



Close the Loop

Krones Recycling Technology Centre



What we do

Our Recycling Technology Centre has been performing washing and SSP tests since 2004. The system, which we developed ourselves, handles both 2D and 3D fractions of the widest range of plastics, such as PET, PE, PP or PS. Its high flexibility makes it possible to perform both cold and hot washing tests in continuous operation mode, as well as SSP tests in batch mode.

Together with our customers, we develop solutions that are precisely tailored to suit individual applications. The core element of our philosophy is intensive research and development work – also and primarily in collaboration with our partners and suppliers.

We plan, implement and document individual recycling tests, from the bale right through to the new packaging.





What we do

Regardless of which plastic you want to recycle, in our Recycling Technology Centre we carry out tests from the bale right through to the new packaging. When doing so, we observe the entire recycling process:

- Pre-sorting
- Hot and cold washing
- Flake sorting
- Decontamination
- Pelletising

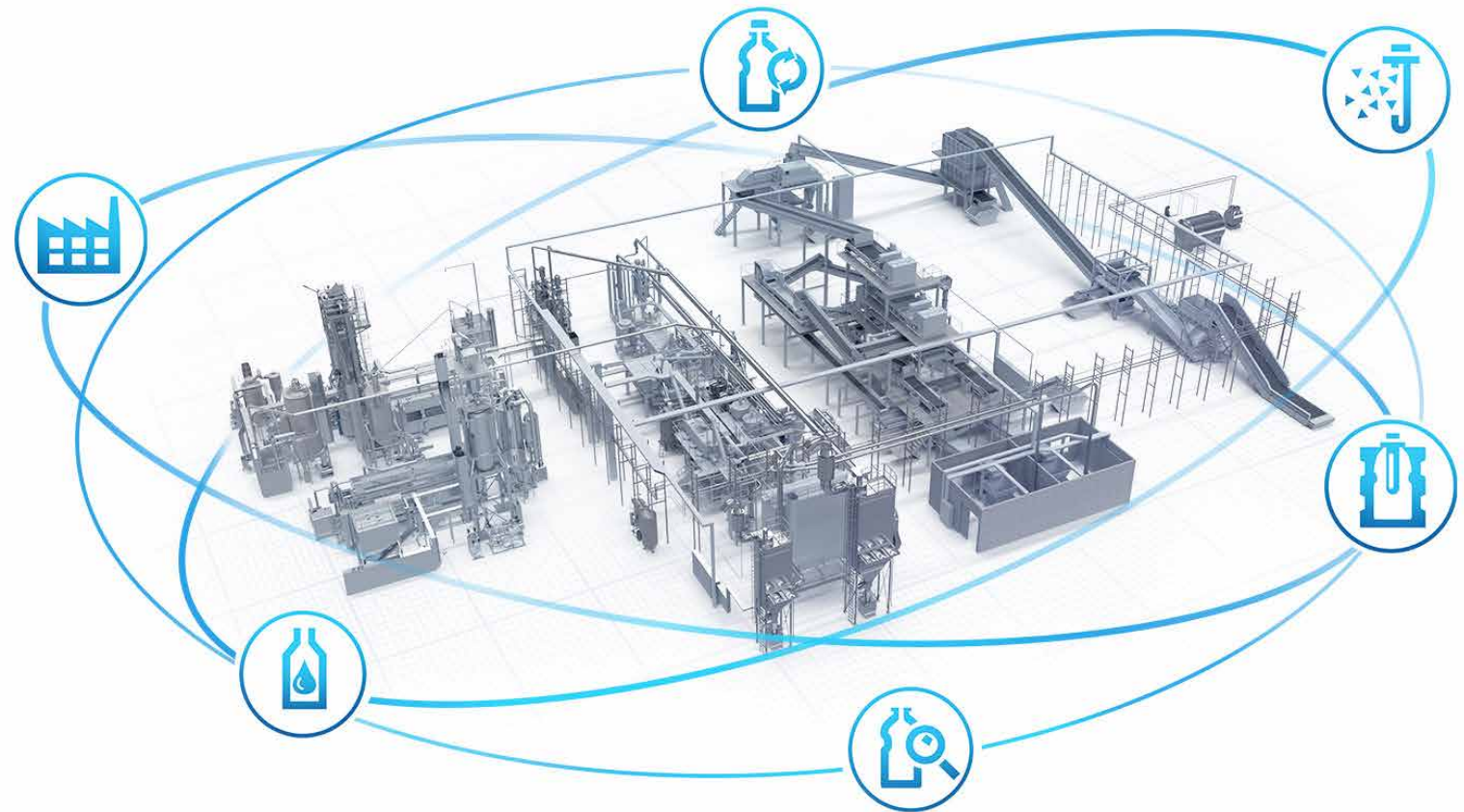




What happens after once the recyclate has been created

As a part of the Krones family, we are embedded in a network that extends across the entire plastics loop. This comprises, among other things:

- Know-how and services surrounding the design of packaging, in particular in the realms of lightweighting and design for/from recycling
- Know-how and technology for the further processing of recyclates, such as for example: Injection moulding tools, blow moulders, inspection systems, and bottling and packaging lines
- Collaboration with external partners from the field of research, the packaging industry, and sorting and recycling technology

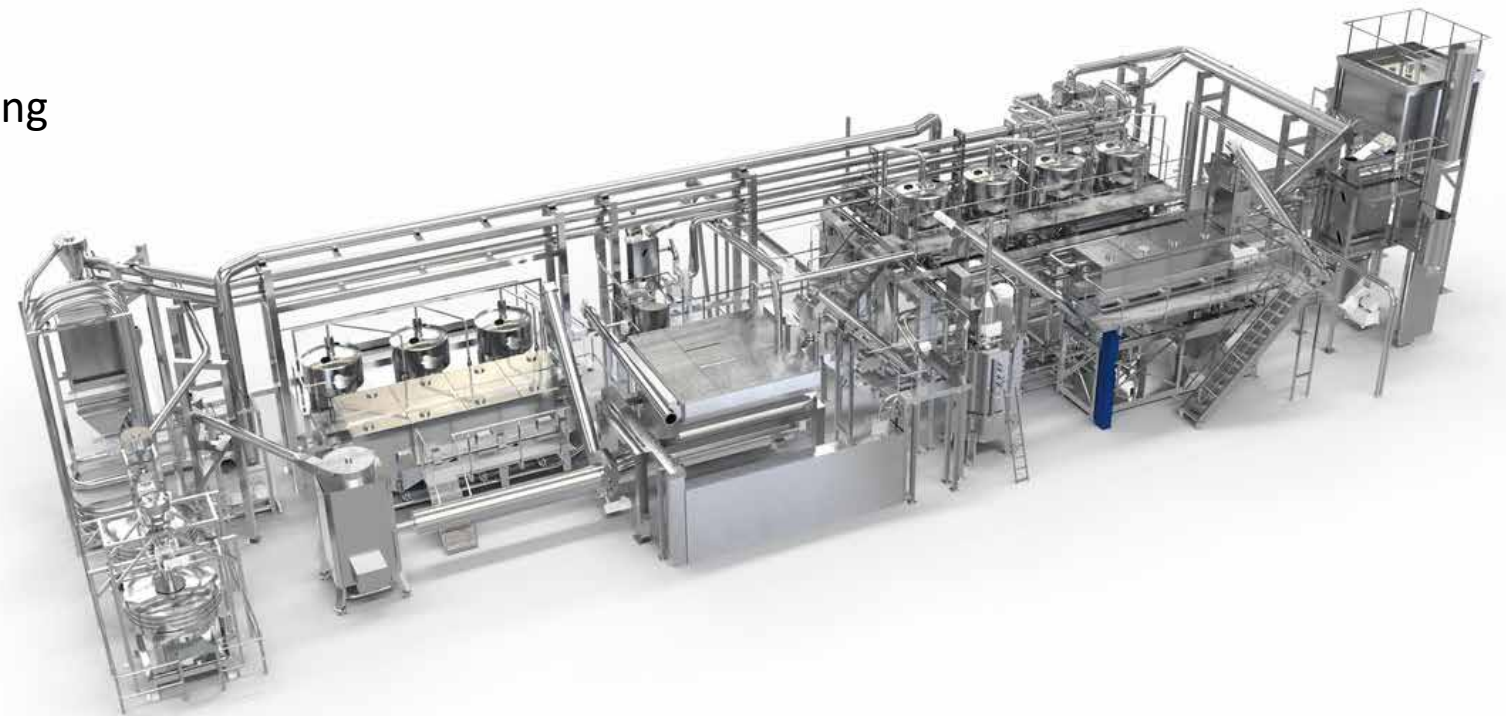




How we are equipped – our technology

MetaPure W

- In our test system, your material undergoes wet-grinding and volumetric dosing.
- The product is then conveyed through a hot or cold washing procedure comprising a variety of washing stages such as pre-washing, intensive washing and post washing.
- Impurities are removed from the production flow using multiple separation stages such as density separation, sifting and metal separation.
- A multi-stage drying sequence to reduce the amount of residual moisture completes the process.



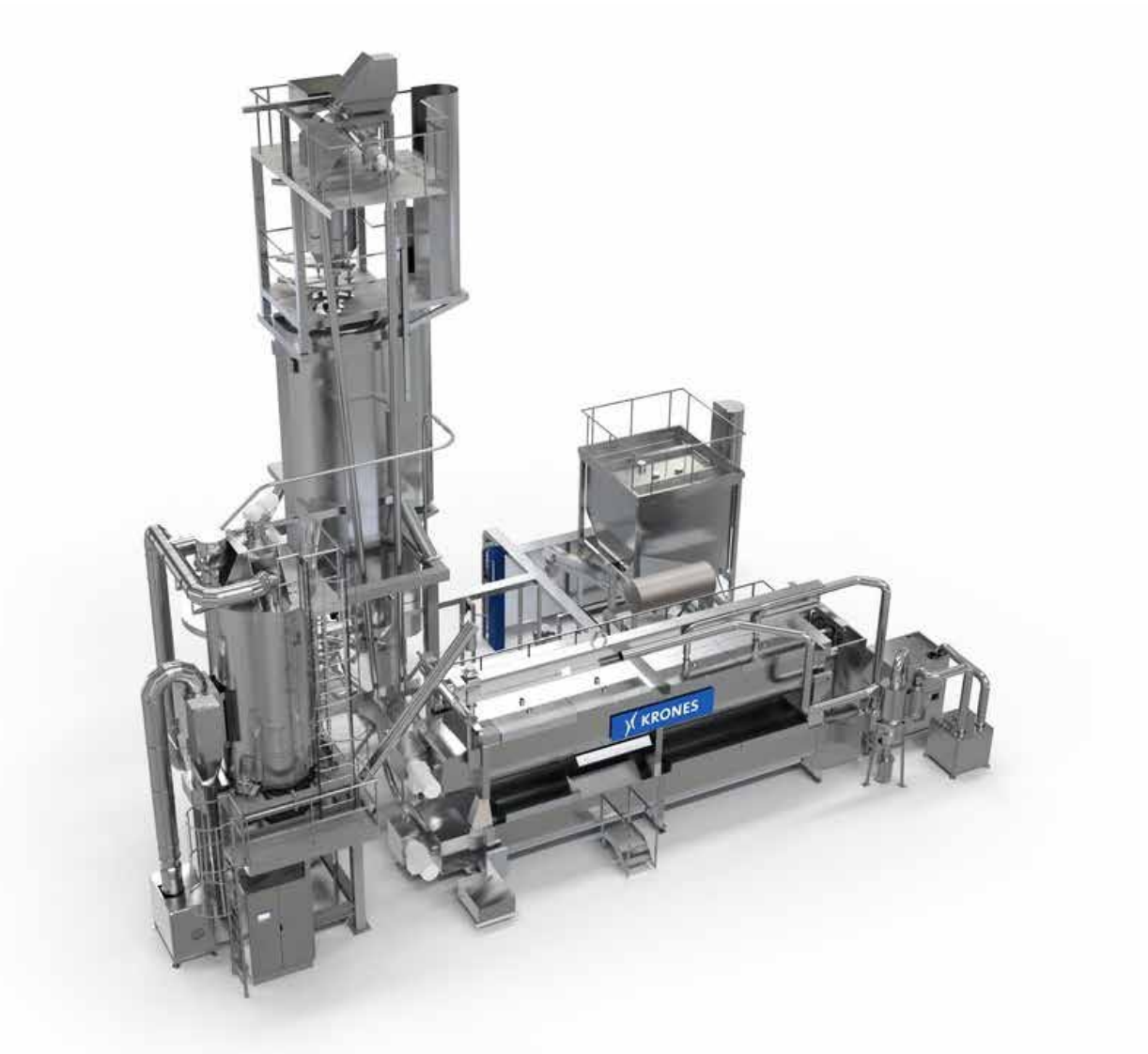


How we are equipped – our technology

MetaPure S

Our Recycling Technology Centre has a test system that simulates all of the process steps of the MetaPure S industrial SSP system in a representative and individual manner:

- In batch mode, both flakes and pellets can be processed in quantities of up to 7.5 kilograms daily.
- Tests to determine the behaviour of a range of materials can be evaluated, including: IV structure, reduction of contaminations and odours.





What makes us special

Tools

- ✓ Testing system of different sizes
- ✓ Wet and dry laboratory

Processes and methods

- ✓ Recognised measuring methods
- ✓ Proven test set-up



Experience

- ✓ In recycling for 20 years
- ✓ Installed capacities of 308,000 t_{recyclate}/year worldwide

Team

- ✓ Experienced engineers and technicians
- ✓ Interdisciplinary team
- ✓ External partners



How we plan our tests

Analysis of the test objective

- ✓ Definition of the target product and target quality



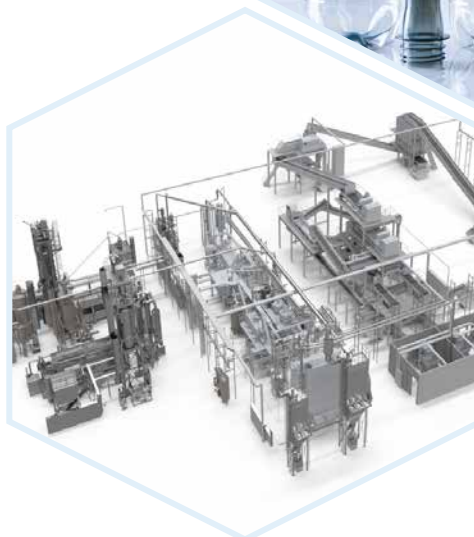
Test plan

- ✓ Planning of test sequence
- ✓ Scheduling



Technology planning

- ✓ Deduction of the necessary technologies



Planning validation

- ✓ Comparison of the planned data with the actual quality of the input material



We offer:

A detailed test plan for your test



How we carry out our tests

Material

- ✓ Flake, pellet
- ✓ Different plastics



Quality assurance

- ✓ Bulk material analytics
- ✓ Process water analytics

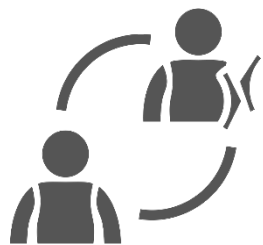
Process

- ✓ Pre-sorting, washing, SSP, flake sorting, granulation



Further processing

- ✓ To test objects
- ✓ To preform and bottle
- ✓ To film and thermoformed packaging



We offer:

Tests from the bale right through to the new packaging with a range of recyclate percentages



How we analyse the tests

Mass balance

- ✓ Listing of all product and auxiliary flows



Quality parameters

- ✓ Product quality, such as the sorting quality, washing quality, colour, residual moisture and particle size distribution



Optimisation potential

- ✓ Measures for increasing the yield and product quality on the basis of the test results



Concept proposal

- ✓ Recommendation of the optimum set-up for the examined task



We offer:

A comprehensive test report with a concept proposal for your specific task in hand



The test options we offer

	Sorting analysis input – manual			Sorting analysis input – automatic			Bulk density	Particle size distribution	Residual humidity	Residual humidity – external	Sorting analysis – internal	Sorting analysis – oven test	Rise in pH	Indicator test	Microscopy	IV value, solubility	MFI value	Lab. values	Turbidity	Inclusions	VOC screening	NIAS screening	Waste water analytics	Turbidity
	Bales/bottles	Flakes/pellets																						
	Input			Washing/solid stating																				
Recycling solutions	x			x	x	x	x	x		x	x	(x)	x	x	x	x	x	x					(x)	x
Krones						x	x		x			x			x								x	x
External partners		x							x											x	x			

You can easily send a request for a non-binding quotation in our Krones.shop.



Benefits to you

Tests as required

Regardless of whether you wish to examine bottles or other hollow objects, label films or other materials: in the Krones Recycling Technology Centre we perform individual washing tests with your desired material.

Professional and holistic

Would you like to gain substantiated information about the entire recycling process? No problem: we cover the entire loop from the bale through to the new packaging if needed. The tests are performed and supervised professionally by our in-house team of experts.

Valuable data and findings

On completion of the tests, you are supplied with a comprehensive test report with all of the calculated data. Our experts also discuss the most significant results and findings with you in a personal meeting. This means you have all relevant data and facts on hand to operate your processes and systems as efficiently as possible.

Easy online booking

Are you interested in having a test performed for you in our Recycling Technology Centre? In Krones.shop you can request an individual quotation including your preferred test date, both quickly and without obligation.



Solutions beyond tomorrow

 **KRONES**