Waste treatment and homogenizer

TRANSFORMATION METHOD OF NON HAZARDOUS FRACTIONS OF SOLID WASTE INTO SOLID RECOVERED FUEL

- CREATION OF A NEW PRODUCTION SYSTEM OF SOLID RECOVERED FUEL.
- OPERATIVE PRODUCTION SYSTEM.
- NEW HOMOGENEOUS HIGH CALORIFIC VALUE FUEL (SRF).
- PATENT PENDING FOR THE METHOD, MACHINE AND PRODUCT.

WHAT IS SRF? ➡ SOLID RECOVERED FUEL

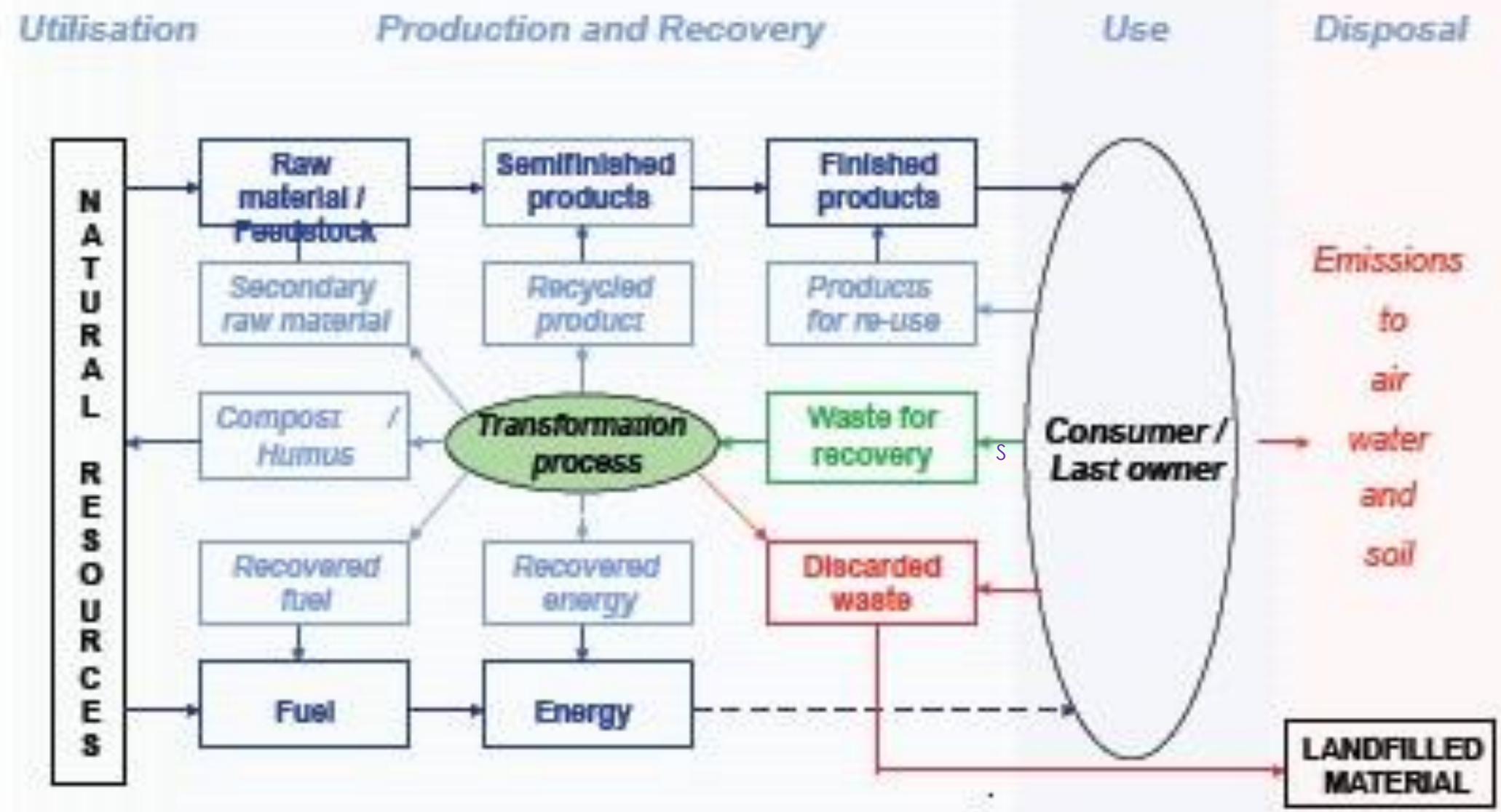
- Produced from the reject fraction of non hazardous solid waste :

  - Forest waste
  - Agricultural waste
  - Municipal waste
  - Industrial waste

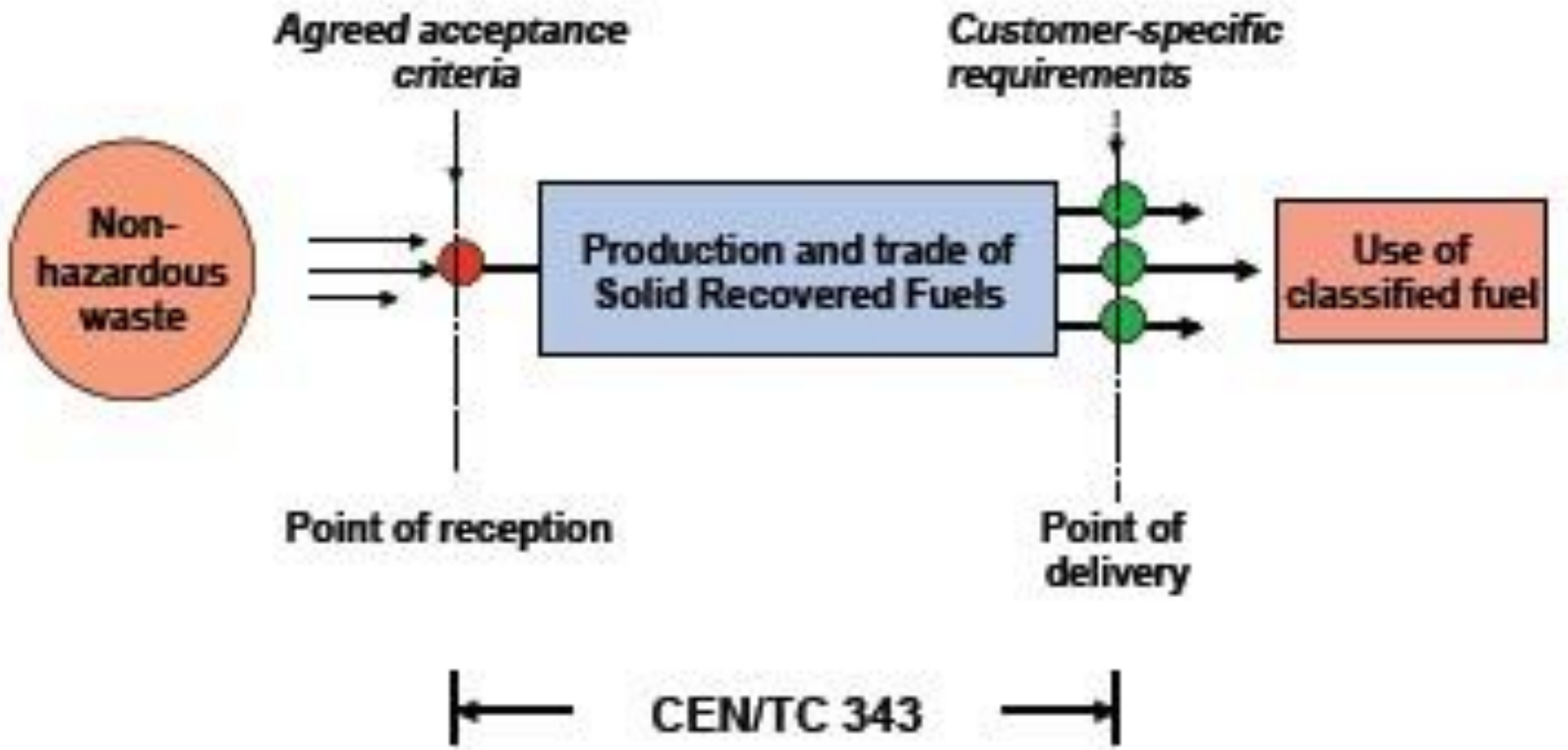
- Subject to the European Standarisation of Solid Recovered Fuels CEN/CT/343 that regulates and classifies the parameters of calorific values and pollutants.

- Formed by a biogenic fraction, considered renewable energy, and an Inorganic fraction, considered alternative energy.

Integrated Resource and Waste Mgt



European Standardisation of Solid Recovered Fuels



Classification system of CEN/TS 15359

Classification Property	Statistical Measure	Unit	Classes				
			1	2	3	4	5
Net calorific value **(NCV)**	Mean	MJ/kg/(ar)	**≥ 25**	**≥20**	**≥15**	**≥10**	**≥ 3**
Classification Property	**Statistical Measure**	**Unit**	**Classes**				
			1	**2**	**3**	**4**	**5**
Chlorine **(Cl)**	Mean	% (d)	**≤0,2**	**≤0,6**	**≤1,0**	**≤1,5**	**≤3**
Classification Property	**Statistical Measure**	**Unit**	**Classes**				
			1	**2**	**3**	**4**	**5**
Mercury **(Hg)**	Median	mg/MJ (ar)	**≤0,02**	**≤0,03**	**≤0,08**	**≤0,15**	**≤0,50**
	80^{th} percentile	mg/MJ (ar)	**≤0,04**	**≤0,06**	**≤0,16**	**≤0,30**	**≤1,00**

DISADVANTAGES OF THE EXISTING SRF

- Heterogeneity.
- Low calorific value (between 11.4 and 13.5 MJ/Kg).
- High Production Costs.
- High humidity content (between 23.6 and 26.8 %).

The final obtained product is an heterogeneous mass of compacted selected wastes, in the form of pellets, briquettes, or mashed.

The existing process consists of the following steps:

Firstly the high polluting materials and the inert materials are separated:

- **Ferrous and non ferrous metals. - Stones, porcelain, ceramics, etc.**
- **Dangerous waste due to their composition:**

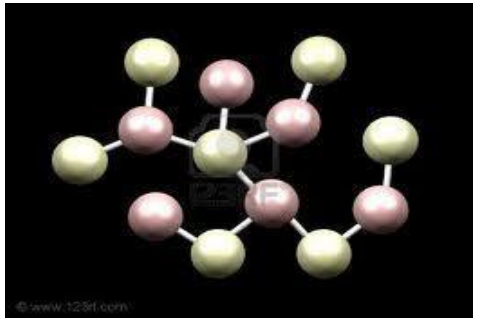
High contents of chlorine, arsenic, mercury, etc.

In the second phase the humidity of the selected materials is reduced.
In the third phase the size of the materials is reduced, obtaining SRF.

CHARACTERISTICS OF OUR NEW SRF

- Production of an exclusive homogeneous fuel.
- High calorific value.
- Clasification as per European Standard CEN/CT 343.
- Minimum humidity content, which results in a high efficiency.
- Waterproof properties.
- Low content in ashes.
- Content in chlorine <1.0% and sulphur below 0.5%
- High Density 1,300/2,000 kg/m3
- All compulsory requirements of European Directive 2008/98/CE are complied with. Compliant also with Spanish Law 22/2011 of the 28th July (Article 5) which establishes the conditions under which the SRF is no longer considered waste, it is considered a new product.

PROCESS AND PRODUCT ENGINEERING



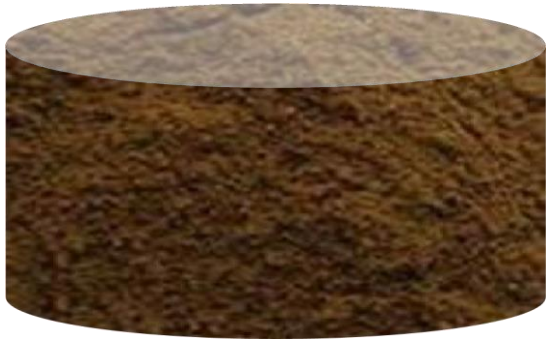
The physical chemical process breaks up the molecules of the substances that make up the different materials, rearranging them differently into processed products.

A new product is obtained formed by the recombined molecules of the different materials and products processed.

The obtained product has physical and chemical properties which are programmable, ideal to be considered an alternative fuel under European Standard CEN/CT343.

OPERATION PRINCIPLE AND PRODUCT

The prototype machine transforms mechanical energy into heat through friction, pressing, crushing and transportation techniques.
The changes in the mix of materials are caused through thermodynamic reactions.
The treated waste acquires adhesive properties which meld together the components firmly.
The result is a new homogeneous product: densified, solid, dry and malleable.



The main technological advantage provided by the process is that the new product obtained has a composition which is homogeneous: maintaining the same density, particle size and moisture.
The characteristics of this new material make it an alternative fuel: renewable and environmentally friendly.

Current SRF

NEW SRF

Mass of non hazardous waste which has been selected, blended and dried.
Heterogeneous Different densities Multiple components Variable particle size

Mass of non hazardous waste which has been selected and transformed into a new material.
Homogeneous Constant density Unique component Constant particle size

THE FUELS OF THE FUTURE

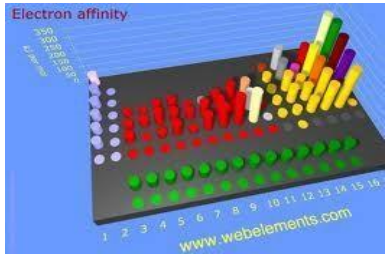
The transformation process developed by WASTE´S ALCHEMY allows us to obtain a new and exclusive final product, composed of the recombined materials molecules and the processed organic and inorganic products.

Waste

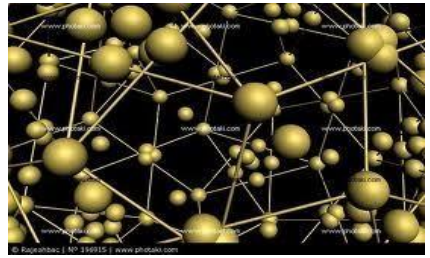
Transformation

Fuel

This is achieved by subjecting the different materials and products both organic and inorganic to a continuous centrifuge process at high pressure and temperature.



Elements



Molecules

Fuel

ADVANTAGES OF OUR NEW SRF

Reduced costs of production: Elimination of moisture-reduction pretreatments.

The economic viability of the production process allows it to be compared with fossil fuels.

Allows the creation of an alternative market to the conventional sources of fuels.

Reduction of landfills and creation of new business lines.

Ideally suited to integrate in the new technologies of energy production:

During the process of energy generation, the amount of oxygen and the temperature the furnaces and boilers can be programmed for high electrical performance thanks to the quality of homogeneity developed in the new fuel.

Numerous environmental and social benefits.

Process Emisions:

Exit gas temperature between 75 ºC and 90 ºC.

CO = 25 ppm

NOx = 150 ppm

SO2 = 55 mg/m3N

GLOBAL VISION OF THE BUSINESS

- Maximizing the use of available resources.
- Possibility of reducing the consumption of fossil fuels.
- Reduction of landfills, maximum profitability.
- Technological advantage: positioning as worldwide leaders.
- Pioneers in a strategic sector for the society.

SUMMARY:

1. The method gives the processed waste new physico-chemical properties, obtaining a new product with an AR LHV (All moisture counted, lower heating value) from two to four times greater than that of the unprocessed waste.
2. The energy expenditure of the process is only between 5% and 10% of the gross energy obtained.
3. Waste does not require any pre-treatment of humidity or grain size reduction.
4. The produced fuel is homogeneous, allowing to define the parameters regulating combustion, in order to obtain the highest percentage possible of the energy contained in the fuel (highest efficiency is obtained), and avoiding incomplete combustions and the generation of dioxins and furans.
5. CO2 emissions corresponding to the biogenic fraction of the produced fuel are counted as neutral.
6. The application of the method globally would allow to reduce by 30% the CO2 emissions from landfills into the atmosphere.

FUTURE OF THE PROJECT

DEVELOPMENT / RESEARCH / FINANCING

PROCESS ENGINEERING + MECHANICAL ENGINEERING + CHEMICAL ENGINEERING



DESIGN AND MANUFACTURE OF NEW FUELS OF THE 21ST CENTURY

Industrial development of the experimental prototype will enable the design of facilities to process a large amount of materials (incoming from industrial, urban, agricultural and forestry waste) and the production of new programmable fuels, in accordance with the specifications requested by each industrial sector:

Wood - plastic (except plastics with chlorine) - paper - cardboard - pads cellulose textile - mattresses - agricultural remnants - fraction rejection of plants municipal waste - rubber - cork – leather

CONCLUSIONS:

Through our method, with the rejection of the municipal waste treatment plants, and without any prior treatment, SRF is produced with the following properties:

1. **High LHV AR** (All moisture counted, lower heating value): two to four times higher than the unprocessed waste.

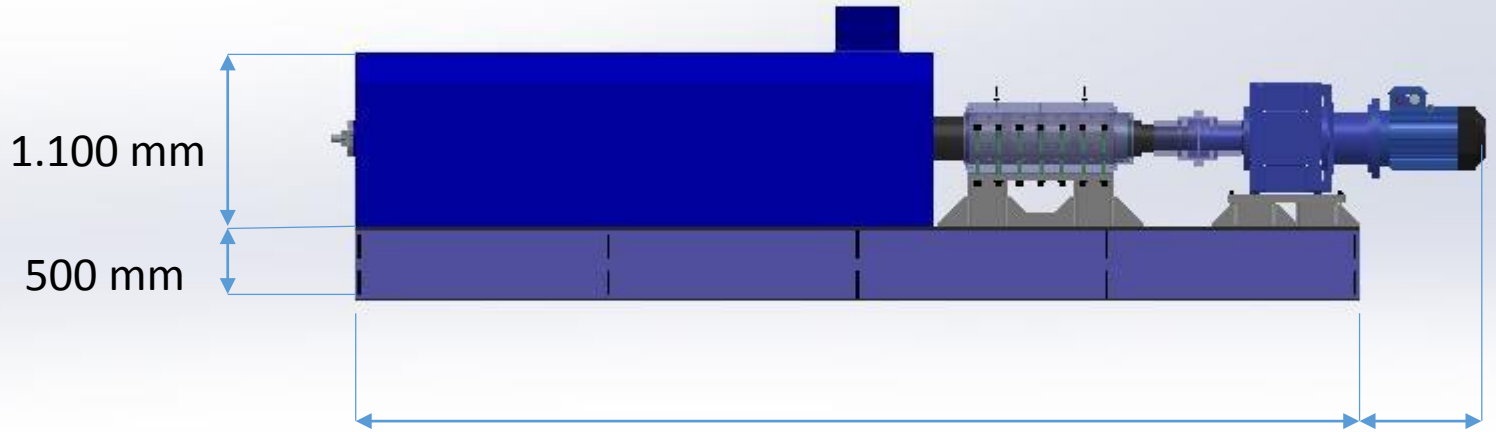
2. **Homogeneous**: composed of a single substance, with defined qualities and physicochemical properties, which are kept constant throughout all the product (only one phase is observed).

3. **Malleable**: can be delivered in any format, including in powder, with a minimum expenditure of energy.

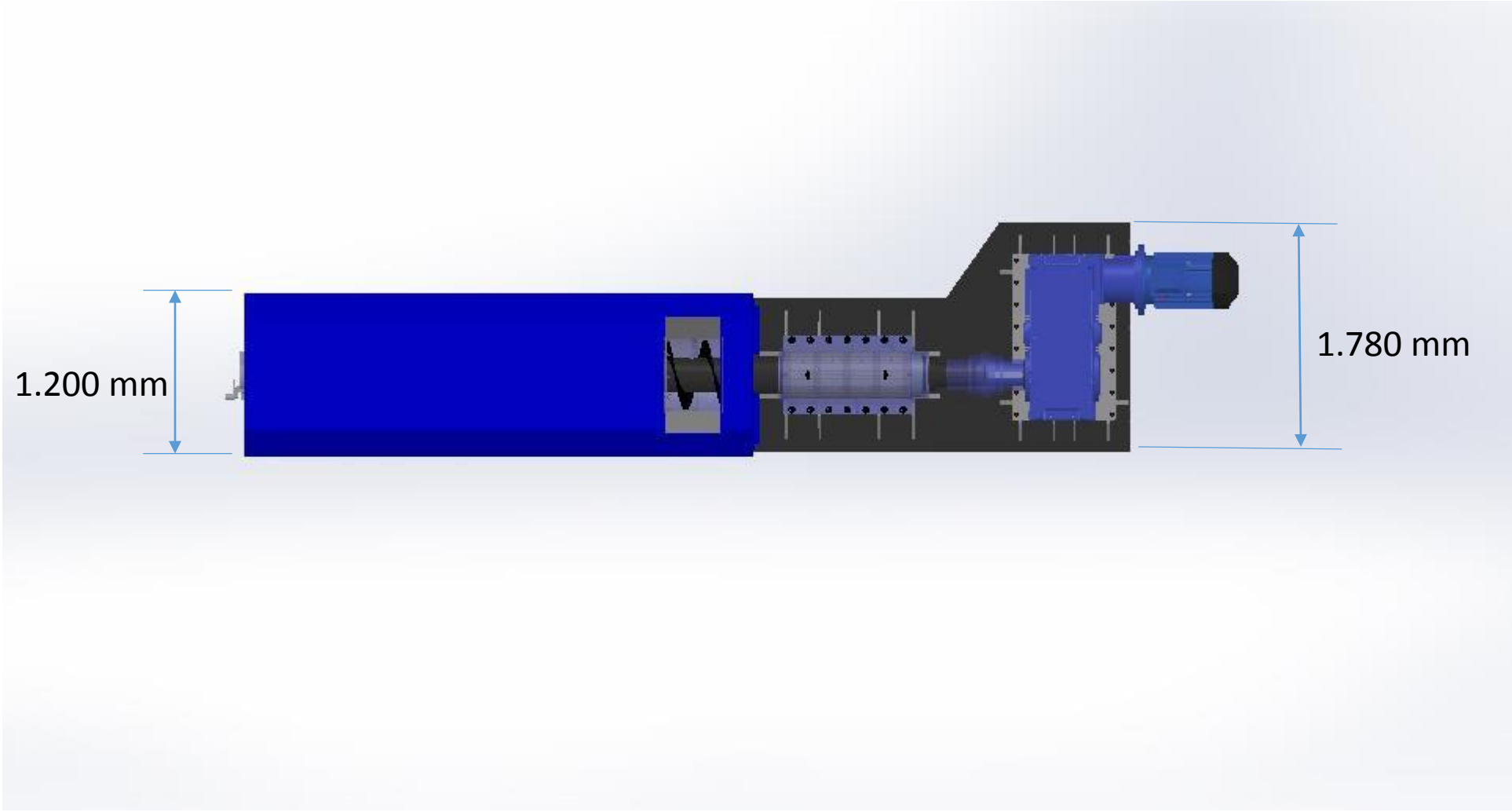
4. **Waterproof**: provided by the plastic content in the fuel, if it present.

The industrial machine

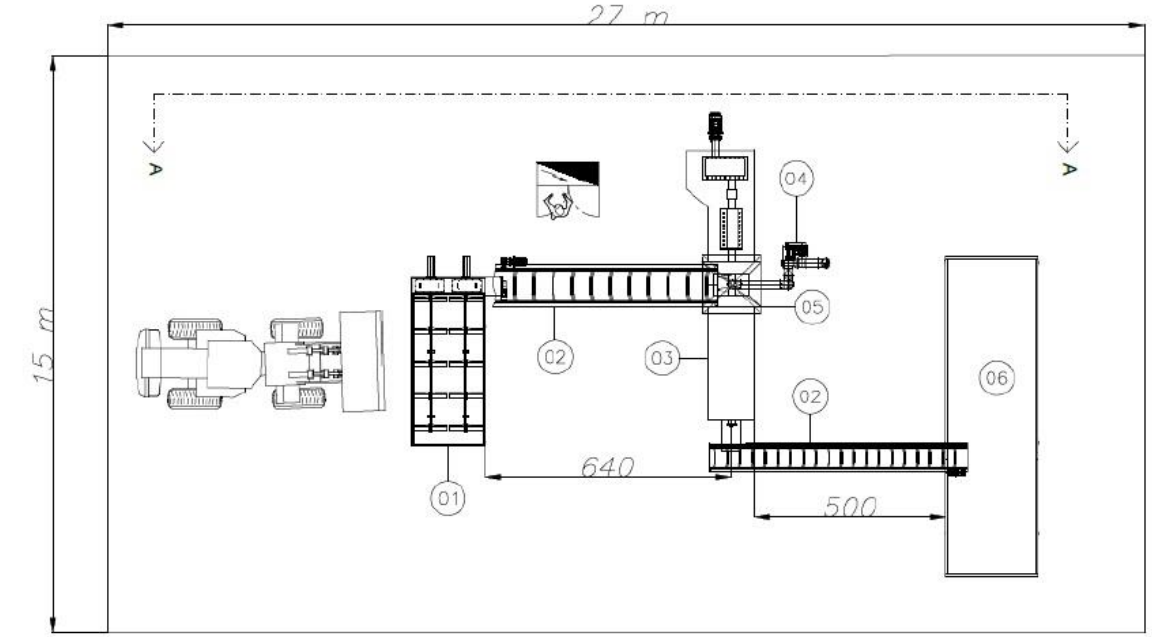
Technical dimensions 1

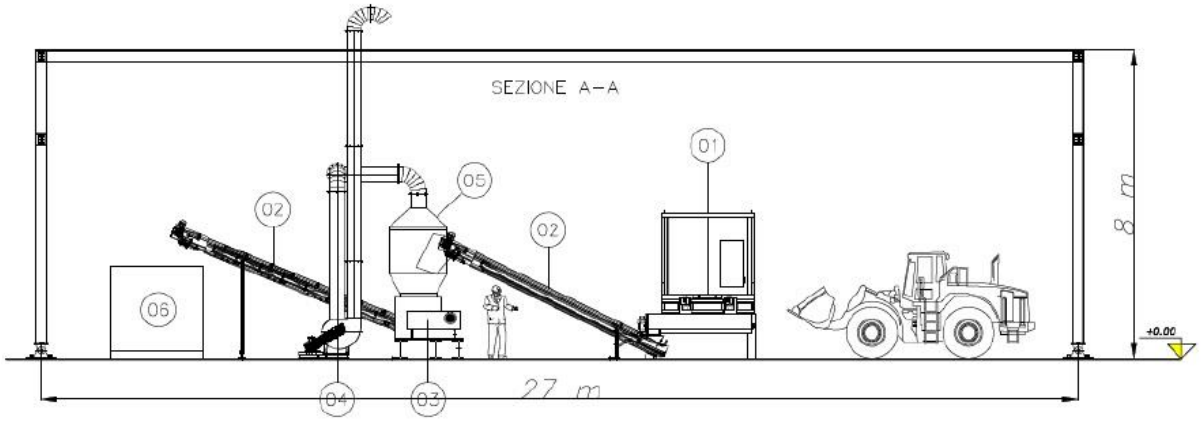


Technical dimensions 2

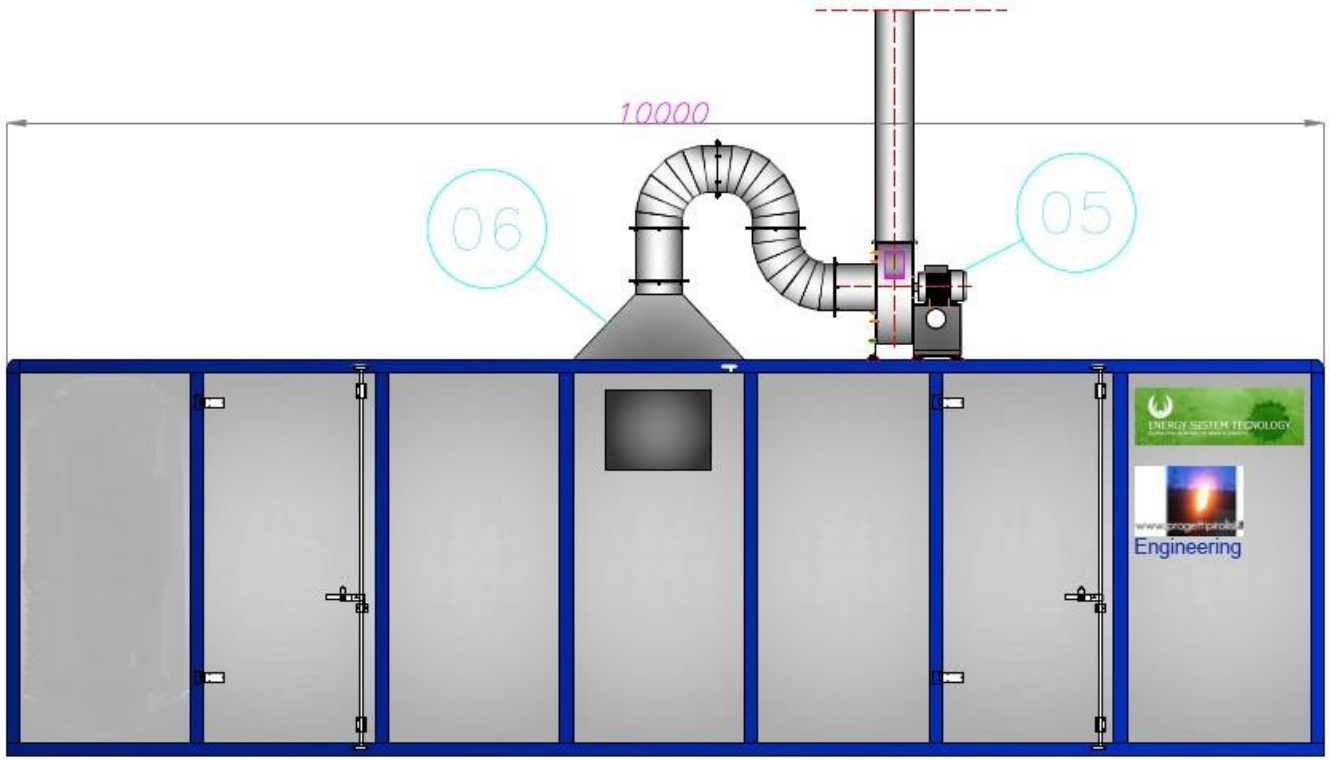


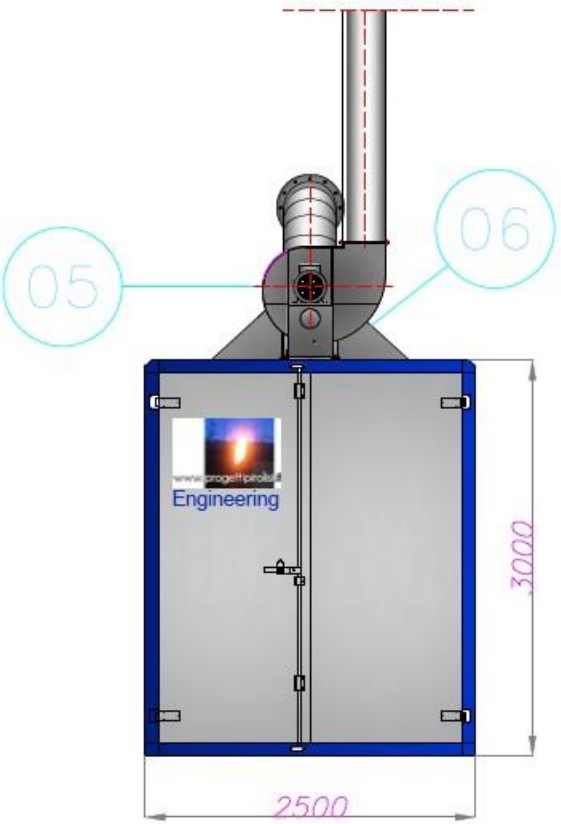
Indicative Plant Layout





Indicative Containers layout





Indicative data sheet

Imput material		:	2.500 kg/h
Production depends	% imput umidity	:	1.450 kg/h
If umidity material	is 50%		
Product umidity	is 15%		
Process time	minimun	:	20 min.
	Maximun	:	60 min.

Process time varied in base of the material composition and his % of umidity.

In this case consumption in Kwel/h is	:	140 kwel/h