

## TECHNICAL DATA SHEET

21.12.2022

Version 1.2

# SULAPAC UNIVERSAL FLEX 30 HIGH FLOW – IM1015

## MATERIAL FEATURES

Sulapac Universal Flex 30 High Flow is ideal for single-use and reusable cutlery that ensures easy mass-manufacturing and outstanding usability. Beautiful and sustainable option for injection molding. Ideal flexural strain and impact strength for complicated designs like knives and forks. Food contact approved to use with all kinds of foods in short term from 70 °C up to 100 °C for both single- and repeated use<sup>1</sup>.

Sulapac Universal Flex 30 High Flow contains 79 % USDA certified biobased content, as analyzed according to ASTM D6866 standard under the USDA BioPreferred® Program. As USDA Certified Biobased Product, Sulapac Universal Flex 30 High Flow has achieved third-party verification of biobased content and has earned USDA certification and approval to display the label. The USDA Certified Biobased Product label is a certification mark of the U.S. Department of Agriculture.



Sulapac Universal Flex 30 High Flow material is industrially compostable certified according to BPI (ASTM D6400) and Seedling (EN 13432). Please check the detailed recycling instructions with local authorities.



Sulapac Universal Flex 30 High Flow is safe for both people and the planet. Ecotoxicity and threshold values for heavy metals have been tested according to EN 13432. The material can be digested by naturally occurring microorganisms and does not leave permanent microplastics behind<sup>2</sup>.

1. *Sulapac Universal Flex 30 High Flow meets the EU and US FDA requirements for food contact materials in the described specifications for use and with the specified restrictions*
2. *Relative biodegradation of 57.6 % in 462 days in the marine environment (30°C / 86°F) (ASTM D6691) as tested in a third-party laboratory. Not considered degradable in California.*

<b>MECHANICAL PROPERTIES</b>		
<b>MATERIAL</b>	<b>SULAPAC UNIVESAL FLEX 30 HIGH FLOW</b>	<b>POLYPROPYLENE</b>
<b>PHYSICAL PROPERTIES</b>		
Material density (g/cm <sup>3</sup> )	1.27	0.90
Shrinkage (%)	0.3 ...0.4	1 ...2
<b>TENSILE PROPERTIES (ISO 527-1)</b>		
Tensile strength (MPa)	33	20
Tensile modulus (GPa)	3.0	1.20
Tensile strain (%)	2.9	100 - 600 (typical)
<b>FLEXURAL PROPERTIES (ISO 178)</b>		
Flexural strength (MPa)	56	25
Flexural modulus (GPa)	3.4	1.25
Flexural strain (%)	2.6	-
<b>IMPACT PROPERTIES (Unnotched, ISO 179-1)</b>		
Charpy impact strength (kJ/m <sup>2</sup> )	12	165
<b>RHEOLOGICAL PROPERTIES (ISO 1133)</b>		
MFI (190°C/2.16 kg)	12 g / 10min	5 - 35 (typical)

## PROCESSING INSTRUCTIONS FOR INJECTION MOLDING

<b>MOISTURE AND DRYING</b>
<b>INSTRUCTIONS</b>
<ul style="list-style-type: none"> <li>• Before processing, the granules should be dried using a dehumidifying or vacuum dryer.</li> <li>• If a dehumidifying dryer is used, the granules should be dried for at least 4 hours at 105°C.</li> <li>• 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.</li> <li>• Avoid exposing the material to ambient conditions after drying.</li> <li>• Moisture content can lead to hydrolysis.</li> <li>• If color masterbatch is added, the granules should be cooled down to 50°C in order to avoid the agglomeration of color masterbatch granules.</li> </ul>



PROCESSING CONDITIONS		
	TEMPERATURE	GENERAL INSTRUCTIONS
Throat	40 – 60 °C	<ul style="list-style-type: none"> <li>• Typical settings may require optimization.</li> <li>• Both cold and hot runner systems are suitable for this material.</li> <li>• Valve gate systems can be used.</li> <li>• Avoid using temperatures above 200°C to reduce the risk of wood and polymer degradation.</li> <li>• The dwell time of the material inside the machine shall be reduced to a minimum to lower the risk of thermal degradation.</li> </ul>
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"> <li>• Purge the plasticization unit and the hot runner with PE (or PP).</li> <li>• 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.</li> </ul>	<ul style="list-style-type: none"> <li>• The material has a tendency to degrade and therefore needs a constant melt flow.</li> <li>• 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.</li> <li>• If an extensive amount of burned material starts to appear in the products, try lowering processing temperature.</li> </ul>	<ul style="list-style-type: none"> <li>• Purge the plasticization unit and the hot runner with PE (or PP).</li> <li>• 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.</li> </ul>

## STORAGE AND TRANSPORTATION INSTRUCTIONS

### STORAGE AND TRANSPORTATION CONDITIONS

#### GRANULES

- It is recommended to store granules in their closed, original moisture barrier packaging at temperatures below 45°C.
- Storage in dry conditions.
- Storage in direct sunlight or in rain should be avoided.
- Temperatures during transportation and storage may not exceed 60°C at any time.
- Material shelf-life is 18 months from the manufacturing date when stored at room temperatures (23 °C). Manufacturing date can be found on the label on material packaging.



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

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