

XTREME RENEW

PET preforms manufacturing in the era of circular economy
by saving environment, energy and costs.



Feel free to imagine.
We make it happen.

SIPA



WELCOME TO THE NEW ERA OF RECYCLING

The first system in the world to produce food-grade preforms from 100% washed R-PET flakes in a single energy cycle.

The new Plastic Economy is now a reality and SIPA gives you the opportunity to be a part of it with a high added-value solution: producing food-grade preforms made from recycled PET flakes, in a circular economy concept. Born out of the collaboration between SIPA and EREMA, XTREME RENEW is a system that directly processes washed flakes of recycled PET into new preforms within the same machine. A revolutionary “bottle-to-bottle” system reducing costs and protecting the environment by creating a perfect circular economy.

The revolution of plastic containers.

XTREME RENEW is a concentrated blend of technical innovations expanding production opportunities, reducing consumptions and CO₂ emissions, optimising management costs and minimising the use of space in industrial plants. An actual revolution in the production cycle for plastic containers that becomes part of a fully sustainable circular economy. Emissions of CO₂ during production of PET bottles from recycled material using traditional RPET processes are already 60% lower than when using virgin PET. With the new highly innovative process, emissions are cut by an additional 25%, and 30% less electricity is consumed, thanks to the integration of the various phases into a single plant. Moreover, Xtreme Renew can produce preforms that are up to 10% lighter than traditional injection system thanks to special design, reduce logistics and transportation costs by 20% and Total Cost of Ownership by 15%.

Number of cavities	Flakes	Max mechanical productivity (p/hour)	Minimum preform base thickness (mm)	Max preform weight (g)	Max preform length (mm)
96	100%	70,000	0.95	60	150
72	100%	57,600	0.95	60	150

From a simple washed flake to food grade PET.

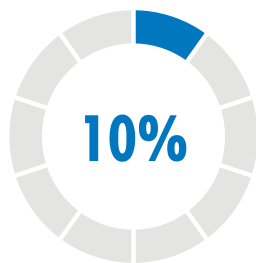
XTREME RENEW outputs a wide range of light preforms for food, detergents and personal care. Applications are varied: mineral water, juices, RTD tea, milk, home care and much more.



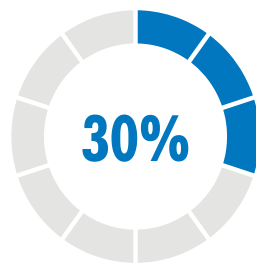
One process step: technical, environmental and economic benefits.

- Production of food-contact compliant preforms directly from up to 100% postconsumer PET flakes
- Major process simplification vs. traditional rPET production
- Safe and approved process (FDA, Efsa, Invima, Anvisa, brand owners, etc.)
- Max preforms quality: IV stability, top colour values (single thermal cycle), food contact compliant, clean preforms
- A sustainable process, from waste to resource
- TCO down by 15% compared to conventional recycling
- Great energy saving (30%) compared to conventional recycling
- Up to 20% reduction in logistics compared to conventional recycling

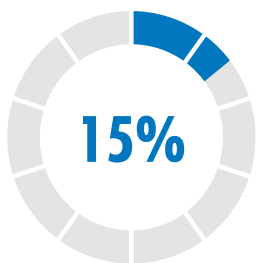
Here are the advantages:



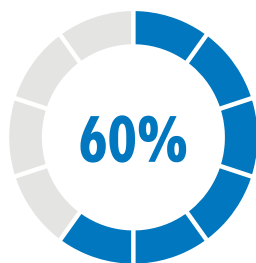
10% lighter PET containers, leading to a competitive advantage in packaging.



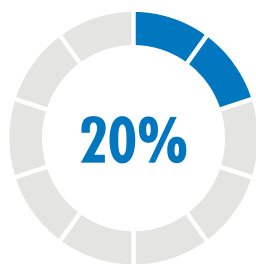
Energy savings: -30%, only 0.58 kWh/kg PET.



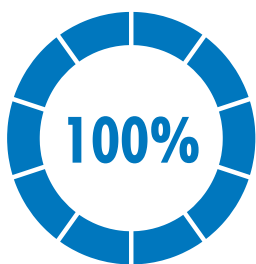
Lower TCO, up to -15%, compared to conventional recycling.



CO₂ emissions: -60% compared to virgin resin.



Advantage in logistics: -20% logistics and transportation costs.



100% sustainable: only recycled PET flakes.



Homogenization / IV - lift

Melt filtration

Online viscometer

Rotary molding wheel

Post mold cooling





From linear to circular economy: process steps.

01.

Decontamination

One of the main advantages of EREMA's patented VACUREMA® technology is that decontamination and moisture removal take place before extrusion. This is a clear advantage for the quality of the melt and consequently of the final product, which presents very stable IV value while maintaining the best mechanical properties. Key system components include a vacuum reactor directly connected to a single-screw extruder. Mixers in the vacuum reactor include three ultra-efficient compartments, interacting perfectly with each other to decontaminate and pre-dry the PET material.

02.

Extrusion

The clean and perfectly prepared PET material enters the extruder's input area with very low residual moisture. This step takes place under high vacuum. As a result, no additional degassing openings are required on the extruder. This means that VACUREMA® technology drastically reduces the extruder length, cuts energy consumption, improves the colours (b-value) of the processed material and keeps AA values very low. Moreover, the excellent homogenization of the extruder plays a significant role in transforming the IV input values into a stable IV output value.

03.

Filtering

A large surface area, high performance downstream filter - resin is filtered through a 25 to 62 µm mesh (normally 40 µm, depending on the final application: CSD, water, etc.). The filter pack is equipped with a patented fully automatic self-cleaning system that ensures long filter life. At this point, the melt is ready and can be transferred to the downstream unit.

04.

Rotary injection and compression

Injection and compression wheel:

- Modular design of the wheel and press assembly for easy maintenance
- Gentle material treatment with very low injection pressure
- Reduced cavity tonnage for less mould wear (maximum 2 tons)
- Easy and quick format changeover (1 minute per cavity)
- Use of a single dosimeter per cavity for simultaneous production of 2 different preforms
- Preforms coming out aligned, to be collected in different container.

05.

Preform cooling

Cold-air jet cooling of the inner and outer surface of the preform. No need to change the customizations: the pliers adapt automatically. Cooling time = 6 cycles. Spiral chain with high efficiency bearings: no maintenance required. Four possible preform release points. Possibility to perform 100% preform quality inspection and to reject non-compliant preforms (up to 5 optical cameras for complete in-line check-in).

XTREME RENEW

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