

KRONES PET-Recycling
Preserving resources with profit



PET-Recycling Technology for a sustainable PET packaging cycle

KRONES PET-Recycling

About 400 billion plastic bottles are filled with beverages each year. This figure alone proves: only if the packaging material preserves the resources and considers the environment, it will have a future. Up to now, PET bottles (bottles of polyethylene terephthalate) are not returned to a great extent to the packaging market. In stead, they are used outside the food industry.

With the innovative KRONES bottle-to-bottle recycling process, PET bottles are recycled in an efficient and gentle process. The recyclate is used to manufacture containers which can be reused in the beverage and food industry without hesitation, because the food-grade recyclate which is won from the environmentally friendly technology of KRONES corresponds with the strict regulations of the American Food and Drug Administration (FDA). KRONES closes the PET cycle not only environmentally speaking but offers bottlers and converters cost benefits at the same time when comparing it to the use of new material (virgin PET).

In our line, food-grade flakes are manufactured by standard. As an alternative, the line is designed to gain food-grade pellets at the end of the recycling process.



*Food-grade
PET flakes*



*Food-grade
PET pellets*

PET-Recycling Figures, data, facts

Method of operation

All process steps take place in a compact line consisting of the washing and bottle-to-bottle-module. First the used PET bottles are fed to a mill. The ground material (flakes) is brought to a uniform size and removed from the labels. Afterwards the flakes undergo a multi-stage washing process, which is structured in pre-washing, intensive washing, and post washing. Before the material is dried, the caps, foreign matter, and fine PET parts are removed from the process.

To be able to reuse the recycle in beverage bottles, all harmful substances contained in the PET must be removed. Thanks to its short processing time, this process is more efficient than standard processes, and it is carried out in stages. Two heat exchangers heat the flakes. They are subsequently decontaminated in the following vacuum reactor. At the end of the process, the last fine parts are sieved and still existing colour flakes as well as metal particles are removed.

Overview: field of application and performance

Line type		
Total line, bottle-to-bottle	Recycling of PET bottles to PET flakes, "bottle-to-bottle"	
Module: washing	Recycling of PET bottles to PET flakes, "non-food"	
Module: bottle-to-bottle	Supercleaning of washed PET flakes to PET flakes with food-grade quality	
Line output (complete line)		
	Output: 500 kg/h	Output: 1,000 kg/h
Washing line (washing module only)		
		Output: 2,500 kg/h
Footprint		
Total line, bottle-to-bottle	700 – 1,000 m ²	
Module: washing	400 – 600 m ²	
Module: bottle-to-bottle	300 – 400 m ²	

PET-Recycling Washing module

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The washing process is the key factor for a successful preparation of PET bottles. Only clean flakes guarantee a first-class decontamination process in the following bottle-to-bottle module. The Krones washing module stands out for its excellent properties. The quality of the Krones washing process is determined by the ability of removing labels, soluble dirt, and other contamination entirely. This is guaranteed by hot caustic washing and hot post-washing. During the entire washing process, there is only a minimum loss of material.

Being an integral part of the washing module, the Krones micro-filtration system Parcival makes sure the consumption of water and chemicals remains low. This preserves resources and is environmentally friendly, and it saves costs at the same time. Parcival continuously filters the cleaning liquid from the washing process. Step by step, filtration becomes finer. This ensures the carried-in dirt is permanently removed from the process water.



Washing module



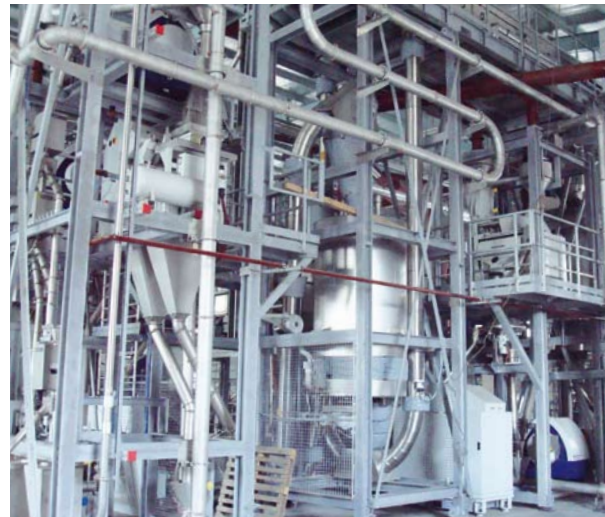
Hot caustic washing



Parcival micro-filtration system

PET-Recycling Bottle-to-bottle module

The vacuum reactor of the bottle-to-bottle module is the heart of the line. Before the homogenised, cleaned, and dried flakes get to the reactor, they are heated in two stages. Afterwards, the flakes are filled into the vacuum reactor. This is where all harmful substances escape from the flakes (decontamination) without affecting the flakes mechanically or thermally. Because there are uniform process temperatures in the reactor, a sound process control can be performed. At the end of the process, food-grade recyclate is provided which has the same physical properties as new products. This completes the PET cycle. The entire bottle-to-bottle process of Krones is patented.



*Bottle-to-bottle
module*

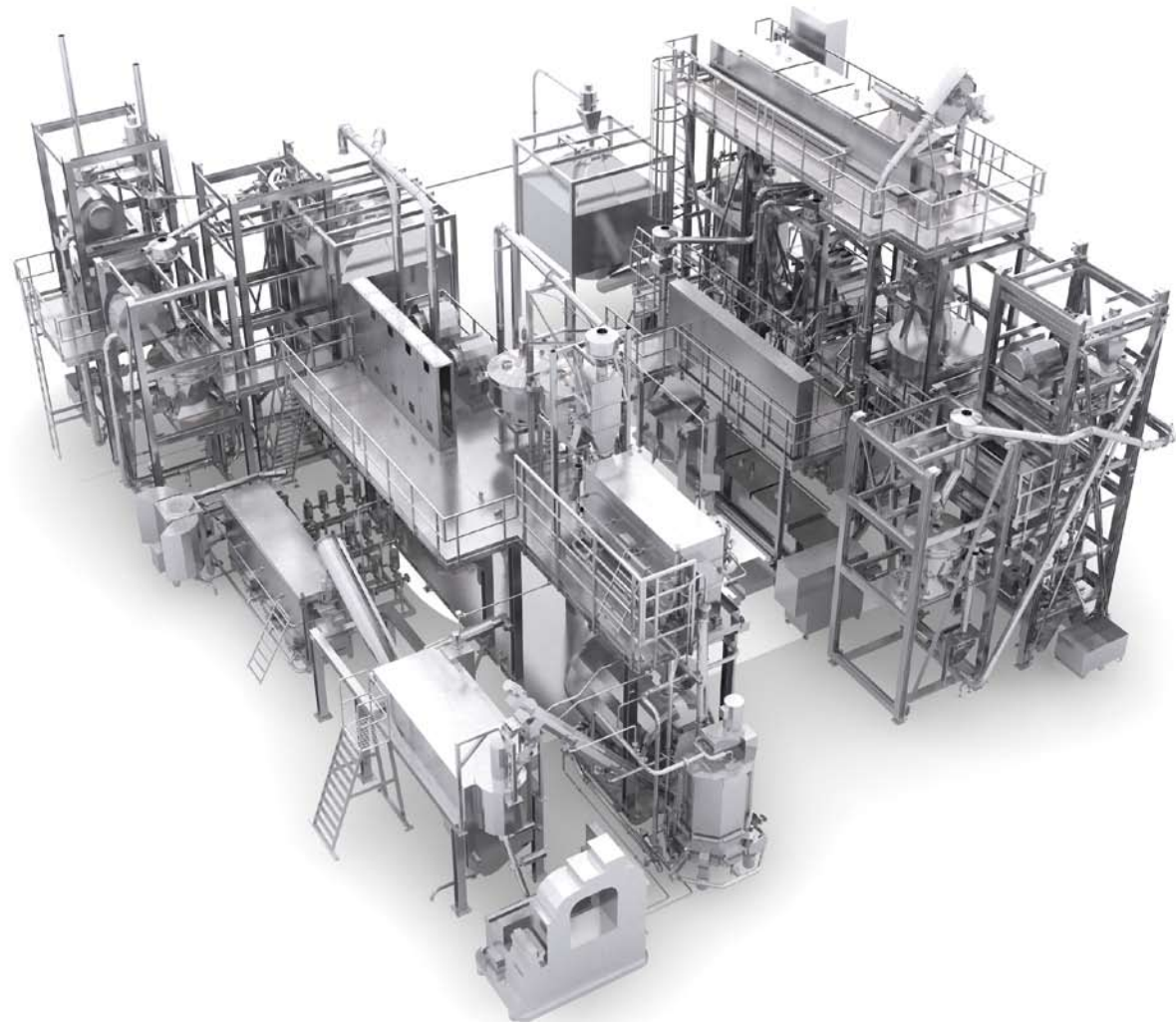


Vacuum reactor

Your benefits

KRONES PET-Recycling

- KRONES has comprehensive know-how and offers all services from one supplier
- Compact line construction
- FDA approval; additional European approvals granted or in preparation
- Low consumption of energy and chemicals
- Intensive filtration of washing media
- Flakes coloured through the thermal process are detected via colour sorting
- Gentle material treatment
- Quick process, because flakes can be decontaminated faster than pellets
- No degradation of IV; on request, IV increase is possible
- Even temperature distribution via multi-stage heating process



KRONES PET-Recycling

Contact

Visit by a customer consultant

Further information material

Mr

Ms

First name

Surname

Company

Street, house number

Post Code

Town

Country

Telephone

Email

Contact person at KRONES (if known)

[▶ Send by email](#)



LCS Lifecycle Service

Each company, each facility, is unique. By making the appropriate selection from the capabilities offered by LCS Services and LCS Parts + Software, you will receive a package tailored precisely to your actual needs. And in addition, you benefit from our comprehensive expertise gained from operating production lines in the food and beverage industries, and in the cosmetic, chemical and pharmaceutical sectors as well.

[▶ more ...](#)

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TCO Total Cost of Ownership

The client is the paramount focus of KRONES' product strategy. This is why many of our new ideas emerge from close liaison between our service and sales people and the client on site. The R&D departments at KRONES then develop the appropriate products, geared without exception to cutting our clients' operating and raw-material costs (total cost of ownership).

[▶ more ...](#)



enviro

KRONES stands for innovative machines and high-performance lines. enviro epitomises its commitment to saving costs, by reducing energy consumption and ensuring economical use of natural resources. Intelligent machinery design to a maximised level of technical excellence enables us to grant exceptionally long lifetimes and economical efficiency to optimised ergonomics and safety for the operators and the maintenance staff alike.

[▶ more ...](#)

 **KRONES**