

# PROCESSING FOR RECYCLING

Treatment of  
mixed waste





OVERVIEW

# Think green!

Komptech is a leading international supplier of machinery and systems for the mechanical and biological treatment of solid waste, and for the treatment of biomass as a renewable energy source.

**Waste recycling**

The goal of reducing our material footprint through a circular economy with high recycling rates presents new challenges for the waste industry. Treatment lines for mixed municipal waste need to be designed in such a way that the process adapts dynamically to changing conditions, to become more recyclables-oriented and efficient. This can raise recycling and reuse rates, and reduce the greenhouse emissions of the entire waste disposal system.

**Customized facilities**

At Komptech we design and dimension recycling facilities to customer requirements. The most important factors are the feedstock composition and the sales opportunities for the recyclables. Komptech builds efficient solutions for complex tasks, using its comprehensive line of cutting-edge machines for shredding, screening and separating, plus market-proven machines by well-known manufacturers.

**Our services**

We provide solid expertise and resources along the entire performance chain for turnkey waste processing facilities, and can assist you from the very first proposal through to detail planning of the entire plant. We'll take care of the implementation too, from installation to operator training to commissioning. After that our Customer Service, which is available almost around the clock, helps ensure the smooth operation of your facilities. With an eye to the future, we are actively pushing the digitalization of plant technology, from individual machines to complete processing lines.

**225 MILL.**

Tons municipal solid waste per year in the EU (Eurostat 2020, EU27)

**505 kg**

Average amount per capita Range: 287 kg (Romania)- 845 kg (Denmark) (Eurostat 2020, EU27)

24%



Landfill

28%



Energy recovery

48%



Material recycling (Eurostat 2020, EU27)

EU targets



From 2025, at least 55% of municipal waste must be recycled, from 2030 60% and from 2035 65%. (EU Waste framework directive 2018/851)

APPLICATION

# Mixed municipal waste as a resource

Municipal waste is waste from private households and comparable sources, as well as similar waste from commerce and industry. Separately collected fractions like glass, paper and organic waste are already reused to a great extent. Mixed municipal waste such as residential, commercial and bulky waste also has high recycling potential.



01 Household waste

03 Commercial waste

02 Residual waste

04 Bulky waste

# 01 Shredding Page 8

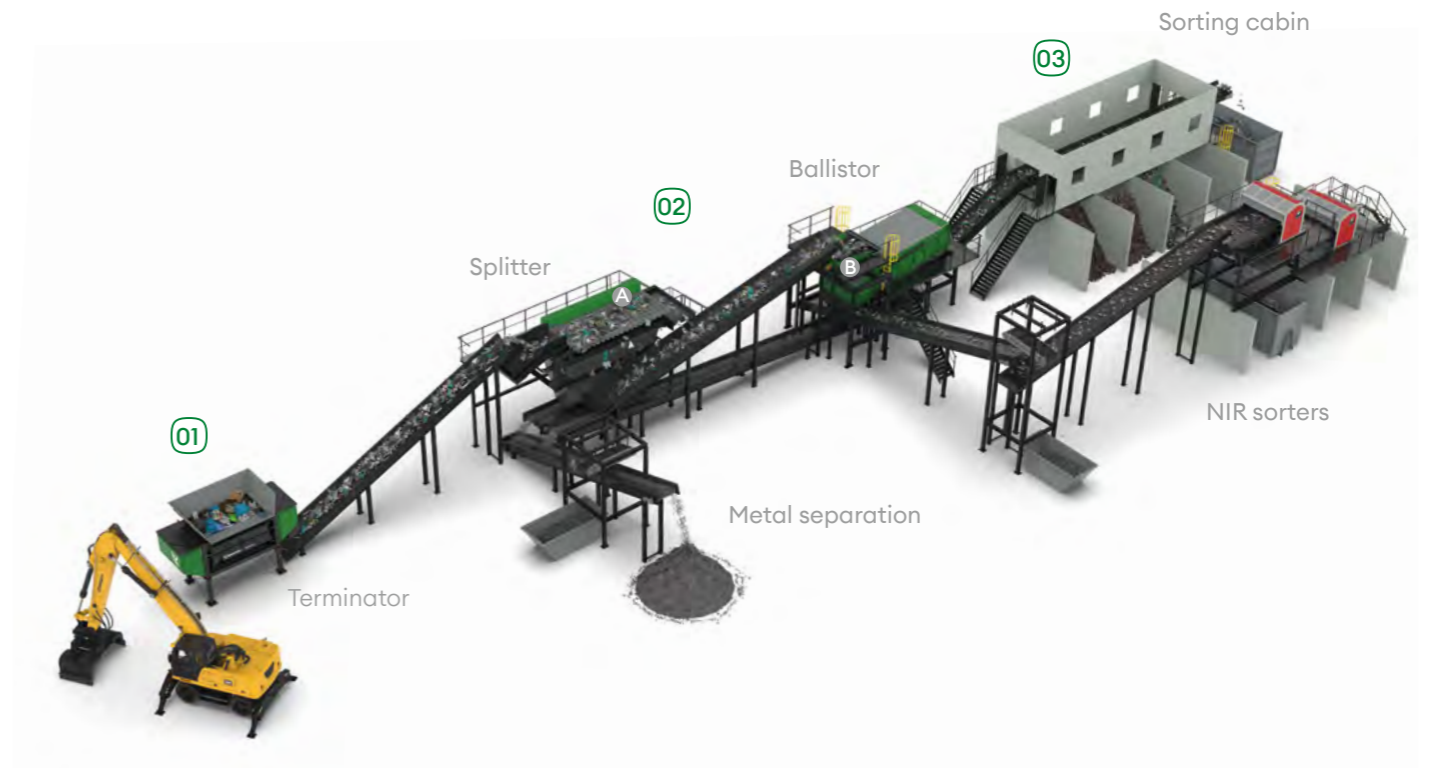
In a processing system, various mixed or presorted wastes are unbagged and separated to get the best possible recycling of the valuable materials in the material streams. The first process step is selective shredding to unbag the material and homogenize the input stream.

# 02 Separation Page 10

If needed, shredding can be followed by separation of the fines (organic and inert) by spiral shaft separator, drum screen or disc screen. This is followed by ballistic separation into flat (2-D) and three-dimensional (3-D) fractions as preparation for further sorting. Ferrous and non-ferrous metals are likewise removed from the separated material streams.

# 03 Sorting Page 12

In the sorting steps that follow, wood, paper, cardboard and plastics like PE, PP, PET, PVC and PS are retrieved from the 2-D and 3-D fractions, manually or mechanically. The remaining high-caloric fractions are used as RDF, either directly or after further treatment.

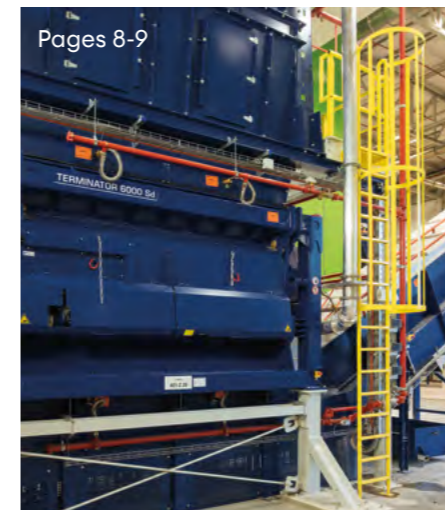


**01**  
Terminator  
Single-shaft shredder

**02<sup>A</sup>**  
Splitter  
Spiral shaft separator  
TS 18/45...25/120 (optional)  
Drum screen  
Flowerdisc (optional)  
Disc separator

**03**  
Manual sorting  
NIR sorters  
Robot sorting (optional)

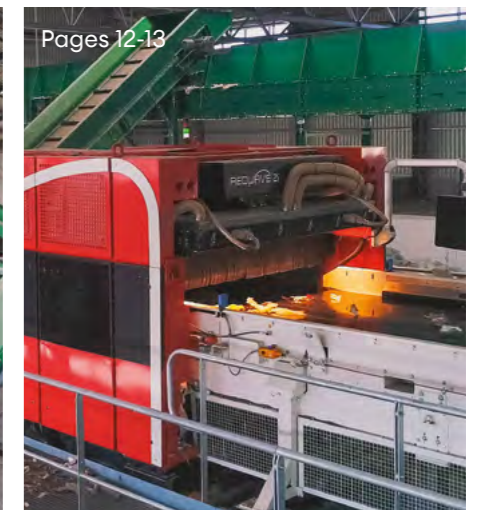
**02<sup>B</sup>**  
Ballistor  
Ballistic separator  
Metal separation



Pages 8-9



Pages 10-11



Pages 12-13



# 01 Shredding

Preshredding brings the input material to a consistent particle size and prevents overlengths that might cause problems farther on. Of equal importance are high contaminant resistance and steady throughput for continuous feed of downstream machines. The Terminator single-shaft shredder meets these requirements perfectly.

The hydraulically adjustable cutting gap lets the operator optimize the shred size to get efficient separation and sorting of the recyclables. The shredding itself is somewhat selective, in that organics to be separated out in the fines are shredded finer than high-caloric or recyclable fractions.

The Terminator is able to shred the most difficult materials. Applications range from coarse pre-crushing to defined shredding, using different drum and counter comb configurations.

## Terminator hydraulic

On the hydraulic models, in addition to the standard frame version, the drive can be physically separated from the shredding unit if desired. The advantages are better protection of the drive, and space-saving integration of the shredding unit in the machine chain.

## Terminator direct

Mechanical direct drive offers high efficiency combined with low energy costs. Other features are two gears to adapt to the material, and automatic reversing.

## Terminator direct SL

The Terminator direct SL shredder has a newly developed all-electric drive system that offers maximum efficiency. With its load-dependent speed control the machine adapts to the input material, allowing high throughput even with the most difficult materials. The space-saving design of the machine makes for easy integration into new or existing processing lines. The clever layout of the cladding protects all of the major components from dirt, while offering optimum access for service and maintenance.



Terminator hydraulic - separated unit



Terminator direct SL

Terminator direct



The engine compartment with its large doors offers perfect access to all drive components. Swivelling of the counter comb provides great accessibility for maintenance of the shredding area.





With our stationary drum screens, a suitable size is available for every throughput rate. The drum diameter ranges from 1800 mm to 2500 mm.

## 02 Separation

The more specific the processing techniques, the more high-quality recyclables can be extracted from mixed residential waste. For example, if the feedstock or the shredded material has a substantial fine fraction (< 80-100 mm), it should be removed prior to sorting. This can be done either with a stationary Komptech drum screen, a compact Flowerdisc disc screen or a Splitter spiral shaft separator.

The addition of a ballistic separator brings a major efficiency boost to sorting, by separating the material stream into 3-D (cubic) and 2-D (flat) fractions. The fine fraction is removed by screen elements with the appropriate hole size. Another adjustment option is to change the degree of 2-D and 3-D separation by changing the slope and release point on the ballistic separator. This reduces mistakes in downstream sorting and reduces the danger of overloading, since the mass stream has already been coarsely separated.

### Splitter

With its long, flat screen deck the Splitter untangles the material and so ensures dependable fines removal. Cleaning and maintenance effort is minimized by the one-sided worm shaft bearings. The spiral shaft Splitter also features low energy consumption and a modular design for high variability.

### Flowerdisc

This sturdy, compact disc screen delivers effective separation of 80-100 mm fines. The flexibly mounted bushings almost entirely prevent blockages and damage of the screen deck.

Splitter



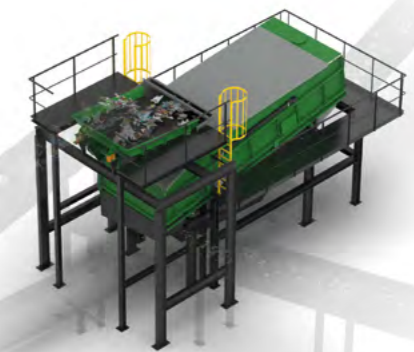
Flowerdisc



### Ballistor

The motion of the screen elements cleans the 2-D fraction of contamination and moves it upwards. The 3-D fraction moves in the opposite direction, downwards. Energy costs are low due to the low power consumption of the efficient mechanism. The tough housing gives easy access to the screen elements, and easy replacement of the wear parts reduces operating costs. With four sizes and many equipment options, the Ballistor can be ideally configured for its application.

Ballistor



Variable configuration of sub-structure, servicing accessibility, enclosure and drive simplify adaptation of the Ballistor to on-site conditions.





## 03 Sorting

In modern waste recycling systems, the sorting function is well on its way to becoming fully automated. Sensor-supported automatic sorters react to changes in the characteristics of the input material, and so are very efficient and dependable. Furthermore, continuous data-gathering offers extensive scope for performance improvement, and the use of artificial intelligence makes these machines self-learning.

It is important that the pieces on the intake conveyor be separate from each other. If they are, the detection unit and separating system can work together almost mistake-free.

Examples of recyclables from mixed municipal waste include:

- (3-D) cubic wood, hard plastics, minerals, C&D waste, ferrous metals, non-ferrous metals, glass
- (2-D) flat wood, flat plastics, plastic film, paper, cardboard, textiles

Redwave sensor-based sorters are powerful sorting machines for the recovery of recyclables from the pre-treated material stream. High-speed valves powered by compressed air eject the identified material.

### Separating systems

Pneumatic blowout systems or robots with various grippers are used to remove items from the stream. Where circumstances are suitable for it, manual sorting remains a practical option.



### Sensor technology

Modern systems use a combination of near infrared (NIR) sensors, optical cameras and metal detectors. Powerful computers interpret the data and activate the respective separation systems.

Future-proof combination: Mechanical processing by Komptech and automatic sorting technology by Redwave.





## SERVICE

# The Komptech plus



### Top advice

We'll show you how to optimize your processes, based on our experience and extensive data analyses.



### All-in solutions

From individual mobile machines to complex stationary systems, with us you get the right process solution.



### Service near you

Expert technicians are on-site quickly to make sure your machines keep running.



### Productivity in view

Apps and integrated monitoring let you keep an eye on operating data and economy.



### Spare parts always available

Intelligent stocking for the fast, economical provision of high-quality spare parts.



### Need-based service

Our maintenance and service agreements, as well as extended warranties, are aligned with your needs.



# Never waste an opportunity.

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## We create value for you



### **Waste-stream expertise**

Because you need a  
setup that is tailored to  
your waste stream.



### **Innovative technology**

Because you need to  
adapt your output to  
your market needs.



### **Flexible sales models**

Because you have the  
choice between new, rental  
and used machines.



### **Service excellence**

Because you always  
need to keep your  
system running.