

# Symbio in touch with nature

For further product details please scan the QR code below.

## About Sappi

Sappi is a global diversified woodfibre group, focused on dissolving pulp, paper-based solutions and high quality functional biomaterials.

Manufacturing operations can be found on 3 continents with sales to more than 150 countries. We are using our global leadership position and significant investment in Research and Development in coated graphic papers, speciality packaging grades, dissolving pulp and biorefinery processes to respond to the growing global demand for high quality functional biomaterials.

As we focus on creating value for our shareholders, we take cognisance of our impact on this planet and stakeholders to ensure that all benefit in the long term. Sustainability is not an add-on, but an entrenched part of the way we manage our daily business activities, mitigate risk, leverage opportunities and plan for the future. We hold ourselves accountable to global sustainability best practice standards by transparently measuring, monitoring and communicating our economic, social and environmental performance.



## Symbio cellulose fibres enhanced plastics

Over many years, Sappi has developed advanced technologies to combine cellulose fibres with different polymers emphasising both function and aesthetics.

Symbio is a new biocomposite material combining high quality cellulose fibres derived from wood and a plastic material such as polypropylene. Symbio is suitable for a broad range of applications across furniture, appliances, consumer electronics and automotive components.

## Uses for Symbio



Material that brings the natural look of your application to a whole new level.



Injection moulded packaging with a soft and warm surface.



Appliances and consumer electronics.



Unique and functional kitchen tools and dining accessories.



Lightweight and rigid injection moulded parts for new generation biobased vehicles.



Natural matt-looking furniture.

## Symbio products

- **Symbio high Concentrate Masterbatch** - cellulose fibre stabilised concentrate especially developed for dilution with polypropylene matrixes. The concentrate is designed and engineered for optimal dispersion in a polymer matrix, contributing to excellent final properties. Due to its good balance between density, stiffness and impact resistance, it can be used for a variety of applications.
- **Symbio PP20 – PP40** - Symbio dilutions (20-40 content of cellulose fibres) made for specific applications and development.



Properties	Sappi Symbio PP20	Sappi Symbio PP40	Sappi Symbio PP20MI	PP 20% Talc filled
Density [g/cm <sup>3</sup> ]	0.98	1.06	0.98	1.05
MFR [g/10min] 230°C, 2.16kg	6	0.6	6.4	12
Flexural modulus [MPa] ISO 178	3,086	4,790	2,552	2,400
Tensile modulus [MPa] ISO 527/1A	2,958	4,620	2,471	-
Charpy notched [kJ/m <sup>2</sup> ] @ 23°C ISO 179	4.2	5.5	5.8	6
Charpy unnotched [kJ/m <sup>2</sup> ] @ 23°C ISO 179	34	34	34	-
HDT-B [°C] @ 0.45 MPa ISO 75	141	155	134	100

- Tailoring possible to optimise stiffness/impact/flow.
- More detailed information and datasheets available on request.



Sappi is collaborating with Intertek for testing of Symbio. Intertek has decades of experience working with OEMs, Tier 1 and Tier 2 automotive suppliers. <http://bit.ly/1PX1eGr>

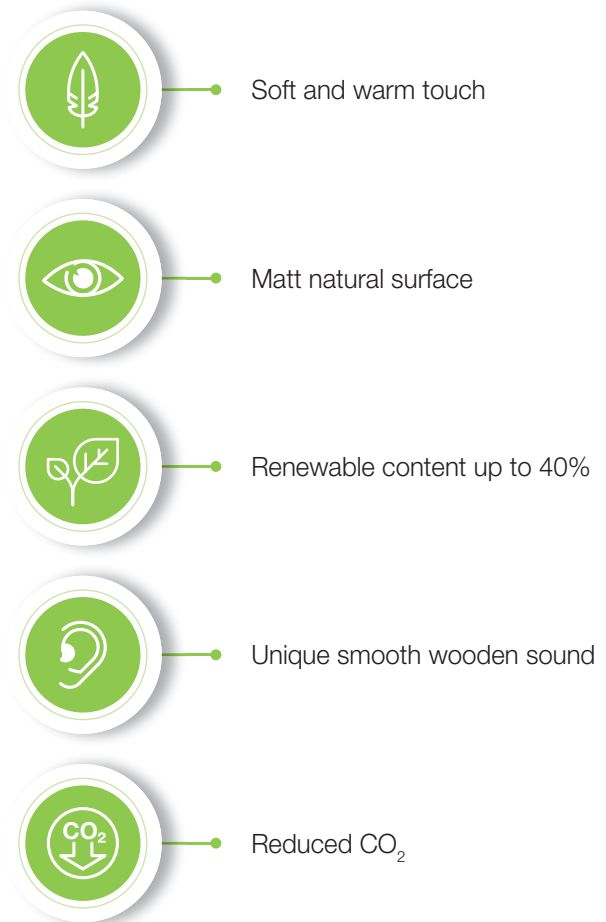
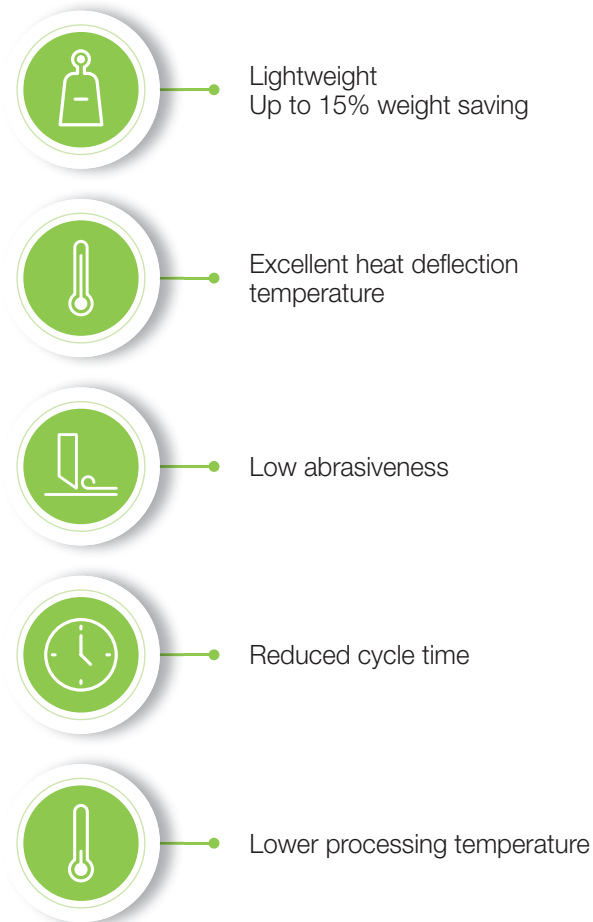
## Properties – scratch resistance

Test method	Sappi Symbio PP20	PP 20% Talc
Scratch Erichsen PV 3592 (F=10N)	-0.42	7.84
< dL 3 days after scratch (D65/10°) >		
MAR resistance PV 3974 (F=3N)		
< Gloss 60° reference (in gloss units) >	1.3	2.6
< Gloss 60° after 3 days (in gloss units) >	2.1	3.8
< Change in gloss level (in gloss units) >	0.8	1.2

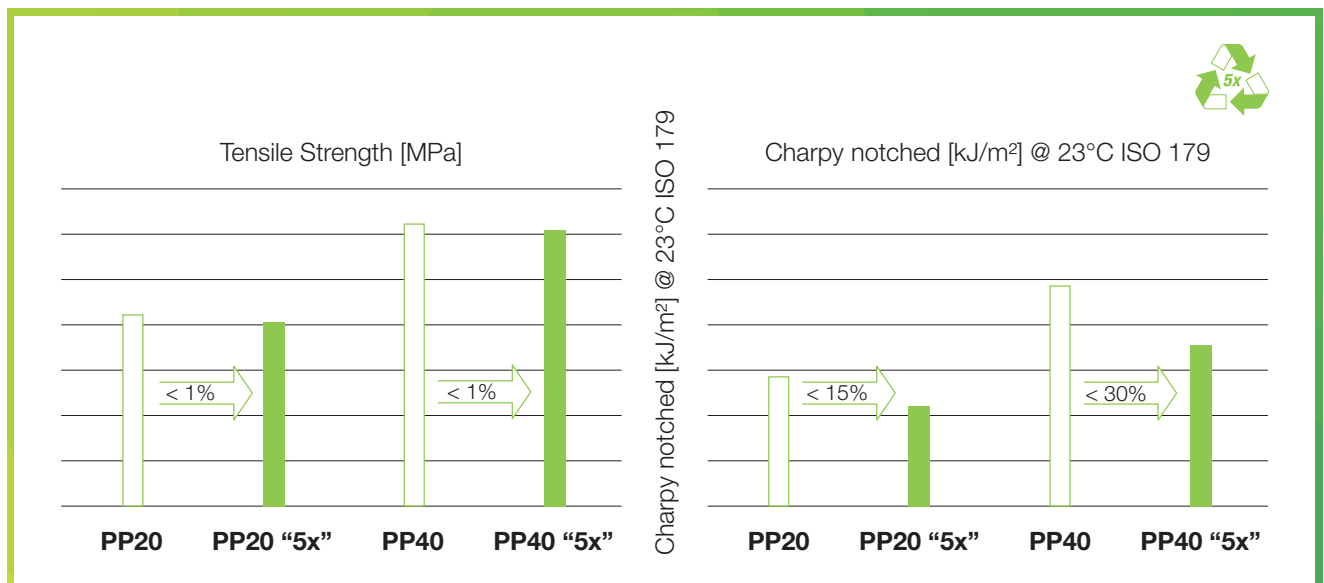


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## Key attributes of Symbio



## Recycling – reusing Symbio



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## Sustainability in Sappi group

We use natural resources like woodfibre and water to create products that support society's needs. To ensure the ongoing viability of these resources, we strive to achieve the highest standards of environmental performance.

Our focus on continuous improvement and commitment to integrate the principles of sustainability into our everyday business activities is highlighted by the fact that in 2019:

- We were included in the FTSE/JSE Responsible Investment Top 30 Index and confirmed as a constituent of the FTSE4Good Index Series.
- Sappi has been classified as Prime by Oekom, one of the world's leading environmental, social and governance (ESG) research and rating agencies for sustainable investments.
- In all three regions, we were awarded a Gold Recognition Level in sustainability performance by independent rating agency EcoVadis.
- We reported to the CDP ([www.cdp.net/en](http://www.cdp.net/en)) under its climate change and forest programmes, making our responses publicly available.
- Recognised as a leader in the 2019 Corporate Sector and Children's Rights Benchmark.

## Symbio

The key benefits of Symbio lie in positive touch and feel (haptics), balanced rigidity and lighter weight. The latter is particularly important in the drive to reduce carbon emissions.



### Value impact

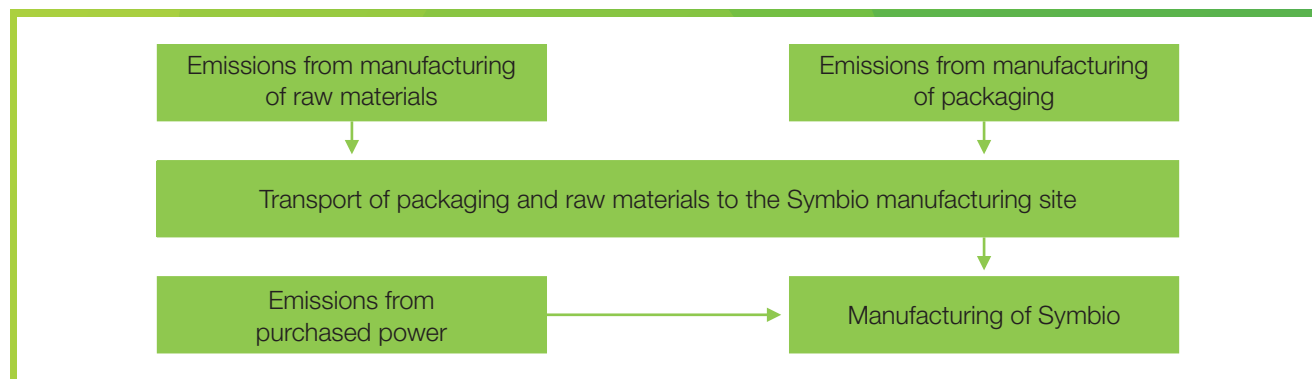
Symbio meets the need for high performance products with strong environmental credentials:

- High quality cellulose fibre which is derived from responsibly managed forests.
- Renewable resource to replace fossil-fuel based source.

## Symbio: product carbon footprint – cradle to gate

The carbon footprint of the product was assessed by using a life cycle impact assessment method. This datasheet presents the results of the climate change impact category. The other impact categories were considered to be outside of the scope of this assessment.

The schema below shows the process steps and components that have been considered in this assessment. The assessment is considered to be a 'cradle to gate' assessment, not covering the transport from us to our customers or further processing of the raw material.



## Results of the assessment

	Share of filler (%)					
	0	10	20	30	40	50
Cellulose fibres (kg CO <sub>2</sub> -eq/ton)	1,981	1,832	1,683	1,534	1,385	1,236
Glass fibres (kg CO <sub>2</sub> -eq/ton)	1,981	2,045	2,109	2,173	2,237	2,301

**IMPORTANT:** The information in this document is given in good faith and reflects our knowledge and experience at the time of printing or presentation. Typical values do not imply a warranty or guarantee for any specific property. Customers are responsible for ensuring a product is suitable for their specific application and conditions of use and that all legal and safety requirements are complied with.



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