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Experts In Rotomoulding Materials

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Rethinking Resources: Pioneering Sustainable Material Solutions for Rotomoulding

Jake Kelly-Walley & Szymon Jedrzejak

Agenda

- Polymer Industry Background
- Looking at Rotomoulding
- Recyclate and Recycling
- Carbon Footprint, Renewables and Biopolymers
- Summary

About Us

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>1,700 Customers

>150 KTA Capacity

>100 KTA Sales

>30 Years Service

>70 Countries

>5,000 Colour Matches

49% PTT GC

45% Colour Powder
37% Natural Granules
14% Natural Powder
4% Speciality Powder

Global Footprint

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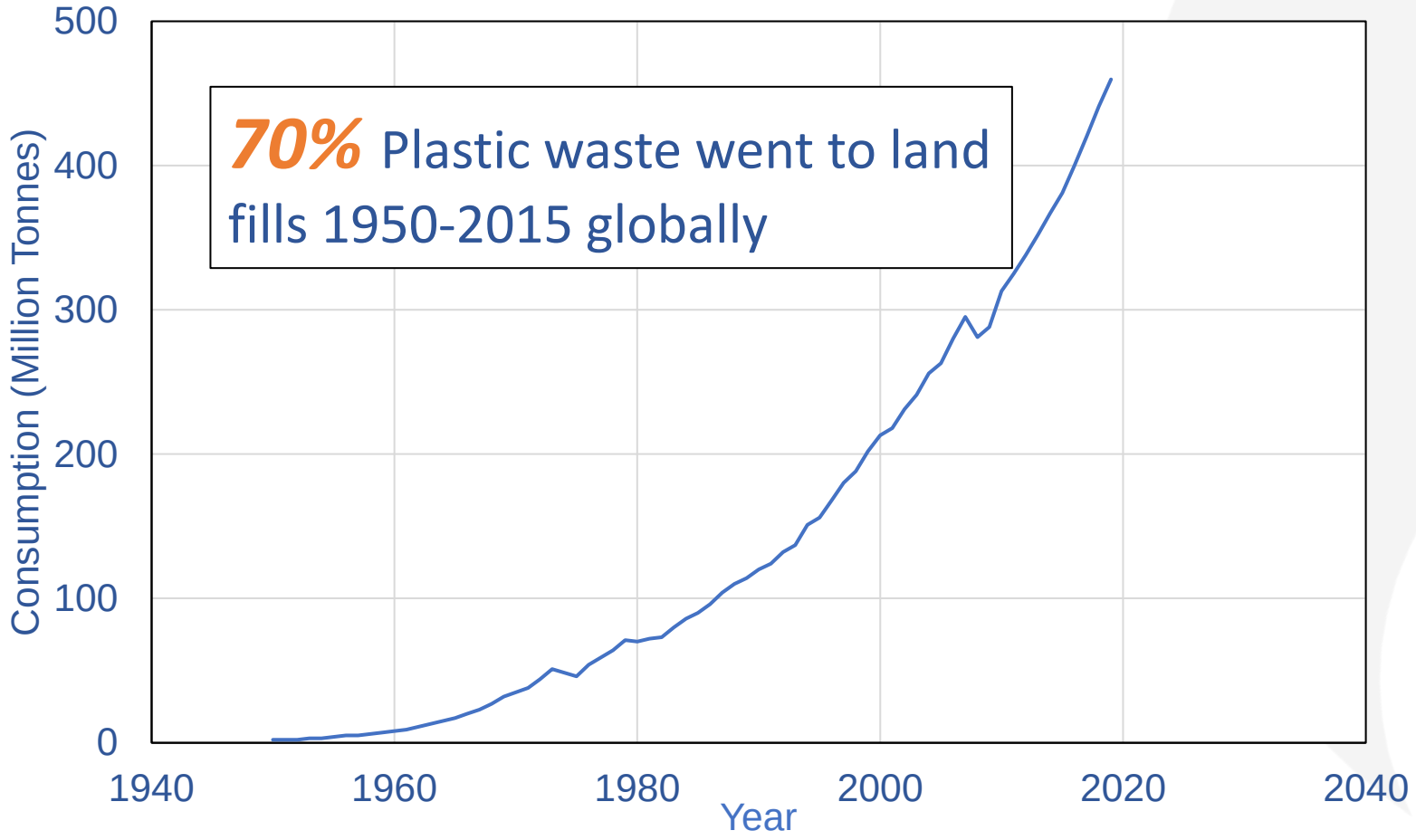
Six Manufacturing Sites Across Three Continents

- Production / Manufacturing
- Technical Services
- Warehousing
- Head Office
- APAC R&D
- European R&D

The Plastics Industry is Growing!

Annual plastic production between 1950 and 2019



Poland significant percentage of European plastics Market

6.8%

27% of Plastic Waste Recycled in Poland

Production has **tripled in Poland in the last 15 years**.

European Parliament, 2021, B. Bara, 2021, European Environmental Agency, 2021, Our World in Data, 2023

Taking a look at the Plastics Industry

Carbon Footprint in Manufacturing

United Nations

WWF

PLASTICS EUROPE
Enabling a sustainable future

- By 2050, based on current projections, production and incineration of plastics will account for 10-13% of the global annual carbon budget
- 11% Plastics production green house gas emissions are from LDPE/LLDPE

Waste Generation and Recycling

United Nations

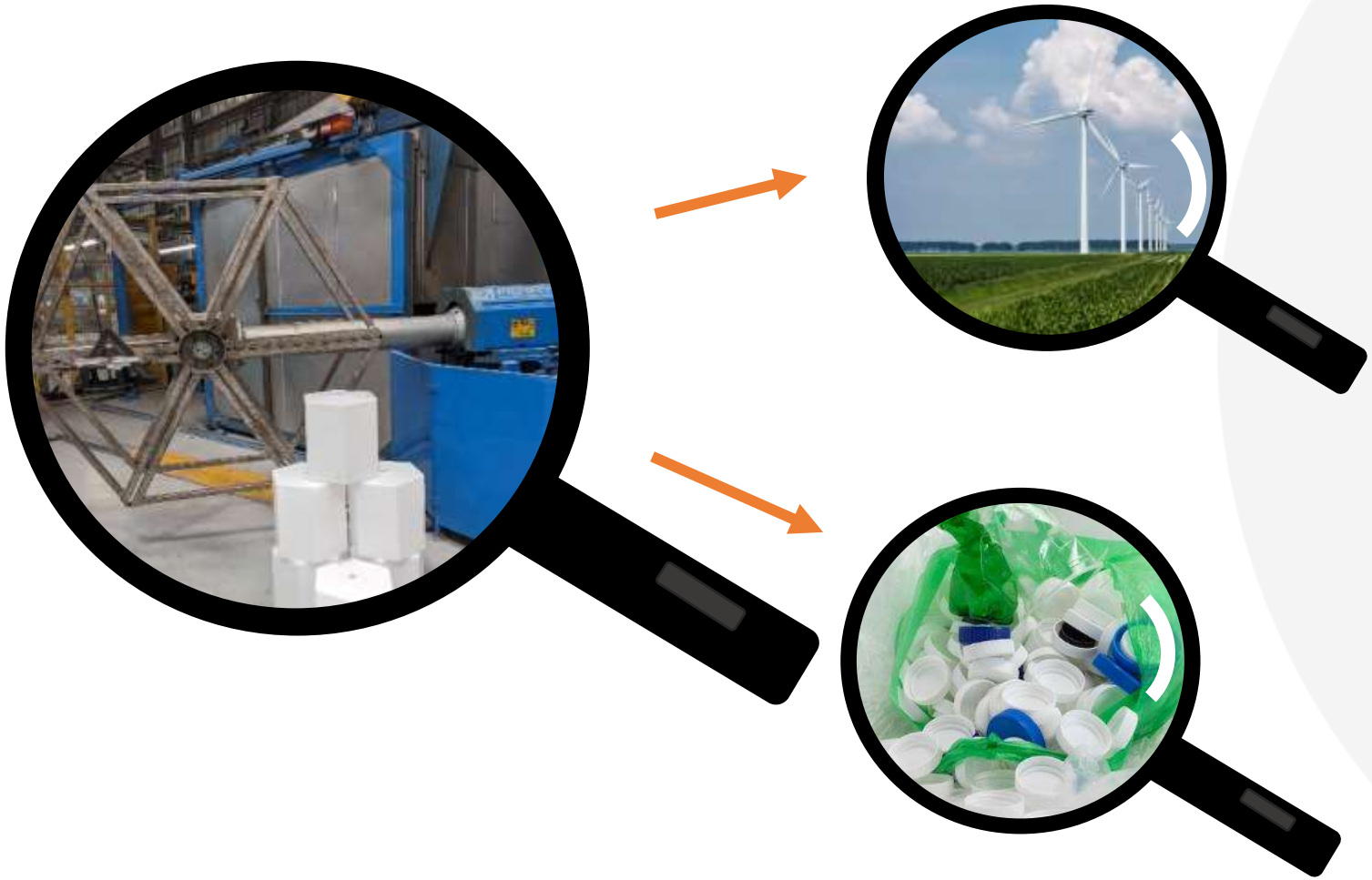
WWF

OECD
BETTER POLICIES FOR BETTER LIVES

- By 2050, more plastic in the ocean than fish
- By 2030, equivalent of a football stadium filled with plastic every day will be in the ocean
- 46% plastic waste is landfilled, 22% mismanaged

No Plastic in Nature, WWF 2022. Jambeck. J, 2020. World Economic Forum, 2016

Taking a look at the Rotomoulding



Carbon Footprint in Manufacturing

- 2-3.5% efficiency calculated for conventional Rotomoulding Process
- Dependent on Gas
- New technologies and process control

Waste Generation and Recycling

- Challenges with processability
- Recycled materials are not always ‘Roto-friendly’
- Relatively low waste

McCourt *et al., 2017*

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Rethinking Resources:

Recyclate and Recycling

Recyclate Materials

Post-Consumer Recyclate (PCR)

- Waste from households
- Not designed for Roto
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Post-Process Material (Regrind)

- Scrap from manufacturing
- Clean and consistent with traceability
- Not regarded by bodies as recyclate

Post Consumer Resin

"Post-consumer resin (PCR), also known as post-consumer recycled content, is plastic material that can no longer be used for its intended purpose. It can be generated by households or by commercial, industrial, and institutional facilities in their role as end-users of the product. PCR is different than PIR (Post-industrial resin/recycled content)."

ASSOCIATION OF PLASTIC RECYCLERS

EcoMould PCR Range

- Consistency and Quality of PCR Feedstock
- Compliant with many internal food standard
- Fully ‘restabilised’ against heat and light degradation
- Established relationship between PCR and performance
- Opportunities to meet future European Commission and EU Directives

Image Courtesy of Moulding Service – water reservoir for washing floor machine

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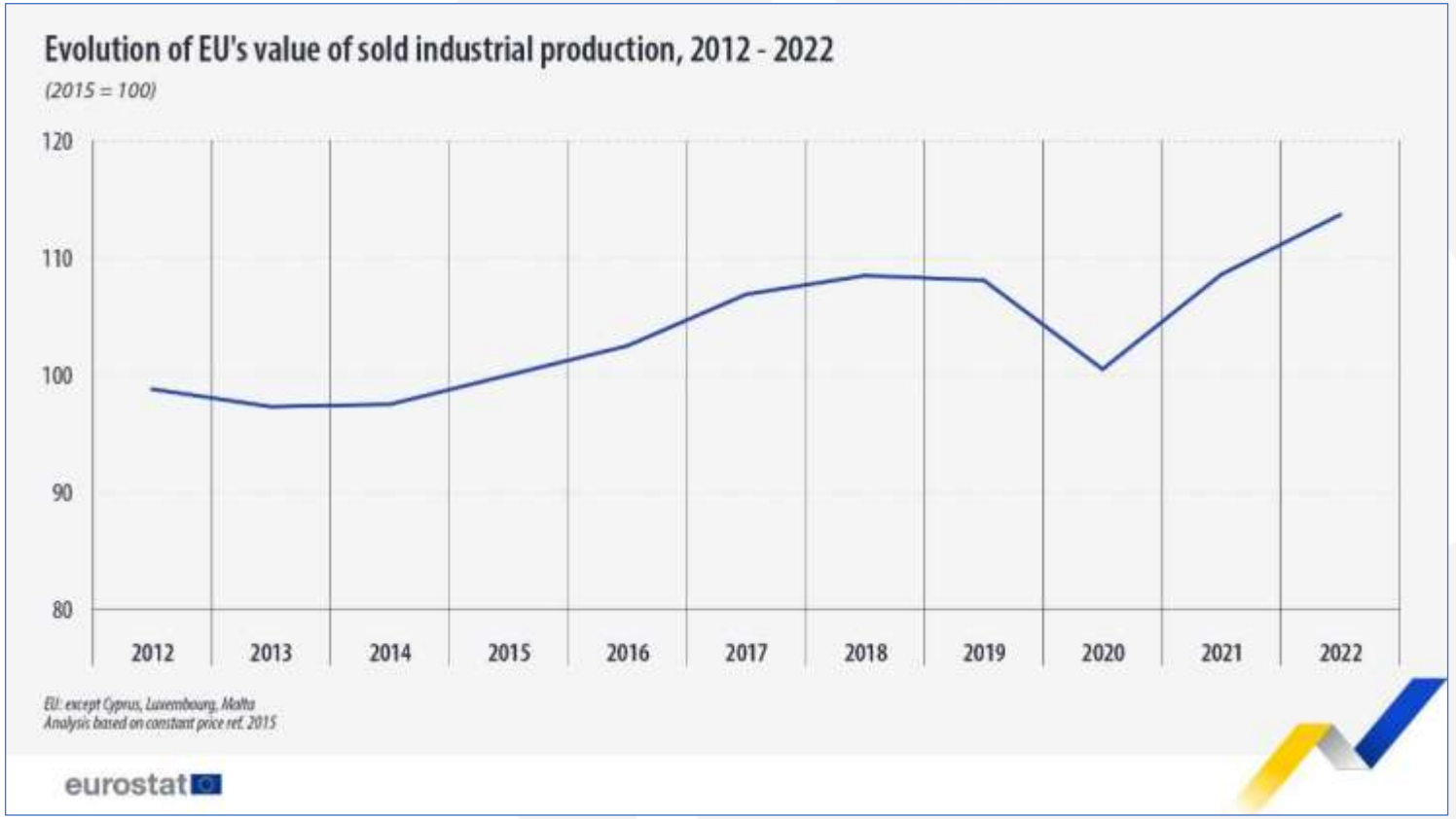
Rethinking Resources:

Renewables and Bio-polymer

Addressing Carbon Footprint

- Optimization of Rotomoulding Process
- Process Control
- Measuring energy consumption
- Using renewable energy

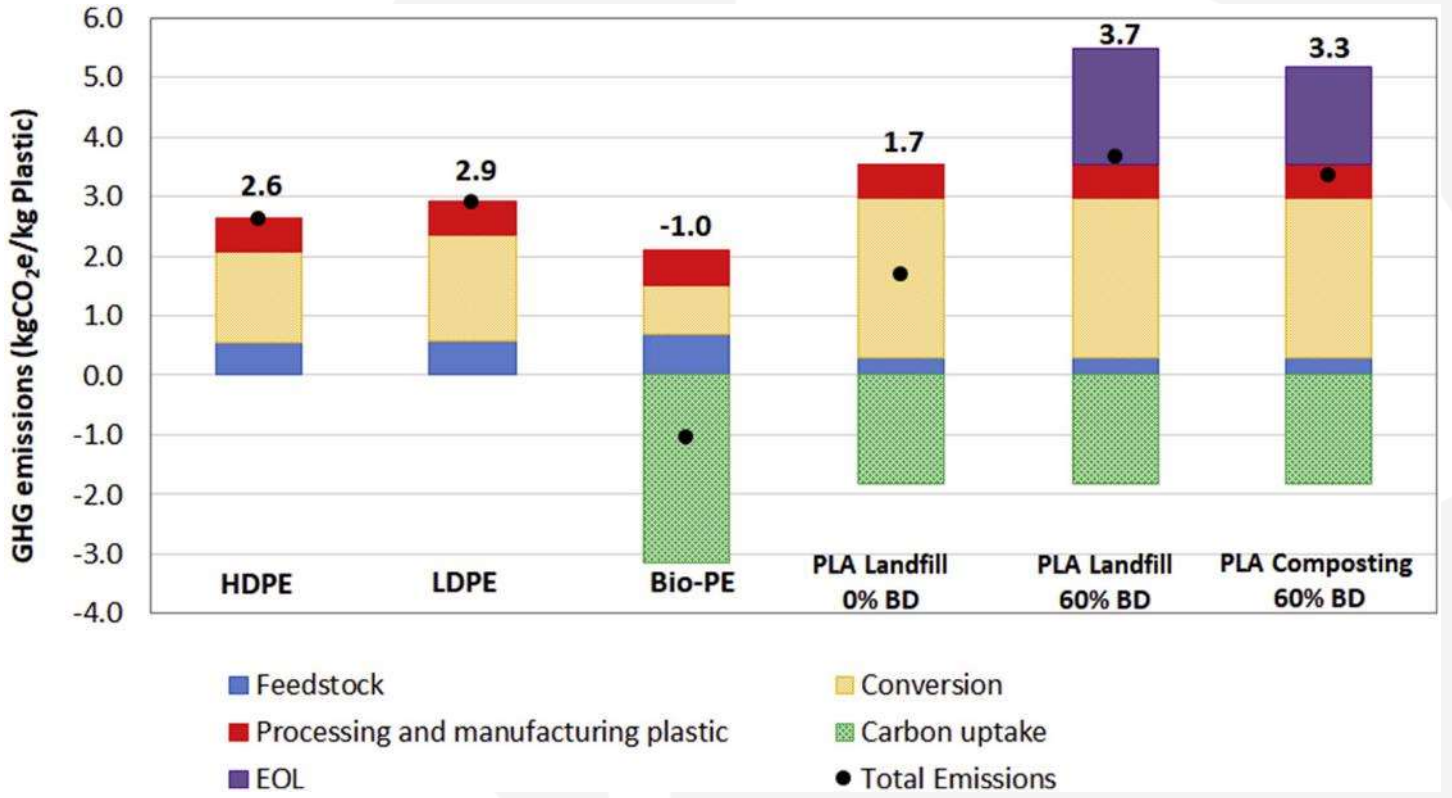
But what about the material you put inside your tool?



Eurostat, 2024

Comparing Fossil and Renewables

- Carbon captured/absorbed during growth of renewable feedstocks, overcoming production emissions



Benavides *et al.*, Journal of Cleaner Production, Volume 277, 2020, 124010, https://doi.org/10.1016/j.jclepro.2020.124010.

Benefits of Biopolymers

Reduction in Carbon Footprint

- Reduction in carbon footprint of final product and operations
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Value to your Business

- Significant value to your organization
- New markets, new applications and increased market advantage

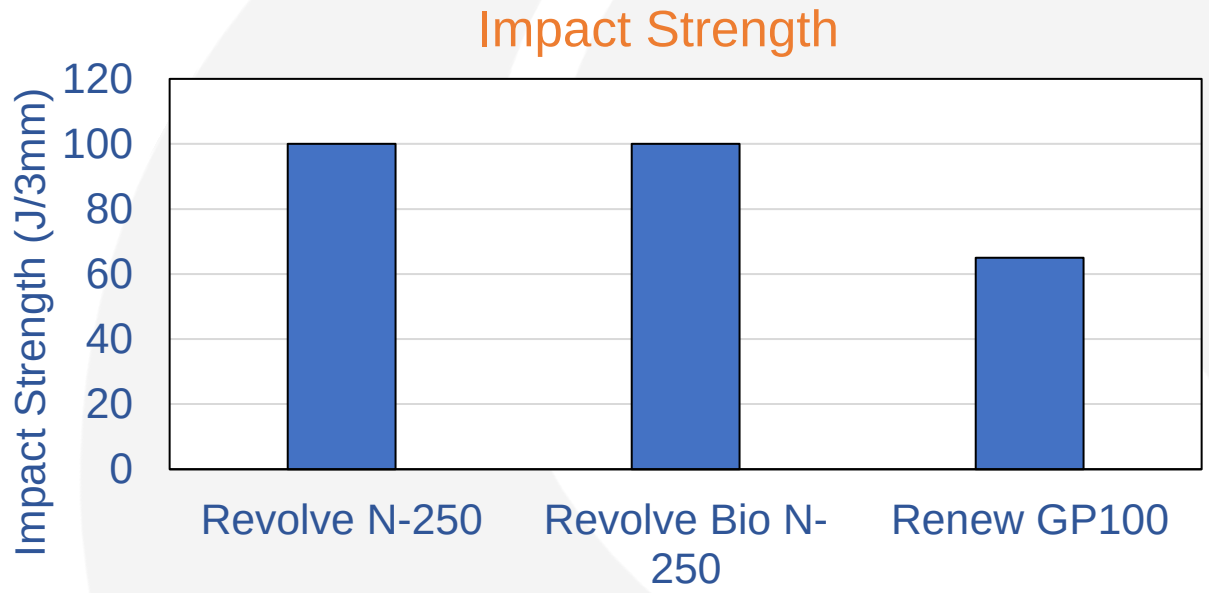
Choosing of Biopolymers

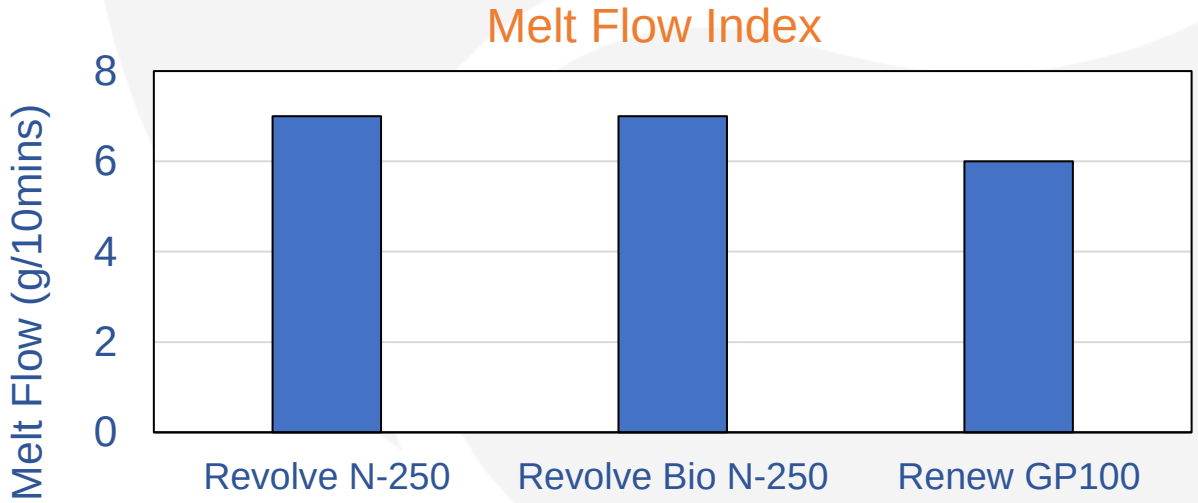
Renew GP100 (Bio-sourced)

- Produced from green ethylene
- Measurable bio-based content (C14) by ASTM test
- Minimum 89% Bio-Content (ASTM D6866)

Revolve N-250 Bio & Revolve N-307 Bio (Mass Balance)

- Drop in solutions
- International Sustainability and Carbon Certification Recognized Method
- Multiple Feedstocks
- Designed for Roto®





UK Innovate Project

- CP Cases, Queen's University and Matrix Polymers joined effort under the project funded by Innovate UK

- This project focuses on revolutionizing rotational moulding by developing bio-polymers paving the way for a more eco-friendly manufacturing process

Sustainability by Material Design

PCR – Post Consumer Recycled
Based on HDPE & LLDPE from blow and injection moulding products and film applications

Bio-polymer – PE based
1. PE based on renewable resource such as sugar cane, starch and maize
2. PE based on crude tall oil, used cooking oil and vegetable oil

Bio-polymer – PA11
100% based on castor oil

Bio-polymer – PLA
Polylactic Acid

Bio-polymer – PHA
Poly-Hydroxyalkanoates

Summary

Matrix Polymers as a leading player in the rotomoulding industry, specializing in rotomoulding powders and offering comprehensive expertise and support.

- Experience: A long history and proven track record in the rotomoulding industry
- Expertise: The company has a deep understanding of the technical aspects of rotomoulding and its capabilities
- Knowledge: Matrix Polymers has an extensive knowledge base on rotomoulding materials and processes, including specific expertise in rotomoulding powders

Matrix Polymers plays a role as a partner for innovation and growth in the rotomoulding industry. Our mission is to assist customers to not only solve technical problems but also in expanding their reach and exploring new markets.

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