

**LINDNER**



**APPLICATION SOLUTIONS  
PLASTICS RECYCLING**

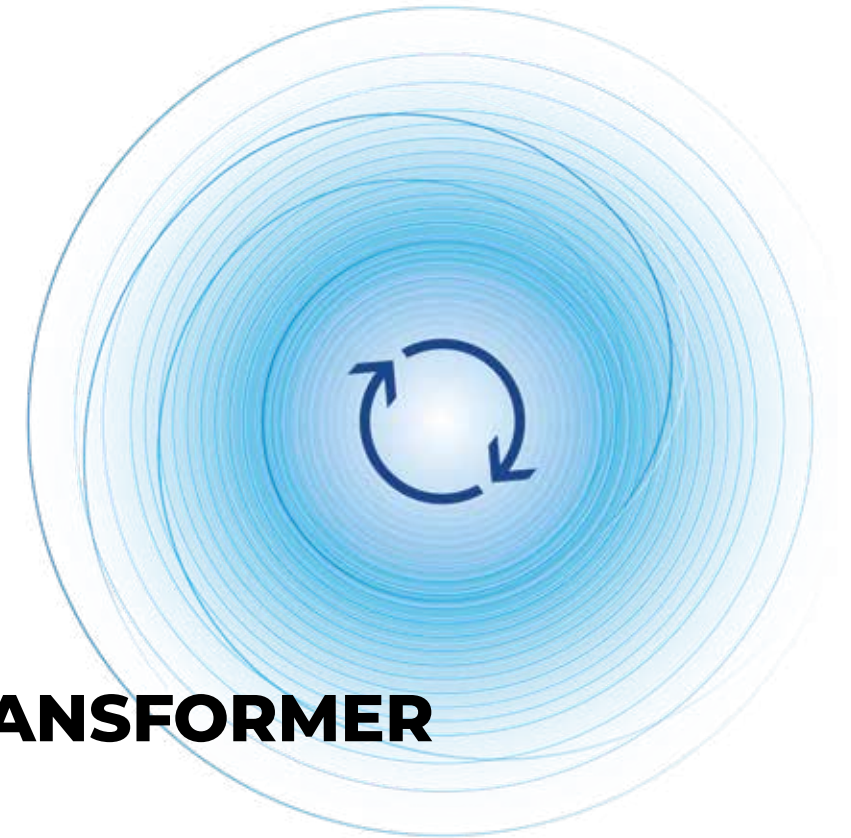
**PURE  
VALUE.**



**KAI HOYER | SOURCE ONE PLASTICS**  
READY FOR THE FUTURE OF HIS  
BUSINESS

**BE A WASTE TRANSFORMER.**

**READY FOR  
THE FUTURE OF  
YOUR BUSINESS.**



**#WASTETRANSFORMER**



# MAKE THE MOST OF WASTE.

**SHREDDING TECHNOLOGY AND SYSTEMS ENGINEERING FOR THE RECYCLING INDUSTRY OF TOMORROW.**

We believe in transforming waste into precious materials. That's why we invest all our knowledge and innovative power in shredding machines and system solutions that are highly efficient, robust, reliable and easy to maintain. So our clients can transform waste into a valuable and reusable resource – efficiently and reliably.



**In-house research and development**



**Production on state-of-the-art machines, using the latest robotics & automation technology**



**In-house electrical engineering department**



**Consulting, engineering & system construction**



**Worldwide service network**

**Export countries**



**> 90**

**Employees worldwide**



**> 500**

**Locations worldwide**



**8**

## **INNOVATION AS A PRINCIPLE – QUALITY PROMISED AND DELIVERED**

Josef Lindner founded our family business in 1948. He started by planning and producing machines and systems for the wood industry. Today, more than 70 years later, the company is still familyowned, employs over 500 people worldwide and exports to more than 90 countries.

Production still takes place in Austria. In 2022, we moved into our home of recycling, the new company headquarters in Spittal an der Drau in Carinthia, Austria. We manufacture in line with trailblazing production standards on a 14,000 m2 facility using the latest robotics & automation systems. This way, we are able to manufacture the majority of components in-house, guaranteeing our proven Lindner quality and the rapid availability of machines, systems and spare parts.





# MAXIMUM VERSATILITY.

## PLASTICS – A HIGHLY SOUGHT-AFTER RAW MATERIAL

### FROM SUPERMARKETS TO SPACE TRAVEL

Due to plastics' countless applications, we encounter them in virtually every aspect of our daily lives. Worldwide production reached 367 million tonnes in 2020 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.

#### 19.7 % PP

Containers, food packaging, tubes, closures, toys, car parts, garden furniture etc.

#### 17.4 % LDPE & LLDPE

Consumer, industrial and agricultural films, Food packaging etc.

#### 12.9 % HDPE, MDPE

Toys, milk bottles, Household goods, pipes, cosmetic bottles etc.

#### 8.4 % PET

Beverage bottles, trays, foils, textile fibres etc.

#### 10.7 % OTHER THERMOPLASTICS

#### 9.6 % PVC

Window profiles, floor coverings, cables, toys, hoses etc.

#### 7.8 % PUR

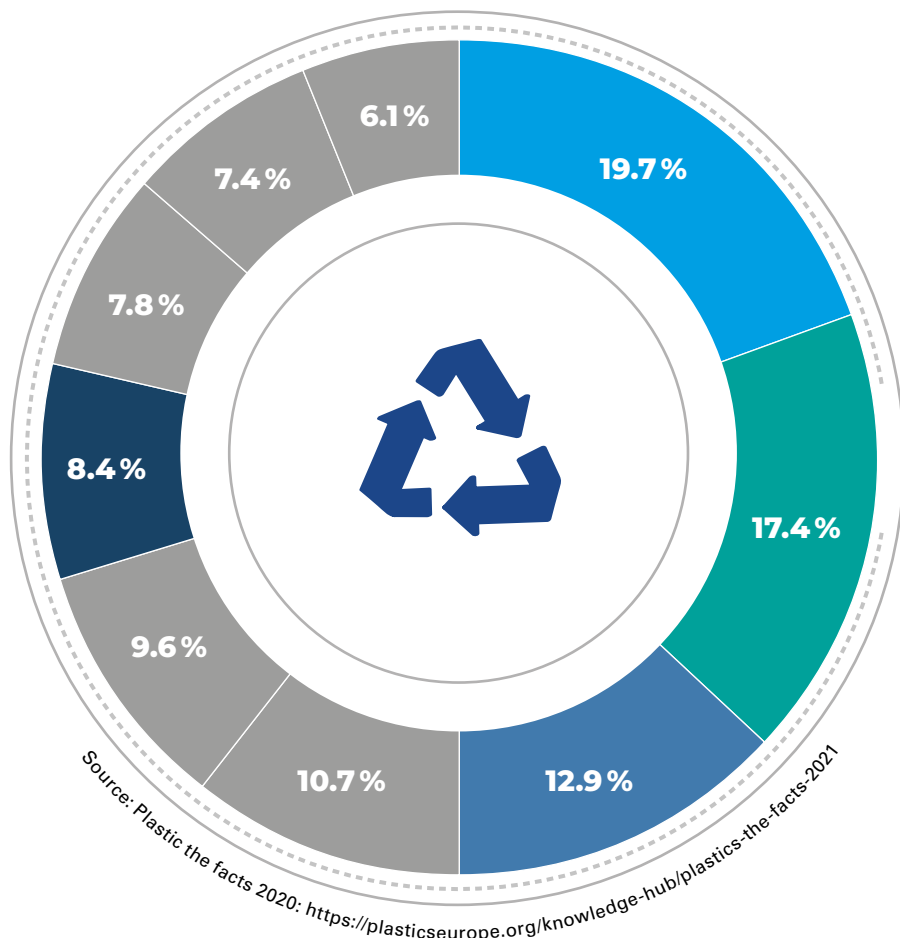
Insulation material, pillows, mattresses etc.

#### 7.4 % OTHER PLASTICS

Insulation material, pillows, mattresses etc.

#### 6.1 % PS, PS-E

Spectacle frames, cups, packing, insulation material etc.

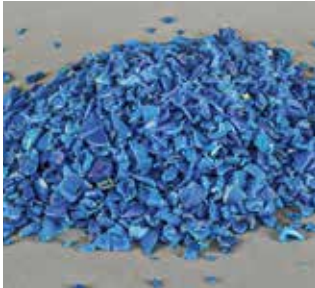


#### LDPE & LLDPE FILM



Large quantities of film are part of the waste stream as post-consumer, post-commercial or agricultural film. Depending on their origins they can be contaminated with organic waste or paper labels. Thanks to modern multi-stage processing and state-of-the-art washing technology, it's possible to produce optimally customised flakes that are perfect for extrusion.

#### HDPE BOTTLES & CONTAINERS



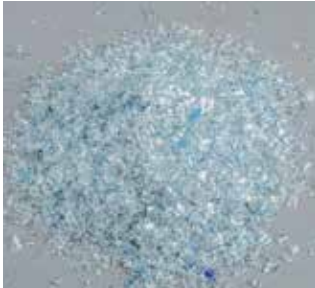
Bottles and containers are traded in pre-sorted and pressed form. The purity of these materials varies greatly depending on their origin. Lindner's hot-wash system can be used to produce such a high-quality regrind that it can even replace virgin HDPE – the basis of a genuine circular economy.

#### PP PACKAGING & RIGID PLASTICS



PP waste is generated as mono or mixed fractions while sorting commercial, domestic or bulky waste. The robust shredder, which is resistant to non-shreddables, reliably shreds these materials into sortable flakes. These are then mostly separated by colour, and subsequently cleaned to obtain a homogeneous source material for new, high-quality goods.

#### PET BOTTLES & TRAYS

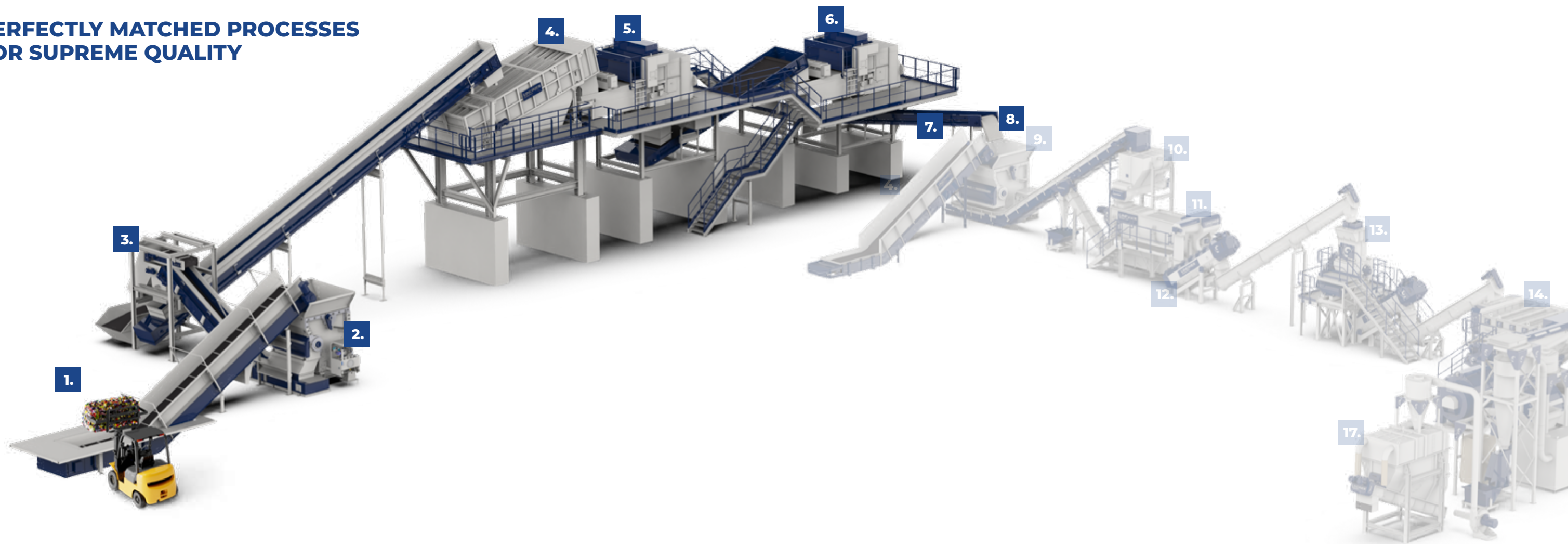


Along with polyolefins, PET is one of the most commonly used packaging plastics. To ensure that PET can be successfully recycled and reused in the food industry, the main focus is on the extensive sorting and demanding cleaning processes. A bottle can then become a bottle again (bottle to bottle) or be used as a raw material for the textile industry.

# THE CYCLE STARTS HERE.

**PERFECTLY MATCHED PROCESSES FOR SUPREME QUALITY**

Quality right from the start. Optimum sorting is an important part of a plastics recycling facility – the higher the sorting quality and the purity achieved, the better the final output granulate. At the beginning of the process chain, the Lindner shredder opens the bales. Specially optimised for the downstream NIR sorting system, the throughput is uniform and has few fine particles. Thanks to NIR sorting devices as well as various processing stages and additional units such as metal separators and screening technology, it's possible to transform waste streams into pure quality, which is then fed into downstream plastic washing systems.



**1. MATERIAL FEEDING**

**2. FIRST SHREDDING STEP –  
OPENING THE BALES**

**3. FERROUS METAL SEPARATION**

**4. CLASSIFICATION – FINE PARTICLES  
SEPARATION AND SEPARATION OF  
FOREIGN MATERIALS**

**5. NIR SORTING I**

**6. NIR SORTING II**

**7. WASHING LINE FEED**

**8. OUTPUT SORTING,  
INPUT WASHING LINE**





# SUCCESS ALL ALONG THE LINE.

EFFICIENT ALL-IN-ONE SOLUTIONS  
FOR PLASTICS RECYCLING

Lindner's multi-stage washing lines are in a class of their own. Perfectly matched components ensure superb output quality. Robust high-tech shredding, washing and drying processes are the key to a smooth 24/7 operation with low maintenance requirements and consistently high throughputs. It has never been easier to guarantee the ideal input for subsequent processes. Based on this standard solution, Lindner's washing facilities are individually adapted to the respective requirements. The additional installation of a hot-wash unit ensures that the output material meets the highest quality specifications.



9. SHREDDING

10. DOSING SILO

11. PRE-WASH

12. FRICTION WASH

13. WET GRANULATOR

14. DENSITY SEPARATION

15. PRE-DRYING

16. MECHANICAL DRYING

17. THERMAL DRYING

18. QUALITY CONTROL

19. STORAGE SILO





# DEFINED PRECISION.



**Jupiter BW in chemical recycling**

Difficult-to-recycle mixed plastics, films and PO fractions from the sorting of lightweight packaging are considered difficult to recycle and are usually used for energy recovery. Chemical recycling aims to channel these materials for recycling. However, before those plastics enter the pyrolysis process in the form of agglomerate, for example, the plastic bales must first be loosened and shredded to a homogeneous, NIR-sortable material with a low proportion of fines.

Mixed fraction plastic (fraction 350)



**APPLICATION NOTE - JUPITER 1800 BW:**

Shredder	Jupiter 1800 BW
Drive	Countershaft drive
Cutting system	145 P
Screen	SD 320
Material	Mixed fraction plastic
Throughput*	Up to 7 t/h
Particle size*	90 % < 300 mm

\*Depending on input material, shaft condition and configuration

For detailed product  
information, pictures  
and videos:





# INGENIOUSLY PRODUCTIVE.



## Micromat HP in chemical recycling

Following the complex sorting process, the recyclable materials remaining in the cycle are shredded to a homogeneous particle size of 30-50 mm and fed into a wet or dry mechanical cleaning process. The Micromat HP enables continuously high throughput rates thanks to its precise cutting geometry. The shredder is equipped with the proven and robust Lindner drive system with safety clutch.

## Mixed fraction plastic (fraction 350)



INPUT



OUTPUT

## APPLICATION NOTE - MICROMAT 2000 HP:

Shredder	Micromat 2000 HP
Drive	Direct belt drive
Cutting system	65 P
Screen	D 50
Material	Mixed fraction plastic
Throughput*	Up to 4 t/h
Particle size*	90 % < 50 mm

\*Depending on input material, shaft condition and configuration

For detailed product  
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and videos:





# LESS FINES, MORE OUTPUT.



**Jupiter BW in film recycling**

With its specific shredder set-up, the Jupiter BW series not only enables film fractions to be shred accurately and true to size, but also reduces the proportion of fines by up to 44%. This means that more input material remains in the recycling process. A homogeneous and sortable material size also ensures optimum sortability by downstream NIR systems. The result: an increase in quality and output from the very first process stage.

link to technical  
article on  
lindner.com



98/2 Film



**APPLICATION NOTE - JUPITER 2200 BW:**

Shredder	Jupiter 2200 BW
Drive	Countershaft drive
Cutting system	143 P
Screen	SD 320
Material	98/2 Film
Throughput*	Up to 10 t/h
Particle size*	90 % < 300 mm

\*Depending on input material, shaft condition and configuration

For detailed product  
information, pictures  
and videos:





GETS ME  
MORE.



**Micromat HP before extrusion**

When it comes to recycling post-consumer mixed plastics, resistance to contaminants and high throughput rates are key. Easy access to the rotor enables quick removal of contaminants and fast, uncomplicated blade changes. In this application example, composite materials are fed to dry mechanical cleaning after shredding and then to extrusion. Construction fence bases and lawn grating panels are manufactured - 24/7.

Mixed fraction plastics (fraction 350)



APPLICATION NOTE - MICROMAT 2000 HP:

Shredder	Micromat 2000 HP
Drive	Direct belt drive
Cutting system	65 P
Screen	D 50
Material	Mixed fraction plastics
Throughput*	Up to 7 t/h
Particle size*	90 % < 50 mm

\*Depending on input material, shaft condition and configuration

For detailed product  
information, pictures  
and videos:





# BITES THROUGH EVERYTHING.



### Universo before washing line

The solid technology and high manufacturing quality of the Universo series stand for long service life and high throughput rates - as proven by thousands of hours of use in a wide range of applications. The combination of high-performance gear drives, robust rotors and a protective clutch make it particularly resistant to impurities that can occur when breaking up plastic bales. The easy accessibility to the contaminant and maintenance flap enables easy access for contaminant removal or maintenance and conversion work.

### Mixed plastics



INPUT



OUTPUT

### APPLICATION NOTE - UNIVERSO 2200:

Shredder	Universo 2200
Drive	Gear drive
Cutting system	65 P
Screen	SK 60
Material	Mixed plastics
Throughput*	Up to 3 t/h
Particle size*	90 % < 60 mm

\*Depending on input material, shaft condition and configuration

For detailed product  
information, pictures  
and videos:





# TOUGH TO TAKE.



## Micromat before granulator

Some plastic parts cannot be fed directly into a granulator due to their size, weight, or contamination (start-up cakes, drums, IBCs, parts from the automotive industry). In such cases, a shredder/grinder combination is the perfect solution. The plastics are fed into the shredder and then shredded to 50-80 mm. The downstream granulator can therefore be significantly smaller, requires less energy and impurities can be separated between the two machines.

## TPU (Thermoplastic polyurethanes)



## APPLICATION NOTE - MICROMAT 2000:

Shredder	Micromat 2000
Drive	Gear drive
Cutting system	60 C
Screen	D 25
Material	TPU (Thermoplastic polyurethanes)
Throughput*	Up to 2 t/h
Particle size*	90 % < 30 mm

\*Depending on input material, shaft condition and configuration

For detailed product information, pictures and videos:





# KNOWS NO LIMITS.



**Special application: Big bags**

As with many plastic recycling processes, the first shredding stage is the most important for big bag recycling. Thanks to its robust drive and safety clutch, the Micromat series shredder is particularly powerful and resistant to non-shreddables. The Micromat's cutting system is also specially designed for big bag shredding. Special knives and an easily adjustable counter knife ensure high productivity

link to  
article on  
[lindner-washtech.com](http://lindner-washtech.com)



**Big bags**



**APPLICATION NOTE - MICROMAT 2500:**

Shredder	Micromat 2500
Drive	Gear drive
Cutting system	43 P
Screen	SK 60
Material	Big bags
Throughput*	Up to 2 t/h
Particle size*	90 % <70 mm

\*Depending on input material, shaft condition and configuration

For detailed product  
information, pictures  
and videos:





# CREATES VALUE.



## **Lindner NEXUS.**

### **The service platform that connects.**

Real-time machine data, performance monitoring & maintenance.

With Nexus, the new Lindner service platform, you have an overview of all relevant machine data. Using the Nexus Gateway, real-time machine data is transferred to the digital platform and summarised in customisable reports. The platform also provides all documentation relevant to the system or the individual shredders, as well as spare parts and updates. The Lindner service and support team can also be reached via Nexus. In urgent cases even 24/7.

### **Service à la Lindner:**

- Lindner Nexus - digital service platform for customised performance monitoring
- Available 24/7 – worldwide
- Remote assistance – rapid support with remote maintenance
- High availability of spare parts thanks to extensive in-house production
- Original Lindner spare parts made in Austria for that extra level of quality

### **Maintenance – to keep everything running smoothly:**

- Flexible maintenance offers for high machine availability
- Spare part packages for every application
- Qualified shaft reconditioning & hardfacing in line with the highest international standards



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