ecoSAVE®

VACUREMA®
PELLETISING

Food Contact Approved Recycling.
With highly efficient decontamination BEFORE the extrusion process.

CHOOSE THE NUMBER ONE.

EREMA®
PLASTIC RECYCLING SYSTEMS

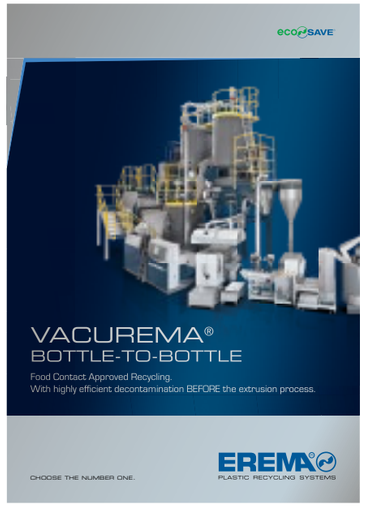
VACUREMA®

The modular technology.
For your application.

Different requirements call for different solutions. Modular solutions which are configured exactly for your particular application. VACUREMA® gives you this flexibility in impressive style. With this patented process you can count on the best established and most used technology for the recycling of post consumer PET bottle flakes, PET in-house waste and also PE-HD bottle flakes.

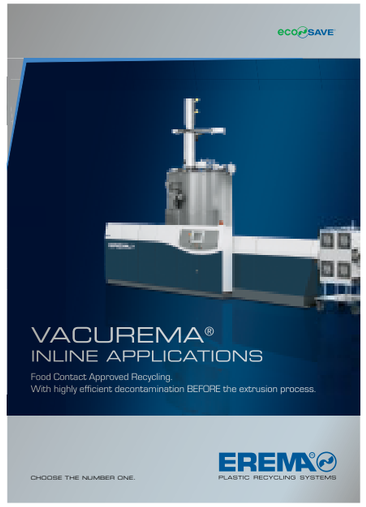
There are currently more than 150 VACUREMA® systems in use around the world, producing high-quality pellets and end products with an overall capacity of over 1 million tonnes. A wealth of experience which guarantees you maximum operational reliability of your system with flexibility in the application at the same time. In the form of a turnkey recycling solution which is customised for the requirements of your end product. One that also runs with the lowest possible energy and production costs.

VACUREMA® – one system, three application fields.



VACUREMA® Bottle-to-Bottle

VACUREMA® Pelletising



VACUREMA® Inline Applications

The decisive benefits for the customer:

1. Decontamination and ultrafine filtration for direct food contact – in accordance with the criteria of the FDA and EFSA:
Thanks to highly efficient and fast decontamination together with large area ultrafine melt filtration, the recycled pellets produced using VACUREMA® technology are approved for food contact.

2. Flexibility, variable input, ideal for mixing with virgin material:
Thanks to Counter Current technology, EREMA systems are extremely flexible and process a notably wide variety of input materials (in line with the end application) such as PET bottle flakes, ground amorphous skeleton waste/ edge trim, virgin material and mixtures with bulk densities of 250 to 850 kg/m³ and adjustable IV increase (depending on throughput and end material).

3. IV stability through vacuum treatment:
Despite varying moisture levels and different IV values in the input material, stable IV values are achieved through the patented pre-treatment method. This means, therefore, that input materials with higher material moisture levels can also be recycled.

VACUREMA® – the Number One technology

VACUREMA® basic principles

Extremely flexible with input material
Depending on the end application the system processes PET bottle flakes, ground amorphous skeleton waste/edge trim and virgin material (also in mixtures), i.e. bulk densities of 250 to 850 kg/m³.

Highly efficient food contact compliant decontamination
Thanks to the patented pre-treatment of PET flakes, IV increase and decontamination are fast, reliable and energy-saving. This means that FDA quality (among other things) can be ensured for the end products produced.

IV stability through vacuum treatment
Despite varying moisture levels and different IV values in the input material, stable IV values are achieved through the patented pre-treatment method. This means, therefore, that input materials with higher material moisture levels can also be recycled.

Melting under vacuum
The patented pre-treatment at raised temperature and in high vacuum before the extrusion process removes moisture and migration materials from the feedstock very effectively and in a stable process environment. This prevents any hydrolytic and oxidative decomposition of the melt in the extruder.

Low thermal stress
The very short extruder screw without additional extruder degassing reduces the thermal stress on the material through minimised dwell time.

Large area ultrafine melt filtration
EREMA filter systems have very large active filter surfaces. This enables filtration with up to 32 µm fineness at low pressure. The result is highly clean pellets.

Compact design
Due to their compact design, VACUREMA® systems require much less space than other systems.

Minimum production costs with ecoSAVE®
Thanks to integrated ecoSAVE® technology, VACUREMA® systems stand out through the lowest production costs of all systems on the market.

Smart Start principle
The plant's software-based process control system gives you extremely easy and reliable operation and premium user-friendliness including automatic start-up at the press of a button, fully automatic continuous operation, permanent monitoring for direct food contact (FCC) and the storage of all relevant process parameters.

Turnkey solutions
We deliver you turnkey systems with competent support from one contact for the entire recycling process: sorting – washing – decontamination – extrusion – quality control – end product.

Highly efficient decontamination

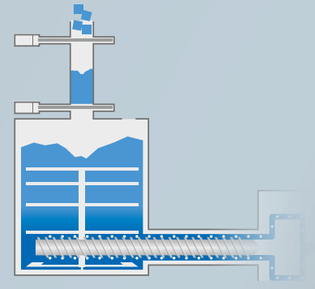
Surface to volume ratio for flakes is 2.5 times higher than for pellets

Bottle flakes
Pre-ground with 12 mm screen, average wall thickness approx. 0.1 to 0.4 mm

Pellets
Typical dimensions: diameter approx. 2.5 mm x 3 mm length or ball shape

EREMA vacuum reactor.
Flake decontamination BEFORE extrusion.

The patented pre-treatment at high temperature and in high vacuum before the extrusion process makes VACUREMA® technology considerably more efficient compared to the decontamination of pellets which have already been extruded.



Counter Current – a groundbreaking innovation.

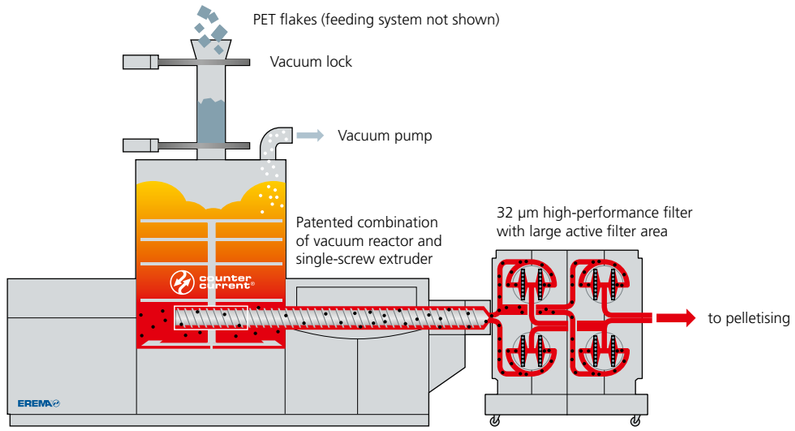
counter® current

In the past the material inside the vacuum reactor turned in the same direction as the extruder - forwards. The patented Counter Current technology now changes the direction of rotation inside the vacuum reactor: the plastic material thus moves in the opposite direction to that of the extruder screw. A simple effect with a major impact. Thanks to the improved material intake the VACUREMA® system ensures even greater flexibility and operational reliability in the processing of an extremely wide variety of materials.

VACUREMA®
Pelletising

rPET pellets with proven recycling technology.

From flakes to pellets, cleaned and decontaminated highly efficiently: the patented VACUREMA® technology is the worldwide proven solution for food contact conforming pelletising. The VACUREMA® Advanced extrusion system in particular – a further development of VACUREMA® Basic technology – stands out through high-quality end products with remarkably low production costs.



How it works

The system consists in its key components of a **vacuum reactor** which is linked directly to a single-screw extruder. The vacuum reactor unit is filled with amorphous, washed PET flakes via a vacuum lock. Decontamination and perfect predrying of the processed material take place inside the vacuum reactor. From the reactor the **material is fed at a high vacuum into the intake zone of the single-screw extruder**. As a result no additional degassing ports are required on the extruder itself. This means that the VACUREMA® technology drastically **reduces the length of the extruder, reduces its energy consumption**, improves colour values (b value) of the processed material and keeps AA values to a very low level.

In the downstream high-performance fine filter the material is **filtered** with a **32 µm mesh screen width**. The filter system is equipped with a patented fully automatic self-cleaning system that enables long filter service life. **The now finished melt is then passed on to the downstream process for the production of amorphous or crystalline pellets.**

VACUREMA® Basic

Technical benefits

- **Minimum thermal stress** thanks to single energy input, preheated material and shortened extruder length
- **Suitable for the production of food contact compliant, ultrafine recycled pellets**
- **High starting material moisture content** up to 1 % and varying moisture permissible
- **Processing of PET recycled pellets melt with stable IV values,** minimum IV loss of 0 to 4 % and lowest energy requirements
- **Large area ultrafine melt filtration**
- **FDA approved** (EFSA approval requested via customers and obtained)

Economic benefits

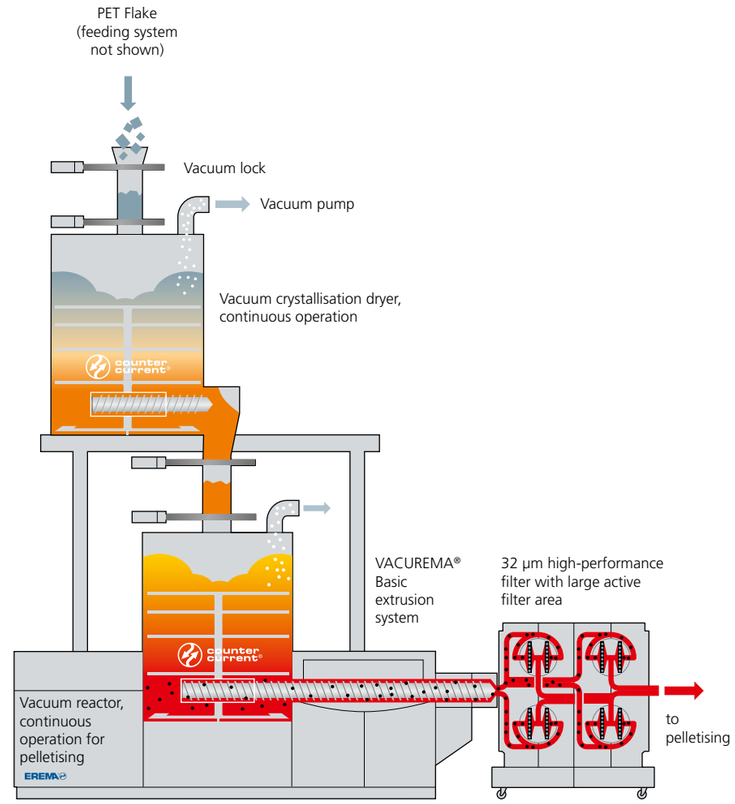
- **rPET pellets identical in consistency and appearance to virgin material,** choice of amorphous or crystalline
- **Low production costs** through specific energy consumption of 0.25 to 0.28 kWh/kg
- **Compact, space-saving design**

VACUREMA® Advanced

The VACUREMA® Advanced system, features an additional, continuously operating vacuum crystallisation dryer upstream of the vacuum reactor. This enables you to achieve an IV increase in the flake to pellet process of up to 6 % - a figure that makes the VACUREMA® Advanced system the first choice for sensitive pelletising jobs.

How it works

The vacuum **crystallisation dryer** is filled with amorphous, washed PET flakes via a vacuum lock. The crystallisation dryer provides additional predrying and decontamination of the input material. The material is then transferred to the **reactor of the downstream VACUREMA® Basic system** via a discharge screw. This means that the system has **all the advantages of the VACUREMA® Basic technology and goes beyond it in terms of the IV values you can achieve in the pellets and with regard to cleaning efficiency**. Decontamination performance FDA approved, ILSI and afssa compliant.



Technical benefits

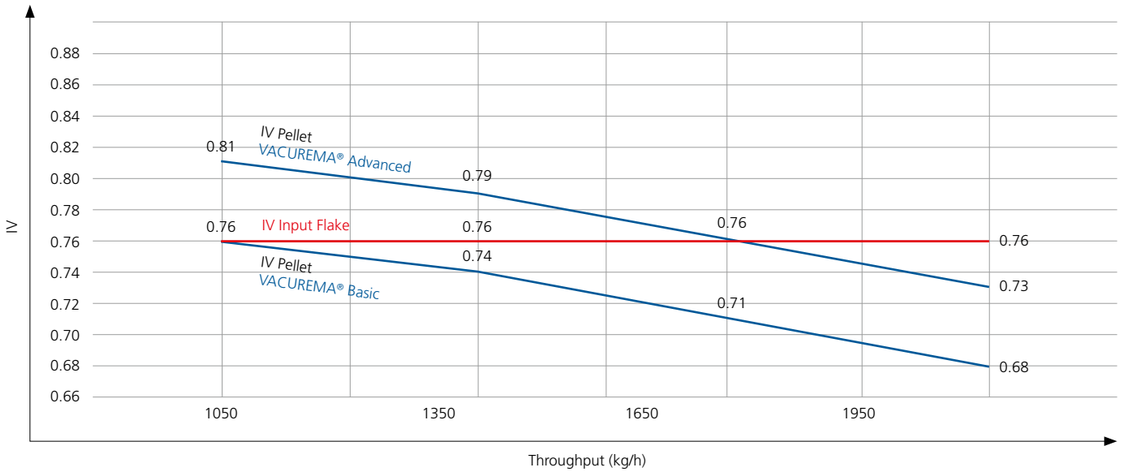
- **Minimum thermal stress and minimum discoloration** thanks to single energy input, preheated material and shortened extruder length
- **PET melt processing** with IV increase of up to 6 %
- **Stronger decontamination performance** through longer average dwell times
- **Large area ultrafine melt filtration**
- **FDA approved, ILSI and afssa compliant** (EFSA approval requested via customers and obtained)

Economic benefits

- **rPET pellets identical in consistency and appearance to virgin material,** choice of amorphous or crystalline
- **Low production costs** through specific energy consumption of 0.28 to 0.31 kWh/kg
- **Total production costs for rPET from PET flake only approx. 0.10 euros per kg of finished BTB pellets**
- **Compact, space-saving design**

IV values attainable in repellets – variable according to chosen throughput

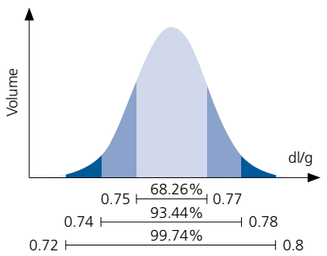
IV increase according to plant type and set throughput; example based on VACUREMA 2018 T:



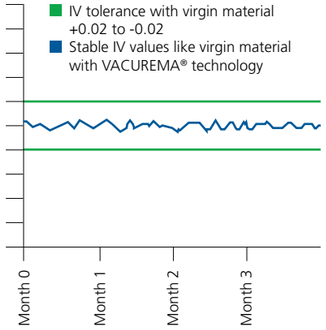
VACUREMA® quality control

IV values in real time
The continuous online IV measurement, combined with the fully automatic plant control system, means you can influence processing parameters such as throughput, processing temperatures, etc.

Input IV – typical distribution

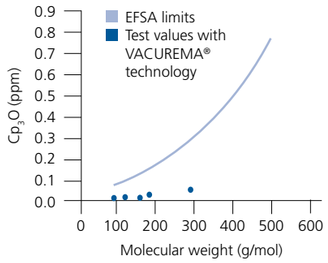


Output IV – with VACUREMA®



FCC – Food Contact Control – automatic operation mode
The parameters for direct food contact compliance are monitored and archived continuously in the recycling process on all VACUREMA® systems. Food Contact Control (FCC) supervises the recipe data stored.

This enables the flexible change to the process parameters required for the production of the respective recyclate. If levels go beyond defined limits an alarm is triggered automatically and (optionally) material flow is diverted away from the production line. This guarantees traceability.



Approvals for the food trade

	VACUREMA® Basic	VACUREMA® Advanced
Approved for direct food contact by/in: *	US FDA (category A-H & J), Austria, Switzerland, Canada, Brazil, Argentina, Uruguay, Paraguay, etc.*	
Fulfils the following decontamination requirements/migration threshold specifications	EFSA approval requested via customers and obtained	
	European ILSI guidelines	
	German BGBI guidelines	
		French afssa guidelines
		Brand owner guidelines

*Other countries to follow further to applications by the respective VACUREMA® users.

Technical data VACUREMA® PET extrusion systems

Systems available	max. output	**Basic** output for an IV change of 0 to -4 %	**Advanced** output for a 4 % IV increase
VACUREMA 906 T	200 kg/h	150 kg/h	150 kg/h
VACUREMA 1007 T	300 kg/h	190 kg/h	190 kg/h
VACUREMA 1108 T	400 kg/h	250 kg/h	250 kg/h
VACUREMA 1109 T	500 kg/h	300 kg/h	300 kg/h
VACUREMA 1310 T	600 kg/h	400 kg/h	400 kg/h
VACUREMA 1512 T	900 kg/h	600 kg/h	600 kg/h
VACUREMA 1714 T	1000 kg/h	850 kg/h	850 kg/h
VACUREMA 1716 T	1450 kg/h	1100 kg/h	1100 kg/h
VACUREMA 2018 T	2000 kg/h	1350 kg/h	1350 kg/h
VACUREMA 2021 T	2600 kg/h	1800 kg/h	1800 kg/h
VACUREMA 2321 T	2900 kg/h	2000 kg/h	2000 kg/h
VACUREMA 2625 T	3300 kg/h	2500 kg/h	
VACUREMA 2628 T	4000 kg/h	3000 kg/h	

The specialists in plastic recycling systems

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More questions?
We would be pleased to answer them!
Your EREMA advisor will be pleased to attend to your request personally and quickly. If you are interested in a demonstration or a test run with your specific material it would be a pleasure for us to make an appointment and welcome you to our EREMA Customer Centre at the headquarters in Ansfelden, near Linz in Austria.

We look forward to seeing you at EREMA!

For worldwide representatives please visit www.erema.at

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English

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