InnoChem Service
Sustainable Excellence

Packaging cosmetico 100% riciclato: limiti e opportunità

Dott. Chiara Franzini Cappelletti

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SICC
Società Italiana di Chimica e Scienze Cosmetologiche

INNOCHEM SERVICE is a consulting and services company specialized for industrial processes and industrial chemistry such catalysts, metals, inorganics, polymers, detergents, cosmetics

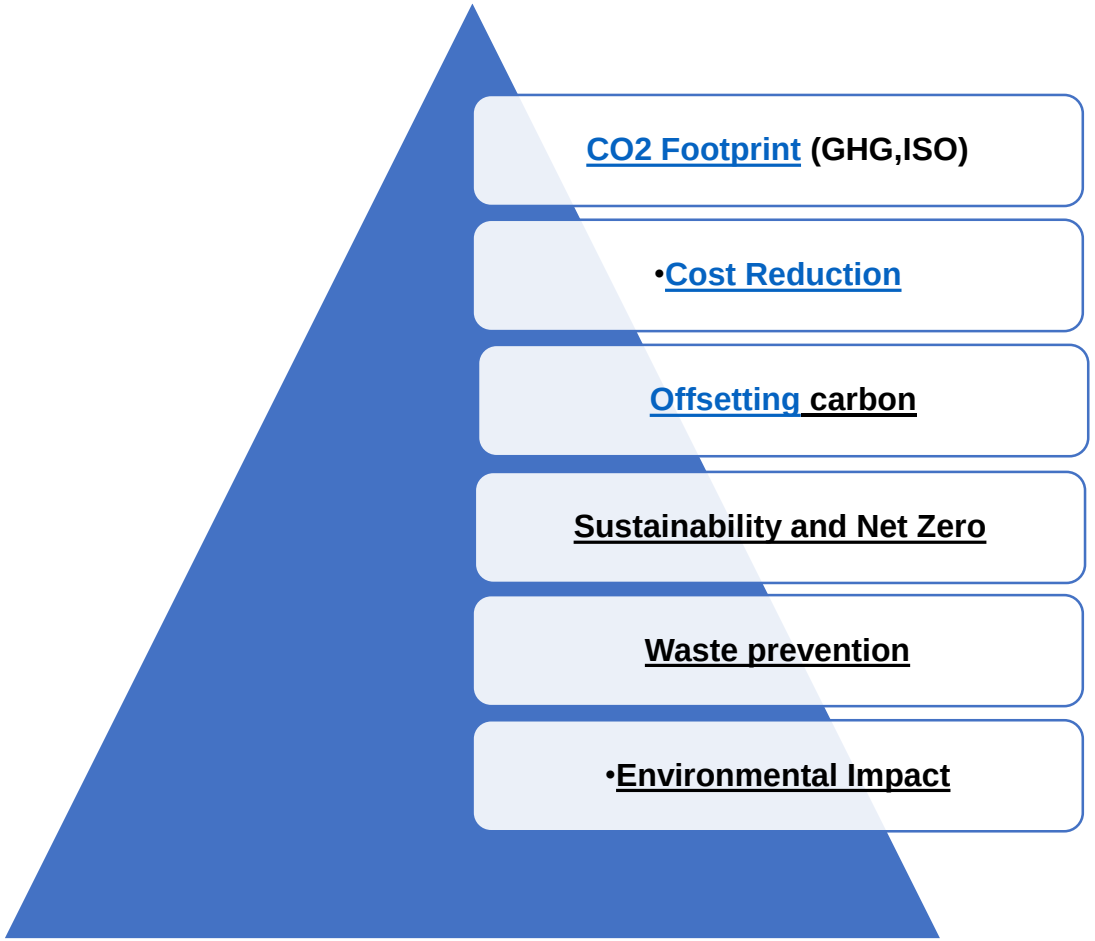
InnoChem Regulatory and sustainabily

Carbon foot print (GHG, ISO)
Sustainability and Net Zero
Prevent waste
Compliance and regulatory

InnoChem Innovation and OpEx

Problem solving
Process standardization
Root-cause analysis
Process chemistry
Operational Excellence
Value asset mapping

From A to Zero CO_2



The challenges for the chemical industry offsetting & carbon project development

Our Vision
We imagine a healthy, prosperous world in which societies are forever committed to caring for and valuing nature, for the long-term benefit of people and all life on Earth

Our mission
is to lead the way in delivering sustainable business solutions that deliver true value for both climate and client.

A tough question

When it comes to the beauty industry, **packaging** plays an important role not only to identify the brands but also catch the customers' eyes.

But have you ever thought about the beauty products you're using may have already contributed damages to our mother earth?

packaging

There are several types of packaging materials available and suitable for a variety of cosmetic products. Materials used commonly are glass, metals, plastics.

Background and challenges regarding cosmetic products packaging

The development of a packaging for a cosmetics product needs to take account of a number of factors. It should meet:

a) The required **technical performance of the pack**, e.g. product protection, compatibility with product, filling line performance.

b) The requirements of the Cosmetics Regulation for safety assessment (i.e. the packaging must not negatively impact the safety of the cosmetic formulation)

c) Requirements regarding **REACH**, the Packaging and Packaging Waste Directive 94/62/EC and other legislation

Properties of cosmetics

Physical properties

- The material should be impervious to any possible **contaminants.**
- The container must be able to withstand with heat if the processing include sterilization.
- The surface must be capable of **clear labeling.**
- The packaging must have a suitable size, thus, rubber may presents problem if it perishes.
- The material must **protect from light** if necessary, i.e., it must be ultraviolet absorbent.
- The container **must not absorb substance** from the product.

Properties of cosmetics

Chemical properties

- The container and the closures should not react together, either alone or in the presence of the product. This can occur with certain combination of dissimilar materials.
- The product should not react with the container or closure, as might happen if alkaline substances are placed in aluminum containers.
- Substance must not be extracted from the product, such as the loss of bactericides from glass, plasticizers from plastics etc.

Biological properties

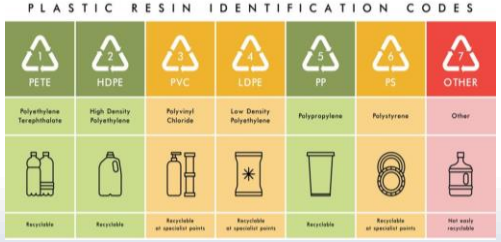
- The material of the container must be able to withstand attack by insects if this hazard is likely to be encountered.
- The packaging should not support mold growth. The risk is greatest with cellulosic substance and if the use of such materials is unavoidable, the attack may be minimized by impregnation.

The Different Types of Material for Your Cosmetics Packaging

The material of the container is made from, can affect everything from cost, how the container is used, and the aesthetic of the packaging.

Plastic - Works well for a wide variety of cosmetic products. However, it's not as simple as choosing plastic.

- **LDPE** is a great option for having a little bit more flexibility for squeeze bottles and tubes.
- **PET** is good for if you're looking for something more rigid and transparent like for spray bottles and jars of makeup.
- **HDPE** offers many of the same benefits of PET except it is lacking in transparency because of its natural color.



Classification of input stream

The input materials for the recycling processes play an important role in the risk assessment of the recyclates. As expected, the recollection system has an influence on the contamination levels of the recyclates. The input materials for a recycling process can be divided into the following different categories (EU 2005):

Class 1 : are post-industrial materials, which are remaining from production.

Class 2 : are post-consumer materials for well-known applications, which are recollected as pure grade by the recycler. (PET bottles)

Class 3 are post-consumer materials recollected from mixed plastics collections and contain all kinds of packaging. (all-waste)

Class 4 are post-consumer materials, that had been chemically reprocessed by depolymerization into monomers or oligomers

What is Recycled plastic PCR?

PCR, Post-consumer packaging refers to the incorporation of materials that consumers have already used and discarded for recycling.

Changing the way we make, things we use, and our lifestyle!

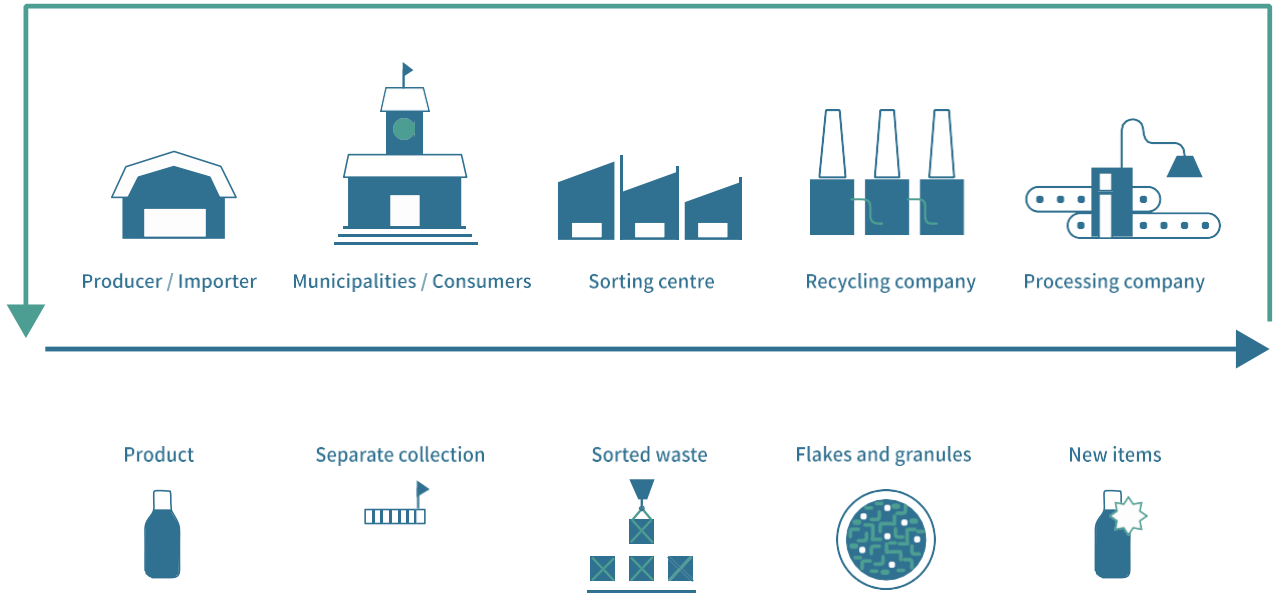
Recently, as we are more and more aware of environmental issues, cosmetics brands have been devoting themselves to finding eco-friendly packaging to save the carbon footprint. Among all eco-friendly packaging, **PCR plastic** packaging must be the most well-known and most used in the industry.

Is PCR plastic biodegradable?

No, PCR plastic is not biodegradable. Biodegradable packaging naturally breaks down into non-toxic component substances once consigned to a compost heap, whereas PCR packaging has already achieved the goal of sustainability before the consumer even purchases it, with no need for further reprocessing.

Is PCR plastic recyclable?

Yes, PCR plastic is recyclable, even they have already been recycled once. Just like the virgin ones, please place them into the proper recycle bin.



During each recycling process, the materials can begin to lose its substance/quality, which is why there are high-grade recyclates and low-grade recyclates

What makes a product recyclable?

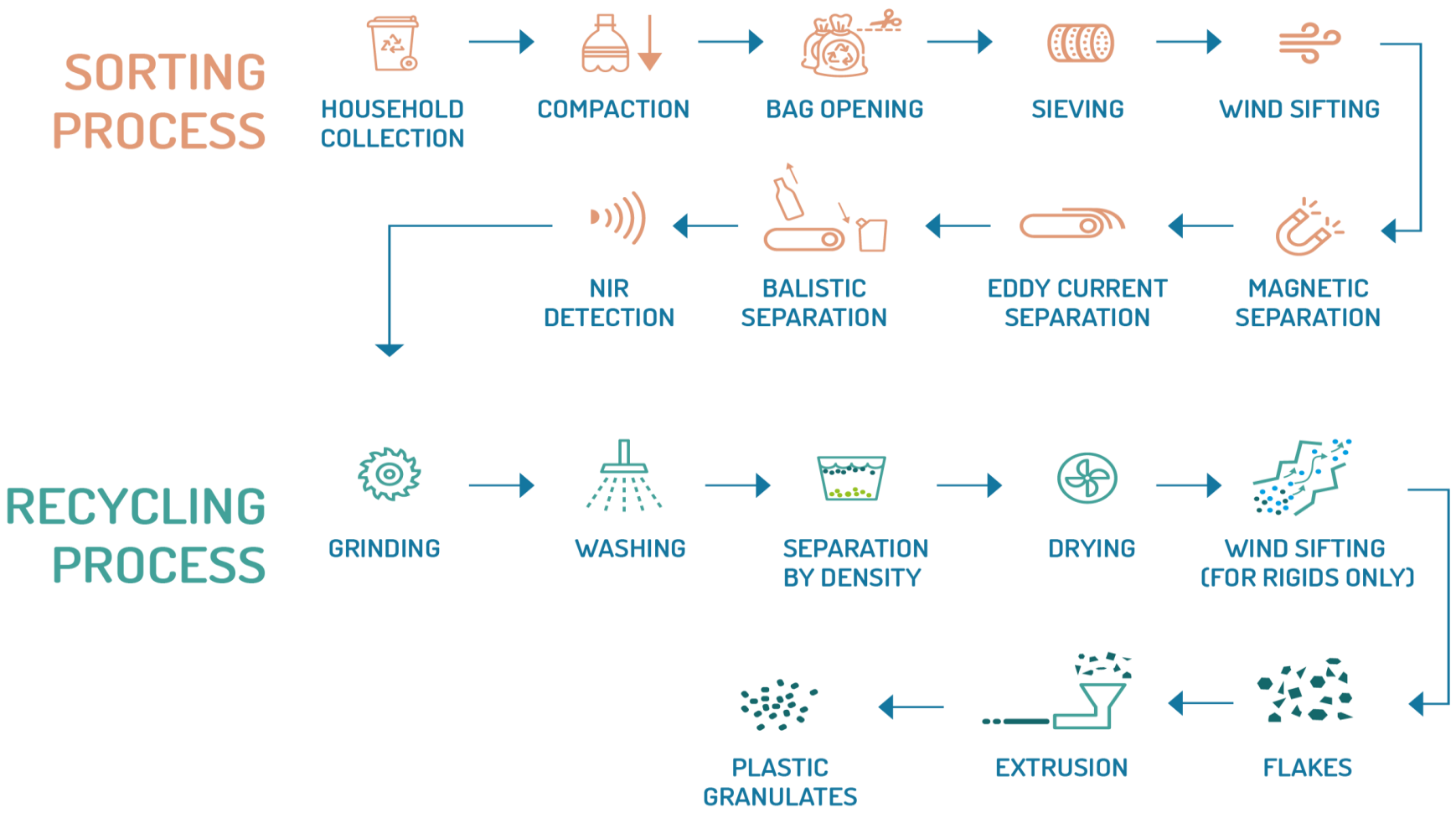
The plastic packaging must be **made with plastic that is collected for recycling,** has market value and/or is supported by a legislatively mandated program.

The plastic packaging must be **sorted & aggregated** into defined streams for recycling processes.

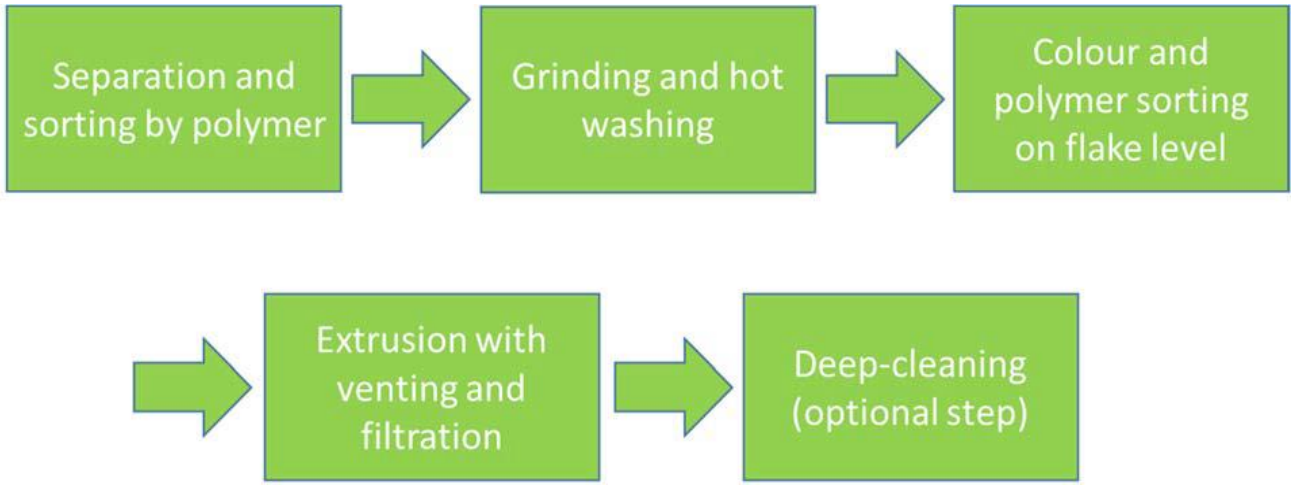
The plastic packaging must be **processed & reclaimed/recycled** with commercial recycling processes.

The recycled plastic becomes a **raw material** that is used in the production of new plastic products.

What makes a product recyclable?



Recycling Process Description



Deep-cleaning
methods reduce significantly the concentrations
in the post-consumer
recyclates and make such recyclates more
suitable as input materials for cosmetic
packaging.

The benefits of PCR plastic

1. Reduce carbon footprint

2. All the same benefits of normal plastic

3. Environmental sustainability

4. Consumers’ preference

So why not PCR?

Annex I of the Cosmetics Regulation describes the information that needs to be considered FOR the Cosmetic Product Safety Report

So why not PCR?

In general, manufacturers of cosmetic products consider the packaging to be safe if **food compliance** can be confirmed according to Regulation (EU) No 10/2011 and Regulation (EC) No 1935/2004.
However, since this is usually **not possible for postconsumer recyclate materials,** the company has to prove the safety of these materials for cosmetics by evaluating all toxicological endpoints of any migrating substance.
A batch-related control of the post-consumer materials by means of **analysis and the evaluation of the substances** found, either directly in the material or after migration tests in the respective product, is mandatory. Based on the concentrations found in the materials, a toxicological evaluation can be applied.

Risk Assessment Recycled Packaging Materials for Cosmetics

The safety evaluation of post-consumer HDPE and PP packaging in contact with cosmetic fillings is based on the substance found in the post-consumer polyolefins. There are three types of substances:

- **Identified substances from the polymer,** which were also found in the reference packaging made from virgin HDPE and PP.

- **Identified substances from previous fillings or from cross-contamination** during recollection or recycling.

- **Non-identified or unknown substances** found in the rHDPE and rPP

No regulation? Test it!

Post-consumer polyolefin recyclate contain substances from the previous filling and include also non-identified substances.

Therefore the recyclates should **monitored** by used of analytical, non-target screening methods.

Headspace gas chromatography
as well as extraction followed by gas chromatographic evaluation are suitable and complimentary methods to determine the differences in the input materials

The appearance of PRC plastic Vs virgin plastic

PCR plastic isn’t as clear as the virgin one. It is because we can’t promise all the recycled plastics are transparent. They might be yellow, blue, grey, green, or any other colors you can see on the market. Therefore, the color of the plastic goes more turbid as the component rate of the PCR material goes higher.

The Future of Cosmetic Packaging

Only with a strong request from the cosmetic industry the packaging producers will start developing scalable economic solutions made with 100% recycled material.

The technology, the raw materials, the risk assessment methods are already in place

The current consumer inclination towards greener cosmetic packaging coupled with the willingness to pay more for the products is further driving the market. Next generation cosmetic packaging serves both the key purposes- offering a sense of pampering alongside catering to environmental responsibility.

THANKS FOR YOUR PARTICIPATION!

Innochem Service

Via Antonio Branca, 4, 20025 Legnano MI

www.innochemservice.com

regulatory@innochemservice.com