (accelerated biodegradation in the landfill, 37°C/99°F): 68% relative biodegradation in 160 days. Not considered degradable in California.

BARRIER PROPERTIES			
MATERIAL	**SULAPAC PREMIUM**	**POLYPROPYLENE**	**POLYETHYLENE (HD)**
WVTR (g/m2/day)	2,6	0.5	0.7
OTR (cm3/m2/day)	<0,1	19	12
OIL (% area)	0	0	0

WVTR = water vapor transmission rate

OTR = oxygen transmission rate

PROCESSING INSTRUCTIONS FOR INJECTION MOLDING

MOISTURE AND DRYING
SULAPAC PREMIUM
• Before processing, the granules should be dried using a dehumidifying dryer or a vacuum dryer. • If a dehumidifying dryer is used, the granules should be dried for at least 4 hours at 105°C. • If a vacuum drying system is used, the granules should be first dried for at least 20 minutes at 105 °C and then kept in the vacuum for at least 40 minutes. • Avoid exposing the granules to ambient conditions after drying. • Moisture content can lead to hydrolysis. • If color masterbatch is added, the granules should be cooled down to 50°C in order to avoid the agglomeration of color masterbatch granules.

PROCESSING CONDITIONS – SULAPAC PREMIUM		
	TEMPERATURE	**GENERAL INSTRUCTIONS**
Throat	40-60°C	• Typical settings may require optimization. • Both cold and hot runner systems are suitable for this material. • Valve gate systems can be used. • Avoid using temperatures above 200°C in order to lower the risk of material degradation. • The dwell time of the material inside the machine shall be reduced to a minimum in order to lower the risk of thermal degradation.
Feed zone	150-160°C	
Compression zone	170-190°C	
Homogenizing zone	175-190°C	
Machine nozzle	175-190°C	
Back pressure	5-10 bar	
Screw speed, max	< 0,20 m/s	
Hot runner nozzle and bushing	180-200°C	
Tooling temperature T_{mold}	20-40°C	

PURGING INSTRUCTIONS - SULAPAC PREMIUM		
BEFORE PRODUCTION	**DURING PRODUCTION**	**AFTER PRODUCTION**
• Purge the plasticization unit and the hot runner with PP or PE. • To purge the plasticization unit and hot runner from residual PP, PE or previous production recipes, at least 10 cycles should be produced from Sulapac material before starting the actual production.	• The material has a tendency to degrade and therefore needs a constant melt flow. • The condition of the mold should be regularly monitored and, if necessary, the mold should be cleaned using, e.g., a glass fiber brush or mold cleaning agent. • If an extensive amount of burned material starts to appear in the products, try lowering processing temperature.	• Purge the plasticization unit and hot runner with PP or PE. • Clean up the mold after production. The temperature of the mold is recommended to be elevated to 70°C. Generally used mold cleaning agents can be utilized.

STORAGE AND TRANSPORTATION INSTRUCTIONS

STORAGE AND TRANSPORTATION CONDITIONS
GRANULES
• It is recommended to store the granules in their closed, original moisture barrier packaging at temperatures below 45°C. • Storage in dry conditions • Storage in direct sunlight should be avoided. • Storage time of unopened bags may not surpass 12 months at room temperature (23°C). • Temperatures during transportation may not exceed 60°C.
EMPTY PRODUCTS
• Can be stored 12 months in low relative humidity (under 50% RH), not exposed to extreme temperatures or direct sunlight, best in dry conditions at room temperature (22-25°C max. 45°C or 68-77°F max. 113°F). • When surface and product dimension stability is critical, transportation is recommended at Temperature controlled conditions where temperature is between 10°C – 30°C with humidity under 50% RH. • Max. filling temperature is 70°C.

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SULAPAC PREMIUM COLOR PALETTE

Sulapac's colors have been inspired by Nordic nature. The Sulapac Premium is by default Natural Wood -colored. Sulapac has 8 food contact approved color masterbatches that can be used to color the natural Premium Material. The recommended loading percentage or dosage of the color masterbatches is 0.5-4 weight-%.

The ultimate appearance of the color depends on the material recipe it is applied to.
Lids: Sulapac® Premium Bottoms: Sulapac® Universal

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