

PRESS RELEASE

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Lignin-based concrete plasticizer technology LigniOx to be scaled-up

LigniOx technology developed by VTT Technical Research Centre of Finland converts lignin by-products from pulp mills and other biorefineries into concrete plasticizers that can compete with the synthetic and lignosulphonate-based admixtures on the market. The technology will be scaled-up, and the lignin-based concrete admixtures will be developed with industrial partners in the LigniOx project, a Bio-Based Industries Joint Undertaking project operating under the Horizon 2020.

Cooperation enables the commercial-scale production and market entry of first products within a few years. Although plasticizers account for less than one percent of concrete, their global market is huge, approximately 10 million tonnes per year. In addition to concrete plasticizer, LigniOx lignins can also be used as a dispersing additives, e.g. in paints, coatings, and in the manufacture of gypsum products.

Concrete is the most used construction material, and good workability of fresh concrete must be ensured without compromising the strength of matured concrete. The LigniOx plasticizers enable the use of a small amount of water, producing a highly workable concrete that hardens into a strong final product. In fresh concrete, the LigniOx lignin works noticeably better than a commercial lignosulphonate-based plasticizer and even competes with some of the synthetic superplasticizers. The lignin oxidation process is easy to integrate into existing biorefineries owing to compatible and safe bulk chemicals.

VTT will further develop its technology together with a machine supplier, a pulping company, bioethanol producers, and a chemical company. The participants are: VTT (project coordinator), VITO (Belgium), Metsä Fibre (Finland), Andritz (Finland), St1 (Finland), CIMV (France), Biochemtex (Italy), Dow (Germany), Vertech Group (France), and Exergy (United Kingdom).

During the project, a mobile pilot unit will be constructed, the process technology will be scaled-up, and demonstrated at the biorefineries using various technical lignins. First, LigniOx-based concrete plasticizer admixtures will be formulated, and their performance will be demonstrated in field tests. After the project, the techno-economically viable and environmentally friendly lignin upgrading technology will be ready for installations of commercial scale. New sustainable and cost-competitive lignin-based, high-performance concrete plasticizers will enter the market soon after that.

Total volume of the 4 year-long LigniOx project is EUR 5.6 Million.

The Bio-Based Industries Joint Undertaking is a EUR 3.7 billion Public-Private Partnership Operating under Horizon 2020, and it is driven by the Vision and Strategic Innovation and Research Agenda (SIRA) developed by the industry. The project has received funding from the Bio-Based Industries Joint Undertaking under the European Union's Horizon 2020 research and innovation programme under grant agreement No 745246.

LigniOx project ((Lignin oxidation technology for versatile dispersants): <https://www.ligniox.eu/>

Bio-Based Industries Joint Undertaking: <https://www.bbi-europe.eu/projects/ligniox>

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