

TECHNICAL DATA SHEET

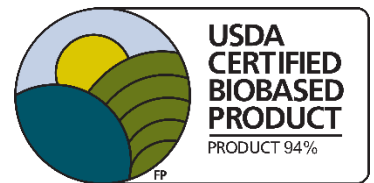
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Version 2.0

SULAPAC UNIVERSAL FLEX 35 – IM1012

MATERIAL FEATURES

Sulapac Universal Flex 35 is a new sustainable material designed for thin-walled structures with good impact strength. Yet, it biodegrades without leaving permanent microplastics behind¹. The material is 94 % bio-based and certified according to ASTM D6866 under the USDA BioPreferred® program. This drop-in solution material can be mass produced with minor, or no changes, to the existing plastic machinery. The flexibility of Universal Flex 35 is 2.6 %.



Sulapac Premium Flex 35 is safe for both people and planet: The ecotoxicity and threshold values for heavy metals have been tested according to ASTM D6400. Sulapac Universal Flex 35 is certified as industrially compostable by Biodegradable Products Institute BPI up thickness 1,48 mm. As the compostability of the end product is also dependent on the geometry of 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 Biodegradation of 79 % in 308 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): 52 % relative biodegradation in 210 days. Sulapac materials within the same family of recipes show biodegradation of 76 % at 168 days on home compost (28 °C / 99°F) (ISO 14855). Not considered degradable in California.

MECHANICAL PROPERTIES

MATERIAL	SULAPAC UNIVERSAL FLEX 35	POLYPROPYLENE
PHYSICAL PROPERTIES		
Hardness (Shore D)	76	55-75
Material density (g/cm ³)	1.27	0.9
Shrinkage (%)	0.3	1...2
TENSILE PROPERTIES (ISO 527-1)		
Tensile strength (MPa)	39	20
Tensile modulus (GPa)	3.5	1.20
Tensile strain (%)	2.7	100-600 (typical)
FLEXURAL PROPERTIES (ISO 178)		
Flexural strength (MPa)	71	25
Flexural modulus (GPa)	3.9	1.25
Flexural strain (%)	2.6	-
IMPACT PROPERTIES (Unnotched, ISO 179-1)		
Charpy impact strength (kJ/m ²)	14	165
RHEOLOGICAL PROPERTIES (ISO 1133)		
MFI (190°C/2.16 kg)	7-9 g/10 min	3-35 (typical)

PROCESSING INSTRUCTIONS FOR INJECTION MOLDING
MOISTURE AND DRYING
INSTRUCTIONS

- Before processing, the granules should be dried using a dehumidifying or vacuum dryer.
- If a dehumidifying dryer is used, the granules should be dried for at least 4 hours at 100°C.
- If a vacuum drying system is used, the granules should be first dried for at least 20 minutes at 100°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.
- Dried granules should be mixed with the color masterbatch after the granules have cooled down in order to avoid the agglomeration of color masterbatch granules.

PROCESSING CONDITIONS

TEMPERATURE		GENERAL INSTRUCTIONS
Throat	40-60°C	<ul style="list-style-type: none"> • 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	150-165°C	
Compression zone	160-175°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

BEFORE PRODUCTION	DURING PRODUCTION	AFTER PRODUCTION
<ul style="list-style-type: none"> • Purge the plasticization unit and the hot runner with PE (or PP). • To purge the plasticization unit and hot runner from residual PE (or PP) or previous production recipes, at least 10 cycles should be produced from Sulapac material before starting the actual production. 	<ul style="list-style-type: none"> • 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 	<ul style="list-style-type: none"> • Purge the plasticization unit and the hot runner with PE (or PP). • 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 granules in their closed, original moisture barrier packaging.
- Storage in direct sunlight or in rain should be avoided.
- Storage time of unopened bags at room temperature (23 °C) may not surpass 12 months.
- Temperatures during transportation and storage may not exceed 60°C at any time.