Plate Recycling Update

September 2023

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MacDermid GRAPHICS SOLUTIONS

FIA UK

Executive Summary

Plate Recycling Project

FIA UK, users and producers of Flexo Plates recognise the need to dispose of plates in a more effective and sustainable way.

MacDermid have started work to review and assess the possibilities. Two key areas for plate recycling: ‘Corrugated’ and ‘Thin Plate’ sectors.

Two work streams in place:

1. Recycle the plates and generate a new product
2. Manage the waste in a different, more sustainable way

FIA UK Project team established with key UK Flexo companies:

Smurfit Kappa, Coveris, Pro-Shim, Contact, MacDermid

Plate Recycling Workstream 1

MacDermid Workstream 1: Recycling

Take plates – Create new raw material – Create new product

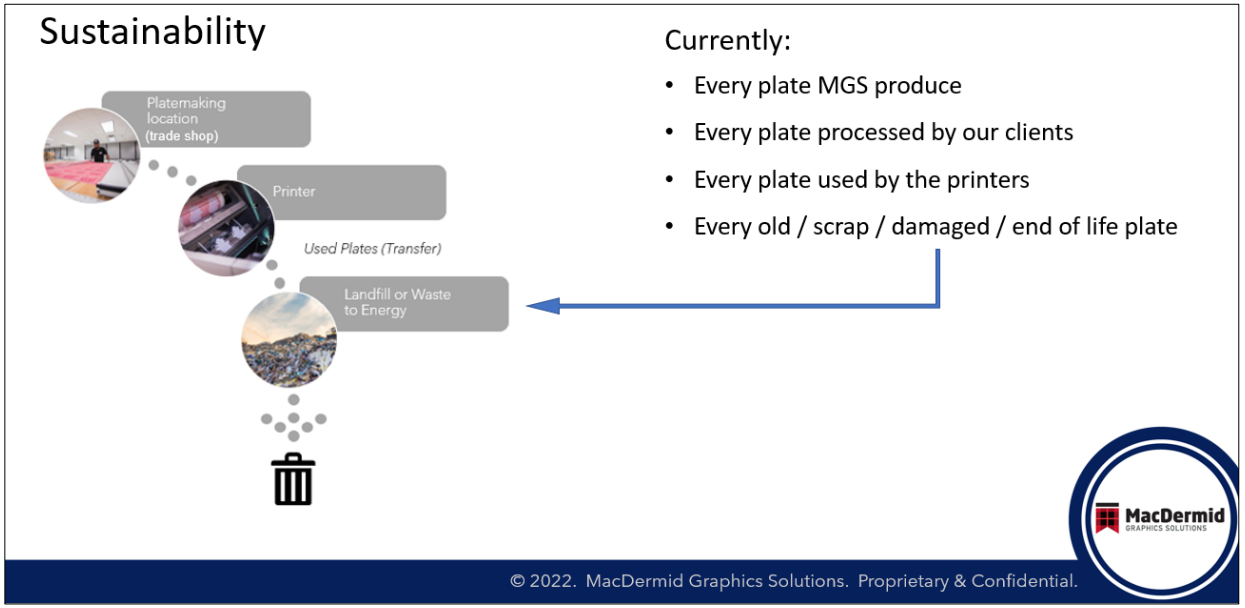

Plate Recycling Workstream 1

MacDermid Workstream 1: Recycling

Desired future state

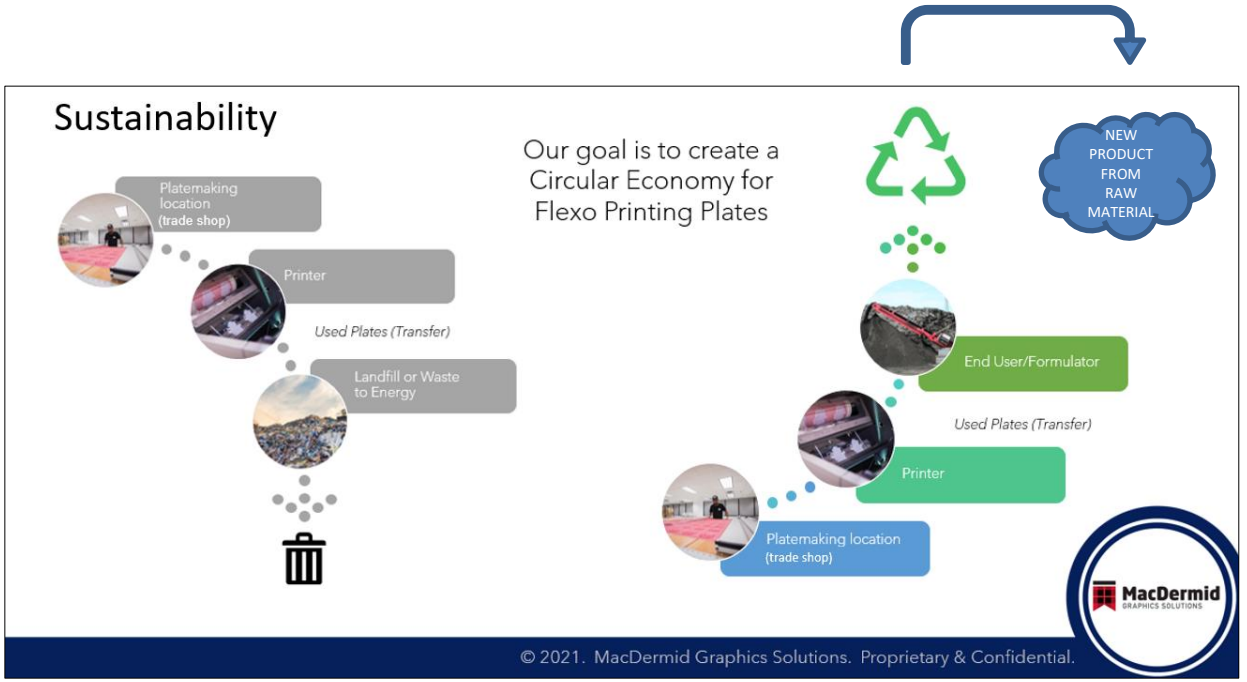

Plate Recycling Workstream 1

MacDermid Workstream 1: Recycling

Phase 1 – Can we recycle and generate a useable new material?

Initial work with ***roofing material*** still progressing. This will include quality / safety testing and validation of product over time, linked to degradation and any potential contamination.

Further 'product' engagement to find alternative sources include:

- ***Floor matting***
- ***Fatigue matting***
- ***Additional Flexo / Print / Packaging related products***
  - Machinery components (R-Bak)
  - Flexo industry related applications
    - ***'NDA work underway'***

Flexo Focused

Plate Recycling Workstream 1

MacDermid Workstream 1: Recycling

Challenges

- Only uses ‘flexo plate’ – Not shims, carriers etc
- 5-10% waste still generated (PET elements and ‘grind purge’)
  - Thus still require waste management
- Infrastructure to collect, grind, store new raw material
- Confirmation of ‘new product’ performance, safety and longevity
- Overall supply chain commercial position

Plate Recycling Workstream 2

MacDermid Workstream 2: Dealing with the waste

Uses **ALL** flexo plate scenarios (thin plate, corrugated shims, water wash, liquid, material mix, plate processing method, ink system).

USA connection with the Consortium for Waste Circularity (CWC), based in Florida USA: ***Regenerative Gasification.***
Production of Eco-Methanol to use in creation of new products.

Plate Recycling Workstream 2

Workstream 2: Regenerative Gasification

- MGS actively testing – Plates and blotter are good ‘ingredients!
- Existing infrastructure – 320 sites in Europe, 682 in Asia, 253 in USA *
- All waste used – No breaking down of products (key for Corrugated)

Flexography’s Sustainable Circular Future: Plates & Packaging - Flexographic Technical Association

(link to CWC presentation – information from 5m 18s)

*** : Waste management and collection infrastructure**

Plates

Blotter

Plate Recycling Workstream 2

Workstream 2: Regenerative Gasification

- Project Team met with CWC for introduction and presentation on the technology – 25th August 2022
- Clarification of the process and opportunity for questions

- **Key Points:**
  - Requires significant investment – Council / Government level
  - Not just linked to plates – Deals with ‘waste’
  - Piggyback on existing collection / land fill ‘supply chain’
  - USA driven by CWC, although opportunities to support and influence here in the UK & Europe
  - Timing – 2024+
  - Provides a solution for all plates, whatever the combination or complexity of product, and the ‘state’ of the product

Plate Recycling Workstream 2

Workstream 2: Regenerative Gasification

- CWC Gasification Process - key differences:
  - More controlled burn process
  - Collects specific vapours chemically
  - New technology differing from existing ‘waste to energy’ process

Benefits over Workstream 1:

- Deals with 100% of the waste
- Longer term solution
- Can work in conjunction with existing recycle / reuse processes

<u>Challenges</u>

- Timeline: 2024+
- Cost: Significant investment in the new technology (£m)

Next Steps

Next Steps

- **<u>Workstream 1, Plate Recycling</u>:**
  - Focus on UK specific route - cryogenic grinding & supply chain
  - Continue testing with alternative ‘new product’ routes within the Flexo Industry - throughout 2023, US led by MGS Atlanta
- **<u>Workstream 2, CWC Gasification</u>:**
  - Continue to work with CWC for progress updates
  - Review of the CWC technology and if UK options available (review other similar processes in UK & Europe)
  - Link UK clients to CWC as part of their project development and wider engagement program

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