Equipment for sorting and recycling of municipal solid waste

TYAZHPRESSMASH

Joint-Stock Company

Quality of our equipment - the key to the success of your business

TYAZHPRESSMASH

A few words about OAO TYAZHPRESSMASH

OAO TYAZHPRESSMASH is a diversified company engineering that produces a wide range of equipment for various purposes. We offer a modern high-tech solutions for many industries.

One of the most promising directions in the work of OAO TYAZHPRESSMASH are engineering, manufacture and turnkey supply of equipment for sorting and recycling of municipal solid waste.

CEO of OAO TYAZHPRESSMASH
Volodin A.M.

Technicians of OAO TYAZHPRESSMASH are ready to:

- develop an efficient project from the technical and economic points of view, to select the necessary equipment and layout in accordance with your requirements;
- implement manufacturing and supply of equipment on the highest technical level in the shortest possible time;
- offer a full turn-key project implementation;
- provide after-sales warranty and service;
- provide technical and advisory assistance for the successful implementation of the project.

OAO TYAZHPRESSMASH equipment is:

- environmentally safe technologies that allow placing equipment in localities;
- economically effective solution of the problem of improving the sanitary condition of cities and regions;
- attracting investment in this sector of the economy;
- transforming the process of waste utilization into a highly profitable business;
- creation of new jobs;
- obtaining additional revenues to the budgets of different levels.

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Basic technological solution used in complexes of the OAO TYAZHPRESSMASH is sorting and pre-treatment of municipal solid waste for further processing - the selection of useful fractions: ferrous and nonferrous metals, plastic waste, PET containers, plastic film, paper, glass, etc., i.e secondary raw materials which find a stable demand in the market.



Further processing of secondary raw materials into marketable products: alternative RDF - fuel (solid secondary fuel), construction and packaging materials, polymer pipes for cold water supply, sewerage and gas pipelines, rubber chips used as a filler for pavement etc., will increase profitability of the project and quick payback of thee equipment.



Manual sorting:

- manual selection of secondary shares of the total mass of waste entering the complex;
- automatic separation of fine fraction, separation of ferrous and non-ferrous metals;
- pressing of secondary raw materials and ballast fractions.

Automatic sorting:

- automatic selection of useful fractions from the total flow of mixed solid waste by their color and chemical composition with the use of infrared and visual spectrometry;
- the ability to switch-over working modes of the equipment in order to optimize the selection of certain fractions considering secondary raw materials market conditions;
- high quality sorting by purity and productivity;
- waste preparation for the technological process of RDF - fuel production.

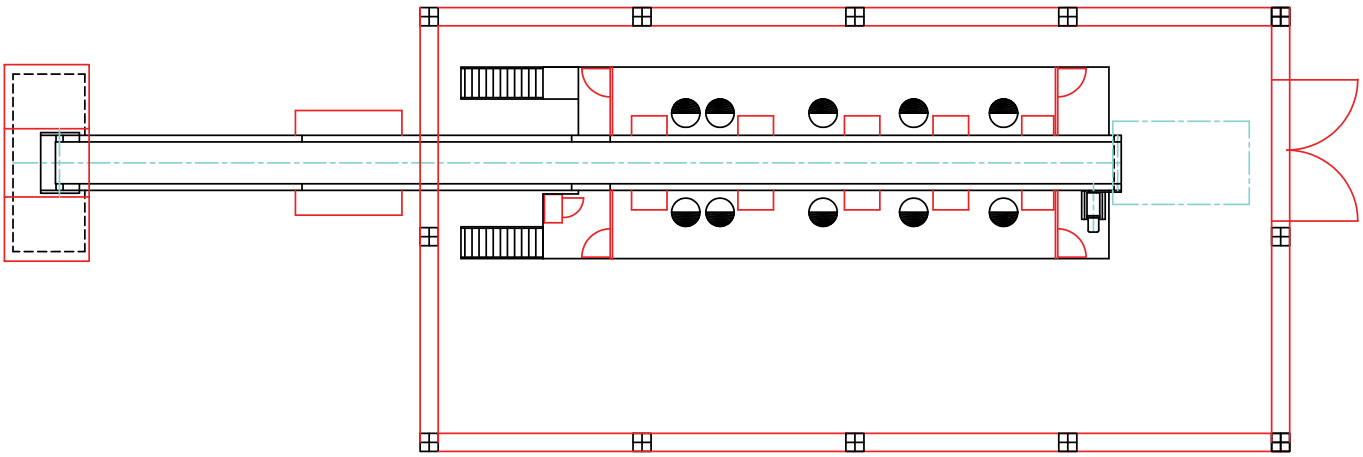
Alternative RDF - fuel production:

- crushing to 20 mm size fractions, separation of ferrous and non-ferrous metal;
- extraction of chlorine-containing raw materials from the total mass through optical scanning;
- quality control of the received RDF – fuel.

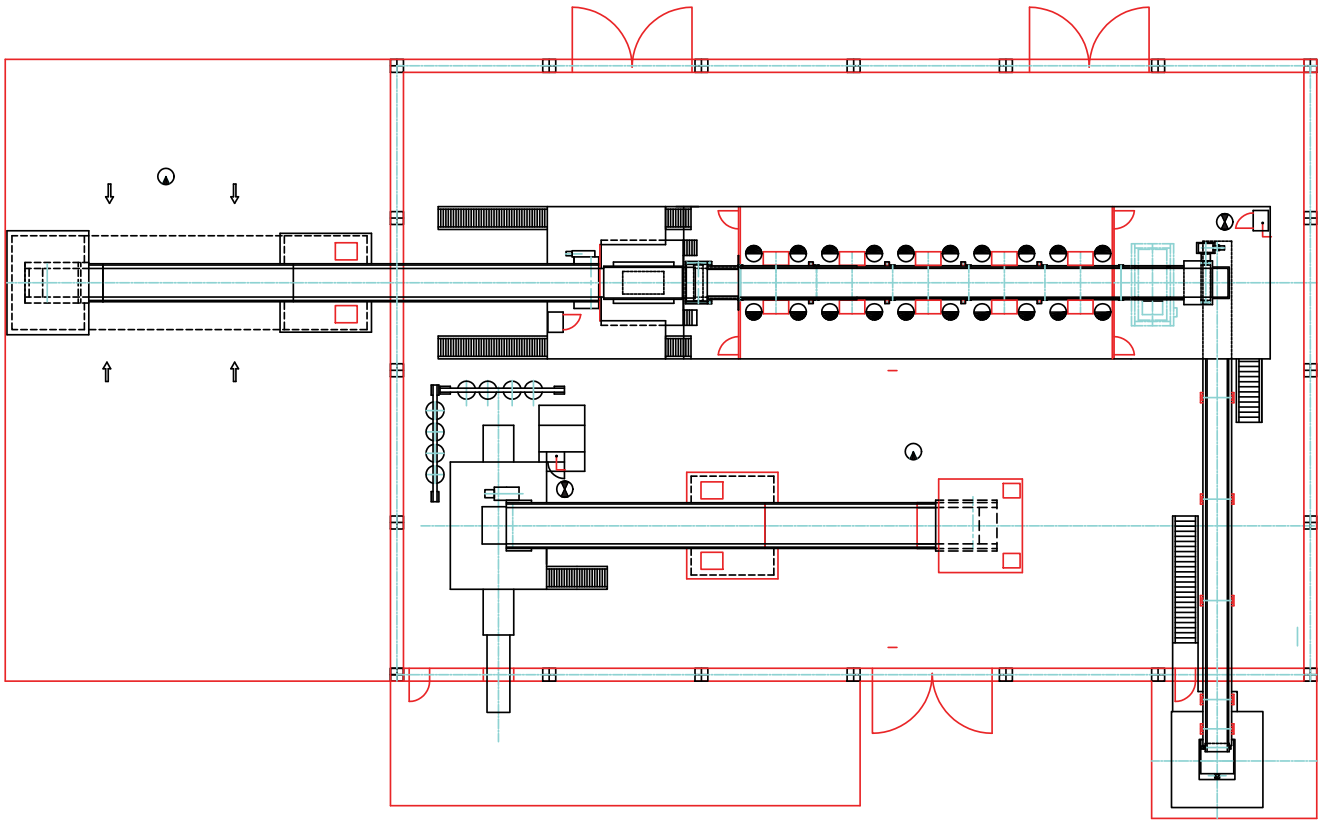
Plastics processing:

- Selected on the sorting line plastic (pet bottles, polymer film, high pressure polyethylene, low density polyethylene) is processed into commercial products: plastic semi-finished product (crushed plastic, granulate, synthetic fiber), packing tape, polymer sewer pipes, etc.

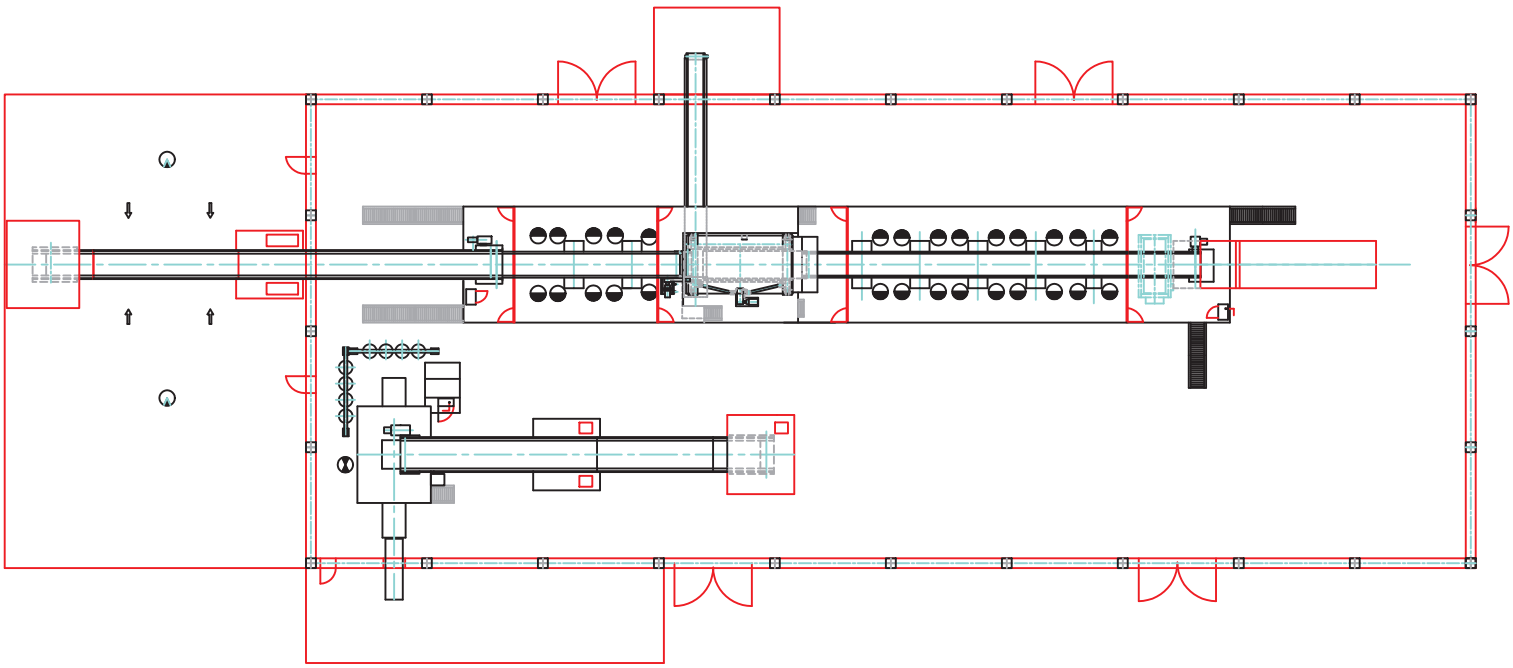
A sorting complex with a capacity of 20 thousand tons per year



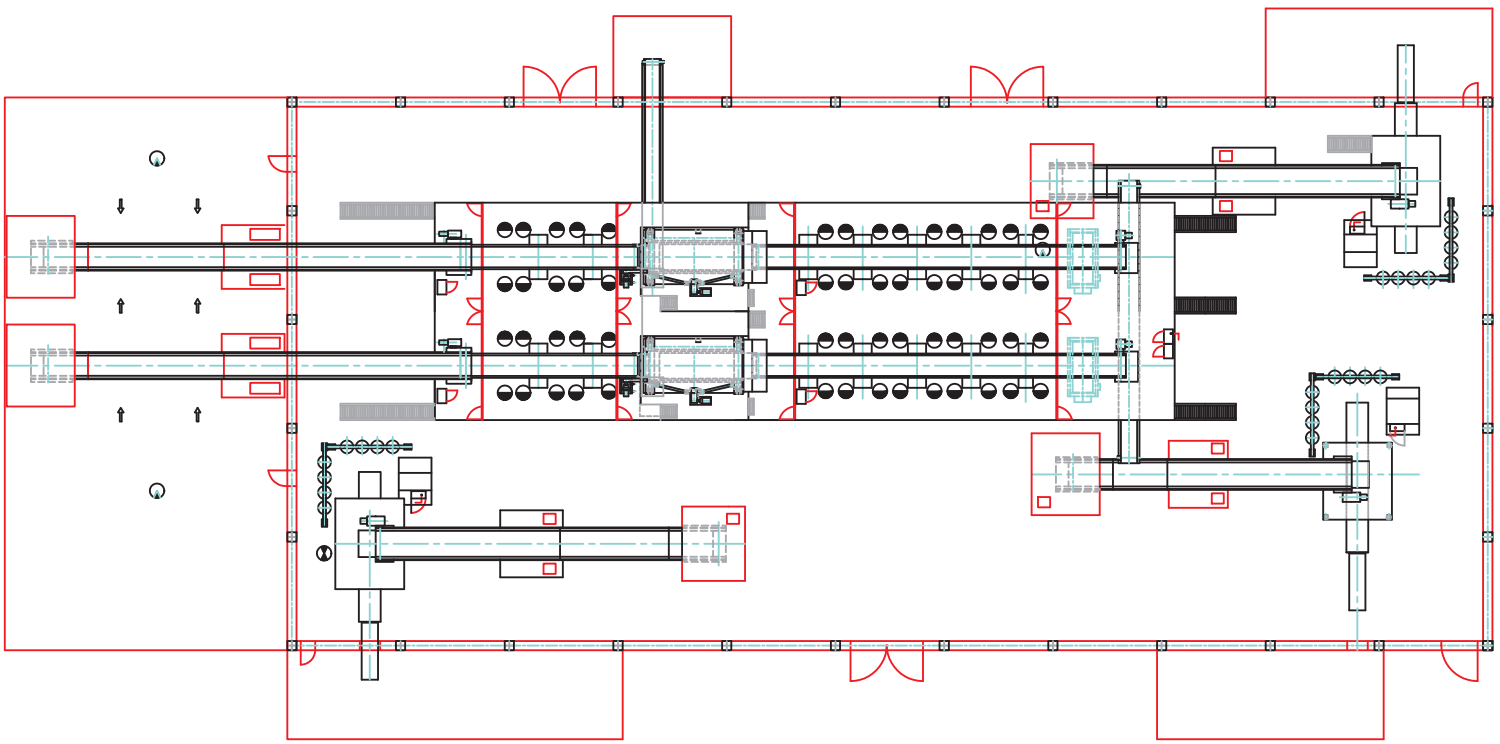
A sorting complex with a capacity of 50 thousand tons per year



A sorting complex with a capacity of 100 thousand tons per year



A sorting complex with a capacity of 200 thousand tons per year



Description of the process of manual sorting of municipal solid waste

The process solid municipal waste sorting begins in the loading department, where large-scale waste are collected, consisting of whole pieces or fragments of products with dimensions of 600x600 mm or 800x200 mm, and also weighing more than 6 kg. They are separated and removed outside the loading bay. The remaining waste is sent for preliminary disassembly, where large sheets of cardboard, polyethylene film and glass are separated.

Further, the waste enters a drum or dynamic separator (the choice of equipment depends on the productivity of the complex), where a fine fraction is separated, the size of which is determined by the dimensions of the holes in the sieve of the separator.

Then the waste is post-piped to the sorting conveyor, where the operators select raw materials from the total garbage for recycling.

Secondary raw materials - paper, cardboard, textiles, polyethylene film, pet bottles, aluminum cans – briquetted, glass (battle and whole tanks), ferrous metals, non-ferrous metals, collected in separate containers and sent for processing.

The non-batch part of the waste is briquetted and transported for disposal to the landfill.

Waste are compressed to the density of natural soils, which allows, in addition to reducing the cost of transport, to carry out disposal of waste at the landfill in a multi-level scheme, significantly reduce the area of polygons, reduce the amount of gas release and filtrate into groundwater.

Description of the process of manual sorting of municipal solid waste

The waste sorting complexes includes:

- band-type and plate conveyors
- briquetting press
- crusher
- separators of ferrous metals
- separators of non-ferrous metals
- drum and dynamic separators
- breaker of garbage bags
- compacting presses
- climatic sorting cabins
- trestles and metal structures

OAO TYAZHPRESSMASH offers to supply a range of basic waste sorting complexes, designed for processing from 10 to more than 300 thousand tons of waste per year.

The modular construction principle allows you to change the composition of the equipment and the layout of the complexes, as well as carry out the phased introduction of the equipment of the complex into operation and the capacity expansion at the request of the customer.

The equipment of the complexes can be located on the existing production areas, or – if no production area is available in prefabricated buildings of hangar type.

At the request of the customer, the residues can also be unloaded to the compactor, to the garbage truck, to the body of a car or tractor trailer for later burial at the landfill, if the equipment of the complex is located on its territory.

Automatic sorting is based on the use of an optical scanning system that allows the extraction of various materials of their mixed or uniform waste stream, taking into account the physical and chemical characteristics of the material.

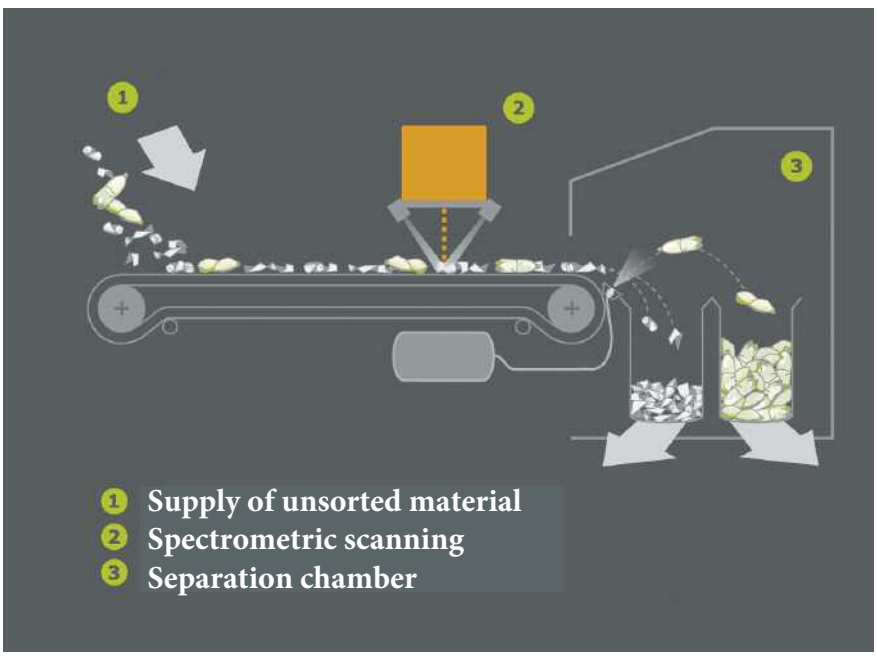
This makes it possible to carry out a better and complete (in comparison with manual sorting) selection from the total mass of the landfill fractions available for sorting of mixed wastes, suitable for processing, while preparing them for the further technological process of processing.

The automatic sorting machine capabilities include a statistical definition of input material, the ability to switch-over the sorting modes, as well as additional management functions and monitoring the sorting process from the control panel.

Using automatic sorting allows you to extract up to 98% certain type of secondary raw materials.

The automatic sorting unit is an optical scanner installed above a high-speed conveyor belt to detects material (up to 10000000 readings per second).

Infrared sensors receive and analyze reflected spectra.



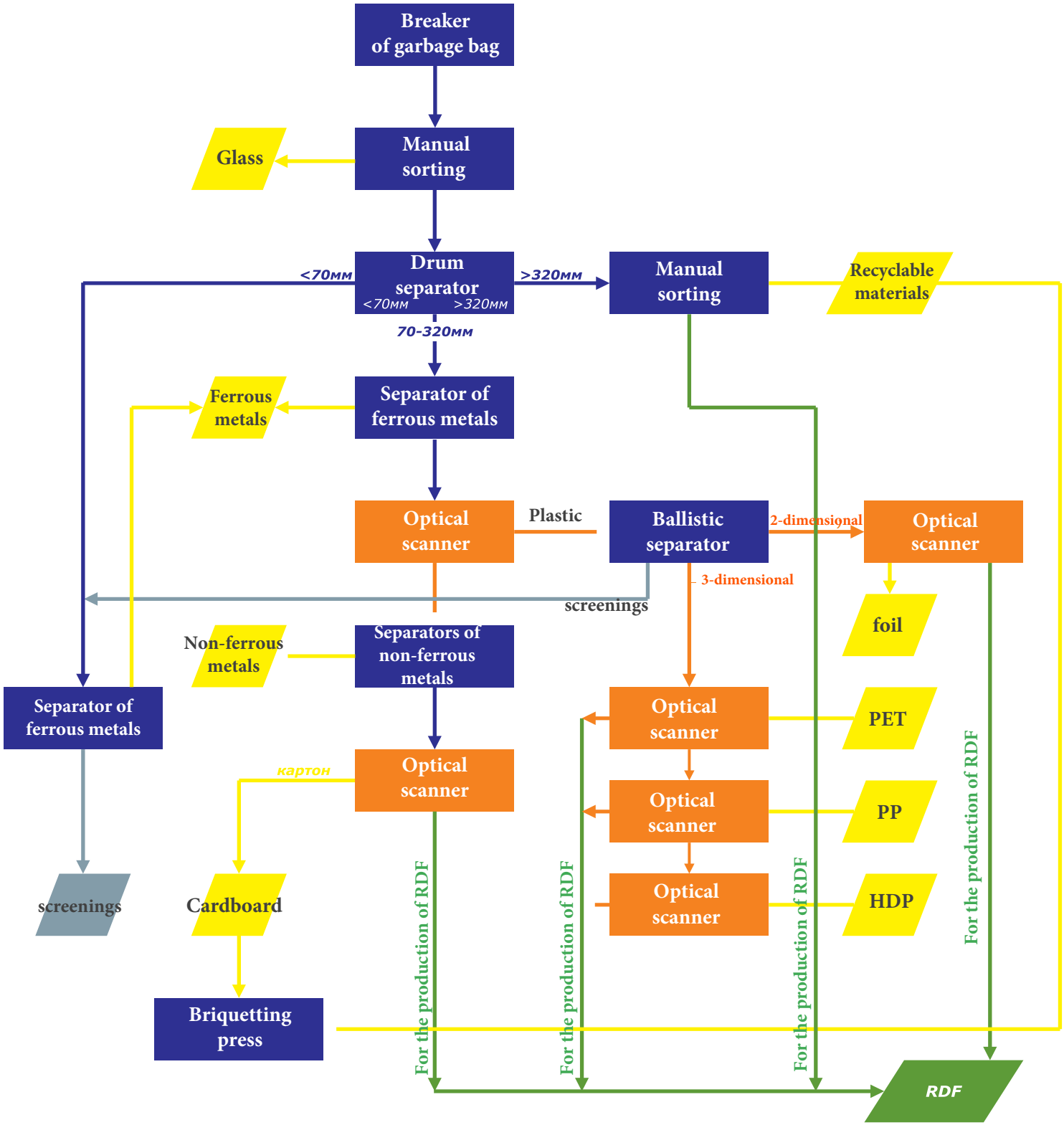
The analysis is conducted on the size, shape, structure and color of the material.

Further, a signal is sent to the pneumatic installation, and the material programmed into the scanner is shot into the corresponding hopper.

Description of the process of automatic sorting of municipal solid waste

Automatic sorting result is the separation of feed streams into fractions depending on the pre-set parameters.
The optical sorting system is built in almost any technological scheme, both newly designed and already existing, including any manual sorting.
It is adapted to local Russian rubbish, which allows it to easily carry out a qualitative selection of components.

Process flow scheme of automatic sorting of municipal solid waste:



Briquetting press MSK 2503



Output, tons / hour	up to 20
Force of pressing, tons	120
Bale size, L x B x H, mm	800x1000x1000–1500
Power consumption, kW	42,4

Automated briquetting line



Output, tons / hour	up to 20
Force of pressing, tons	120
Power consumption, kW	47,9

Main technological equipment of waste sorting complexes

Separators of screening of fine fraction (drum and dynamical)

	drum	dynamical
Length, mm	4000 - 8000	3400
Drum inner diameter, mm	2000 - 2380	
Diameter of sieve screen cells, mm	60...150	60
Power consumption, kW	10 - 30	4

Separators of ferrous and non-ferrous metals

	ferrous	non-ferrous metals
Length of conveyor, mm	3135	1600
Effective width of conveyor belt, mm	900	1200
Power Consumption, kW	2,2	5,2

Band-type/plate conveyor

Band-type plate conveyer

Output, tons / hour	up to 20	∆o 20
Belt width, mm	800, 1200, 1400	1200, 1400
Transport speed, m/min	6 - 24	6 - 12
Power consumption, kW	3,5 - 7,5	5,5

Overhead conveyor

Performance, tons/ hour	up to 15
Running gear width, mm	1400, 2000, 2800
Transport speed, m/sec	3,5
Power consumption, kW	5,5

Main technological equipment of waste sorting complexes

Crushers for plastic and cardboard

For cardboard | For plastic

Performance, tons/ hour	400	500-600
Motor power, kW	15	22
Recyclable material	cardboard, plastic	PP-PET-PETF
Overall size, mm	2000x1900x1700	1650 x 1600 x 1900
The weight, kg	2100	1600

Metal structures, trestles, sorting cabins

Alternative fuel RDF(refuse derived fuel) or solid secondary fuel the is fuel derived from waste.
Waste fractions such as synthetic fibers, leather and leatherette, polymers, rubber, textiles, paper and etc., are suitable for the production of fuel.

Basic RDF fuel characteristics

- The calorific value of the RDF - fuel is 20000 +/- 2000 kJ / kg
- The RDF grain size is 20 mm
- The content of hazardous constituents in fuel is strictly controlled and does not exceed the permissible standards.

RDF can be used as an additional fuel in furnaces of cement plants, cogeneration plants, metallurgical furnaces. The use of RDF for incineration in cement plants can significantly reduce the consumption of primary energy resources (gas, fuel oil, coal) and reduce costs for the production of cement. Based on their calorific value of materials, 1.7 kg of RDF corresponds to 1 cubic meter of gas.

Solid municipal waste generated annually in Russia can be potentially processes to produce 10 million tons of secondary fuel, which will save up to 4.3 million cubic meters of natural gas per year. This amount of gas would be enough to produce about 25 million tons of cement per year.

Impact of RDF fuel burning on the environment is significantly lower than solid municipal waste burning at incineration plants.

Preliminary selection of chlorine-containing fractions and high temperatures of the cement clinker production process ensure a minimization of the content of harmful substances in the waste gases.

Recycling of PET and polymer waste

Selected on the sorting line plastic (PET bottles, polymer film) is processed into a plastic semi-finished product (crushed plastic, granulate, synthetic fiber).

The plastic waste recycling line consists of:

- crusher,
- washing (cooling, hot, friction),
- centrifuge,
- dryer,
- drum separator,
- agglomerator,
- granulator.

The resulting plastic semi-finished product is the raw material for the production of marketable products: packaging tape, packaging film, polymer sewer pipes, and other consumer goods

Almetyevsk, Republic of Tatarstan
Commissioned in 2005 the productivity of 100 thousand tons per year

Ryazan,
Commissioned in 2005 the productivity of 100 thousand tons per year

Operating equipment of waste sorting complexes

Gomel, Republic of Belarus
Commissioned in 2006 the productivity of 100 thousand tons per year.

Chelyabinsk region, Miass
Commissioned in 2008 the productivity of 100 thousand tons per year.

Republic of Dagestan, Botlih
Implemented in 2008 the productivity of 50 thousand tons per year.

Magnitogorsk
Commissioned in 2010 the productivity of 100 thousand tons per year.

Operating equipment of waste sorting complexes

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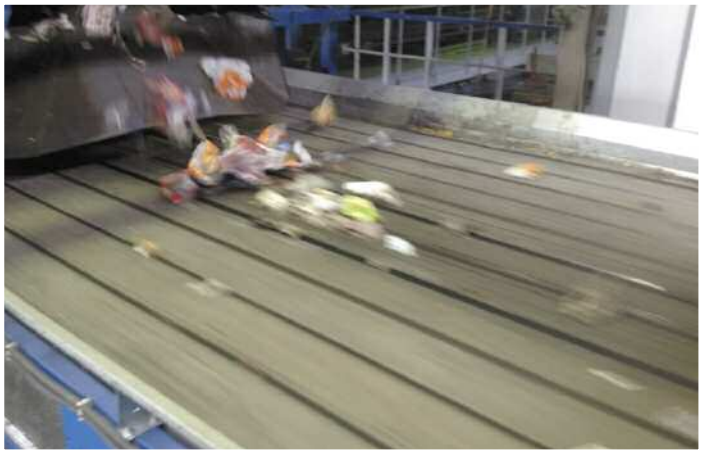
Saint-Petersburg,
St. Petersburg State Unitary Enterprise "The waste treatment plant" (MPBO-2)
The modernization was carried out in 2011, the automatic sorting node.

Tolyatti,
Commissioned in 2011 the productivity of 100 thousand tons per year.



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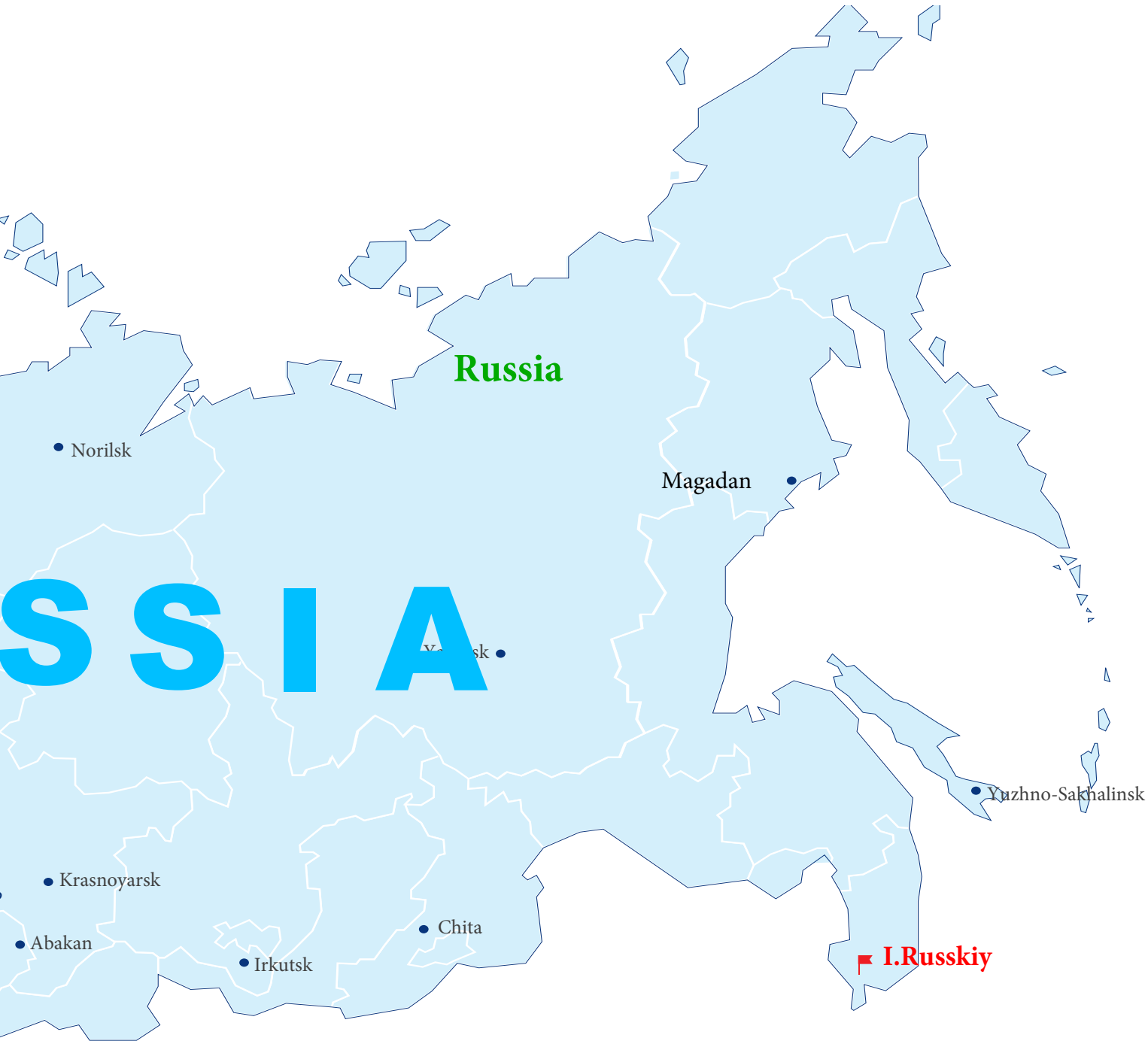
Geography of implemented projects

Our partners:

OOO Polymerstal - fabrication of metal structures of trestle cabs for sorting
OOO Ekoinj - environmental design, environmental solutions, engineering surveys
ZAO Bezopasnie tehnologii - thermal waste management
OOO Ruuki Rus - prefabricated buildings of hangar type
Perm State Technological University - project and working documentation for the construction of solid municipal waste landfills, general schemes for sanitary cleaning of cities and municipalities, determination of the morphological composition of solid municipal waste.

Geography of implemented projects



Our company has successfully implemented more than 20 major projects for sorting and processing of solid municipal waste in Russia and CIS countries, in such cities as **Moscow, Khimki, St. Petersburg, Kolpino, Ryazan, Maloyaroslavets, Almetyevsk, Magnitogorsk, Ufa, Gomel, Mogilev, Chimkent, Miass, Arkhangelsk, Nizhnevartovsk, Pyatigorsk, Omsk, Balakovo, Volsk, Murom, Botlikh, Barnaul and others.**

Leasing and credit:

- MinB OJSC
- UralSibLeasing LLC
- Mashleasing OJSC
- OJSC Promsvyazbank

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