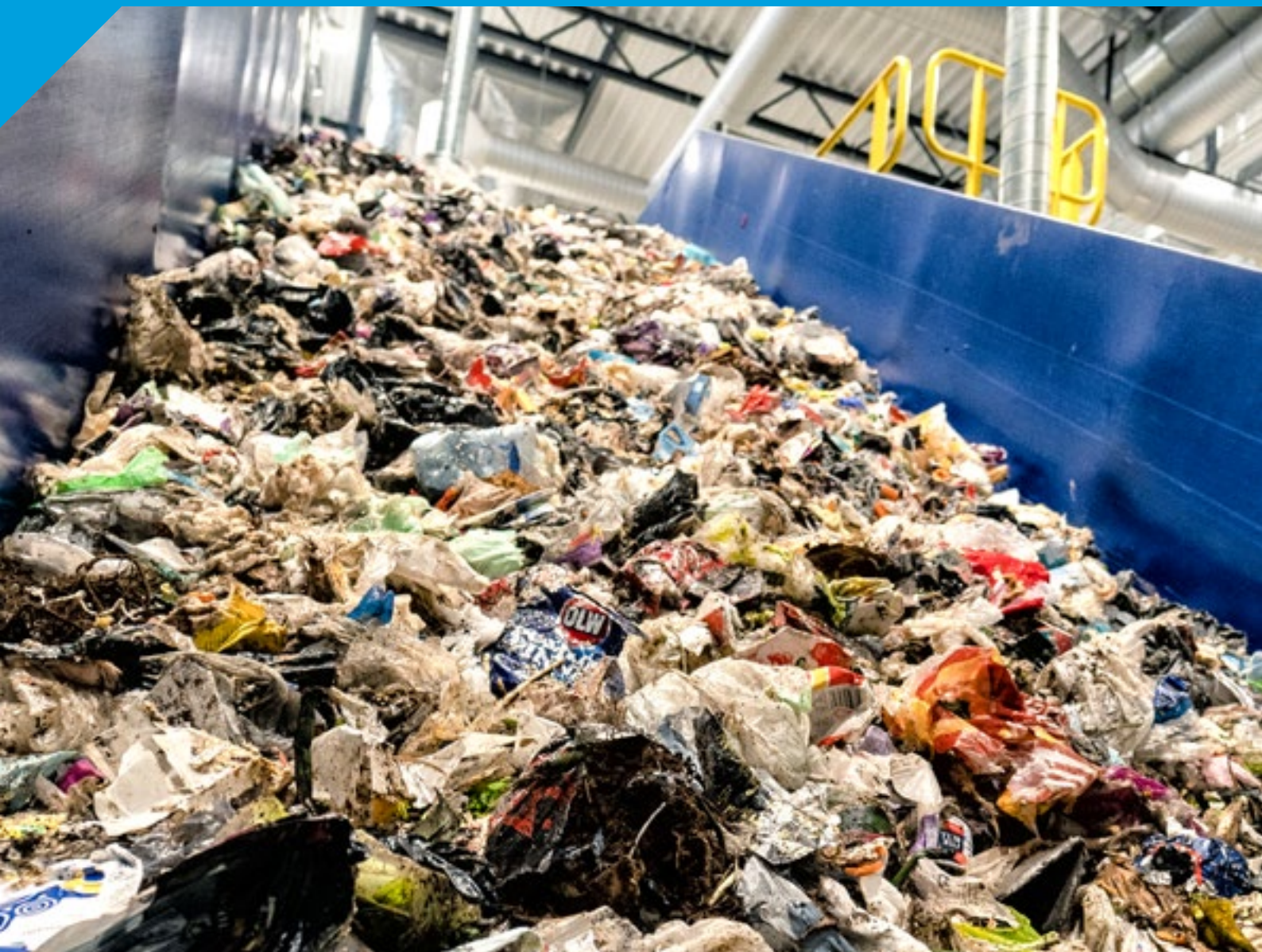


SORTING AND PROCESSING TECHNOLOGY

# DRY RECYCLABLES



WE GET THE BEST OUT

# INNOVATIVE PLANT SOLUTIONS FOR THE RECYCLING INDUSTRY

**SORTED - STRINGENT - SPECIFIC - SUTCO**

Since 1985, Sutco RecyclingTechnik has constructed turnkey plants for the sorting and treatment of dry recycling, adapted to the material properties that occur in each country.

**WE GET THE BEST OUT.** The experienced plant constructor supports its international customers from the conception to acceptance of the plant - with the goal at all times of achieving the best possible result: valuable recycled

materials that can be reused, turned into other products or broken down again into raw materials.

We lay the foundations for the economical and ecologically viable recycling of materials and their return to the circular economy.

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# MUNICIPAL AND SOLID WASTE / MSW

## TREATMENT OF MUNICIPAL AND SOLID WASTE

**MUNICIPAL AND SOLID WASTE**, collected mixed and unsorted, contains a variety of different materials that can be recycled. In addition to organic waste, there are also many recyclable materials in the input.

Municipal and solid waste has a variable density between 0.1 to 0.3 Mg/cubic metre. In order to create an economically interesting concept, it is important to obtain and take into account customer information regarding throughput capacity, waste composition and objectives.

The bandwidth of a robust plant ranges from semi-automatic to fully automatic solutions. A high degree of flexibility as well as stability is required.

### THE PROCESS

Roughly speaking, the process is as follows: After the dosing feeder, the material is separated into different particle sizes via the screening drum and the ballistic separator (separation in 2D/3D). An air classifier is often used here to separate films. Magnetic separators and eddy

current processes are also used to further equalise the material flows. The high output qualities are achieved by using NIRs (near infrared separators). After a manual or automatic quality control, the individual fractions are cleanly separated. An intelligent bunker management system collects the individual recyclables and compresses them for transport or storage or stores them in containers.

### OUTPUT FRACTIONS

- ▲ Mixed plastics
- ▲ Film
- ▲ PE
- ▲ PET
- ▲ Tetra Pak
- ▲ PP
- ▲ Metals
- ▲ Non-ferrous metals
- ▲ Paper / cardboard
- ▲ Organic

... and more



# MECHANICAL BIOLOGICAL TREATMENT / MBT

## MECHANICAL BIOLOGICAL TREATMENT PROCESSES

**THE INPUT**, consisting of household waste, similar commercial waste, green, organic, and mixed waste, is separated into material and thermally exploitable substances.

### THE PROCESS

Division of the input material into various material streams to gain secondary raw materials. The process corresponds to the description for **MUNICIPAL AND SOLID WASTE SEPARATION**. The fine fraction is further processed anaerobically in the biological part of the plant using the Sutco composting processes.

### OUTPUT MATERIAL

- ▲ Substances for material exploitation
- ▲ Substances for energetic exploitation
- ▲ Substances for thermal exploitation
- ▲ Substances for biological treatment and subsequent landfill



# PACKAGING WASTE

## SORTING PLANTS FOR PACKAGING WASTE

A distinction is made between recyclables from separate collection (yellow bag, yellow bin or recycling container) and recyclables from mixed collection.

**PACKAGING WASTE** is essentially paper and card, cardboard, glass, and light packaging made of plastics, metals and composites. Since the EU packaging directives came into force, recyclable materials made of plastic, aluminium, tinplate, and glass have been subject to a special obligation: manufacturers, importers, or distributors must take them back after use and dispose of them in an environmentally sound manner.

### THE PROCESS

Using automated sorting technologies, the materials are separated and fractioned using near-infrared technology. For maximum sort-

ing purity, processing in this stage needs high technical maturity in the plants combined with a rational, efficient treatment technology.

### OUTPUT MATERIAL

High-quality secondary raw materials in the form of clean, separate fractions such as:

- ▶ PE
- ▶ PET bottles
- ▶ PET trays
- ▶ PP
- ▶ PS
- ▶ Tetra Pak
- ▶ Metals
- ▶ Non-ferrous metals
- ▶ Film
- ▶ Mixed plastics

... and more

# PLASTIC / FILM

## SORTING PLANTS FOR PLASTIC AND FILM

**COMPACTED MIXED PLASTICS** and loose mixtures are separated by automated sorting technologies and returned to plastics processing. Together with our cooperations, e.g. car wash manufacturers, we can implement the entire recycling cycle. The goal is to sort out pure fractions so that the material can then be sent through various processing stages to manufacture sustainable products.

During the implementation of the **SORTING OF FILMS**, different polyolefins are distinguished and separated.

The films are delivered in bales that are first unwired, then sieved and the separate foil materials separated by NIR technology.

### OUTPUT FRACTION e.g. film sorting

- ▶ Clear PEHD films
- ▶ Coloured PEHD films
- ▶ PP films

... and more



## PRE-SORTING PLANTS

### PREPARATORY PLANTS FOR INCINERATORS / POWER PLANTS

In waste delivery and the pre-treatment of municipal waste for thermal treatment, the presorting plant fulfils various requirements regarding control, pre-sorting, shredding and homogenisation.

**THESE PLANTS** are for the pre-sorting of mixed waste streams, separating out various fractions for reuse. Recyclable materials not collected separately in bins but disposed of in municipal and solid waste return to the circular economy as a secondary material thanks to the use of the preparatory plant.

**COMMERCIAL, MUNICIPAL AND SOLID OR RESIDUAL WASTE AND BULKY WASTE** contain a high portion of recyclable materials, which is returned to recycling via the preparatory plant.

#### THE PROCESS

Division of the input material into various streams to gain secondary materials and a high-calorie fraction.

#### OUTPUT MATERIAL

- ▶ Mixed plastics
- ▶ PE
- ▶ PP
- ▶ Non-ferrous metal
- ▶ Film

... and more



## ProDIGIT - DIGITAL SOLUTIONS FOR SORTING TECHNOLOGY

### MODERN EQUIPMENT COMBINED WITH DIGITAL SOLUTIONS FOR MARKETABLE PRODUCTS

The clever **ProDIGIT** solution ensures the optimum operating sequence in sorting and treatment plants for the recycling industry.

#### BUNKER MANAGEMENT

Automated and digitalised bunker emptying for the production of optimised bales. Designed with minimal energy input, with consideration for the different filling speeds of bunkers.

#### THROUGHPUT OPTIMISATION

... the waste sorting facility that maintains required product qualities such as the level of purity. Intelligent measurement technology allows smart control of all stages up to the complex overall process.

#### COMPLETE WEEKLY, DAILY OR HOURLY WEIGHT READINGS

Quantity adjustments adapted to the materials and composition allow continuous recording and online readout of the input and output quantities. Output data divided into material types, residues and similar, can be viewed at any time.

#### AUTOMATED BALE LABELLING

After the pressing process, the bale label is printed on a PET band that is firmly attached to the bale. Labelling is automatic for each individual bale after it has been weighed. Barcodes and QR codes can be read out by scanner.



## COMMERCIAL & INDUSTRIAL WASTE

### SORTING PLANTS FOR COMMERCIAL AND INDUSTRIAL WASTE

Alongside pure material extraction, the treatment technology for commercial and industrial waste also serves to obtain replacement fuels that, because of their high density, in turn place a heavy burden on the plant technology.

**COMMERCIAL WASTE** is residue from commercial operations and institutions with a high proportion of valuable resources for the global raw materials economy. Alongside gaining recyclable materials, the treatment serves to obtain replacement fuels. Individual concepts adapted to the country in question can also be created as needed.

#### THE PROCESS

Using intelligent sorting systems, polymers, paper, and foil, etc. are sifted to optimise the quality. As needed, this plant technology can also process other inputs (construction waste, bulky waste).

#### OUTPUT MATERIAL

- ▶ PE
- ▶ PET
- ▶ PP
- ▶ Wood
- ▶ Film
- ▶ Paper
- ▶ Iron
- ▶ Non-ferrous metals

... and more



## REFUSE DERIVED FUELS (RDF/SRF)

### TREATMENT PLANTS TO GENERATE REFUSE DERIVED FUELS

A refuse derived fuel or secondary fuel is one as a rule consisting of high-calorie waste.

**A REFUSE DERIVED FUEL** is any non-fossil fuel for combustion. It can be manufactured from selectively obtained, product-specific commercial waste, bulky waste and solid waste. Mostly, these kinds of waste consist of plastics, paper, textiles, wood, minerals, and composite packaging of high calorific value.

#### THE PROCESS

The process stages can be broken down by two basic criteria: the composition of the waste and the use of the fuel. Preparation starts with pre-sorting or the removal of impurities. After rough chopping, the material is sieved, separated via the wind sifter and taken through

Fe/NF separation, then NIR separation. The material can be shredded down again before being pelleted for use or filled into containers or bunkers.

#### OUTPUT MATERIAL

Using a modern treatment technology, a fuel (so-called co-incineration) is produced for cement, lime works and power stations or as the sole fuel for waste-to-energy plants.



## “SINGLE STREAM” / MRF

### TREATMENT PLANTS FOR DRY MATERIALS (MRF)

Single-sort recycling, also known as “commingled” or “single-stream” recycling, combines paper, plastics, metals, etc. into a single collection vehicle. Instead of taking them in separate loads in separate trucks, all the recycling is dumped into one load, which is then screened and separated at a recycling plant.

Here, a detailed material analysis and an indication of the desired output fractions are necessary. The density of the materials can vary greatly.

#### THE PROCESS

After pre-sorting, screening is carried out by means of sieves into different fractions, from which the sorting of recyclable materials is then carried out using NIR technology. The separated fractions are compressed for transport with baling presses.

#### PURPOSE OF THE PROCESS

Manufacture of pure materials for recycling such as:

- ▶ PE
- ▶ PET bottles
- ▶ PET trays
- ▶ PP
- ▶ PS
- ▶ Tetra Pak
- ▶ Metal
- ▶ Non-ferrous metal
- ▶ Film
- ▶ Mixed plastics
- ▶ Paper / Cardboard
- ▶ Glass

... and more



## WASTE PAPER AND CARDBOARD

### SORTING PLANTS FOR WASTE PAPER AND CARDBOARD

Sorting and separation of non-paper components to return high-quality paper to the paper industry. The more primary fibres are replaced with secondary fibres from waste paper, the less water, energy, and raw materials need to be used.

WASTE PAPER, CARD AND CARDBOARD are important waste streams e.g. in Germany.

#### THE PROCESS

Sorting can take place manually or automatically. The collected paper waste is sorted into various fractions and classified with the aid of ultra-modern visual detection systems. Non-paper components (metals, glass etc.) are separated by sieves and sorting facilities.

#### PURPOSE OF THE PROCESS

Sorting of deinking, card and mixed paper, etc. with flawless quality for reuse in the paper industry.



# SLAG AND BOTTOM ASH FROM INCINERATION

## TREATMENT PLANTS FOR SLAG AND BOTTOM ASH

In waste combustion, various different quantities of slag and ash arise for each tonne of waste, with different quantities of minerals, scrap iron, water, and heavy metals.

**SLAG AND ASHES** are residues from combustion processes in power plants or waste-to-power plants. Slag from waste-to-power plants is particularly important for environmental protection.

### THE PROCESS

After pre-storage of the slag to incorporate air (CO<sub>2</sub>), it is sieved and crushed. Ferrous scrap and non-ferrous metals (aluminium, copper

and brass) are separated, and unburnt residues are removed. Physical and chemical processes take place in conjunction, for which reason the slag must be stored for a set period after processing as per the technical guidelines.

### OUTPUT MATERIAL

The secondary product can be used as a construction material for roads.

# MIXED BUILDING DEBRIS

## SORTING PLANTS FOR MIXED BUILDING DEBRIS

Separation of recyclable and non-recyclable waste for reuse.

**MIXED COMBUSTION WASTE** is a mix of mineral and non-mineral materials. For example, mixtures of wood, metal, cables, film, packaging, glass, paper, card, plastics, etc. The mineral substances include e.g. bricks, tiles, masonry rubble, stone, and concrete.

### THE PROCESS

Mixed construction waste (mineral and non-mineral) is separated into recyclable and non-recyclable materials. The recyclable fraction is separated and fed back into the system.

### OUTPUT MATERIAL e.g.

Gaining recyclable products such as

- ▲ Stone
- ▲ Sand
- ▲ Wood
- ▲ Metal
- ▲ Non-ferrous metal
- ▲ Plastics
- ▲ Replacement fuels

... and more





## OUR LOCATIONS WE GET THE BEST OUT

### SUTCO® RECYCLINGTECHNIK GMBH

Paffrather Straße 102-116  
51465 Bergisch Gladbach  
Germany

[info@sutco.de](mailto:info@sutco.de)

### SUTCO® UK LTD.

Palmerston House  
814 Brighton Road  
Purley, Surrey CR8  
United Kingdom

[info@sutco-uk.com](mailto:info@sutco-uk.com)

### SUTCO BRASIL LTDA.

Av. Ana Costa, nº 61, terreo, sala 22  
Bairro Gonzaga, Santos, SP  
CEP 11.060-001  
Brazil

[info@sutco.com.br](mailto:info@sutco.com.br)

### SUTCO® SWEDEN AB

c/o Rödl & Partner Nordic AB  
Jungmansgatan 12  
211 11 Malmö  
Sweden

[info@sutco.de](mailto:info@sutco.de)

### SUTCO® POLSKA

Spółka z o.o., ul. Hutnicza 10  
40-241 Katowice  
Poland

[info@sutco.pl](mailto:info@sutco.pl)

### SUTCO® IBÉRICA RECYCLING TECHNOLOGY S.L.

Avda. Diagonal 463 BIS, 7º, 2ª  
08036 Barcelona  
Spain

[info@sutco.es](mailto:info@sutco.es)

### SUTCO SINGAPORE PTE. LTD.

4 Battery Road # 25-01  
Bank of China Building  
Singapore, 049908  
Singapore

[info@sutco.de](mailto:info@sutco.de)

### SUTCO® RECYCLING TECHNOLOGY ROMANIA SRL.

Str. Gheorghe Țițeica, Nr 121C, Etaj 3  
Sector 2, Bucharest  
Romania, Post Cod: 020295

[info@sutco.ro](mailto:info@sutco.ro)



[WWW.SUTCO.COM](http://WWW.SUTCO.COM)

