

Sustainable Plastics Technology

From material development towards improved end-of-life options



FOOD & BIOBASED RESEARCH
WAGENINGEN UR



Within the expertise field "Sustainable Plastics Technology" our goal is to develop materials, processes and products that lower the ecological footprint of plastic products. For this purpose we work with biobased plastics but we also have a strong focus on optimizing end-of-life options via mechanical recycling or organic recycling. We closely cooperate with industry during the developmental phases of our research and we help industry to implement new materials and technologies.

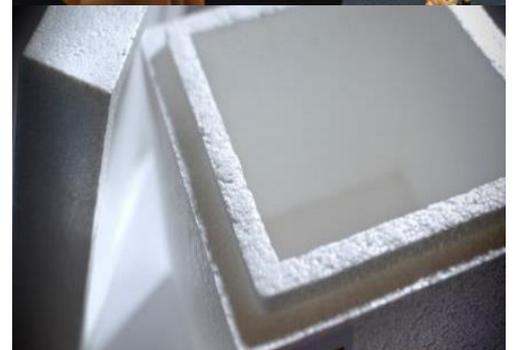
Our track record

Various materials and products developed at WFBR have been commercialized. Examples include Biofoam®, a PLA-based particle foam, Whimzees™, edible Pet chews and D-grade®, compostable plant pots. Also, we are well known for our work on co-continuous starch based blends, heat stable PLA products and our developmental work on PHA's.

Biobased polymers

Our strength is that we work with all biobased polymers available on the market. Moreover we process novel polymers that we have produced ourselves on a kg scale. For us the most important polymers are:

- PLA including nucleated and sc-PLA
- Starch blends
- PHA's
- PEF
- Thermoplastic celluloses
- Various polyesters like PBS(A), PBAT, PCI and PGA



Information

Karin Molenveld
T +31 (0)317 48 11 57
E karin.molenveld@wur.nl

Bornse Weiland 9
6708 WG Wageningen
The Netherlands
www.wageningenUR.nl/en/fbr

Our processing equipment

We have a broad range of processing equipment that operate at scales starting from 0.5 kg to 1000 kg batch size. Equipment includes:

3 compounding extruders that can be provided with (side-)feeders, dosing pumps for fluids, degassing equipment including a stuffer, a melt pump and various pelletising systems:

- Leistritz ZSE 18 HP Twin screw, 18 mm 40D.
- Berstorff ZE 25 Twin screw, 25 mm 40D.
- Berstorff ZE 42 Blue Power Twin screw, 40mm 56D/40D

injection moulding machine:

- Sumitomo Demag Intelect2 75/420-250; 75 ton; to be equipped with 2 possible injection cylinders for 23 & 99 g PS

Equipment for (co-)extrusion and film blowing:

- Dr. Collin Teachline E 20 T extruder, 20 mm, sheets max. 15 cm wide
- Pilot scale co-extrusion machine for up to 5-layers film blowing and sheet extrusion

Additionally we have a 300 g batch scale Haake kneading mixer, a two-roll mill, 2 compression moulding machines, cutting and milling equipment and various types of dryers.

Polymer analyses

To support materials and product development we have various options for polymer analyses including

- Mechanical analyses (tensile, bending, (dart) impact)
- Chemical analyses (GPC, GC-MS, FTIR)
- Rheology (various techniques)
- Microscopy
- Thermal analyses (DSC, TGA, DMTA,ARES)

Our expertise

We have both theoretical and practical knowledge on the properties and processing behaviour of biobased polymers. As most biobased polymers are polyesters, we are experienced in working with "water-sensitive" of materials. Our experienced staff all have their specific expertises.

Examples include:

- Compounding extrusion
- Injection moulding
- Film blowing
- Foaming
- Biodegradation
- Encapsulation
- Rheology

What we can do for you

We can help you to find biobased and sustainable alternatives for your current plastic products. Research can start with development of new monomers and polymers and can end with (pilot) trials at your facilities, during which our staff is happy to assist.

