SULAPAC

TECHNICAL DATA SHEET

07.02.2024
Version 2.2

SULAPAC UNIVERSAL – IM1002

MATERIAL FEATURES

Sulapac Universal is a sustainable, beautiful, and functional biocomposite for injection molding. The material is 100% bio-based and certified according to ASTM D6866 under the USDA BioPreferred® program. 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 Universal 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 doesn't leave permanent microplastics behind[3]. The material complies with the food contact requirements of the EU and FDA legislation.[4]

Sulapac Universal is certified as industrially compostable by Biodegradable Products Institute BPI up to thickness of 1,66 mm. As the compostability of the end product is also dependent on the geometry of the product, it is the responsibility of the manufacturer of the end product to ensure compliance with the regulations.

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

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

[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.

[4] Restrictions and specifications of use apply, please refer to the relevant Declaration of Compliance for further information.

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MECHANICAL PROPERTIES		
MATERIAL	SULAPAC UNIVERSAL	POLYPROPYLENE
PHYSICAL PROPERTIES		
Hardness (Shore D)	79-81	55-75
Material density (g/cm^3)	1.27	0.90
Shrinkage (%)	0.1…0.2	1…2
TENSILE PROPERTIES (ISO 527-1)		
Tensile strength (MPa)	50-55	20
Tensile modulus (GPa)	4-6	1.20
Tensile strain (%)	1.0-1.5	100-600 (typical)
FLEXURAL PROPERTIES (ISO 178)		
Flexural strength (MPa)	80-85	25
Flexural modulus (GPa)	4-6	1.25
Flexural strain (%)	1.0-1.5	-
IMPACT PROPERTIES (Unnotched, ISO 179-1)		
Charpy impact strength (kJ/m^2)	7-9	165
RHEOLOGICAL PROPERTIES (ISO 1133)		
MFI (190°C/2.16 kg)	8-15 g/10 min	5-35 (typical)

BARRIER PROPERTIES			
MATERIAL	**SULAPAC UNIVERSAL**	**POLYPROPYLENE**	**POLYETHYLENE (HD)**
WVTR (g/m^2/day) ASTM F1249 (23 C/85%)	2.1	0.5	0.7
OTR (cm3/m^2/day) ASTM D3985 (23 C/0%)	<0.1	19	12

WVTR = water vapor transmission rate
OTR = oxygen transmission rate

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PROCESSING INSTRUCTIONS FOR INJECTION MOLDING

MOISTURE AND DRYING

SULAPAC UNIVERSAL

- 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 5 – 6 hours at 80°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 material 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

	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 wood and polymer degradation. • The dwell time of the material inside the machine shall be reduced to minimum in order to lower the risk of thermal degradation.
Feed zone	150-160°C	
Compression zone	160-170°C	
Homogenizing zone	175-190°C	
Machine nozzle	175-190°C	
Back pressure	5-10 bar	
Screw speed, max	< 0,25 m/s	
Hot runner nozzle and bushing	180-200°C	
Tooling temperature T_{mold}	20-40°C	

PURGING INSTRUCTIONS – SULAPAC UNIVERSAL

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 agents. • If an extensive amount of burned material starts to appear in the products, try lowering processing temperature	• Purge the plasticization unit and the 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.

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STORAGE AND TRANSPORTATION INSTRUCTIONS

STORAGE AND TRANSPORTATION CONDITIONS
GRANULE
• It is recommended to store the granules in their closed, original moisture barrier packaging. • Storage in dry conditions and direct sunlight and rain should be avoided. • Temperatures during transportation and storage may not exceed 60°C. • Material shelf-life is 24 months from the manufacturing date when stored at room temperatures (23 °C). Manufacturing date can be found on the label on material packaging.

SULAPAC UNIVERSAL COLOR PALETTE

Sulapac's colors have been inspired by Nordic nature. The Sulapac Universal for Injection Molding is by default Natural Wood -colored. Sulapac has 8 food contact approved color masterbatches that can be used to color the natural Universal 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

kiwa certified
ISO 9001
ISO 14001
Inspecta Sertifiointi Oy

Sulapac is proud to be an ISO 9001 and ISO 14001 certified company.

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