



Fibenol

The material and chemical industries still heavily depend on fossil-based chemicals, often at the expense of the environment and with limited transparency in value chains. At Fibenol, we are committed to building a more sustainable future.

Our premium biomaterial portfolio includes various grades of lignin, cellulosic sugars, and specialty celluloses – bio-based building blocks that can replace fossil-based chemicals in industries such as plastics, construction, and road pavements. By enabling the transition to sustainable production, Fibenol helps the material and chemical sectors reduce reliance on fossil-based resources and meet future net-zero targets.

Fibenol's demo plant in Estonia was commissioned in 2024, with a full-scale industrial plant set to launch in Valmiera, Latvia, by 2030. Our goal is to support the growth of the bioeconomy and cleantech industries, helping to reshape current fossil-based industry standards.

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Interview

with Peep Pitk
Chief Development Officer
Fibenol, Estonia



Peep Pitk holds a Ph.D. in environmental chemistry and bioprocess engineering from TalTech, specialising in optimising protein-rich side streams and anaerobic digestion processes.

In 2016, he joined the Fibenol team and has been leading the company's development journey. Starting with the concept of wood valorisation on paper, he has guided the Fibenol team to the completion of a globally unique industrial demonstration plant for wood fractionation. The commissioning and ramp-up of this plant were completed in 2024, paving the way for the scale-up to an industrial-sized plant by 2030.

Often, low-quality hardwood and its residues are not valorised but simply discarded and incinerated, whereas Fibenol uses them as main renewable feedstock for its products.

What functions – besides its role as feedstock for your products – does hardwood fulfil in your own model for the bioindustry? How does this fit into the circular economy?

Forest management and wood processing generates huge amounts of residual biomass (sawdust, wood flakes and low-quality wood). Only around 40% of harvested wood ends up in high value and long-term carbon storage applications, such as construction and furniture production. There is a significant volume of hardwood that is harvested in forestry but not used to its highest value potential. To solve this issue, we in Fibenol, have developed a technology to valorise the under-valued fraction of wood into high quality, safe and sustainable products that could replace almost any existing fossil chemical on the market.

By valorising underutilised lower-quality hardwood we enhance resource efficiency, reduce reliance on fossil-based chemicals and create new value chains that contribute to more sustainable material streams.

In your innovative biorefinery flagship plant, you can convert over 90% of your utilised hardwood biomass into usable high value biomaterials and bioproducts.

Which kinds of primary products can you extract from this “waste” resource and for which range of final products can they be applied?

Wood primarily consists of cellulose, lignin, and hemicellulose. Fibenol’s approach is built on the ambition to valorise all these components to their highest value, in contrast to the conventional wood valorisation route – chemical pulping – which has traditionally focused on cellulose extraction.

Produced at our demonstration plant, commissioned in early 2024, our product portfolio includes:

- LIGNOVA™ lignin (various grades)
- Specialty microcrystalline cellulose (various grades)
- C6 cellulosic sugar syrup
- C5 cellulosic sugar syrup

LIGNOVA™ lignin serves as a drop-in substitute for fossil-based chemicals across various industrial applications. Notable examples include its use as a bitumen additive in asphalt production, a phenol replacement in plywood, mineral wool, and abrasive resin production, and a functional additive in bio-composites.

Our specialty cellulose is well-suited for paper, packaging, and thermoformed products, serving as a strength enhancer and a bio-based coating enabler, offering oxygen, grease, and oil barrier properties.

Our cellulosic sugars are ideal platform chemicals due to their high fermentability, low inhibitor content, and non-food, non-feed competing nature. Our partners use them in fermentation-based production of bulk chemicals, alternative proteins, and biosurfactants. Additionally, there is growing interest in their application as a bio-based binder for mineral wool, a retarding agent for concrete, and in the development of 100% bio-based binders to replace formaldehyde- and phenol-based resins in engineered wood and construction materials.

You claim to offer products with a minimal environmental footprint. Why is this an important sales argument and which role does certification play?

The topic of environmental impacts and LCAs is very complex. The main challenges are related to availability of data and variability of methodologies. Often the term “Wild Wild West” is used by the industry specialists to describe the situation. To lead with an example, we have established principles to use as

much primary data as possible and to be as transparent as possible when it comes to methodology.

Currently, the best option for transparent and harmonised LCA in our opinion is an EPD (environmental product declaration). An EPD is a standardised approach that provides transparent, quantified, and verified information about the environmental impacts of a product throughout its life cycle. There are predefined set of rules known as Product Category Rules (PCRs), ensuring consistency and comparability between products in the same category. Our EPD, covering environmental impacts of LIGNOVA™ and cellulosic sugars is available for anyone who is interested (<https://www.environdec.com/library/epd9726>).

Which challenges do you face as a bio-economy company? Which support measures are needed in order to increase consumer acceptance and to support a transition to a more sustainable EU economy?

Currently, the biggest challenges stem from the complexity and fragmentation of regulations, leading to unnecessary market access barriers and overlapping safety assessments across different sectors and applications. Additionally, there is insufficient policy support to translate the Industrial Clean Deal into tangible actions.

Without a dedicated, mandated market for chemicals and materials derived from advanced feedstocks, securing the necessary investment decisions for new biorefineries – essential for the defossilisation of our economy – remains difficult. Likewise, the widespread adoption of these materials faces significant hurdles.

Another major topic is general awareness. We have seen that public and private sectors rarely align communication strategies for bio-based innovations. This misalignment often leads to positive narratives being misunderstood, while negative perceptions, such as the “high cost” narrative, dominate. These issues start from overly complex messaging about policies and a mutual lack of understanding between

stakeholders and the public. To solve this, the focus should be on educational collaboration, aiming long-term solutions that simplify explanations of challenges we face, and innovations provided. This approach could drive a shift toward more environmentally positive solutions and support from the public.

And we cannot leave out the challenge of funding. Bringing new bio-based materials and products to market often involves significant investment, high risk, or both. While Europe boasts a world-class research ecosystem and leading support programs, it still lacks effective mechanisms to help businesses navigate the valley of death and successfully commercialise bioeconomy innovations in long term. Developing infrastructure for piloting and scaling solutions, along with creating collaborative and tailored financing instruments to reduce risks and encourage investment, is crucial. By supporting innovative businesses in overcoming this challenge, Europe can foster competitiveness and long-term prosperity.

Why did you decide to become part of the RCI and how can the RCI profit from your membership?

Membership in RCI provides Fibenol with a platform to influence the renewable carbon landscape, collaborate with industry leaders, and enhance its market position. It aligns with Fibenol’s goals of driving innovation, promoting bio-based solutions, and contributing to the EU’s sustainability objectives. And of course we are thankful for the additional networking opportunities, knowledge sharing, regulatory support and increased visibility.