



Chemical Recycling Legislative Update

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Polymer Chemical Recycling - Glossary

Chemical Recycling – the recovery of polymeric constituents:

- by chemical depolymerisation
- by heat

Produces:

- monomers for direct reuse in polymerisation.
- liquid/gas/solids for further recovery and reuse in diverse applications

Monomer Recycling – the process of breaking down a polymer to its monomer constituents and then reusing the monomers directly for repolymerisation

Feedstock Recycling (pyrolysis) – is the thermal degradation of plastic waste at different temperatures (300–900°C), in the absence of oxygen, plus a catalyst to produce liquid, gas and solid hydrocarbon products.



Monomer Recycling - Legislation

The Framework Regulation

Regulation (EC) No 1935/2004 of the European Parliament and of The Council of 27th October 2004 on Materials and Articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC.

The Mechanical Recycling Regulation

Commission Regulation (EC) No. 282/2008 of 27th March 2008 on Recycled Plastic Materials and Articles intended to come into contact with foods and amending regulation (EC) No. 2023/2006.

The Plastics Regulation

Commission Regulation (EU) No. 10/2011 of 14th January 2011 on Plastic Materials and Articles intended to come into contact with food.

The GMP Regulation

Commission Regulation (EC) No. 2023/2006 of 22nd December 2006 on good manufacturing practice for materials and articles intended to come into contact with food.

The REACH Regulation

Regulation (EC) No 1907/2006 of the European Parliament and of The Council of 18th December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

Read the Regulations and the Guidance Documents

Read the “Whereas.....” as these explain what the Legislation is doing and why it is doing it.

Read the Guidance documents, They are easier than the Legislation.

Plastics Legislation (GMP, Recycling, Food Contact)

https://ec.europa.eu/food/safety/chemical_safety/food_contact_materials/legislation_en

Chemicals Legislation (REACH)

<https://echa.europa.eu/guidance-documents/guidance-on-reach>

The Framework Regulation

Regulation (EC) No 1935/2004 of the European Parliament and of The Council of 27th October 2004 on Materials and Articles intended to come into contact with food and repealing Directives 80/590/EEC and 89/109/EEC.

Whereas 3

The principle underlying this Regulation is that any material or article intended to come into contact directly or indirectly with food must be sufficiently inert to preclude substances from being transferred to food in quantities large enough to endanger human health or to bring about an unacceptable change in the composition of the food or a deterioration in its organoleptic properties.

The Framework Regulation covers a wide range of regulatory measures for all materials that can come into contact with food.

Specific reference to **Article 16**

Declaration of compliance – this is a general requirement in legislation but **The Plastics Regulation** has specific DoC requirements which include the whole plastics value chain, from raw mat. supplier to final article manufacturer.

The Mechanical Recycling Regulation

Commission Regulation (EC) No. 282/2008 of 27th March 2008 on Recycled Plastic Materials and Articles intended to come into contact with foods and amending regulation (EC) No. 2023/2006.

Article 1

Subject matter and scope

1.

2. This Regulation shall not apply to the following recycled plastic materials and articles, provided that they have been manufactured according to good manufacturing practice, as laid down in **(The GMP Regulation)** Regulation (EC) No 2023/2006:

(a) recycled plastic materials and articles made with monomers and starting substances, derived from chemical depolymerisation of plastic materials and articles;

The Mechanical Recycling Regulation excludes Chemical Recycling

The Plastics Regulation

Commission Regulation (EU) No. 10/2011 of 14th January 2011 on Plastic Materials and Articles intended to come into contact with food.

Article 8

General requirement on substances

Substances used in the manufacture of plastic layers in plastic materials and articles shall be of a technical quality and a purity suitable for the intended and foreseeable use of the materials or articles. The composition shall be known to the manufacturer of the substance and made available to the competent authorities on request.

The Plastics Regulation includes monomers from Polymer depolymerisation

It is incumbent on monomer recyclers to produce monomers of the technical quality and at a purity that is required for polymer manufacture.

They must align with already listed monomers, or they must apply to EFSA for an approval of a new substance.



Monomer Recycling - Legislation

The REACH Regulation (highly complex)

Regulation (EC) No 1907/2006 of the European Parliament and of The Council of 18th December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC

The REACH Regulation covers the manufacture and importation of substances. Monomers are substances and so they are subject to REACH. Monomer recycling manufacturers and importers must register the monomers they make.

If the monomers are of the same Technical Quality and Purity as existing registered monomers they can join the substance (monomer) Joint Submissions.

If they are not equivalent, they must register separately.

If there are no existing registrations then a new registration must be prepared.

The GMP Regulation

Commission Regulation(EC) No. 2023/2006 of 22nd December 2006 on good manufacturing practice for materials and articles intended to come into contact with food.

Article 1

Subject matter

This Regulation lays down the rules on good manufacturing practice (GMP) for the groups of materials and articles intended to come into contact with food (hereafter referred to as materials and articles) listed in Annex I to Regulation (EC) No 1935/2004 and combinations of those materials and articles or recycled materials and articles used in those materials and articles.

Article 2

Scope

This Regulation shall apply to all sectors and to all stages of manufacture, processing and distribution of materials and articles, up to but excluding the production of starting substances (monomers).

Flake Injection Recycling

Flake Injection (FI) is Chemical Recycling. It is not Monomer Recycling. It is a hybrid process. It is legislated by The Mechanical Recycling Regulation, The Plastics Regulation and by The GMP Regulation.

Why is FI different from Monomer recycling?

Mechanically recovered PCR flake (per **The Mechanical Recycling Regulation**) is fed directly into a PET manufacturing plant where it is internally depolymerised, cleaned and then repolymerised. The output is virgin quality, % recycle content, PET which is subject to **The Plastics Regulation**.

EFSA opinion states **Flake Injection** is a Chemical Recycling process, however it is subject to **The GMP Regulation** as it produces a food contact material (a polymer).

It is a polymer in, polymer out, recycling process and is probably exempt from **The REACH Regulation (TBD)**.



Monomer Recycling - Legislation

The Future.....

The Commission is going to produce Legislation to include Chemical Recycling.

The legislation is not even in draft stage, hints were:

Some exemptions to that legislation.

Better enforcement.

Requirement to ensure no genotoxins can pass to consumers.

and.....

will almost certainly be affected by the EU Chemicals Sustainability Strategy



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