COMPANY PROFILE

MACHINES

SHREDDING
DENSIFICATION & BRIQUETTING
SORTING
BIO-TREATMENTS
Founded in 1996, Promeco SpA is an Italian Company based in Como that manufactures, on proprietary technology, plants and equipment for waste recycling and recovery with energy production, material recovery or production of finished goods.

Innovation, R&D, passionate and skilled team along with the customer satisfaction have always been the success of Promeco and they still are the peculiarities of our Company. Besides the historical Promeco-patented equipment, like single and double shafts shredders, extruders, densifiers, briquetting machines, separators, squeezers and centrifuges, the Company offers a wide range of turn-key plants, among which:

- briquetting and pelletizing plants
- shredding plants
- plants for RDF production
- plants for the production of second raw material and finished products
- plants for recycling of post-consumer plastic waste
- plant for the catalytic conversion of mixed plastic waste into liquid fuel
- plants for recycling of waste pulper
- plants for wood fiber production from green waste and biomass fiber
- plants for the pretreatment of the organic matter of MSW for anaerobic digestion

Promeco is able to develop customized solutions too. Promeco plants are composed for 80% by machinery at 100% designed, constructed and assembled by the same Promeco, which is still the customer after-sale referent thanks to its well-stocked storage.

The constant R&D allows the development of new processes in response to specific requirements of the waste problem, which requires to anticipate future lifestyle and environmental laws which are constantly changing.

The Company policy focuses on product quality: robustness and functionality of the machines that maintain their value over time. The ability to challenge ideas and concepts and to interact with partners worldwide has allowed and still allows Promeco to stay highly competitive and to be an ideal partner for the world market.

PLANTS
PLASTIC RECYCLING
SHREDDING, SCREENING, SORTING & RDF PRODUCTION
BRIQUETTING
BIO-TREATMENTS
SHREDDING

PRIMARY SHREDDERS – TWIN SHAFTS
• PREMIER
• ROTOR SHEARS
• BAG OPENERS

SECONDARY SHREDDERS – SINGLE SHAFT
• KR
• KRF

GRINDER
• FAST GRINDER IGGY MILL

DENSIFICATION & BRIQUETTING

BRIQUETTING MACHINES
• PROMECO EXTRUDER SYSTEM PES-V

DENSIFIERS
• PROMECO EXTRUDER SYSTEM PES-M

GRINDER
• PROMECO EXTRUDER SYSTEM & PELLETTIZER PES+PE
MACHINES

SORTING

SCREENS
- PDS DISC SCREENS
- PEV DISC SCREENS WITH ANTI-WRAPPING TECHNOLOGY
- PDS-R STAR SCREEN

AIR SEPARATORS
- PAS AIR SEPARATOR

SQUEEZERS
- PED ECO DRYER

CENTRIFUGUES
- PEC ECO CENTRIFUGE

BIO-TREATMENTS

PULPERIZER
- PED

BIOEXTRUDER
- BIOEXTRUDER PES-C

ORGANIC WASTE CLEANING
- POS ORGANIC SEPARATOR
PLANTS FOR PLASTIC RECYCLING

DENSIFICATION

AGRICULTURE FILM RECYCLING

CONVERSION OF WASTE PLASTICS INTO HYDROCARBON FUEL

SHREDDING, SCREENING, SORTING & RDF PRODUCTION PLANTS

SHREDDING & SCREENING PLANTS FOR MSW AND INDUSTRIAL WASTE

RDF PRODUCTION PLANTS

MIXED MATERIAL SORTING PLANTS
PLANTS

BRIQUETTING PLANTS

CAR-FLUFF
PAPER FROM PAPER MILL
BRIQUETTES FOR GASIFICATION
BRIQUETTES FROM MIXED WASTE

BIO-TREATMENT PLANTS

OFMSW OR BIOMASS PRE-TREATMENT FOR ANAEROBIC DIGESTION
WOOD FIBER PRODUCTION FOR TOPSOILS, ANIMAL BEDDING & GREEN BUILDING
GROWING MEDIA MIXING
COMPOST OVERSIZE CLEANING
PROMECO SHREDDING CONCEPT

TWO SHAFTS

150-400 mm

SINGLE SHAFT

15-150 mm

GRINDER

3-15 mm
The two-shaft shredders Promeco have been designed to grind different materials, such as:

- Unsorsted municipal solid waste (MSW)
- Commercial waste
- Bulky waste (beds, sofas, refrigerators, doors)
- Industrial waste
- Plastic waste (film, purgings, pallet)
- Pulper waste reject
- Timber, railway sleepers, trimmings of plants
- Organic waste
- Tyres
Capacity:

Production capacity is up-to 100 ton/hour; it varies according to type, size and bulk density of the material input, engine power, size of the rotors. The material that cannot be shred is rejected automatically.

Models

<table>
<thead>
<tr>
<th>Type</th>
<th>Main power [kW]</th>
<th>Shredding room [mm]</th>
<th>No. of blades</th>
<th>Weight [ton]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PREMIER 1500</td>
<td>2x90</td>
<td>1500 x 1800</td>
<td>6+6</td>
<td>20</td>
</tr>
<tr>
<td>PREMIER 2000</td>
<td>2x110</td>
<td>2000 x 1800</td>
<td>8+8</td>
<td>26</td>
</tr>
<tr>
<td>PREMIER 2500</td>
<td>2x132</td>
<td>2500 x 1800</td>
<td>10+10</td>
<td>32</td>
</tr>
</tbody>
</table>

Different size upon request.
Inner chamber completely built in wear resistant steel

Bearing housing detached from the machine body

Knives made in wear resistant steel. It is possible to rebuild the component with anti-wear welding on customer’s site

Wings-like opening to allow the discharge of the unshreddable material

Adjustable and removable combs

Hydraulic drive

3 different cutting sizes available
Different combs on both external sides
Bag-opener with central cutting

Cutting system developed to run 90,000 hours before shafts' replacement

PLC control system with 20 different programs depending on the material to be shred

Patented breaking blocks

Wear prevention shells to protect the shafts

No middle cutting table
The cutting discs are designed according to the material to be processed and the kind of shredding, thus defining the thickness and the disc diameter over the geometry of the hooks. Equipped with rotor’s cleaning knives.

Models

<table>
<thead>
<tr>
<th>Type</th>
<th>Main power [kW]</th>
<th>Shredding room [mm]</th>
<th>No. of blades</th>
<th>Weight [ton]</th>
</tr>
</thead>
<tbody>
<tr>
<td>PRS 1307</td>
<td>2x22</td>
<td>1300 x 700</td>
<td>13+13</td>
<td>8</td>
</tr>
<tr>
<td>PRS 1507</td>
<td>2x22</td>
<td>1500 x 700</td>
<td>15+15</td>
<td>12</td>
</tr>
<tr>
<td>PRS 1511</td>
<td>2x45</td>
<td>1500 x 1100</td>
<td>15+15</td>
<td>14</td>
</tr>
<tr>
<td>PRS 2011</td>
<td>2x75</td>
<td>2000 x 1100</td>
<td>20+20</td>
<td>16</td>
</tr>
</tbody>
</table>
The shredder that opens the bags only without shredding the content.

- The first equipment of sorting plants to open the bags.
- Pre-treatment for organic waste

## Models

<table>
<thead>
<tr>
<th>Type</th>
<th>Main power [kW]</th>
<th>Shredding room [mm]</th>
<th>No. of blades</th>
</tr>
</thead>
<tbody>
<tr>
<td>PBO 1500</td>
<td>2x18</td>
<td>1500 x 1000</td>
<td>5 + 5</td>
</tr>
<tr>
<td>PBO 2000</td>
<td>2x37,5</td>
<td>2000 x 1000</td>
<td>7 + 7</td>
</tr>
<tr>
<td>PBO 2500</td>
<td>2x45</td>
<td>2500 x 2500</td>
<td>9 + 9</td>
</tr>
</tbody>
</table>
Configuration:

Promeco KR shredders answer the more diverse customer needs, in terms of production capacity and materials to process.

The machines are offered in several configurations, differing in:
- Size
- Motor power
- Number of knives and counter-knives.

Application:

Promeco KR can shred various materials:

- MSW inorganic fraction
- RDF/RPF/SSF
- Plastic / rubber
- Packaging waste
- Light metals as aluminum profiles, cans, light iron scraps
- Textile scraps
- WEEE (waste electrical and electronic equipment)
- Industrial products
- Leather
- Paper and cardboard
- Wood waste
- Cables

SECONDARY SHREDDER - SINGLE SHAFT
Features:

- Robustness
- Optimization of the cutting process
- Reliability
- Versatility
- Ease of maintenance

Models:

<table>
<thead>
<tr>
<th></th>
<th>from</th>
<th>to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotor length</td>
<td>1,000 mm</td>
<td>2,800 mm</td>
</tr>
<tr>
<td>Rotor diameter</td>
<td>440 mm</td>
<td>730 mm</td>
</tr>
<tr>
<td>Mechanical motor</td>
<td>45 kW</td>
<td>132 kW</td>
</tr>
<tr>
<td>Hydraulic motor</td>
<td>160 kW</td>
<td>250 kW</td>
</tr>
<tr>
<td>Grid holes</td>
<td>10 mm</td>
<td>100 mm</td>
</tr>
<tr>
<td>Production</td>
<td>1,000 kg/hour</td>
<td>12,000 kg/hour</td>
</tr>
</tbody>
</table>

Different size upon request
PLC OPERATION WITH CLIENT’S PROGRAMM

Machine structure with 50 mm shoulders

Level sensor of feeding bunker

Feeding bunker

Lifting points

Back protection for cylinder

Electric motor from 30 to 250 kW

Hydraulic coupling for progressive starting and torque limitation

Support for transmission group

Pulley and belts

Spaced and oversize bearing

Elastic joint with breaking plugs for torque limitation

Parallel gear reducer with high service factor

Extraction material system with screw or tape

INVERTER AS OPTIONAL FOR ENERGY SAVING
DIFFERENT ROTORS FOR DIFFERENT PURPOSES
KRF shredders are the evolution of KR in terms of speed of operation. As the KR s, they stand for strength, versatility, reliability, high production with low hourly operating and management costs, as well as ease of maintenance. Perfect for RDF. Ø from 10 to 30mm

Capacity up to 20,000 kg/h
Innovative design of the shaft and the blades
Optimal for homogeneous materials free from metals

Models:

<table>
<thead>
<tr>
<th></th>
<th>from</th>
<th>to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotor length</td>
<td>1500 mm</td>
<td>2.800 mm</td>
</tr>
<tr>
<td>Rotor diameter</td>
<td>440 mm</td>
<td>730 mm</td>
</tr>
<tr>
<td>Motor</td>
<td>45 kW</td>
<td>250 kW</td>
</tr>
<tr>
<td>Grid holes</td>
<td>10 mm</td>
<td>100 mm</td>
</tr>
<tr>
<td>Production</td>
<td>up to 20,000 kg/h</td>
<td></td>
</tr>
</tbody>
</table>
Specifically designed for size reduction of pre-sorted or pre-shredded waste, suitable for RDF/SRF production and other recycling applications. Different rotor cutting configuration available
High performance
Ø from 3 to 15mm

Features:
• Different rotor cutting configuration available
• High performance
• Multi blade rotors
• Unique cutting edge geometry
• Robust engineering
• Suitable to work in hostile environment

Models

<table>
<thead>
<tr>
<th></th>
<th>from</th>
<th>to</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power installed</td>
<td>22 kW</td>
<td>250 kW</td>
</tr>
<tr>
<td>Rotor speed</td>
<td>400 rpm</td>
<td>700 rpm</td>
</tr>
<tr>
<td>Rotor length [mm]</td>
<td>700 – 1.1000 – 1.400 – 1.690 – 2.100 – 2.300</td>
<td></td>
</tr>
<tr>
<td>Rotor diameter [mm]</td>
<td>400 – 580 – 670 – 900</td>
<td></td>
</tr>
</tbody>
</table>

Different size upon request
THE MULTIPURPOSE MACHINE

DENSIFICATION & BRIQUETTING
PROMECO EXTRUDER SYSTEM
PES 600

The patented and unique worldwide PES - Promeco Extruder System - is the simplest, most flexible, efficient and effective solution to the problems of agglomeration and volume reduction producing briquettes and pellets. The high flexibility allows the treating of different materials:
- Mixed plastics, paper and cardboard, textiles and wood
- Commercial waste and waste residual from sorting plants
- Industrial solid waste similar to municipal waste
- Plastics: PE, HDPE, EPS, PP, PVC, polymers from ASR
- Mixed inorganic fraction of MSW used as RDF (lightweight plastics, textiles, wood, paper and cardboard)
- ASR Car fluff, pre-treated
- Wood waste and green waste

Endless applications
- RDF pellets, thickened or briquettes
- Profiles and/or finished goods (e.g.: spacers for pallets; poles for agriculture, wheel stoppers, profiles for walls structures and insulation, curbs outdoor)
- Agglomeration of mixed plastics
- Pre-treatment of the organic fraction for composting
- Production of wood fiber from wood chips or wood waste

The PES is even suitable for the pre-treatment of plastic film out from washing lines

Models:
Screw diameter: 300 or 600 mm
Motor (with inverter): 90, 315 or 400 kW
Power consumption: 50-60% of power motor installed
Production: from 350 to 2,200 kg/hour or 30 m³/h

Flexibility:
The waste usually has different size, water content, density and composition. The PES is able to handle this difference in the best way. The control system, based on PLC logic, continuously checks the most important parameters as current and temperature on the output plate of the machine and arranges the working process automatically. The main motor is generously oversized to maintain the production rate even in presence of material "difficult" to treat. The average consumption is 60% of installed capacity. Control system based on PLC to monitor continuously several parameters as electrical power consumption and temperature of the extruded material, and to adjust the operations of the machine.
Input material:
• Organic waste
• Biomass material (for Anaerobic Digestion process as corn, seeds cultivated for bio-energy production, straw)
• Wood waste
• Wood chips
• Compost oversize
• Bark

Products:
• Organic matter for anaerobic digesters
  Organic ground material ready to be eaten and attacked by the anaerobic bacteria, during the anaerobic process.
• Wood fiber
  Lignocelluloseous, fiber-opened material with density from 140 to 200 kg/m³, with chemical and physical parameters similar to peat allows an analogous utilization in agriculture, floriculture and growing media.
• Compost
  The output is a mix with characteristics of high reactivity compared to the raw material, due to:
  • Increased porosity
  • Higher oxygenation capacity.
  • Increase of the surface available for the aerobic bacteria.
  • Structural optimization of the composting material.
  • Reduced moisture content.
PROMECO BIOEXTRUDER
FOR ORGANICS

The simplest, easiest and most effective solution for the organic fraction treatment.

Advantages:
- Continuous process
- Increase of biogas yield +50%
- No water required
- Low maintenance cost
- Great shorting of the composting time.
- Less surface required for composting.

Treatment capacity:
- **Compost and organic fraction for anaerobic digestion**
  25 - 40 m³/h, depending on the mixture composition, the structure and the end size of the product required
- **Wood fiber**
  20 - 40 m³/h according to the requirements of the product and to the characteristics of the feedstock
Input material:

- MSW
- Mixed waste plastics
- C&I
- MRF reject
- ASR/car fluff
- RDF fluff
- Biomass
- Compost
The PES-Briquetting machine is the most flexible, efficient and effective machine to produce briquettes or pellets.

**Products:**

**RDF briquettes**
- Different shapes
- Size from 40 to 140 mm
- Compact, high adherence
- Briquettes can be ground (in a shredder without grate) to obtain a mix of high density material sized 5-80 mm, suitable for fluidized bed furnaces.
- Density between 0.4 and 1.2 kg/dm³.
- Humidity ranging between 2 and 11%.
- Production capacity: up to 3,000 kg/h

**Pellets**
- Size from 25 to 40 mm.
- Water content < 1%
- Density > 1,000 kg/mc
- Completely homogenized

- Pelletized biomass
  - To be burnt into biomass furnaces
  - For gasification or for electrical and heat power production

- Compost in pellet
  - Pelletized compost
  - Composite animal feed
  - Pelletizer fertilizer
- Strong treatment of green waste composting
- Biomass pelletizing for gasification process
- Production capacity: up to 2,500 kg/h
Input material:

Thermoplastic and plastic waste
- Mix plastic with similar melting point
- PE from washing line, PE, PVC, PP, EPS, Tetrapack scraps Al+PE or mix of different polyolefin plastics

Products:

- Melted plastic
  - Output size: from 25 to 60 mm.
  - Water content < 1%
  - Completely melted and homogenized.
  - Plastic melted output

Plastics (LDPE, HDPE, PP, EPS, PVC, polylaminated scraps Al+PE, etc.)

Capacity:

- Up to 1,500 kg/h
- It depends mainly on the characteristics of the input plastics and on the required density of the product.
PROMECO PLASTIC DENSIFIER

AGGLOMERATOR FOR MIXED WASTE PLASTICS, WASHED LDPE

The PES Densifier the simplest and most efficient solution for plastic densification and agglomeration.

The flexibility of the system allows to process:
• Mixed plastics as scraps, industrial & commercial and waste plastics
• Plastics (PE, HDPE, EPS, PP, PVC as foil shredded, powder or similar)

The PES can handle the difference of feedstock composition automatically in the best way. The direct combination of the PES and the traditional Extruder allows the optimal feeding of the material to the single shaft shredder and grants the homogeneity of the production.

The control system, based on the PLC logic, continuously checks the most important parameters as current and temperature on the plate of the machine and then arranges the working process automatically.

Advantages:
• Mixing and homogenization of different polymers
• Homogenous and continuous melting
• Output product completely dry
• Degasing on Promeco Extruder System and therefore not necessary in the traditional extruder
• Shortened melting time
• Few machines to install and manage, reduction of investment costs
• Reduced footprint of the equipment
• Low power consumption (~0.092 kW/kg of input plastic)
Input material:

Wet plastic material from washing plants like:

- Packaging thin film
- Film from agriculture

Product:

Pellets

Capacity:

Up to 1,500 kg/h.
It depends on the characteristics of the input plastics and on the required density of the product.
The innovative Promeco Pelletizer is made by the combination of PES densifier and a traditional single screw extruder. Promeco agglomerator dries and pre-melts the plastic material and feeds the single screw extruder directly. The double vent system on the pelletizer grants the residual moisture removal from the product.

Advantages of PES agglomerator and pelletizer:

- Treating of materials with up to 20% moisture
- Feedstock size up to 60 mm
- Triple vent systems, 1 on the agglomerator, 2 on the pelletizer
- Increased production
- Low energy consumption
- Small footprint, line compactness
- No other machinery (belt, grinder, transports, storage, pressure feeding…) between the agglomerator and the pelletizer
The Promeco Eco Dryer is designed to reduce the humidity content and to compact:
- Recycled polyethylene/polypropylene film from washing lines
- Mixed plastics
- Scraps from paper mill pulper waste

Reliable, versatile, the PED removes the water from 30 to 10% (in case of film material from washing lines), increases the apparent density of the material, even up to a factor of 10, and compacts the treated material.

To increase the density of the material from 1 to 10, compacting and drying from 30% down to 10% moisture.
Promeco Eco Centrifuge is specifically designed for the separation of water from plastics. Input material is loaded into a small feeding bunker, where a screw doses and leads the material into the rotary dryer basket, which rotates at a very high speed. The centrifugal force is exerted on the material, which is propelled towards the internal surface of the basket and is dewatered. The water is collected at the bottom of the machine. A screw inside the basket allows the advancement of the material and the continuous cleaning of the internal surface of basket; moreover it continuously mixes the material, optimizing the efficiency of the process. The entire structure can bear heavy loads, all the components are strong and solid, the forces are balanced.

- Automatic continuous lubrication of the bearings
- Reduced time needed for maintenance.
- Adjustable motor and augers speed
- Optimal dewatering capacity for every type of material
- PEC can be operated either automatically or manually

Continuous process to dry plastic film from washing line, humidity from 30% down to 8%.
PROMECO ECO DRYER
FOR ORGANIC
TO EXTRACT ORGANIC PULP FROM ORGANIC WASTE

Designed from the experience gained from waste plastic treatment.

Capacity:
Up to 3.000 kg/h
PROMECO ORGANIC SEPARATOR POS

PRETREATMENT FOR ANAEROBIC DIGESTION PROCESS.

To separates the organic from the inorganics of MSW. The organics is cleaned from contaminants such as plastics or paper.

Designed from the experience gained using the Promeco Eco Dryer in the waste plastic.

Capacity:

Up to 10 ton/h
Varies depending on the characteristics of the input organic waste.
Dedicated to compost, green waste, wood and bark is the PDS-R star screen disk, made of parallel shafts and rubber star discs. The innovative geometry of the discs is that one finger is longer than the others so that it keeps the previous and the following shaft clean while rotating.

<table>
<thead>
<tr>
<th>Model</th>
<th>Power installed from – to</th>
<th>Screening surface from – to</th>
<th>Production from – to</th>
<th>Screening section from–to</th>
</tr>
</thead>
<tbody>
<tr>
<td>PDS</td>
<td>3 - 2x5.5 kW</td>
<td>1.6x2 - 1.6x6 m</td>
<td>15-80 40-230</td>
<td>30 - 400 mm</td>
</tr>
<tr>
<td>PEV</td>
<td>3 - 2x5.5 kW</td>
<td>1.6x2 - 1.6x6 m</td>
<td>15-80 40-230</td>
<td>30 - 400 mm</td>
</tr>
<tr>
<td>PDS-R</td>
<td>3 - 2x3 kW</td>
<td>1x2 - 1x6 m</td>
<td>4-14 20-70</td>
<td>10 - 25 mm</td>
</tr>
</tbody>
</table>

Different size upon request
The Promeco star screens PDS and PEV are the most reliable screen for the separation of all kind of material.

The PDS consists of several parallel rollers installed on a supporting structure and powered by a motor and movement transmission devices. Each roller is a shaft on which several discs and idle tubes are fixed. While the rotation of the shafts moves along further the material, the fine material falls between the discs on the conveyor belt.

The unique feature of the PEV is that every idle tube is provided with a rod connected to another horizontal rod adapted to prevent the complete rotation of the idle tubes: this mechanism allows the PDS to screen every kind of material, even the thinnest ones that would otherwise twist on the rollers causing a blockage of the system.

Promeco Flip-Flop (PFF) is a ballistic separator designed to separate solid waste according to density, size and shape.

The PFF separates the input material as:
- Fines (inert, organic matter)
- Rolling (3D materials)
- Flat (2D materials)
The air separator Promeco PAS is renowned for its high efficiency in sorting light from heavy materials. Specifically designed to face the sorting of MSW and similar solid waste, commingled plastic waste or waste from selective collection, the Promeco PAS is designed to handle difference in specific weight of the materials to process and sort 2 fractions:

- Heavy (stones, glass, metal, wood, textile wet ...)
- Light (paper, film, plastics ...)

PAS allows to get a clean fraction that can be reduced in size using secondary shredders such as Promeco KR, in order to get a RDF fluff free from undesirable materials. The PAS is strongly suggested before shredders and secondary granulators.

- High efficiency
- Ease of operation
- Remarkable versatility
- Precise and easy to operate setting system
- Can meet different needs
Applications:

- Separation of plastic film from plastic bottles and containers
- Sorting of stones, metals, glass, light inorganic fraction from the materials used to produce RDF
- Removing of contamination and impurities (plastic, glass, metals) from compost
- Processing of specific waste classes such as car fluff, paper mill pulper, plastic to recycle, sand from sweeping.
- Preservation of one-shaft shredders in RDF plants
UNDERSCREEN TO ANAEROBIC DIGESTION PRE-TREATMENT

PROMECO PREMIER BAGS OPENING & FIRST SIZE REDUCTION

PROMECO AIR SEPARATOR HEAVY MATERIALS REMOVAL

PROMECO SHREDDER KR TO GRIND MATERIAL AND PRODUCE RDF FLUFF

PROMECO STAR SCREEN FINE FRACTION REMOVAL

MATERIAL DRYING

PROMECO EXTRUDER SYSTEM PES PELLET PRODUCTION OR MATERIAL DRYING

PROMECO AIR SEPARATOR HEAVY MATERIALS REMOVAL

METALS SEPARATION

OPTICAL SEPARATOR PVC REMOVAL

PROMECO PREMIER BAGS OPENING & FIRST SIZE REDUCTION

PROMECO STAR SCREEN FINE FRACTION REMOVAL

PROMECO SHREDDER KR TO GRIND MATERIAL AND PRODUCE RDF

PROMECO AIR SEPARATOR HEAVY MATERIALS REMOVAL

PROMECO SHREDDER KR TO GRIND MATERIAL AND PRODUCE RDF

PROMECO PREMIER BAGS OPENING & FIRST SIZE REDUCTION

PROMECO STAR SCREEN FINE FRACTION REMOVAL

PROMECO EXTRUDER SYSTEM PES PELLET PRODUCTION OR MATERIAL DRYING

PROMECO AIR SEPARATOR HEAVY MATERIALS REMOVAL

PROMECO PREMIER BAGS OPENING & FIRST SIZE REDUCTION

PROMECO STAR SCREEN FINE FRACTION REMOVAL

PROMECO EXTRUDER SYSTEM PES PELLET PRODUCTION OR MATERIAL DRYING
Input waste:
- Municipal Solid Waste
- Industrial waste
- Mixed plastics

Output material:
- RDF
- Recyclable plastics (PET, HDPE, Film)

The plant must be implemented with production of briquettes, allowing to densify and to establish the shape and density of the RDF.

Advantages of Promeco RDF production systems:
- Use of the fractions with higher calorific value as fuel only, to produce a high quality RDF
- Stabilized RDF
- RDF shape and density for easy storage
- Flexibility in the management of production operations and in the conveyance of the product.
- Untied value of RDF from needs of users
- Recover of valuable materials for recycling
- Landfilling limited only to fractions of unsuitable material
PROMECO SHREDDER KR
SIZE REDUCTION

MATERIAL FEEDING

SUCTION SYSTEM
FOR BAGGING

PROMECO EXTRUDER SYSTEM PES
MATERIAL MELTING

PROMECO SHREDDER KR
GRINDING

PATENT No. 1348579
SELECTION OF RECYCLABLE PLASTICS

Input waste:
- Mixed plastic

Output material:
- Densified granulated plastic as second raw material

Advantages:
- Few machines used
- Low maintenance costs
- Small footprint of the plant
- Low investment cost
- Minimum electric power installed
- Simple maintenance
- Increased productivity
- Great continuity of production
- Versatility
Input waste:
- LDPE film from agricultural
- post-consumed film
- industrial film

Output material:
- LDPE pellet
Input waste:
• ASR / car fluff
• RDF Fluf
• Reject from MRF

Output material:
• RDF Pellets
• RDF Briquettes

RDF PELLETS AND RDF BRIQUETTES PRODUCTION

PATENT No. 1365902
**Input waste:**
- waste pulper from paper industry
- tetrapack pulper

**Output material:**
- pelletized RDF
- densified RDF

---

**Input waste:**
- waste pulper from paper industry
- tetrapack pulper

**Output material:**
- recycled paper back to paper mill
- granulated plastic
Input waste:
• mixed waste plastic

Output material:
• oil
  (yield: 1 kg of polymer = 1 lit. of oil)
• gas
• coke

<table>
<thead>
<tr>
<th>Input waste (11.000 ton/year)</th>
<th>Output</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polymer</td>
<td>Oil</td>
</tr>
<tr>
<td>Moisture</td>
<td>9.600.000 lit/year</td>
</tr>
<tr>
<td>Not polymer</td>
<td>Gas</td>
</tr>
<tr>
<td></td>
<td>900 ton/year</td>
</tr>
<tr>
<td></td>
<td>Coke</td>
</tr>
<tr>
<td></td>
<td>2000 ton/year</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic of gas</th>
<th>Characteristic of coke</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat of combustion</td>
<td>Heat of combustion</td>
</tr>
<tr>
<td>6.000 kcal/kg</td>
<td>5.000 kcal/kg</td>
</tr>
<tr>
<td></td>
<td>Carbon black content</td>
</tr>
<tr>
<td></td>
<td>20-60%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Characteristic of oil</th>
</tr>
</thead>
<tbody>
<tr>
<td>Heat of combustion</td>
</tr>
<tr>
<td>9.000 kcal/kg</td>
</tr>
<tr>
<td>Sulfur</td>
</tr>
<tr>
<td>0.02%</td>
</tr>
<tr>
<td>Flash point</td>
</tr>
<tr>
<td>35°C</td>
</tr>
</tbody>
</table>

PATENT No. 1393116 – 1396562 – 256996 (1281/che/2006)
PROMECO BAG OPENER PBO
To open the bags without breaking the input waste

- Two shafts
- Hook designed to open the bags without breaking the content, blades designed to prevent the hooking of the plastic bags, independent speed and rotating sense of the rotors, adjustable by inverter
- Adjustable distance between the blades
- Countercombs to optimize the breaking of the input waste

PROMECO STAR SCREEN PDS
To remove plastics from organic

- Screen with anti-wrapping system
- Reduced footprint
OFMSW PRE-TREATMENT FOR ANAEROBIC DIGESTION

PROMECO ORGANIC SEPARATOR
To clean organic from plastics and contaminants
- Sorting of organic from not-organic material
- Screw for drum cleaning
- Possibility to add water
- The high speed pushes the organic matter through the holes and the plastics are discharged at the end of the machine

PROMECO BIOEXTRUDER
To pulp and to smash the organic waste
- Organic smashing without cutting plastic
- Increased surface for a better attack from bacteria
**Input waste:**
- Organic waste

**Output material:**
- Organic pulp for anaerobic digestion treatment
  Dry matter ~ 25%

---

**Input waste:**
- Organic waste

**Output material:**
- Organic pulp for AD,
  dry matter ~ 10%

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**ORGANIC DRY PRE-TREATMENT FOR ANAEROBIC DIGESTION**

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**ORGANIC WET PRE-TREATMENT FOR ANAEROBIC DIGESTION**
Input waste:
- Material rich in lignocellulose
- Maize silage
- Biowaste from agriculture
- Wheat
- Straw
- Green waste (i.e. hops)

Output material:
- Open-fibre material optimal for anaerobic digestion
- Low density
- Small particle size
- High homogeneity

Advantages:
- Increase of the digestion of maize silage +40% in 12 days' retention (Study of University of Linköping, Sweden):
  - 25,000 ton/year of maize silage = 1 MWh power
  - 18,000 ton/year of extruded maize silage

Pre-treatment for composting of green waste:

Input waste:
- Green waste and other fibrous products

Output material:
- Substrate for easier composting
- Substrate for anaerobic digestion
- Wood fiber
WOOD FIBER PRODUCTION FROM WOOD CHIPS

Input waste:
• Wood
• Compost oversize
• Green waste and other fibrous products

Output material:
• Wood fiber

PATENT No. 1397517
Input:
- 5 substrates
- 5 fertilizers

Output material:
- Growing media
SHREDDING WASTE
DENSIFICATION
BRIQUETTING
PELLETTIZING
BIOEXTRUSION
WASTE SELECTION
DRYING
DEWATERING
PRE-TREATMENT FOR ANAEROBIC DIGESTION
(WET AND DRY)
WOOD FIBER
PLASTIC TO DIESEL
GROWING MEDIA MIXING PLANTS
CUSTOMIZED PLANTS

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