

## **From idea to industry – bio-based products drive industrial disruption**

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**The principles of reduce, reuse, and recycle have turned the focus into exploring bio-based products and innovative process technologies to minimize the use of non-renewable resources. Waste is minimized and renewable sources are favored, while side streams and residues are utilized to the fullest.**

“The goal is to develop process technologies for multiple renewable feedstocks to support customers in reaching industrial scale. We are currently working with several industry players to commercialize these applications, which will pave the way for the manufacture of a broad range of new sustainable and bio-compatible products and thereby accelerate circular economies,” says Sirpa Välimaa, Head of Business Segment PPI at Sulzer.

The green transition in industrial manufacturing provides opportunities for consumers and businesses alike. Cooperation in research, development, and innovation is the prerequisite for the industrialization and commercialization of new feedstocks. Due to their fibrous structure, technologies familiar from wood, paper, and pulp processing can be adapted.

### **Higher value for wood**

Fiber modification aims at developing higher-value products out of wood. The research focuses on producing renewable alternatives for traditionally fossil-based

products. It builds heavily on the resources and infrastructure of forestry, wood, pulp, and paper operators seeking sustainable growth.

### **From waste biomass to value**

Approximately 140 billion metric tons of pulp-containing waste biomass is generated globally every year in agriculture and the food and beverage, forestry, and wood-processing industries<sup>1</sup>. Waste and side streams occur naturally from agricultural processes, since only a small portion of plants qualifies for consumption. And sources from more unusual contexts can also be found, such as waste streams from breweries.

### **Turning textiles sustainable**

The textile applications revolve around recycling textiles from post-consumer waste and producing textiles from bio-based virgin sources. The development holds promising direction for the textile and clothing industries as well as the non-wovens category as the global annual production of textile waste is expected to hit 134 million tons by 2030<sup>2</sup>.

### **New applications rely on pulp processing expertise**

The process development and commercialization of bio-based products leverage the existing equipment and knowhow from pulping processes. “We have reached major milestones in the research of the rheology of bio-based feedstock. Our findings and continuous research offer a solid foundation to produce

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<sup>1</sup> <https://wedocs.unep.org/20.500.11822/7614>

<sup>2</sup> <https://globalfashionagenda.org/>

environmentally friendly alternatives in a range of industrial applications and end products,” says Sirpa Välimaa, Head of Business Segment PPI at Sulzer.

### **Foam forming**

Foam forming is a worthwhile alternative for conventional intermediates and it can be used in various applications such as building materials, packaging, and in a range of everyday consumables. Creating and processing the foam requires capability for varying air content as well as equipment for aeration, mixing, pumping, and tanking of the slurry. Sulzer is the equipment supplier in successful foam development projects.

### **Separation applications**

Wood, straws, and other bio-based mass consist of lignin, cellulose, and hemicellulose that are in great demand due to their versatile possibilities. With the right technologies, the main components of biomass can be carefully extracted and utilized in further refining. Sulzer offers a range of process equipment for homogenization, agitation, mixing, and pumping stages in separation applications.

### **Microfibrillated cellulose**

Due to its versatile nature and changing viscosity, microfibrillated cellulose (MFC) is regarded as a very potential alternative to conventional fossil-based raw materials. By manipulating the fiber dimensions, numerous opportunities can be found for wood. Known use cases for MFC are found in cosmetics, coatings, films, and the like. Additionally, new possibilities and suitable process equipment are constantly developed. Sulzer’s broad portfolio offers suitable production and processing devices for the various forms of MFC.

**Evolve by expertise – process development partnership with Sulzer**

Active contribution to development projects involving bio-based products is a strategically meaningful part of Sulzer's operations. This has resulted in successful cooperation with clients, universities, and other sovereign institutions.

Sulzer employs full-scale testing facilities and empowers their partners' research and development initiatives by offering rental test equipment. "We offer our partners flexible and cost-efficient ways to execute successful R&D projects without large investments in testing equipment," says Jukka Rantanen, Business Development Manager, PPI of Sulzer.

Despite being a large-scale operator, Sulzer is an agile partner for process development. Sulzer's comprehensive portfolio of advanced process equipment and extensive research facilities are combined with an explorative and adventurous attitude. "We learn alongside our partners, and as they are ready to scale up, Sulzer has the resources to provide the equipment and support needed for each step of the way," Sirpa Välimaa concludes.

**Image captions:**

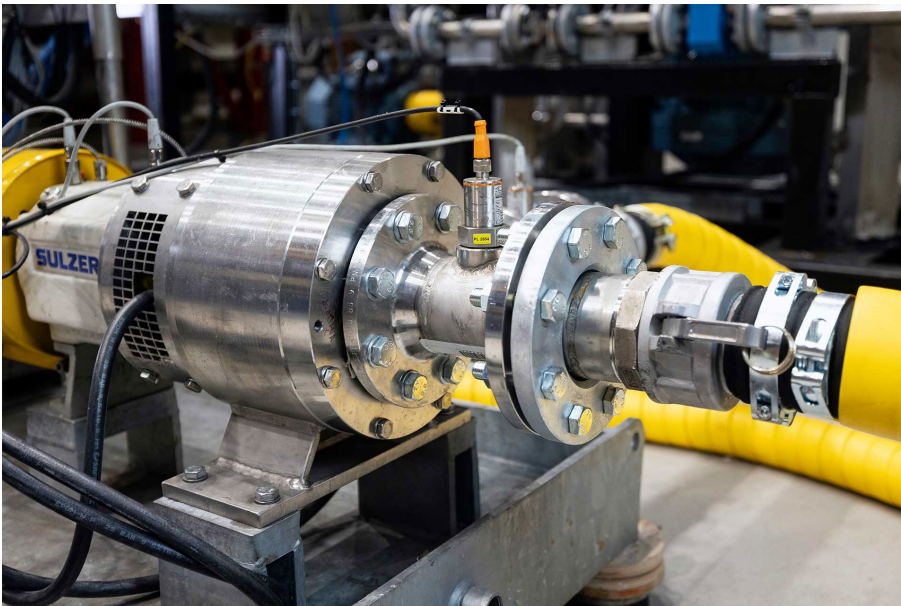
**Image 1:** Wood, straws, and other bio-based mass consist of lignin, cellulose, and hemi-cellulose that are in great demand due to their versatile possibilities.



**Image 2:** Sulzer employs full-scale testing facilities and empowers their partners' research and development initiatives by offering rental test equipment.



**Image 3:** Due to its versatile nature and changing viscosity, microfibrillated cellulose (MFC) is regarded as a very potential alternative to conventional fossil-based raw materials.



**Image 4:** Sulzer's comprehensive portfolio of advanced process equipment and extensive research facilities.

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**About Sulzer**

Sulzer is a global leader in fluid engineering and chemical processing applications. We specialize in energy-efficient pumping, agitation, mixing, separation, purification, crystallization and polymerization technologies for fluids of all types. Our solutions enable carbon emission reductions, development of polymers from biological sources, recycling of plastic waste and textiles, and efficient power storage. Our customers benefit from our commitment to innovation, performance and quality through our responsive network of 180 world-class manufacturing facilities and service centers across the globe.

Sulzer has been headquartered in Winterthur, Switzerland, since 1834. In 2022, our 12'900 employees delivered revenues of CHF 3.2 billion. Our shares are traded on the SIX Swiss Exchange (SIX: SUN).

For more information, visit [www.sulzer.com](http://www.sulzer.com)

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