

Special quality and testing regulations

Recyclate manufacturing

1-0 Scope

These special quality and testing regulations specify the contents and the extent of the requirement profile associated with the manufacturing of recyclates for PET beverage containers.

Unless specified otherwise, these special quality and testing regulations are only applicable in connection with the general quality and testing regulations, and they also apply in connection with the 'preform manufacturing' and 'bottle-blowing/filling' modules.

1-1 Process description - Recyclate manufacturing procedure

For recyclate manufacturing established processes from machine builders and equipment manufacturers have to be applied:

- AMUT,
- Bühler (Super-Cycle),
- EREMA,
- KRONES,
- SOREMA,
- Starlinger,
- STEHNING-OHL,
- URRC.

In principle, the treatment processes correspond to the following schematic. The following processing steps are executed, depending on the treatment processes:

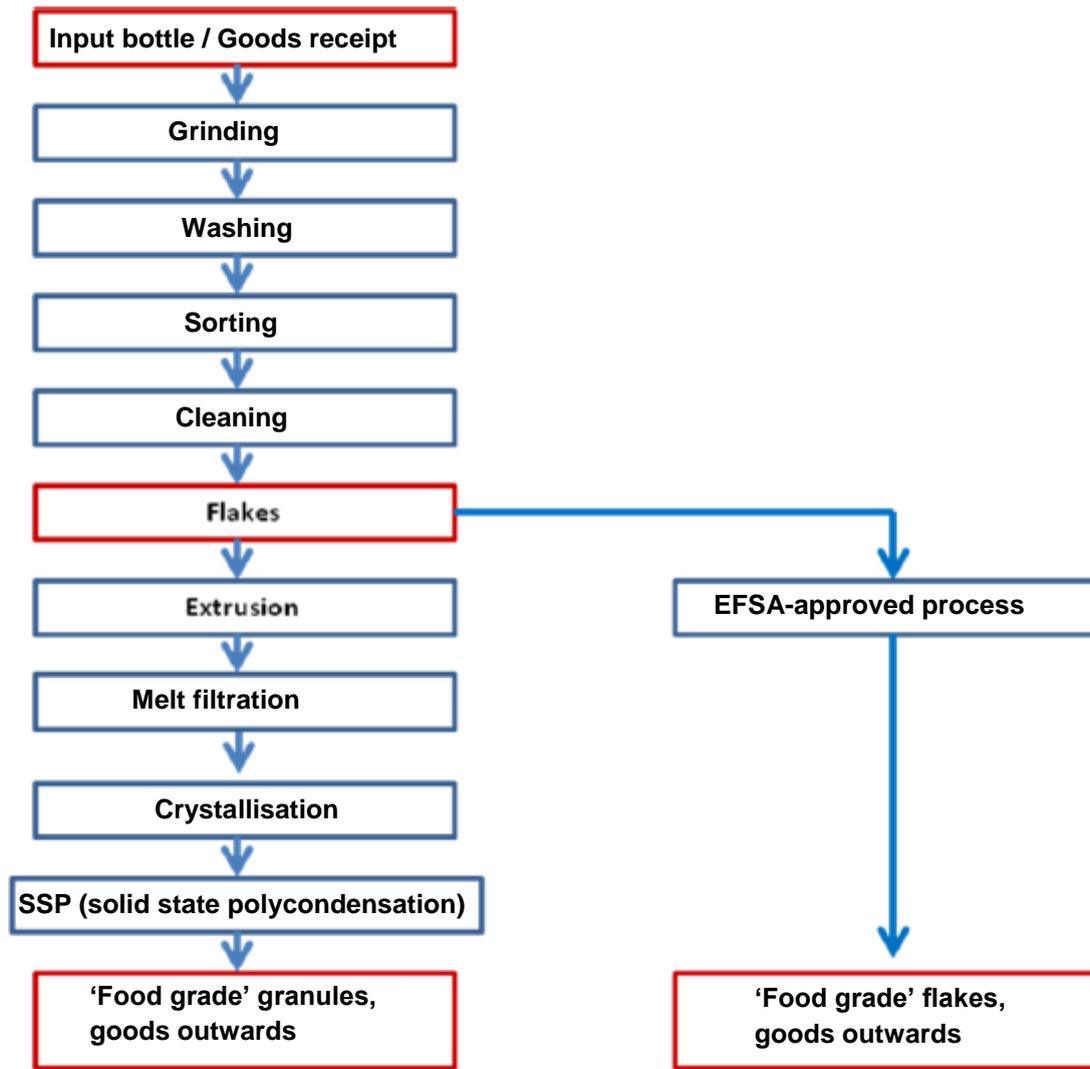


Figure 1-1: Recyclate manufacturing

The actual process is preceded by the goods receipt stage, which involves the specified requirements associated with the origin and quality of the raw material (in this case, beverage containers made of PET). In addition to bottles, it also includes other beverage containers such as tins or barrels made of PET, and the entire container associated with the primary package (including labels, seals, etc.).

The following description illustrates individual work steps:

- The collected PET beverage containers go through a pre-sorting procedure that separates extraneous materials from the PET bottles. Furthermore, the items can also be sorted with respect to colour.
- The caps of beverage bottles and small parts are separated via a screening operation.
- A mill grinds the bottles into flakes.
- Remnants of the beverage and adhesive particles of dirt are removed through a washing procedure. During the cleansing process, an admixture of lye is used to remove labels and other attachments from the flakes.

- Within a swim-sink separation process, the plastics are separated from each other on the basis of their physical density.
- The PET material is dried before further processing.
- An air separator is used to get rid of light extraneous materials such as multilayer films or labels.
- Processing of the cleaned flakes as per an EFSA-approved procedure, for the creation of R-PET granules or R-PET flakes.

A goods output point is defined at the end of the overall process.

1-2 Quality regulations

The described process stages should comply with the following requirement criteria associated with R-PET in the granules and flakes:

Control/ Measuring point	Quality criterion	Test method	Criterion for passing	Inspection interval
Entire process	Registered recycling process as per directive (EC) 282/2008	./.	Registration by EFSA (with respect to approval of the process: approval number)	./.
Goods receipt	Origin of the raw materials: Only collection systems for PET beverage containers	Supplier audit	Verification of the delivery notes	With each delivery of goods
Process control	Plant utilisation exclusively for the manufacturing of food-grade granules and	Customer audit	Verification - Production plan	regular
	Melt filtration for granulate	Use of screen as per quality manual	Maximum filtration size - 60 µm	regular
Outgoing goods	Intrinsic viscosity IV for granulate	DIN EN ISO 1628-5	0.78 ± 0.02 or 0.80 ± 0.02 or 0.82 ± 0.02 corresponding to the product specifications between the preform manufacturer and recycler	Each sales batch
	Intrinsic viscosity IV for flakes	DIN EN ISO 1628-5	0.75 ± 0.03	Each sales batch

Outgoing goods	Humidity for granulate	On the basis of DIN EN ISO 585	≤ 0.3%	Each sales batch
	Humidity for flakes	On the basis of DIN EN ISO 585	≤ 0.7%	Each sales batch
	VOC decontamination for granulate and flakes (VOC: up to 200 g/mol)	Published Fraunhofer IVV method	Ethylene glycol: < 50 ppm; 2-Methyl-1,3-Dioxolane: < 20 ppm; acetaldehyde: < 3 ppm; others: < 0.3 ppm	Each sales batch
	Dust for granulate	Sieving method	Fraction < 1 mm, max. 0.01%	Each sales batch
	Colour for granulate and flakes	DIN 5033 T 1-9, DIN EN ISO 11664, sample preparation on the basis of DIN EN ISO 294: 2013-04	Alignment with product specification	Each sales batch
	pH value for flakes	DIN EN ISO 15348-D	Delta pH ± 0.5	Each sales batch
	Bulk weight for flakes	On the basis of DIN EN ISO 60	250-500 kg/m ³	Each sales batch
	Particle size distribution for flakes	DIN EN ISO 15348-A	for oversized particle > 8 mm: ≤ 3%; for undersized particle < 1 mm:	Each sales batch
	Extraneous materials for flakes	DIN EN ISO 15348-C	PVC: ≤ 10 ppm; metals: ≤ 10 ppm; polyolefins: ≤ 10 ppm; polyamide: ≤ 20 ppm; others: ≤ 20 ppm; other colours, PET: ≤ 500 ppm	Each sales batch

Table 1-1: Requirement criteria associated with recyclate manufacturing (granulate and flakes)

1-3 Monitoring

When it comes to the monitoring regulations, Section 3 of the general quality and testing regulations applies.

1-4 Labelling

When it comes to the labelling-related modalities, section 3.7 of the general quality and testing regulations applies.

As shown in the following image, quality-certified products/services are tagged with the certification mark of the quality association, along with an additional service-related phrase:



1-5 Changes

Section 4 of the general quality and testing regulations applies to the changes made to these special quality and testing regulations.