



Specific requirements for recycling processes in the chemical industry

Version: RC² 1.0

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1 Introduction

The production of chemical products emits considerable amounts of greenhouse gases and causes direct environmental damage. Reducing emissions and protecting natural resources are important goals that can be achieved in part by recycling of materials that are already in circulation. Organic as well as inorganic materials can be recovered using both chemical and mechanical methods, and in both cases the provisions in sections 5.3 and 5.5 of the scheme document "Scheme principles for the certification of sustainable material flows in the chemical industry" apply. The definition of "recycled materials" used here is based on the definition of the term in ISO 14021:2016.

The requirement criteria outlined in this document apply to suppliers and conversion plants – including upstream and downstream companies – in the chemical industry. To determine the companies and production units to be certified, please refer to the REDcert² scheme document for the chemical industry. The minimum quantity of mineral or fossil-based raw materials to be replaced in the production process is identical to the requirements for fossil-based raw materials in the REDcert² system for the chemical industry (20%).

Chemical recycling can, for example, consist of the pyrolysis of used plastics, the solvolysis of polymers or extraction processes. Chemical recycling usually results in virgin grade intermediates or, in the case of pyrolysis, raw materials (pyrolysis oil).

Mechanical recycling includes, for example, granulation and compounding, distillation or sublimation. In general, the term "mechanical recycling" is used whenever recovery is based on physical rather than chemical methods and the chemical identity of a substance is not permanently changed by the process. Mechanical recycling always produces intermediates, which usually lose some of their physical properties during the process. In the subsequent production steps, mechanically recycled compounds must be managed within a mass balance system in line with the requirements of the REDcert-EU document "Scheme principles for mass balancing".

2 Requirements for specific recycling processes

2.1 Chemical recycling of polymers by mono- or oligomerisation

If a polymer containing waste is converted back into monomers or oligomers by an appropriate chemical process, this process represents a form of chemical recycling in the REDcert² scheme for the chemical industry. As an alternative to the conventional mass balance approach, methods for determining the final chain length and thus the savings in fossil-based raw material are particularly suitable here (monomer counting or carbon counting). Materials recovered this way (e.g. oligomers), which are not listed in the conventional bill of material, may be added to the process. The prerequisite is that the reaction product allows a clear conclusion to be drawn about the total amount of raw materials saved.

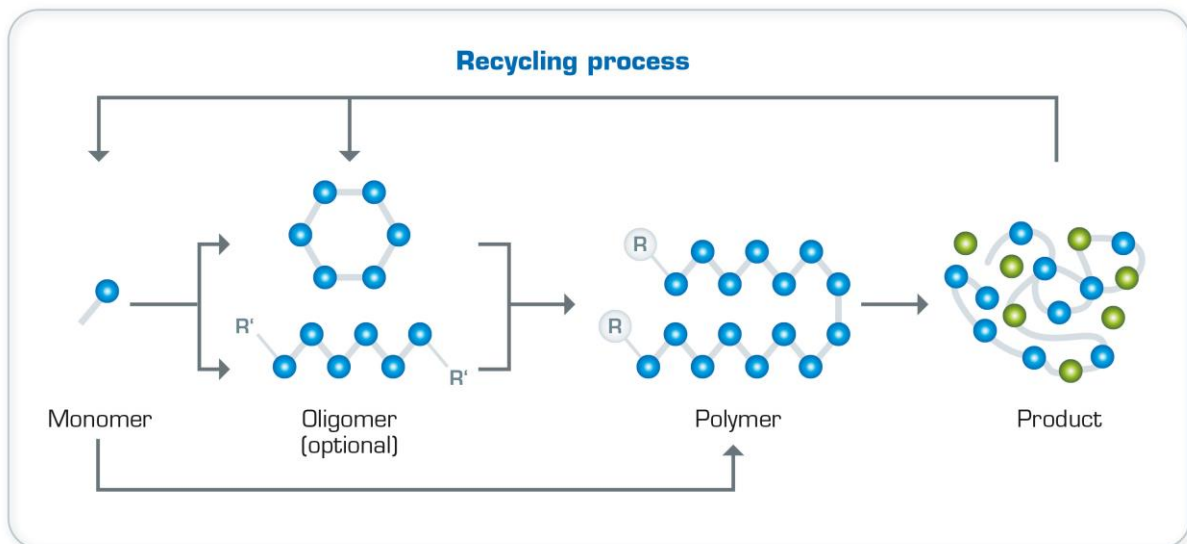


Figure 1: Diagram of the manufacturing process of a polymer and subsequent chemical recycling by mono- or oligomerisation.

To determine the recycled content in the polymer, the provisions in section 5.2 apply. The paragraph "Negligible aggregates" applies in the case of polymers to their end groups and fillers. In concrete terms, this means that possible end groups and fillers are evaluated according to their share by mass in the polymer: if this is less than 1%, it is negligible. If it is between 1% and 5%, it is necessary to compensate either according to the actual value or according to the product-specific average with an additional surcharge of 10%.

2.2 Recycling carbonates from waste materials

Metal carbonates are important raw materials for construction materials, glass and paints as well as neutralising agents in the chemical industry and agriculture, which means that by implementing and certifying suitable recycling processes, we can promote the more efficient use of naturally occurring mineral raw material sources.

Traceability along the entire production and supply chain that produces or uses recycled metal carbonates must be ensured through a mass balance system, which must be operated in accordance with the requirements of the REDcert-EU scheme document "Scheme principles for mass balancing". In this case, the information and traceability system applies from the moment when waste containing metal carbonate, collected separately or from a sorting facility, is used to produce mechanically recycled metal carbonates.

Certified sustainable, recycled metal carbonates can replace their respective mineral equivalents in conventional products. In addition, they can be used in individual cases to substitute related metal-containing carbonates and bicarbonates of mineral origin, provided that their function in the product to be certified is exactly the same as the function of the metal carbonate of mineral origin in the conventional product ("function-based substitution", for example in the case of fillers or to adjust the pH value).

If the metal carbonates were recovered from biogenic waste (e.g. eggshells), they are also considered biogenic as defined in the REDcert-EU scheme document "Scope and basic scheme requirements". Metal carbonates may generally be chemically converted during the production of the recycled carbonates (e.g. to hydrogen carbonates or intermediate CO₂). This is not considered a separate conversion step.

2.2.1 Additional advertising claims

- "X% of the mineral raw materials required to manufacture this product have been replaced by sustainably recovered raw materials."
- "X% of the mineral [material] required to manufacture this product have been replaced by sustainably recovered [material]."
- "(Inorganic) resource-saving product."
- "(Inorganic) resource-saving product due to the use of certified sustainable recycled materials in the value chain."

- “This product supports/initiates/results in/comes with a xx% substitution of inorganic primary material by certified sustainable recycled material in the value chain.”
- “In this product, xx% of the primary [material] in the value chain has been replaced by certified sustainable recycled [material].”
- “By purchasing this product, xx% of the [material] used to make the product is replaced with certified sustainable recycled [material].”

Product claims with other wording are only permitted in individual cases and after individual review or approval by REDcert.

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