Floreon

Redefining PLA

Plant-Based Plastics for Engineering Applications

Floreon Therma-Tech

Award Winner of Innovation in Bioplastics 2024

By PLASTICS INDUSTRY ASSOCIATION

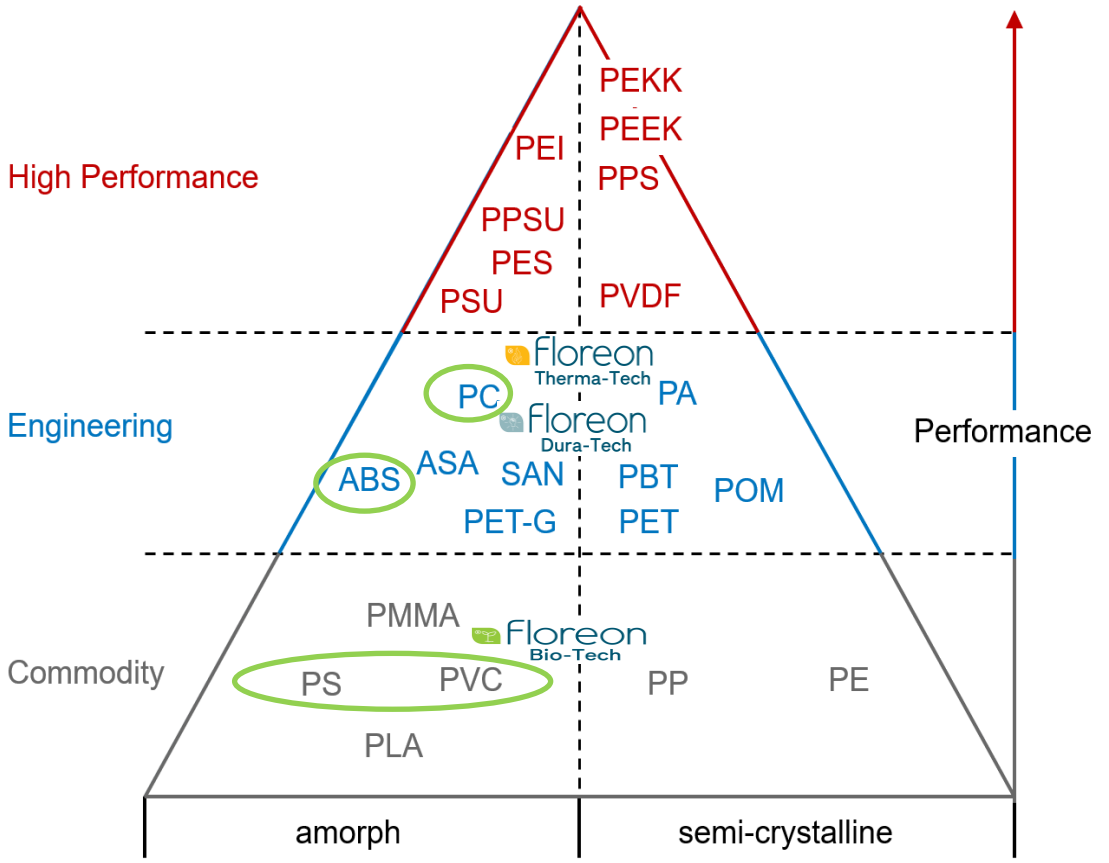
Floreon

About us…

Floreon is an innovative company that emerged from a successful Knowledge Transfer Partnership with the University of Sheffield

Floreon's technical team has developed expertise in using Polylactic Acid (PLA) to produce a highly robust line of biopolymers for engineering purposes.

Unlike typical PLA, which is often used for disposable items, Floreon's technology converts it into an exceptionally durable, high-performance material suitable for a wide range of applications.



Floreon Therma-Tech

Flame Retardant Grade

- First halogen-free PLA-based compound to be UL94V-0 certified
- Produced from plants, Floreon® Therma-Tech is a low carbon footprint alternative to flame retarded ABS, with more sustainable end-of-life options

Proud recipient of **Innovation in Bioplastics** 2024 Award Winner

A Genuine World First

FLAME RETARDANT (UL94V-0)

HIGH IMPACT STRENGTH

HIGH RENEWABLE CONTENT

HIGH HDT

Performance and High Renewable Content with No Compromise

Key Properties and Characteristics

Characteristic	Therma-Tech Value (Units)	FR-ABS Value (Units)
UL94V @ 3.0 mm	V0	V0
UL94V @ 1.6 mm	V0	V0
Tensile Strength	37 (MPa)	38 (MPa)
Tensile Modulus	2.6 (GPa)	2.6 (GPa)
Ball Pressure @ 75 °C	Pass	Pass
Melt Flow Index (2.16 kg)	10 (g/10 min)	45 (g/10 min)

Target Applications

Floreon® Therma-Tech is ideal for:

- Home appliances
- Laptop, computer and TV casings
- Electrical housing and power supplies
- Insulating and construction products
- Automotive, rail & marine components

Floreon

Dura-Tech

Durable Grade

- Ideal alternative to ABS in demanding applications not requiring fire-resistance.
- Strength and impact resistance of exceeds that of common grades of ABS, whilst giving comparative levels of flex and rigidity

Impact Resistance and Safety with a Renewable Feedstock

Characteristic	Dura-Tech Value (Units)	ABS Value (Units)
Tensile Strength	45 (MPa)	45 (MPa)
Tensile Modulus	1.8 (GPa)	1.95 (GPa)
Notched Impact Strength	44 (kJ/m^2)	21 (kJ/m2)
Heat Deflection Temp.	90 (°C)	90 (°C)

Dura-Tech Applications

Floreon® Dura-Tech is food and toy safe and ideal for applications such as:

- Medical products and devices
- Safety products
- Toys & sporting goods
- Non FR electrical goods
- Reusable foodservice items

Floreon

Bio-Tech

Compostable Grade

- Food safe and toy safe
- Meets the certification criteria for Industrial Compostability
- Ideal alternative to high impact polystyrene or other rigid polymer
- Can be processed via injection moulding or extrusion processes

A Plant Based Alternative to HIPS

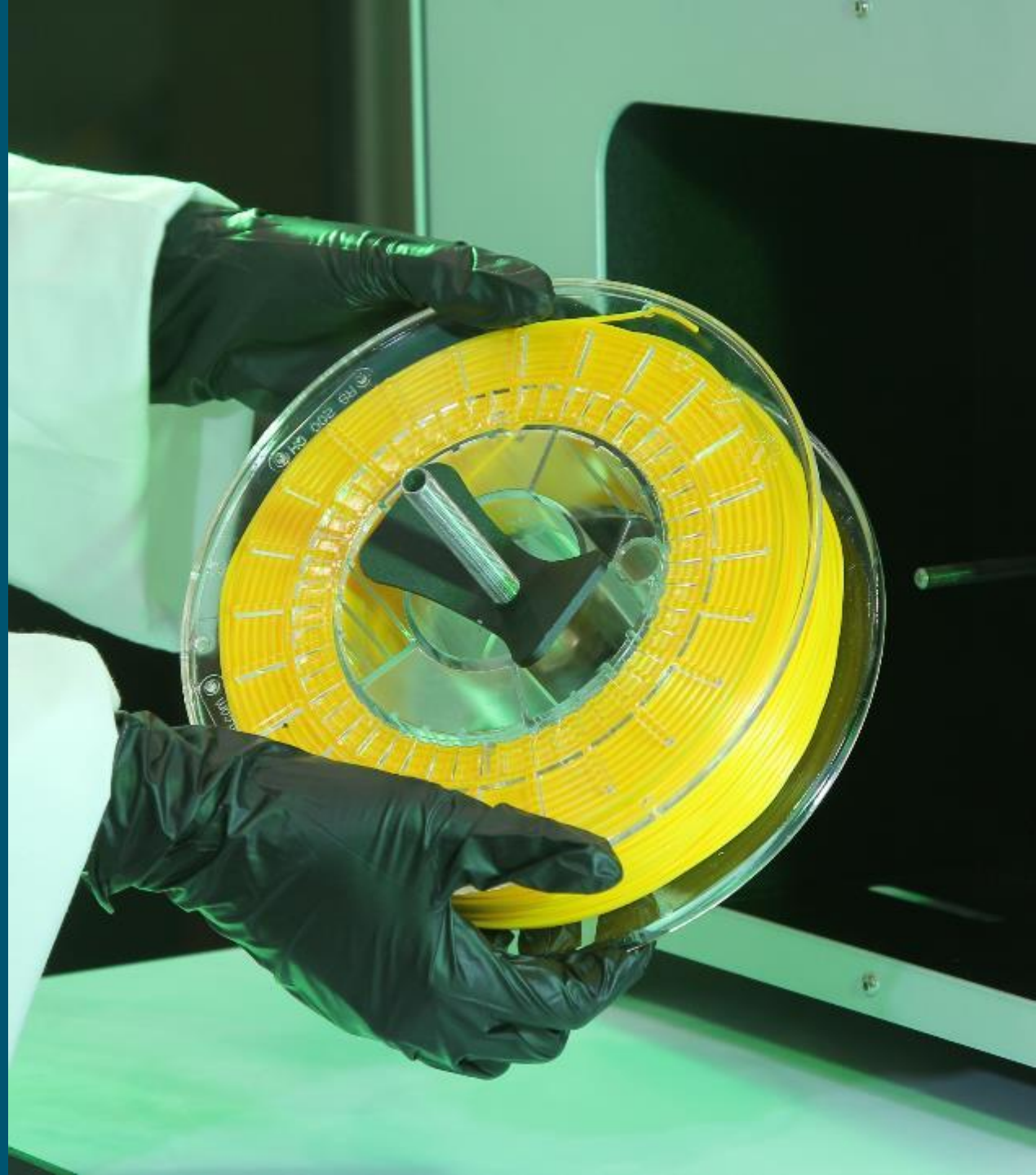
Rigid and Tough with High Thermal Resistance

Characteristic	Bio-Tech Value (Units)
Tensile Strength	47 (MPa)
Tensile Modulus	3.1 (GPa)
Tensile Strain at Break	30 (%)
Heat Deflection Temp.	90 (°C)

Bio-Tech Applications

Floreon® Bio-Tech is food & toy-safe and meets the certification criteria for Industrial Compostability. Applications include:

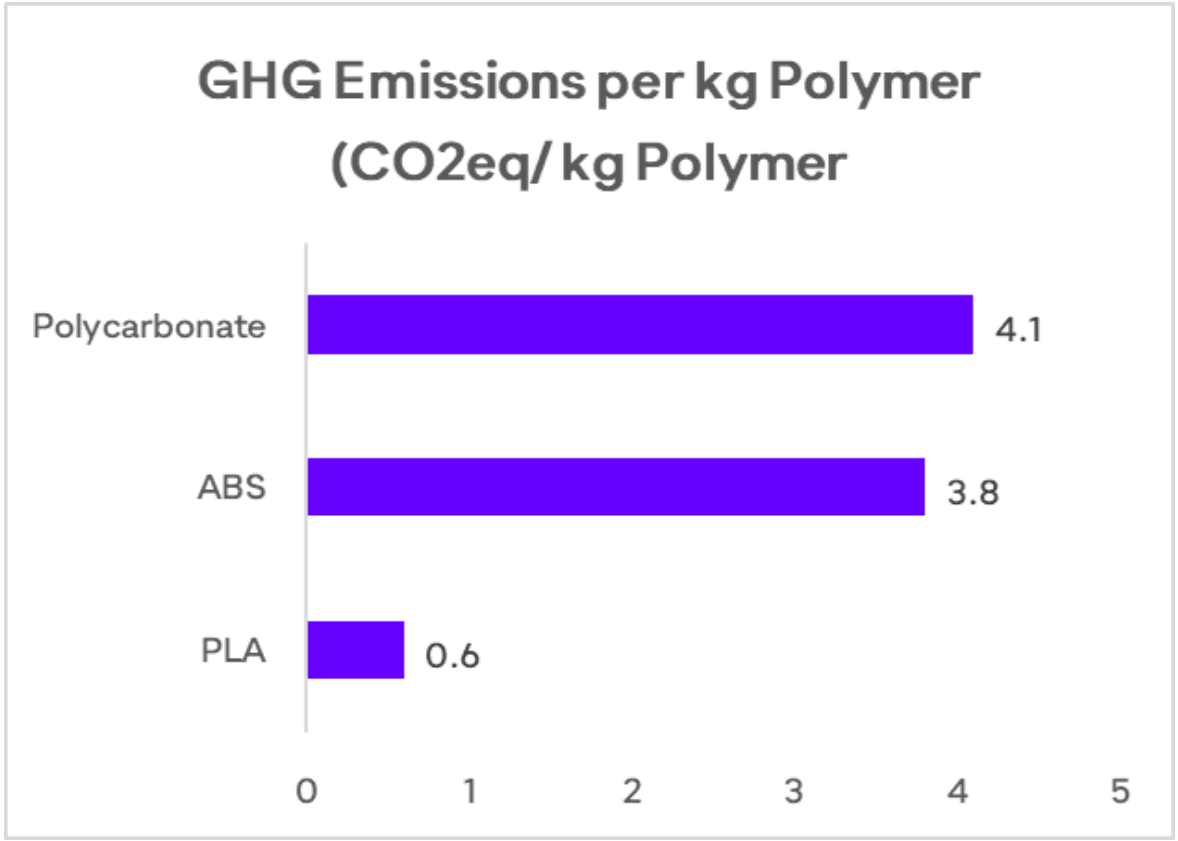
- Extruded sheet products
- Film and fibres
- 3D Printing filament
- Disposable or reusable foodservice items
- Packaging



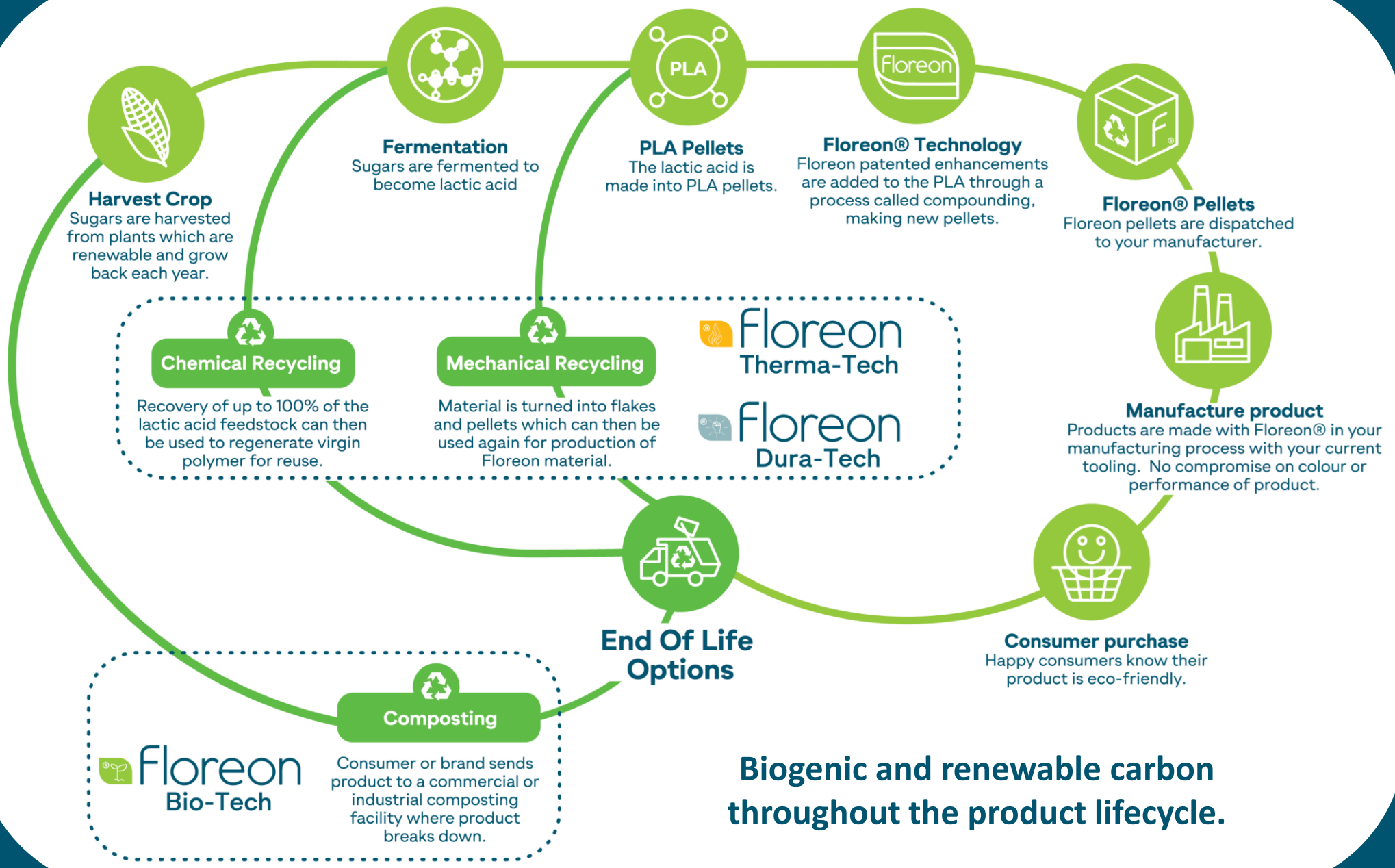
Reducing Product Carbon Footprint

The production of polylactic acid (PLA) is less energy intensive than that of polycarbonate or ABS and uses atmospheric CO_2 (via plants) as a feedstock.

Our independent LCA tool can calculate the emissions reduction Floreon is able to achieve in your application.



Source: Vink & Davies, Industrial Biotechnology, June 2015



Biogenic and renewable carbon throughout the product lifecycle.

VITAL Project

Through the EU funded VITAL project (Inno**V**at**I**ve processing **T**echnologies for bio-based fo**A**med thermop**L**astics) we are substituting fossil-based polymers such as ABS, EVA and PP.

Applications include refrigerator covers, appliance casings and automotive components.

The €5.6 million, EU funded 'VITAL' project aims to generate fundamental knowledge and expertise to substitute synthetic thermoplastics with bio-based alternatives.

Link: https://vital-project.eu/uses-cases/

First commercial application for Floreon…

Floreon is delighted to announce its partnership with Morph, a leading UK manufacturer of modular construction systems.

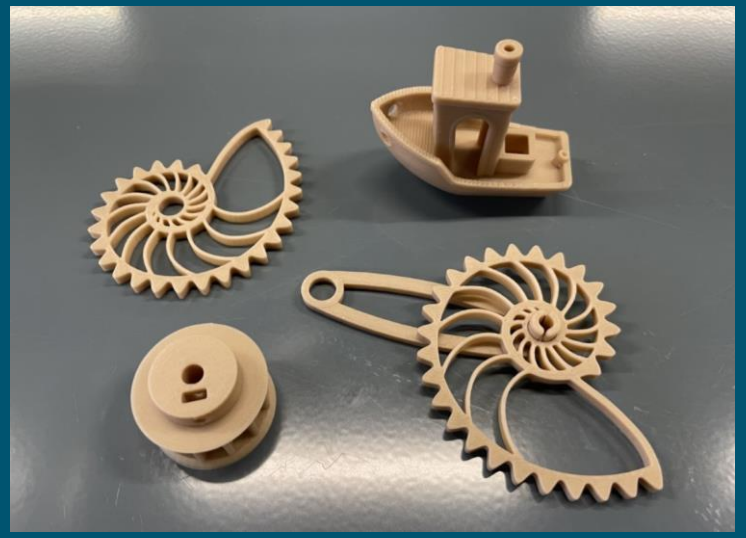
Committed to sustainability and eco-friendly materials, Morph has selected Floreon® Therma-Tech to manufacture their new Morph Therma bricks, responding to market demand for halogen-free, flame-retardant features, coupled with high impact strength.

Morph Therma bricks were used to build Floreon's stand at Plastics Live tradeshow in Coventry.

https://www.morphbricks.com/

Other commercial application

Floreon Therma-Tech now available in 3D print filament, through Spectrum Filaments: Flame-Guard



Filament Spectrum FlameGuard PLA 1.75mm LIGHT GREY 1kg

Spectrum FlameGuard PLA is a halogen-free, flame-retardant filament made from the innovative Floreon® Therma-Tech PLA formula, winner of the 2024 Plastics Industry Association Bioplastics Innovation Award, designed for applications requiring both durabili

Spectrum® FILAMENTS

Material characteristics

- flame retardancy V0 (UL94)
- Halogen-free, environmentally friendly
- Eco-friendly alternative to ABS FR
- 7 times lower carbon footprint than ABS FR
- Similar mechanical properties to ABS FR
- High-temperature resistance, high crystallinity

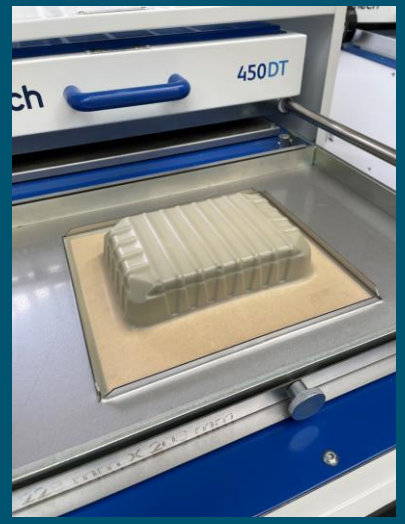
Available colors

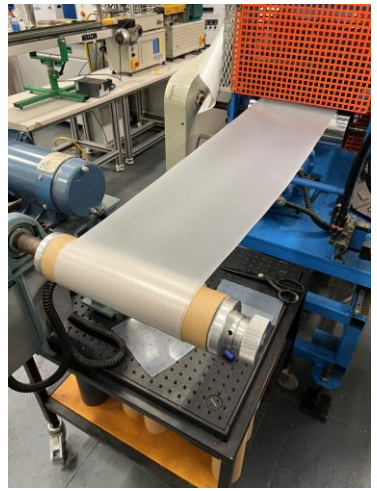
Click on the selected color to enlarge the photo in full screen.

FlameGuard PLA
Spectrum Filaments

Other recent successful trials

- in mono-layer, 3-layer blown films
- in cast films
- in sheet & profile extrusion
- in thermo/vacuum forming



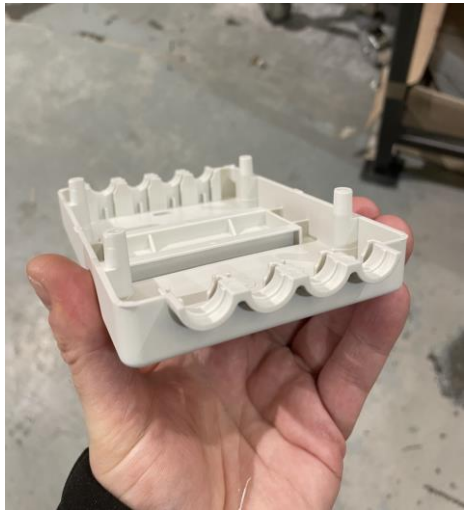


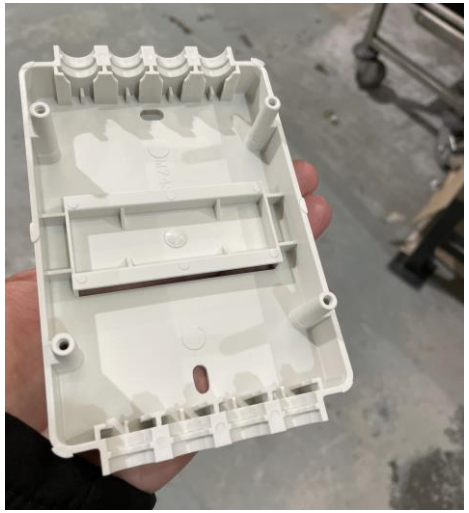
Successful injection moulding trials also for E&E applications, such as enclosures, casings, power supplies

Floreon

Case study 1: FR-ABS replacement
Comparable cycle time
Processing temperature reduced by 40°C

Case study 2: FR-PC replacement
Cycle time reduced by 3s (10%)
Processing temperature reduced by 100°C





Meet the investors backing Floreon Technology

In November 2023 Floreon received a £2M investment from **Northern Gritstone**, and in May 2024 a further £250k co-investment from CPI.

Northern Gritstone are an independent investment company, supporting the leading businesses of tomorrow which emerge from the world-class science and innovation hub that is the North of England today.

CPI Enterprises is the venture capital and investor engagement arm of CPI, a UK-based, leading independent technology innovation centre.

These investments have enabled Floreon to build its team and accelerate the commercialization of its unique patented technology.

Series A extension fundraising round due to launch in Q2’2025.

Floreon

NORTHERN GRITSTONE
THE VALUE OF IDEAS

cpi

Floreon allows new applications for PLA, preserving its environmental benefits whilst offering the performance of engineering plastics for durable applications.

We are targeting high value applications which leverage the added functionality of our technology.

Contact us to discuss how we can work together

E: hello@floreon.com / W: www.floreon.com

Floreon Technology Ltd, Sheffield Technology Parks, Room 106,
Cooper Buildings, Arundel Street, Sheffield, S1 2NS, United Kingdom

Floreon
Redefining PLA

2024 Innovation in Bioplastics Award Winner

The Plastics Industry Awards 2024 Finalist

ASBP The Alliance for Sustainable Building Products ASBP MEMBER

BBIA CHAMPIONING THE INDUSTRIAL BIOECONOMY

MADE IN BRITAIN

Certified B Corporation