



SYNBRA TAKES THE BIO-BASED ECONOMY TO YOUR HOME

Synbra

Synbra Technology, an Etten-Leur based company that produces sustainable bioplastics, is small (90 employees); but as a part of Synbra Holding (26 branches throughout Europe) it is a big player. Synbra Holding in all its European branches produces expanded polystyrene foam (EPF) for sustainable construction systems and packaging. Styrene itself is produced by Synbra Technology.

Since 2011 the company produces bio-based polylactic acid (PLA), also used in foam (called BioFoam), but aimed to be used in a wider range of purposes. At present, Synbra is the second largest producer of this foam in the world. Synbra's new high-tech heat PLA is going to be a real start performance product. As the first PLA product it acquired a Cradle-to-Cradle (C2C) certificate, and it won innovation prizes. It is an excellent material to produce higher-value household appliances. Already, there is a large demand for biopolymers, because of their green image. The bio-based economy has come to the consumers' home. Thanks to Synbra's innovation.

Says Jan Noordegraaf, CEO of Synbra Technology: 'Until quite recently biopolymers had a bad public image. But that changed, just like with common plastics from oil – with the advantage on top of that they are bio-based, and in our case even biodegradable.' The first generation of bioplastics could not withstand boiling water. Thanks to research at Wageningen UR, Synbra succeeded in producing a new sustainable high-performance material.

Synterra®PLA, as it is called, is formed from a combination L- and D-lactic acid to produce a plastic material of superior quality. Jan Noordegraaf: 'Without Wageningen UR's research we could not have developed this material. This proves that it is absolutely necessary for a small firm like ours to cooperate with research centers, in order to get innovation going in the Netherlands.'

The new biopolymer can be molded into many plastic products by mechanical operations like injection molding and thermoforming. Synbra is the first company to have developed bioplastics of such a high quality, and on this basis the firm can enter the market of high-performance bioplastics. Last year Synbra received the Accenture Blue Tulip Award, a Dutch prize, for the innovative qualities of its new PLA product. Synbra's PLA pellets already find their way to Asia and the USA. In the Netherlands, Haval Disposables in Gemert produces colored disposable cutlery from it.

Jan Noordegraaf is quite happy with the new Dutch government policy toward innovative SME's. He perceives positive elements in key sector policy, notably extra subsidies and capital that find their way to SME's through a revolving fund, and extra tax credits for research in SME's, for which they could hardly qualify in the past.

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PHOTANOL, BIOSOLAR CELLS SYMBIONT

The names of Photanol, BioSolar Cells and Symbiont indicate a new and very promising venue in Dutch bio-based based on fundamental and synthetic biology.

Photanol is the private enterprise of two professors at the University of Amsterdam, Klaas Hellingwerf and Jo Teixeira de Mattos. They devised an elegant way to produce chemicals from light, carbon dioxide and water, using modified cyanobacteria as agents. They take a shortcut from the photosynthesis reaction. One of the first steps in photosynthesis is the intermediate production of a molecule called GAP. Photanol modifies cyanobacteria in a way that they can produce any desired substance from GAP. For this synthetic route, the professors have obtained several patents.

Among the substances that can be produced most easily rank ethanol and lactic acid. Recently, a test facility has been completed. This facility will run an area of some tens of square meters. Within some years, Photanol hopes to see its product on world markets.

In another line of inquiry, called SynSymbiont, scientists try to unravel the process of biocatalysis. They investigate microorganisms (aerobic and anaerobic), yeasts and cyanobacteria in order to understand more fundamentally biological processes. This kind of applied fundamental research may well lead to commercial production of very specialized substances, e.g. medicines for very rare diseases or very specific polymers. But in the short run the work is about interpretation of a very large set of fundamental data and knowledge about the processes of biological reactions.