

# 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 CO<sub>2</sub> 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 CO<sub>2</sub> 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

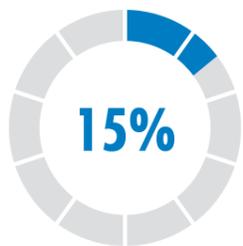
## Here are the advantages:



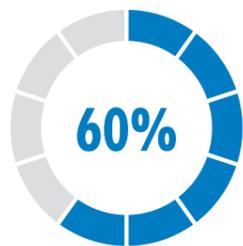
10% lighter PET containers, leading to a competitive advantage in packaging.



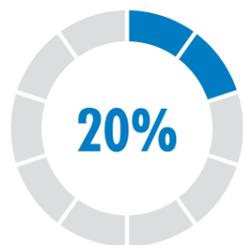
Energy savings: -30%, only 0.58 kWh/kg PET.



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



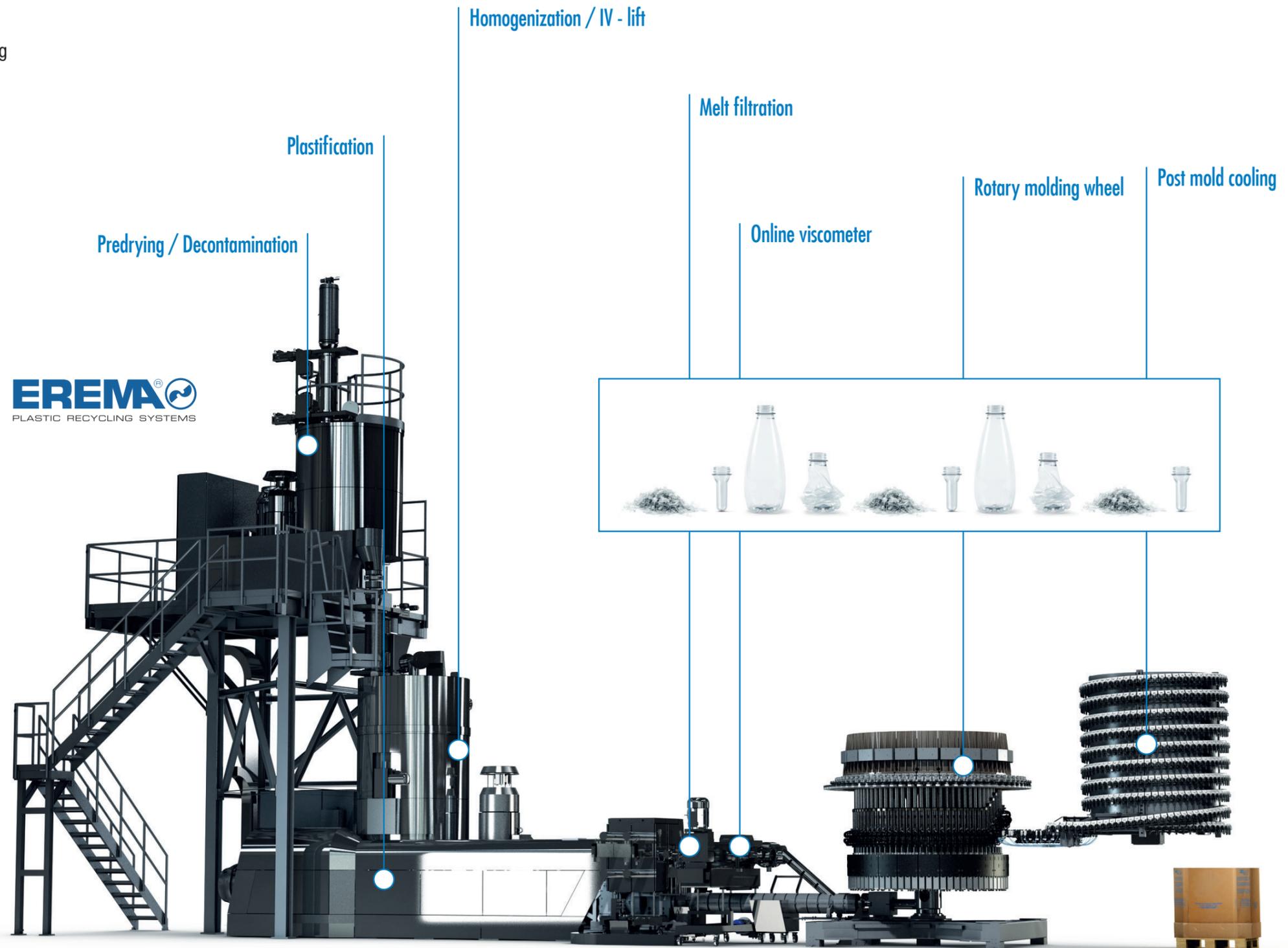
CO<sub>2</sub> emissions: -60% compared to virgin resin.



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



100% sustainable: only recycled PET flakes.



# 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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