

## Post Consumer vs. Post Industrial Recycled Materials

*You have probably encountered the abbreviations PCR and PIR used in relation to plastics. What do these terms mean? What is the difference between them and what properties do they have? We will explain this to you in the following article.*

### PCR (Post-Consumer Recycled)

Post-consumer means that the plastic has been used by the customer for its intended purpose. These are regranulates produced from plastic waste from the **yellow bins**, i.e. from end consumers and households, which are very heterogeneous and polluted.

Due to the origin of plastic waste used for the production of PCR regranulates, it is clear that these are regranulates that must go through several steps in the process of their production:

- *sorting by types of materials* – sorting is carried out mainly manually and it is only up to the experience of the workers who perform the sorting how precisely it will be done in terms of materials, color and contamination
- *waste cleaning / washing*– washing is usually performed in several stages in washing equipment (it is a very energy- and water-intensive process, washing produces a difficult-to-apply slurry waste). Many PCR regranulate manufacturers do not even have this step available and enter directly into the next step (this has a great impact on the quality of the final PCR regranulate)
- *mechanical recycling*– transformation of plastic waste by melting in an extruder into regranulate – a material that can then be used for production

From the nature of the origin and method of processing plastic waste into PCR regranulate, it is clear that such **regranulate has the following properties:**

- *It is not completely transparent, but it is honey yellow* – the final color depends on the sorting done
- *contains a number of inhomogeneities, non-purification of T, gels and various materials* – their occurrence depends on the quality of the sorting, whether the waste was washed or not and what melt filtration was used in recycling

Depending on the quality of PCR regranulate, the final product's look may vary. ***The draft EU regulation states that from 2030 PCR regranulate should be added to all plastic products intended for packaging or packaging production in a quantity of 35%***, which is not a small share, especially since some products can hardly be produced from primary raw materials, such as very thin, transparent films, etc.

Films with a proportion of PCR regranulates have ***visual defects, an uneven surface, are yellowish, sometimes have a characteristic odor***. In many cases, in the production of products with a proportion of PCR regranulates, more waste is generated than is processed by regranulates, which makes the circular economy system meaningless.

***The use of PCR regranulates brings a number of technological complications*** – faster wear of technological parts of production equipment, the need for more frequent interruptions of production due to the replacement of filter cloths and cleaning of technological parts from material deposits (reduction of production capacity, increase in waste generation, etc.), products intended for printing are more frequently worn out of printing plates, etc.

A big problem is and will be that **there are insufficient sources of suitable waste and suitable capacities for the production of PCR regranulates**, especially because a large number of products and packaging are coloured, printed and heterogeneous. Suitable sources of transparent, unprinted plastic waste are scarce and very limited.

This situation determines the pricing policy on the PCR regranulate market and generates their high price. In many cases, PCR regranulates are already **priced at the same level as primary materials**. **In the case of PCR regranulates with certificates, their prices are higher** than primary materials, which logically leads to an increase in the prices of final products and films.

## PIR (Post-Industrial Recycled)

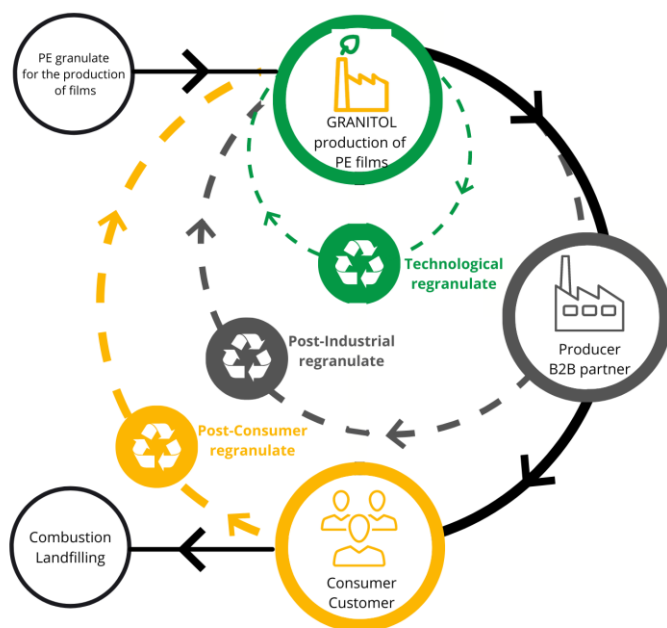
Post-Industrial is a plastic that never reached the final consumer. PIR materials **come from waste generated during the original packaging production process**.

It is a more closed system where production facilities collect the remnants of a particular product created during the manufacturing process, melt them down, and then reuse them to produce the same product.

This excess plastic remains from the production process and can arise for various reasons. Part of the waste comes from shaping products or changing production on the line. At other times, waste is generated during the necessary checks on product quality and printing standards.

Another option is to collect used or waste films by buying them back from their business partners, recycle them and convert them into new ones.

PIR plastics are **easier to collect and recycle**. Post-industrial plastics are recycled by benefiting from the fact that input waste is of known composition and controllable, making the recycling process more efficient – more precisely, manufacturers know exactly what type of plastic is used, eliminating the need to clean and decontaminate the plastic.



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