

**LINDNER**



**SYSTEM SOLUTIONS  
PLASTICS RECYCLING**

**GET THE BEST  
OUT OF IT.**



A man with short brown hair, wearing a dark grey suit jacket over a white shirt, stands on the right side of the frame. He is looking directly at the camera with a slight smile. Behind him and to the left is a large, colorful pile of compressed plastic waste, including various types of plastic bottles, containers, and fragments. The background is a bright blue sky with scattered white clouds.

# LINDNER

ONLY LINDNER CLIENTS CAN TRULY SAY:

# YOU'RE TOO PRECIOUS TO WASTE.

Thought Borealis, a leading provider of base chemicals and polyolefins. Borealis was the first virgin plastics producer to try and become the industry's recycling technology front runner. The Borealis subsidiary mtm plastics relies on Lindner's highly productive technology for mechanically processing rigid plastic waste. The result has been innovative products such as the Purpolen® regranulate made of 100% recycled plastics, which is suitable for manufacturing high-quality plastic products such as branded consumer goods. In this way, valuable resources are transformed back into precious materials that close the loop as upcycled products.

'The recycling process starts with efficient waste processing prior to extrusion. And for that we rely on Lindner's technology.'

**Günter Stephan**  
Head of Mechanical Recycling  
Borealis Circular Economy Solutions  
Austria



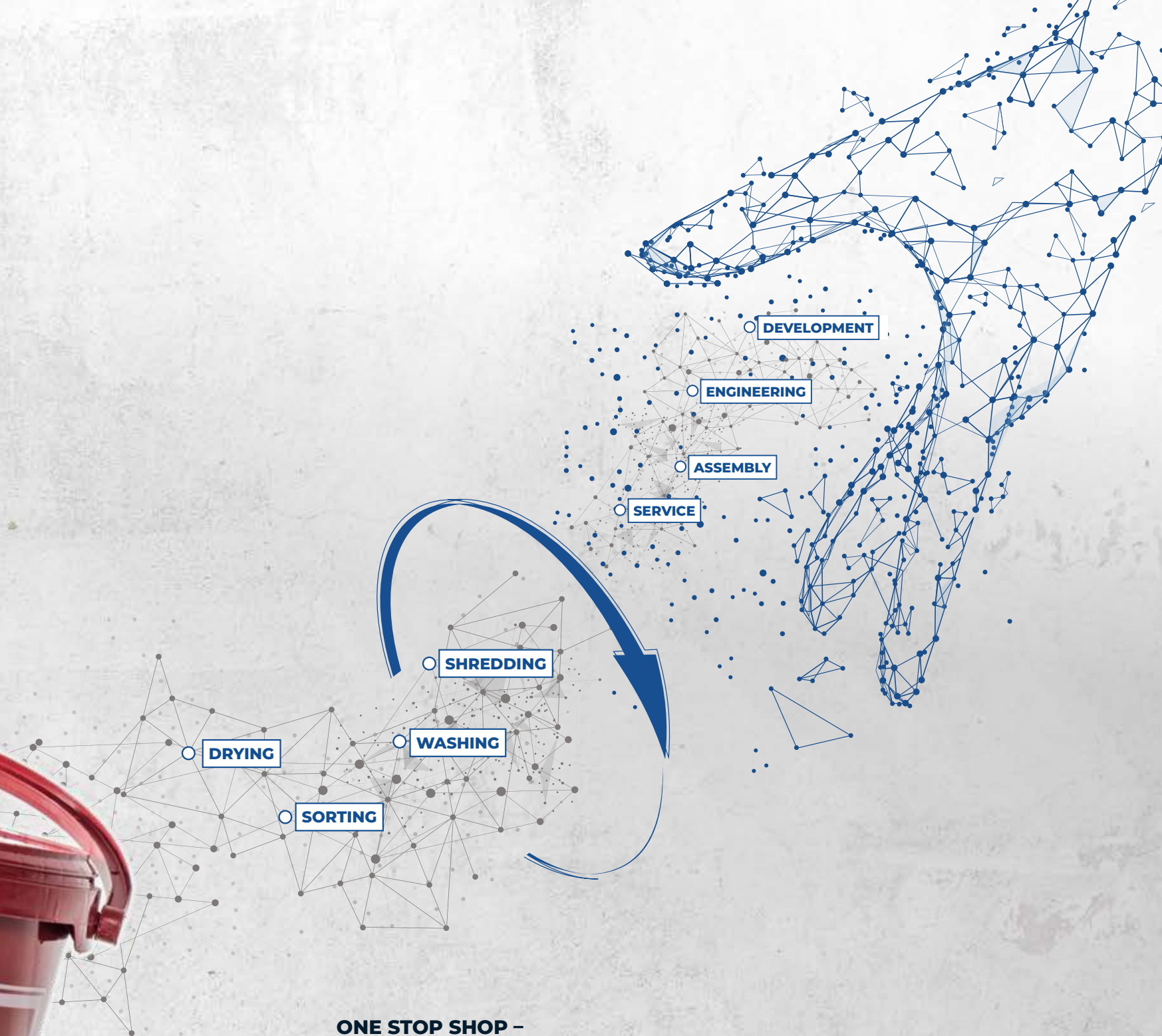
# THE CYCLE STARTS HERE.

## SYSTEM SOLUTIONS FOR RECYLING AND UPCYLING

### ZERO-WASTE POTENTIAL.

Polymers have become indispensable in our society. Even though plastic products are coming under increasing scrutiny worldwide, the truth is that we can hardly do without this fascinating material. That's why the demand for products made of high-quality recyclates is constantly rising, and large manufacturers of branded goods in particular are eager to satisfy this demand. Which means they need large quantities of consistently high-quality secondary raw materials.

The Circumat project group proves just how effective recyclates can be with their engineered rigid plastic containers called Recycling Öli. Öli is a multiple-use bucket for the collection of used cooking oil from households and the catering industry in Germany, Austria and Switzerland. Previously it was made from virgin PP, but thanks to this cooperation and modern processing technologies, it can now be manufactured from 100% recyclate. Go to [lindner.com/circumat](http://lindner.com/circumat) to find out more.



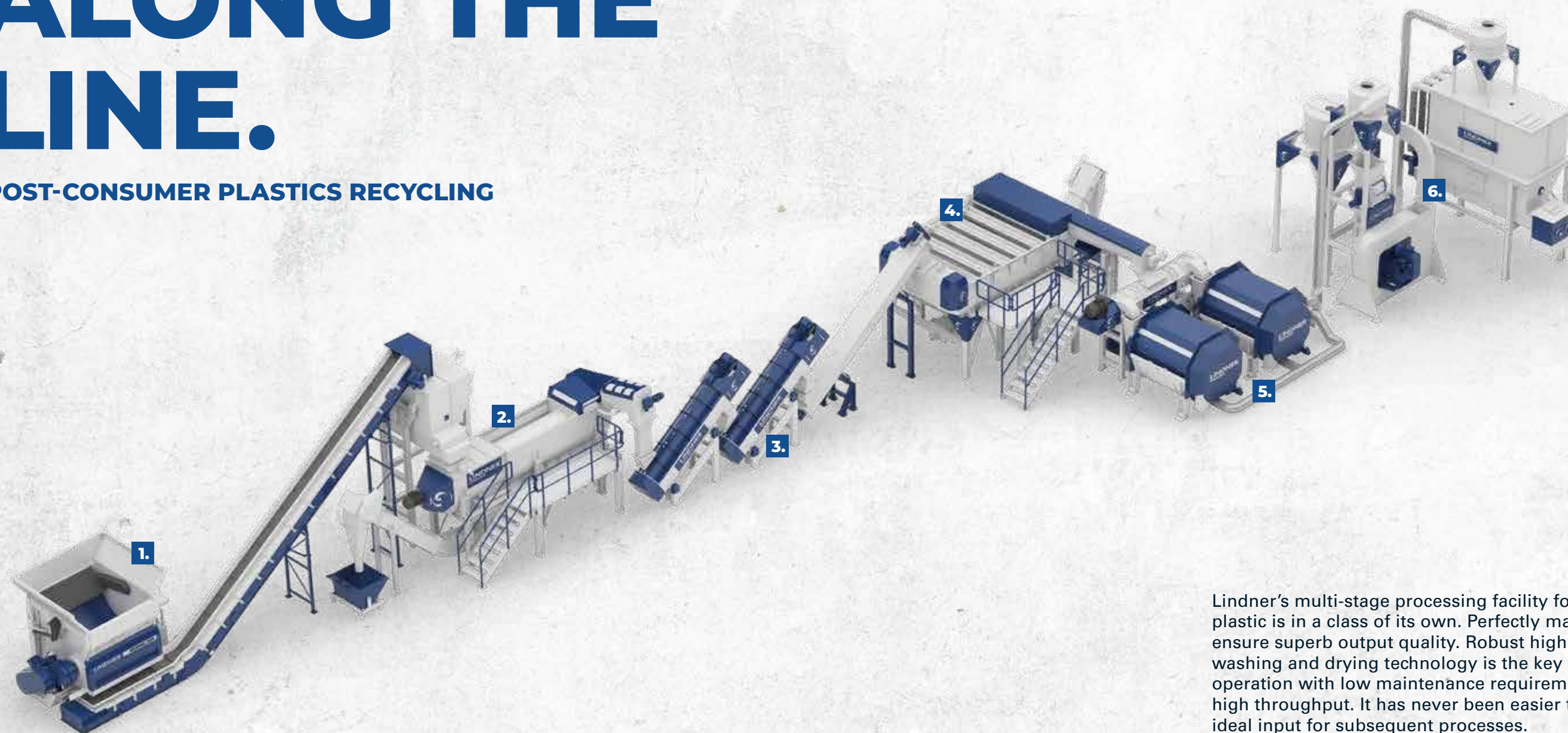
### ONE STOP SHOP – TURNKEY SOLUTIONS FOR MECHANICAL RECYCLING

Lindner's turnkey system solutions for plastics recycling are all the rage. Because a functioning circular economy can only be achieved with high-end recyclates. And for that you need the right raw material. Which Lindner's full range of modern shredders, washing and sorting equipment – all from a single source – produces profitably while keeping costs as low as possible. Thanks to the engineering team's extensive experience, Lindner's perfectly coordinated machines join together to form highly productive solutions that perfectly prepare material for extrusion and jump-start circularity.



# SUCCESS ALL ALONG THE LINE.

## POST-CONSUMER PLASTICS RECYCLING



Lindner's multi-stage processing facility for post-consumer plastic is in a class of its own. Perfectly matched components ensure superb output quality. Robust high-end shredding, washing and drying technology is the key to smooth 24/7 operation with low maintenance requirements and consistently high throughput. It has never been easier to guarantee the ideal input for subsequent processes.

### 1. SHREDDING

It all starts with shredding. Baled or loose contaminated plastic waste is fed into the machine by forklift or a conveyor belt. The result: consistent quantities of homogenous output for subsequent washing and sorting.

### 2. PRE-WASHING

The Rafter is an efficient pre-wash system for heavily contaminated, primary-shredded plastics. Three zones effectively separate contaminants such as stones, metal, glass and non-plastics stuck to the material, optimally preparing the plastics for the downstream washing process.

### 3. FRICTION WASHING

The Twister series friction washers effectively remove even the finest dirt particles. Thanks to the highly dynamic washing process using friction applied by the rotor, contaminants are continuously washed off with water and separated by a screen.

### 4. SEPARATION

The Graviter separates different types of plastics based on their relative density using the tried-and-tested sink/float method. In this process, plastics with a density lower than 1 g/cm<sup>3</sup> (PE, PP) are separated from plastics with a density higher than 1 g/cm<sup>3</sup> (PVC, ABS, PET).

### 5. MECHANICAL DRYING

In the Loop Dryer the plastic granulate is dried mechanically. With controlled centrifugal force any remaining non-plastics are also detached from the material. The dryer spin-dries the plastic granulate at approx. 600–1,000 rpm, effectively removing water and residues such as paper.

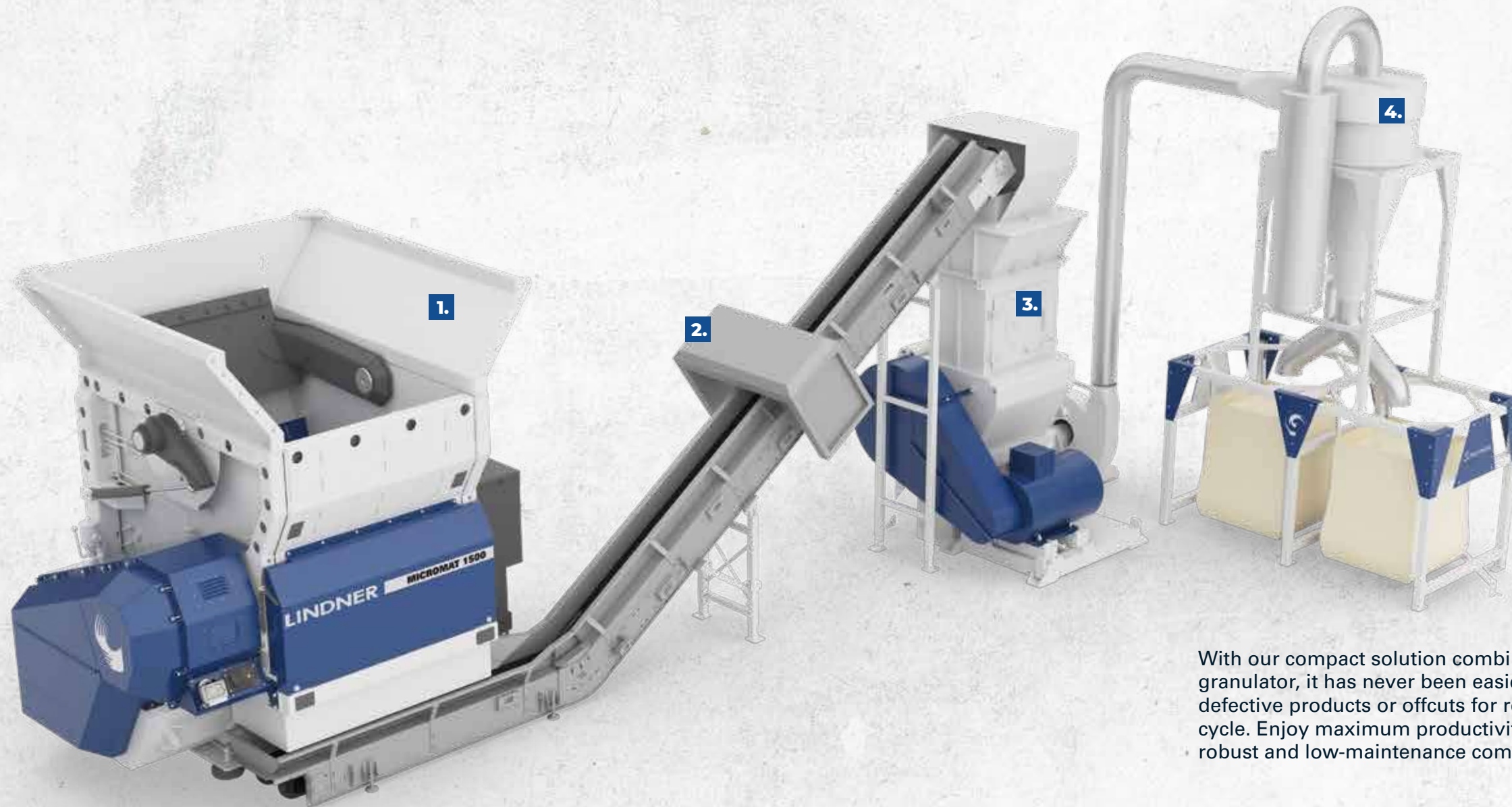
### 6. THERMAL DRYING

The thermal dryer dries the material to less than 3% moisture content using adaptive heating technology, perfectly preparing it for extrusion. With the highly efficient PLC, the temperature is kept constant and energy consumption low.



# NOTHING TO WASTE.

## POST-INDUSTRIAL PLASTICS RECYCLING



With our compact solution combining a primary shredder and granulator, it has never been easier to prepare plastic waste, defective products or offcuts for re-entering the production cycle. Enjoy maximum productivity with our highly efficient, robust and low-maintenance components.

### 1. PRIMARY SHREDDING

Primary shredding kicks off the process. The robust Lindner shredder splits the material into the right output size for subsequent processes. To achieve the best possible throughput the shredder, conveyor and granulator continuously communicate and control both the speed and the amount processed.

### 2. CONTAMINANTS DETECTION

Even with mostly homogenous industrial waste, contaminants such as metal may be in the input material. To avoid damage to downstream machines, these are identified by detectors, the system is safely stopped and an alarm is triggered.

### 3. GRANULATION

The material coming from the non-shreddables-resistant shredder is fed into the granulator and processed to the required particle size. High rotor speeds are normal in this process, which means that only clean, contaminant-free material is processed into extrudable material in the granulator.

### 4. GRANULATE COLLECTION

In this step of the process, the material that has been shredded by a granulator to a particle size of 8–10 mm is sucked into containers like big bags or directly transported for further processing.

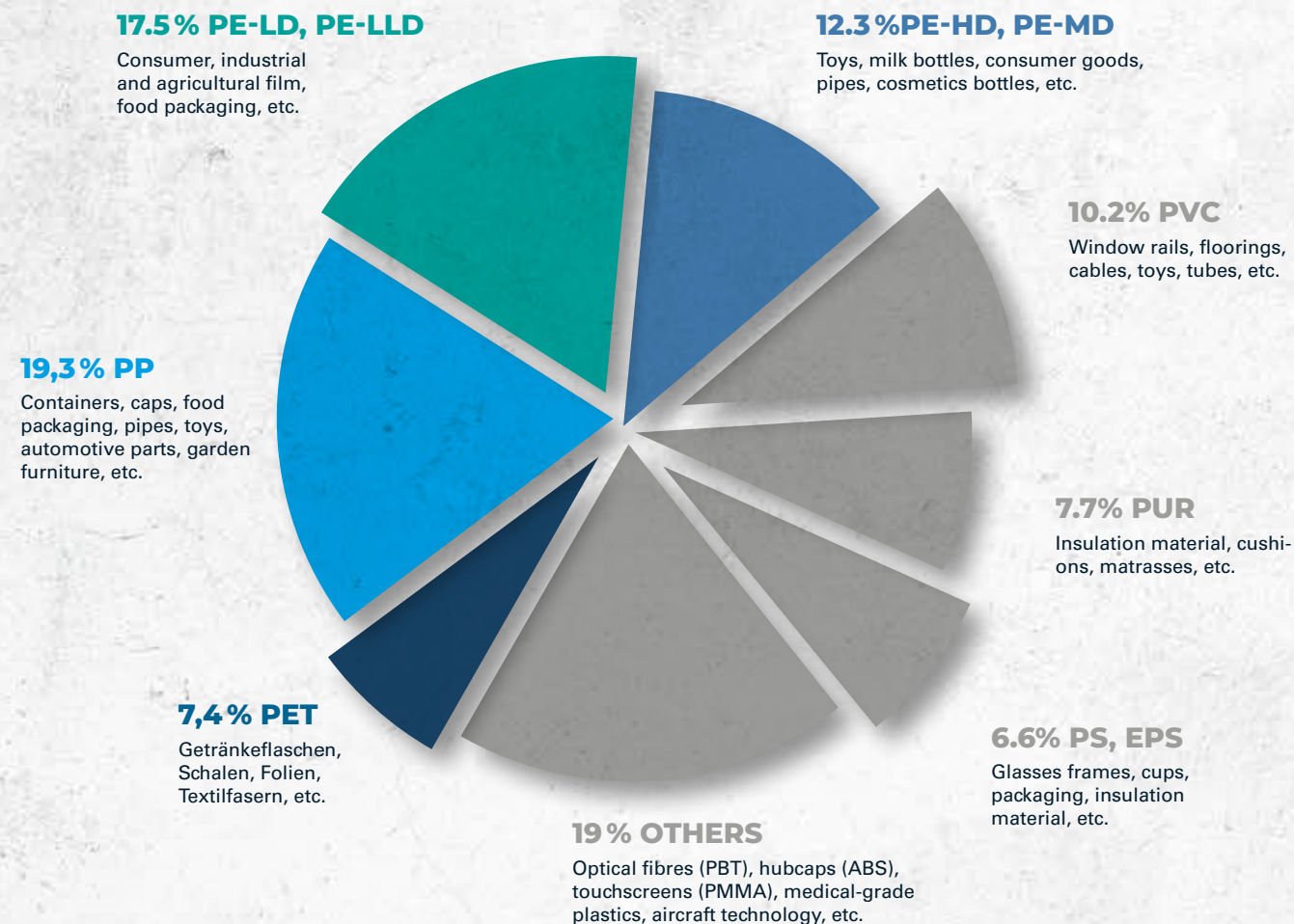


# IMPRESSIVE VARIETY.

## PLASTICS: A HIGHLY SOUGHT-AFTER MATERIAL

### FROM SUPERMARKETS TO SPACE TRAVEL

Due to plastics' countless applications, we encounter them in virtually every aspect of our daily lives. Worldwide production already exceeds 400 million metric tons and is rising every day. Polyethylene and polypropylene account for the largest share in terms of volume. The good news: with the right technology, discarded plastics can be transformed back into secondary raw materials, saving precious resources at a profit.



### PE-LD & PE-LLD



Large quantities of film find their way into the waste stream as post-consumer, post-commercial or agricultural film. They are usually contaminated with organic waste and paper labels. With modern multi-stage processing and the right washing technology, it's possible to produce clean flakes that are as transparent as possible and ideally suited to extrusion.

### PE-HD BOTTLES



PE-HD Bottles are traded in pre-sorted and pressed form. The purity of these materials varies greatly depending on their origin. The Lindner hot-wash system produces such high-quality regrind that it can replace virgin PE-HD – the basis for a genuine circular economy.

### PP CONSUMER GOODS



PP waste is generated as mono- or mixed fractions while sorting commercial or bulky waste. The robust and non-shreddables-resistant shredder then reliably transforms these materials into sortable flakes. Finally, they are cleaned and separated to obtain a perfect, homogeneous raw material for new, high-end products.





# LINDNER

ONLY LINDNER CLIENTS CAN TRULY SAY:

# YOU'RE BACK IN THE RACE.

In Vechta, Germany, Lohner Kunststoff Recycling (LKR) knows exactly how to bring industrial plastic waste back to the starting blocks. Jointly owned by Remondis Group, the company has been recycling production waste and surplus since 1992. Today, LKR is a specialised full-service provider that transforms 45,000 metric tons of waste into valuable raw material every year for its customers worldwide. To shred this waste, the company relies on Lindner's technology – like the Micromat with its new Multiplex rotor. Thanks to the cutting system's new 3D stepped design, the shredder can produce up to 40% more output, even with tough input material. All the while maintaining Lindner's signature high flexibility and maximum productivity.

'With the new Micromat cutting system, we were able to significantly increase throughput even with tough materials.'

**Jan-Hendrik Wilming**  
CEO  
Lohner Kunststoff Recycling GmbH  
Germany



# WE HAVE IT ALL WRAPPED UP.

## WE GO THE EXTRA MILE.

Innovation as a principle. This basic principle has informed Lindner's actions ever since the company was founded in 1948. As a specialist in shredding technology, we produce ground-breaking solutions for waste processing at three modern production sites in Austria. You will love the results: state-of-the-art machines and system components – with ultimate output quality, productivity and efficiency. You want to plan and execute a large project? No problem. Because one thing is certain: with us, you are always that crucial step ahead.

## YOU CAN COUNT ON US.

Heavy-duty machines, experienced and reliable first-class service worldwide. Whether you need quick assistance with your technical problems or professional maintenance: we will be there for you and do everything it takes to extend your system's life and operating time with our expertise in shredding technology and our high-quality, signature Lindner spare parts.

## THE COMPLETE PACKAGE

- Commissioning and training by skilled, qualified staff
- Individual fine tuning of your machines on site
- Professional service hotline, quick technical support
- 100% Lindner, 100% original: quality spare parts that are readily available worldwide
- Tailor-made service and wearing parts packages
- Machine cleaning and tool reconditioning services
- Professional maintenance of electrical components by ABB-certified personnel

## KEEPING AN EYE ON EVERYTHING – THE LINDNER MACHINE INFORMATION SYSTEM

Keep productivity on track: with the right information at the right time, the Lindner MIS puts all relevant performance data and valuable additional information at your fingertips for full transparency, minimum downtime and maximum output.

- Performance data including reporting
- Provision of daily reports via email
- Request spare parts and see order status
- Integrated training clips and maintenance sequences
- Computer- or smartphone app-operated
- Inbuilt operating instructions
- Database to record performance data and material flows





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