



RECYCLED PET IN FOOD PACKAGING

Terminology and Standards

Recycled PET in Food Packaging: Terminology and Standards

Background

Faerch is on a mission to making food packaging circular. In a circular economy, food trays are made from recycled content and recycled into food trays of the same quality again and again. PET is the only plastic type that allows true circularity in food packaging, as it can be made fully from recycled post-consumer content in food contact applications, while not compromising on food safety or any other functional properties. PET is a well-known food contact material used in bottles, and it is becoming the standard material in rigid food packaging. Its homogenous material composition makes it ideal for recycling, and its degradation process is reversible. It can be grinded, melted and made into new food packaging in an infinite number of cycles.

The share of recycled content is a key indicator to assess the sustainability of a food container. When referring to recycled content, distinguishing between post-consumer content, post-industrial content and other material is key to ensure comparability between different solutions.

Definitions

Post-Consumer



PET material is called Post-Consumer (PCR) if it has been in the hands of consumers, has reached the end of its use and is perceived as waste. Post-consumer PET is collected from deposit systems, curbside collection and closed-loop systems. It is sorted and mechanically recycled into food grade recycled PET (rPET) for use in new food packaging.

Food grade rPET has been made from used bottles for many years, and with its recycling facility in the Netherlands, Faerch can also recycle used trays into new food packaging at an industrial scale.

Post-Industrial



PET material is called Post-Industrial (PI or “pre-consumer”) if it consists of unused products (e.g. manufacturing errors), production offcuts or process scrap supplied from a third party producer, who cannot recycle or re-use it and therefore perceive it as waste. Post-Industrial PET can, for example, come from skeleton waste from a form-fill-seal process or waste from production of bottles (scrapped preforms/bottles/errors). However, to qualify as Post-Industrial, the material *must* be purchased externally and delivered by a third party.

Virgin Content



In offcuts and scrap that contain virgin material generated from a manufacturer’s own production process that is grinded and used again in its products, it is important to split the fractions of virgin, PI and PCR up when looking at recycled content. Virgin content should never be classified as recycled content but as virgin material.

Recycled Content

Faerch strongly recommend the application of the most ambitious definition when referring to recycled content in food packaging. Packaging producers should make best use of Post-Industrial content, and offcuts and scrap containing virgin material from their own production processes should be used. However, virgin scrap and virgin offcuts from internal production should not be classified as recycled content. Only those materials that have been in use by consumers and that have been recycled (post-consumer content) should qualify and be referred to as post-consumer recycled content both as direct input or as re-grind.

In circumstances where it provides an environmental benefit to utilize a third party's post-industrial waste fraction, this will be perceived as part of the rPET percentage.

Calculation

At Faerch, PET trays need to be mono-materials to ensure full and efficient recyclability. They typically consist of multiple PET layers designed in an A-B or A-B-A structure with the top A-layers in direct food contact. The design helps meeting the highest standards for food safety while allowing the maximum measures of post-consumer content. It also contributes to maximising production efficiency at the food packers' processing lines.

The layers typically contain different material types, i.e. post-consumer recycled content, post-industrial, virgin or regrind. When the A-layer material is made from post-consumer content, a special surface treatment ensures food safety and the required functional properties. Beside the PET layers, trays typically contain a certain measure of food safe additives to improve processing and end-use performance.

When calculating the share of recycled content in a tray, all these different categories need to be taken into account. To be accurate, regrind requires special attention, as it contains a blend of these categories itself including post-consumer content, additives and potentially virgin or specially treated post-consumer material. The share of recycled content needs to reflect the share of post-consumer content in the steady-state of the cyclic process, which should correspond to the overall mass balance, i.e. the ratio between post-consumer material on the one hand and virgin material and additives on the other hand going into the factory.

APET trays from Faerch can contain from approximately 80%-100% post-consumer content. For example, in an APET 80% tray, if no regrind was used, trays would be made from 10% virgin and the remaining 90% of the tray would be post-consumer content. However, as regrind

from production is used, which itself not only contains post-consumer content, but also a certain virgin share, over time the share of recycled content stabilises at 80%.

Post-consumer recycled content

Faerch will on a mass-balance level have more than 70% post-consumer recycled content (PCR) in the total consumption in the PET production.

APET, MAPET® II and CPET products from Faerch, are made with multiple recipes with different shares of post-consumer content:

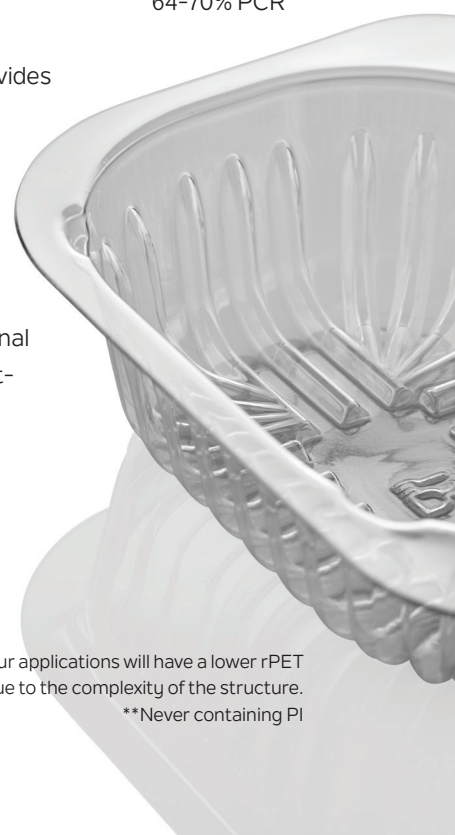
APET:

APET Standard	82% PCR
APET Heat Seal	82% PCR
MAPET® I	82% PCR
APET Matt	86,2% PCR
MAPET® II	85,7% PCR
MAPET® II (100%)	99,3% PCR
Heat Seal (100%)	99,3% PCR
APET Anti mist (100%)	99,3% PCR

CPET:

CPET Standard*	69-75% PCR
CPET Frost**	64-70% PCR

In circumstances where it provides an environmental benefit to utilize a third party's post-industrial waste fraction, Faerch will substitute up to approximately 10% on circular economic grounds. Faerch will never include internal virgin scrap as part of the post-consumer and post-industrial percentage.

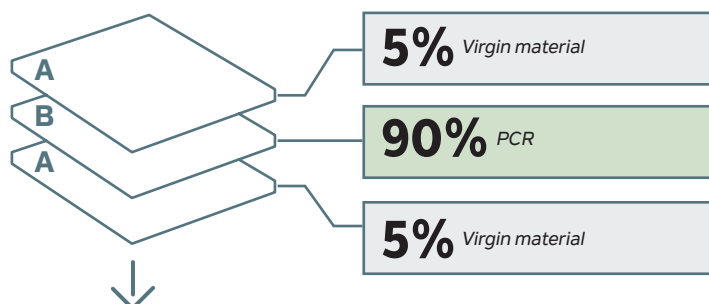


*Dual colour applications will have a lower rPET percentage due to the complexity of the structure.

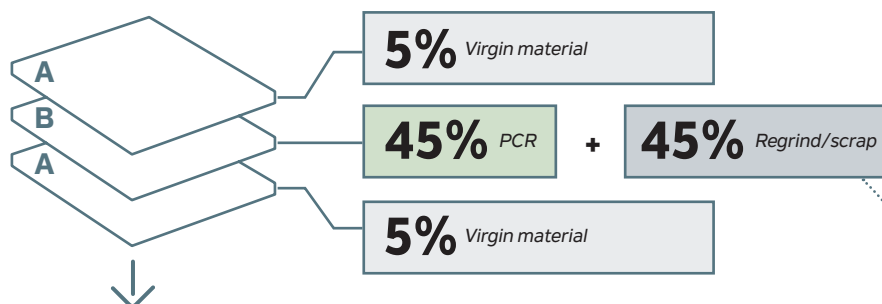
**Never containing PI

The origin of the layering in APET 80% PCR

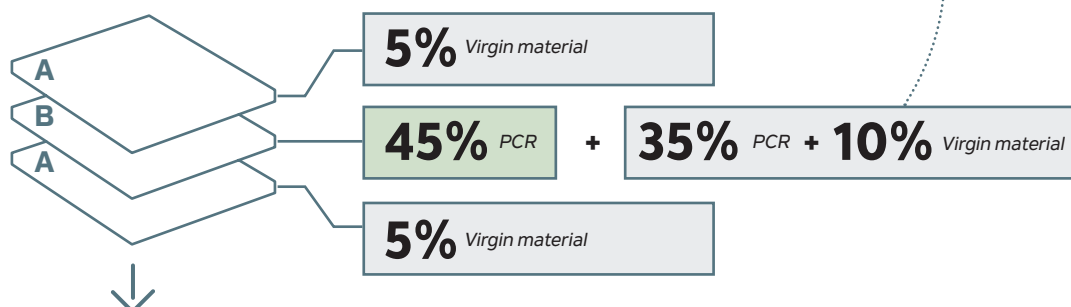
1st time a new recipe is extruded...



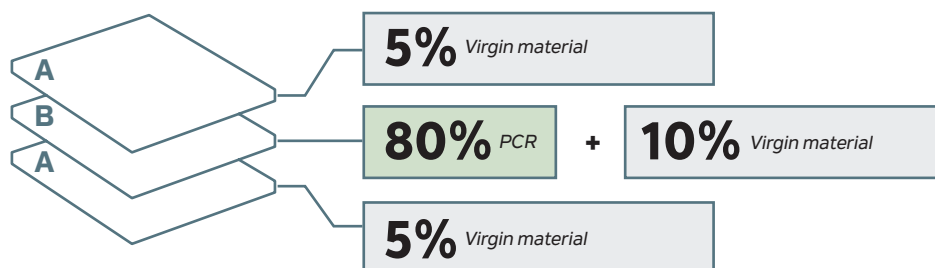
After several extruder runs with regrind, we reach steady stage...



What is the regrind made of after steady stage?



Composition of APET trays at steady stage



PCR = Post Consumer Recycled Content