

Embracing innovative solutions for automotive interiors

Driving sustainable natural fibre-based materials with engineered performance



sappi | Symbio

Tailor-made for automotive composites

As a global diversified woodfibre group, focused on dissolving pulp, paper-based solutions and high functional materials, we develop and produce unique biocomposite materials.



Key deliverables



Sustainability

Sappi relies on renewable natural resources, **sustainability** is at our core. Achieving ambitious sustainability targets helps us deliver the highest quality products and solutions. Sappi Symbio automotive interior materials deliver the perfect solution that allows freedom of design, high quality, low emissions with minimum odour whilst promoting a robust sustainability agenda.



Global supply

Sappi is a global company supplying fibre-based solutions worldwide, providing support to automotive Tiers and OEMs around the world. From our origins in South Africa, we've grown to manufacture across three continents, with operations in over 20 countries.



Lightweight

Imagine the possibility of reducing weight in combination with an improved overall life cycle analysis. Sappi Symbio is an innovative material solution based on premium cellulose fibres and thermoplastic, allowing automotive manufacturers and their partners to achieve tangible targets in lightweight performance and reduction of cycle time.

Sappi Symbio - sustainable solutions for automotive interiors

The way the world works is changing fundamentally. Development of a sustainable global economy, which permits improving purchasing power and living standards without exhaustion of resources for future generations, requires a fundamental change in attitude. These shifts mean that we are recalibrating our approach to issues of commerce, community and consumption, focusing more intensely on the use and regeneration of our natural resources.

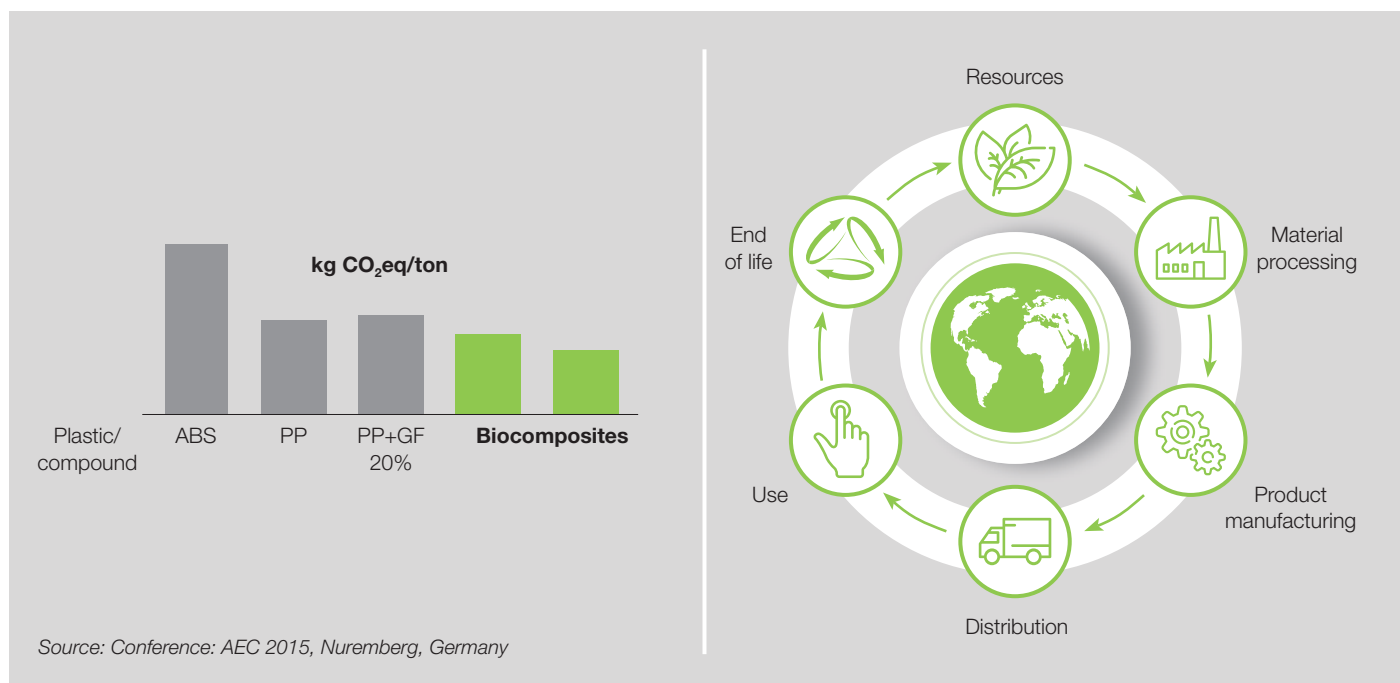
On ecological grounds, preferred products should be those that are based on photosynthetic CO₂ fixation. The benefit of these sustainable resources is that they can be regrown within the foreseeable future, without negative side-effects on global biodiversity. Therefore, competitive products based on renewable resources need to be developed that have high quality, show excellent technical performance, and cause less harm to the environment than current products based on petrochemical materials.

Sappi Symbio is an eco-responsible solution combining advanced performance with a high energy efficiency and environmentally friendly products. Sappi Symbio is created with premium cellulose fibres sourced from renewable and well-managed forests. It is manufactured in an environmentally responsible production process and strives to replace fossil-based materials with sustainable materials derived from renewable resources.

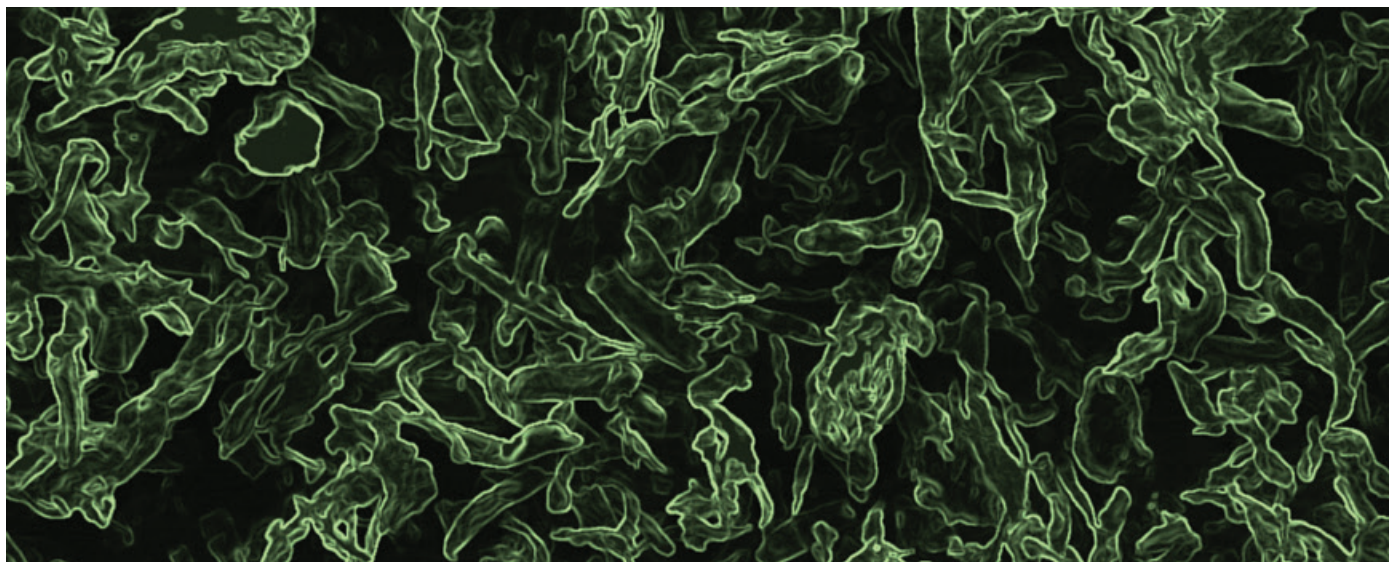
Cellulose fibres improve the life cycle analyses of your product and process, compared to fossil-based conventional materials, by considerably reducing the CO₂ footprint. Moreover, Sappi Symbio can be reused and recycled.

- **Less plastic**
- **Lower carbon footprint**
- **Lower energy consumption**
- **Reduced cycle times**
- **Lightweight solutions**

Life cycle analysis



- Using lightweight materials decreases the energy consumption and hence greenhouse gas (GHG).
- The production of lightweight materials generally requires more energy and generates more GHG emissions than the production of conventional materials.
- **LCAs should therefore be conducted to validate the total net energy, greenhouse gas emissions and other environmental impacts of using lightweight materials.**

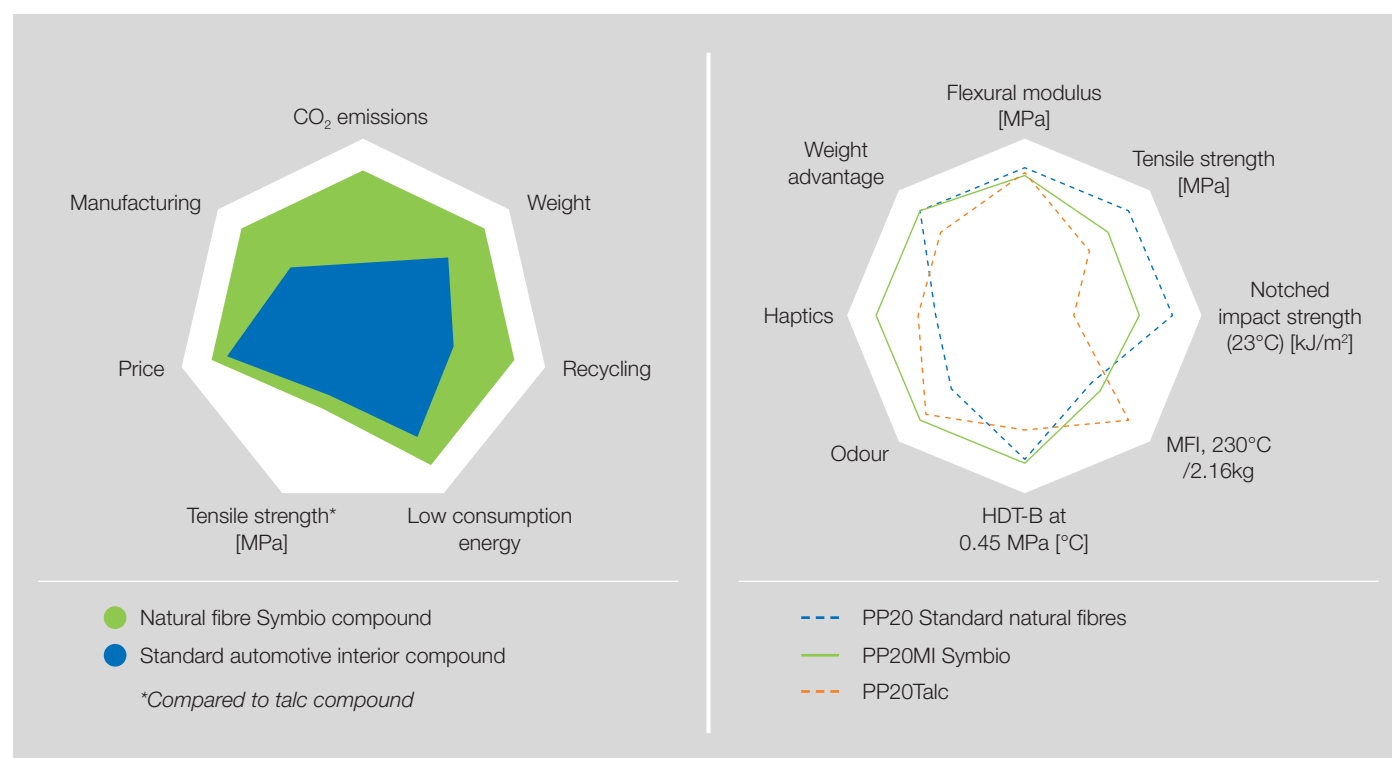


Symbio composites - integrating natural performance

Symbio composites are designed to meet the high mechanical performance requirements whilst delivering superior haptic perception. Advanced material design ensures limitless opportunities for colour and visual appearance.

Symbio combines the advantage of cellulose strength and lightweighting in a tailor-made composite material with the processability of thermoplastics. These low density materials exhibit excellent haptic properties, maintaining a unique feeling of warmth and softness.

Sappi Symbio comparison with standard solutions



Engineered for sustainable lightweight automotive solutions

Sappi Symbio is a highly engineered, strong and sustainable alternative to standard compounds for automotive interiors. Low density with high stiffness, combined with unique features of a natural fibre reinforced material.



Haptics

- Soft and warm touch
- Endless visual possibilities
- Enhanced design
- Low gloss



Superior performance

- Lightweight solutions
- Low density and high stiffness
- Reduced environmental impact
- Optimised cycle times
- Low odour and emissions
- Improved acoustic properties
- Natural touch and feel
- Consistent high performance



Cellulose fibre reinforced biocomposites adding value in automotive applications



Lightweight - up to 15% reduction



Reduced cycle time up to 40%



Soft and warm touch



Low abrasiveness



Very good acoustic properties



Lower processing temperature



Excellent heat deflection temperature



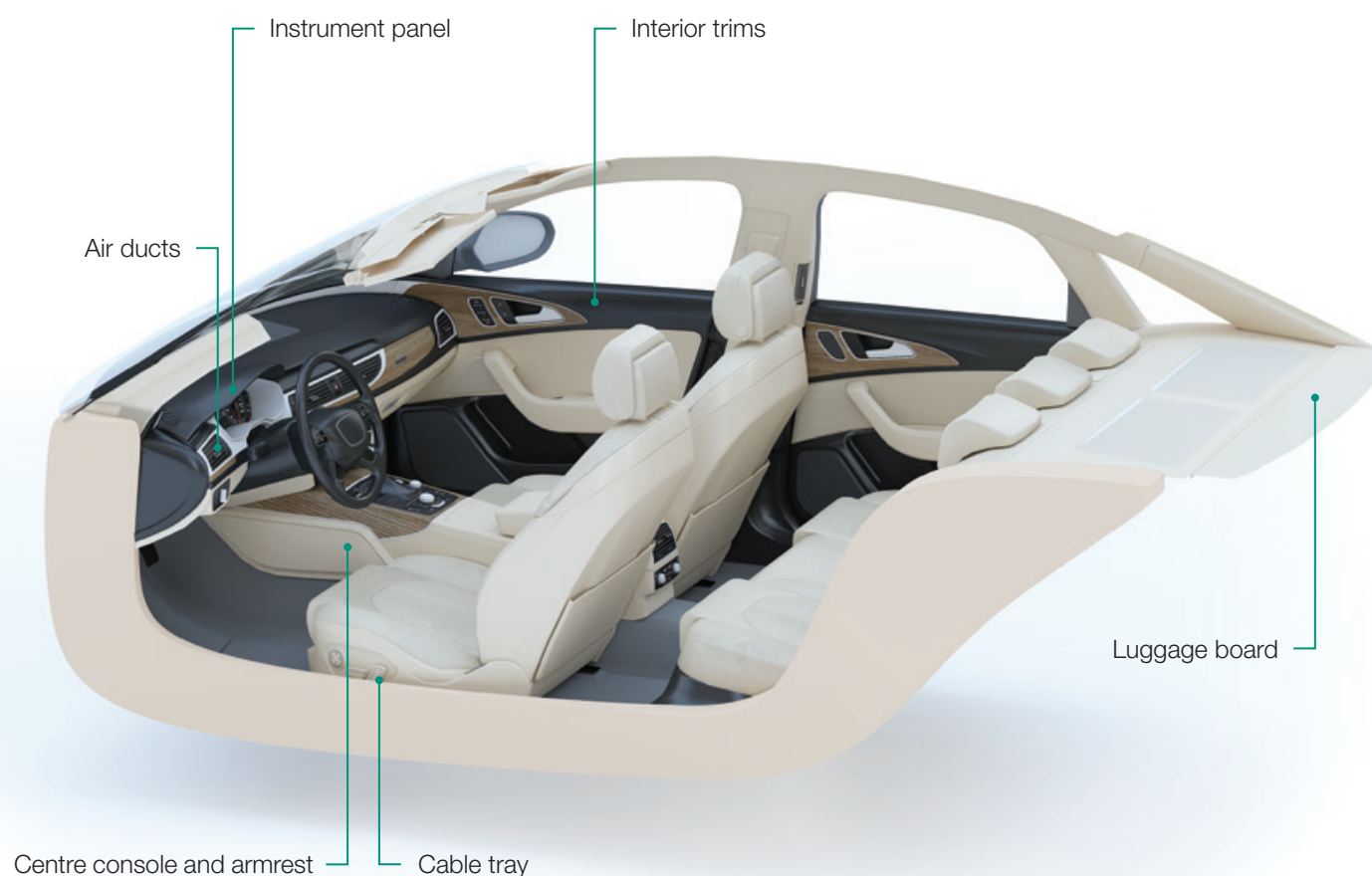
Renewable content up to 40% - reduction of fossil-based materials

Advanced automotive interior parts with lightweight materials

From the structural parts, to door trims and the centre console, our innovative premium cellulose best-in-class solutions enable the automotive interior industry to design the parts of the future. We work closely with the world's leading OEMs and brands on the latest advanced sustainable technologies.

Possibilities for using Sappi Symbio in automotive interiors

- Instrument panels
- Door panels
- Centre consoles
- Structural parts
- Air ducts
- Cable trays
- Luggage boards and others



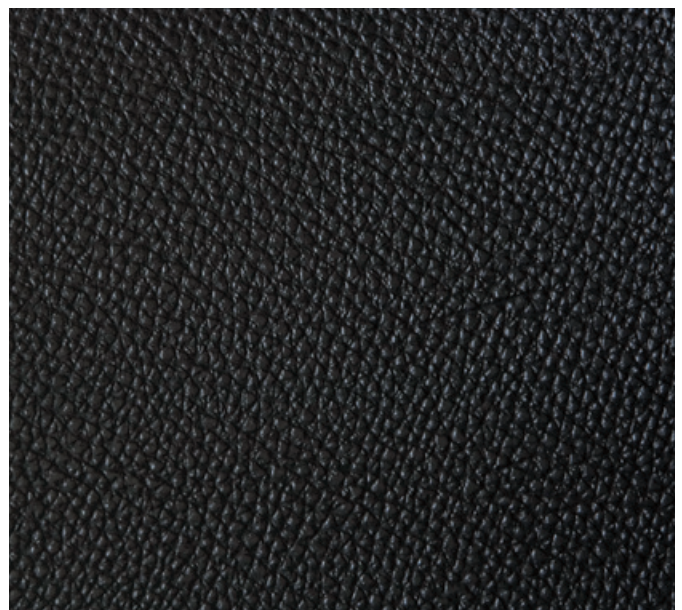
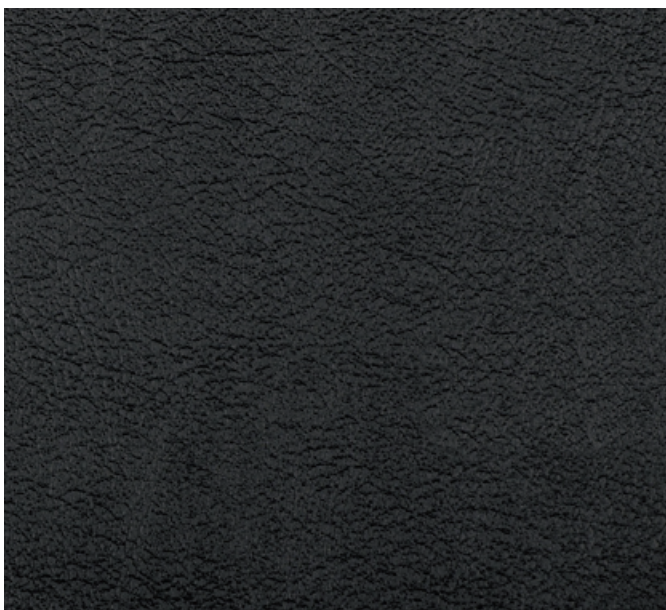
Drivers

- Weight reduction up to 15%
- Sustainable materials from a consistent source
- Improved LCA
- Reduction of fossil-based materials

Next level of natural fibre composites - colour and aesthetics

Sappi Symbio can be tinted to any selected colour and in addition has a soft and smooth surface similar to wood. A unique biocomposite with high specifications and tight quality control allowing it to be the perfect choice for automotive interior materials.

Symbio accommodates textured or grained surfaces for interior components such as trims, pillars, door components and air vents. In addition, Symbio offers superior scratch-resistance when compared to standard talc filled materials.



Processing with optimum balance and other features

Sappi Symbio materials can improve moulding cycle times by up to 40 percent. Products made with Sappi Symbio require less energy to produce and can reduce wear and tear on processing equipment when compared with those containing abrasive short glass fibres. These substantial benefits create significant advantages for companies looking to reduce their carbon footprint while enhancing performance and productivity.

Sappi Symbio can be recycled and reused during the production process, with minimum loss of performance thus improving efficiencies.

Improved sound performance and noise reduction

Sappi Symbio fibres are natural cellulose and have inherent superior acoustic advantages, similar to that of wood. With very low resonance, parts made with Symbio can absorb unwanted noise and reduce rattles and squeaks.

High performance in emissions and odour

Cellulose fibre reinforced biocomposites adding value in automotive applications

Sappi Symbio is a premium sustainable lightweight solution for the replacement of talc or glass filled fossil-based composites. Symbio supports component lightweighting resulting in improved fuel efficiency and lower CO₂ emissions. In addition to sophisticated haptics, Symbio meets stringent requirements of low odour and emissions.

Different from traditional natural fibre biocomposites, Sappi Symbio allows the production of parts to comply with stringent Original Equipment Manufacturer (OEM) requirements. Low emission Sappi Symbio products are designed for structural and visual uses and provide exceptional strength, stiffness and dimensional accuracy, with reinforcement levels up to 40% of renewable content. Standard formulation has been tested and authenticated by independent outside laboratories according to industry standard test methods for odour, fogging and total VOC emissions. Results meet the requirements in all three categories.





Sappi Symbio solutions

Highly experienced technical teams are on hand to provide global support.

At Sappi Symbio we believe sustainable solutions for the automotive industry with high quality and performance are possible. We work together with Tiers and vehicle manufacturers globally to provide the best solution for automotive interiors.

Each of our products can now be developed, produced and delivered from multiple locations worldwide, which provides our customers with greater flexibility, speed and reliability in a sustainable way.

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.



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**Enhancing composites
naturally**

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Sappi has 19 production facilities and 36 sales offices worldwide



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