



TECHNOLOGY
AND TURNKEY SOLUTIONS
FOR WASTE MANAGEMENT
AND WATER TREATMENT



In last few decades there is ongoing discussion about compatibility of the economic development and the ability of the environment to sustain to increasing consumption of natural resources. Concern for the protection of soil, air and water from the harmful impact of industry and human livelihood activity seems to be one of the major challenges of the XXI century.

Especially EU legislation is trying to maintain situation, pointing directions in reducing indicators related to e.g. flue gas emission levels, materials recycling, depositing on landfills.

Control Process for years is providing technology and turnkey solutions according to highest standard for Investors in EU countries.

Provided plants and technologies not only are fulfilling EU standards, but also enabling Investors to make a profit, by producing energy or materials recovery.

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ABOUT THE CONTROL PROCESS GROUP

CONTROL PROCESS GROUP

CONTROL PROCESS S.A. is one of the largest construction companies in Poland. It has been continuously active in the market since 1991, consistently providing to customers the highest quality services and products. CONTROL PROCESS started off as a local company, which was initially dedicated to design, installation and start-up of automation.

After more than twenty years of continuous development, starting up new specialized companies and the takeover of competitive companies, it has evolved into a strong Capital Group with an established position in the Polish market and is operating on an international markets.

Presently, the CONTROL PROCESS Group consists of several specialized companies whose principal area of business is the realization of investments in key sectors of the economy, such as:

- extraction, processing, transportation and storage of crude oil and natural gas
- production and distribution of electricity and heat
- environmental protection facilities
- industrial installations and infrastructure facilities

The ownership structure of the CONTROL PROCESS Group is based on Polish private capital. Consequently, it is characterized by its independence, both in terms of choice of business partners, as well as selection of technological solutions. This unique independence ensures delivery of the most beneficial and tailored solutions to customer requirements, each and every time.

TIMELINE

- 1991
Marian Wiatr, current CEO of CONTROL PROCESS S.A., founds the company known as CONTROL PROCESS: Automation and Measurement.
- 1994
CONTROL PROCESS: Automation and Measurement begins providing services for the heating sector and participates in projects co-financed by the World Bank, with the aim of improving energy efficiency of Thermal Energy Enterprises.
- 2001
After 10 years of dynamic growth and development in the gas and heat sector CONTROL PROCESS: Automation and Measurement becomes "CONTROL PROCESS Sp.z o.o."
- 2003
CONTROL PROCESS Sp. z o.o. starts focusing on turnkey investments. The first facilities include: "Natural Gas Mine Biszczka, Książpol" and "Sewage Treatment Plant in Jarosław".
- 2004
The company performs its first major take over, acquiring the majority of shares in the Lifting Equipment Maintenance Company REMDŹWIG Sp. z o.o.
- 2007
CONTROL PROCESS evolves into a public limited liability company. A year later it becomes CONTROL PROCESS Capital Group.
- 2009
CONTROL PROCESS S.A. realizes its first turnkey investment for the energy production sector: „CHP Plant – LMG Project”.
- 2012
CONTROL PROCESS'S revenue exceeds 110 million EUR, whereas the number of employees exceed the 1000 people.
- 2014
The CONTROL PROCESS S.A. Capital Group consist 14 engineering and construction companies which attain more than hundred million EUR in revenue and employ more than 1000 employees.





CONTROL PROCESS comprehensively executes turn-key projects to protect natural environment, we are leader of delivering comprehensively solutions for municipal waste management in Poland.

Our Clients are subsidiaries of local and central government authorities, associations of municipalities and private investors. CONTROL PROCESS Capital Group offers solutions to treatment of wastewater, management of municipal solid wastes, recycle of raw materials and energy from wastes and air protection through flue gas cleaning systems.

We are supporting our Clients in each stage of the project:

- cost analysis and obtaining external financing (including from EU funds)
- feasibility study
- design and engineering
- construction
- start-up and comissioning
- maintenance

Plants and technologies provided by CONTROL PROCESS enables investors to achieve revenue and making profits, by producing energy and materials recovery.



SOLUTIONS FOR ENVIRONMENTAL PROTECTION

OFFERED PLANTS AND TECHNOLOGIES:

WATER AND SEWAGE TREATMET

- sewage treatment plants
- water treatment plants
- sludge drying
- sludge incineration

FLUE GAS TREATMENT

- desulphurisation (DeSOx)
- denitrification (DeNOx)
- dedusting (DeDust)

TREATMENT AND UTILIZATION OF MUNICIPAL SOLID WASTE

- mechanical-biological treatment
- recycling
- incineration



MECHANICAL-BIOLOGICAL TREATMENT PLANTS

Dynamic growth of the population in the world connected to economic growth and intense growth of urbanization rate put the society through the new challenges. One of them is a significant increase of municipal waste production and necessity of its management.

Municipal Solid Waste (MSW) is waste generated by domestic and commercial activity in cities and towns. The composition of this urban waste varies greatly according to the location, climate and degree of industrialization of each country.

Existing waste management procedure was the land-filling of waste. This solution to face of significantly increased waste production stopped to perform a function – landfills are overflowing, the waste became danger for environment due to lack of treatment and verification of its content, and economic potential of waste (recycling of resources and energy) was not used.

Solution of this problem became waste management plants. In most of the cases, municipal solid waste are made up of a combination of miscellaneous materials of which approximately half consist of non-ferment-

able (inorganic) materials, most of which are recyclable. The rest of the materials are organic waste, which must also be recovered to be stabilised, or to produce compost or energy-recoverable biogas.

The aim of every urban waste treatment plant is to recover the greatest quantity of recyclable materials, treat the organic fraction and reduce the amount of retained fraction sent to landfills.

The so-called MBT plants are facilities devoted to the complete treatment of urban waste, which includes mechanical and biological treatments for their recovery.



CONTROL PROCESS is technology supplier and „turn-key“ project construction company for wide range of solutions for treatment of MSW:

- mechanical treatment plants,
- mechanical-biological treatment plants (MBT plants),
- biological treatments of the organic fraction (aerobic or anaerobic), biodrying and compost refining lines,
- RDF production facilities

CONTROL PROCESS offer includes delivering of single technological lines and building complete facilities considering the following processing units:

- sorting lines
 - bag openers
 - shredders
 - drum sieves
 - flip-flop sieves
 - ballistic separators
 - electromagnetic separators
 - eddy current separators
 - optical separators (NIR)
 - waste segregation cabins
 - baling presses
 - automatic container loading stations
- anaerobic digestion technologies
- composting/aerobic stabilization technologies
- biodrying
- cogeneration
- air deodorization installation
- biogas management and treatment
- landfills





SORTING LINES

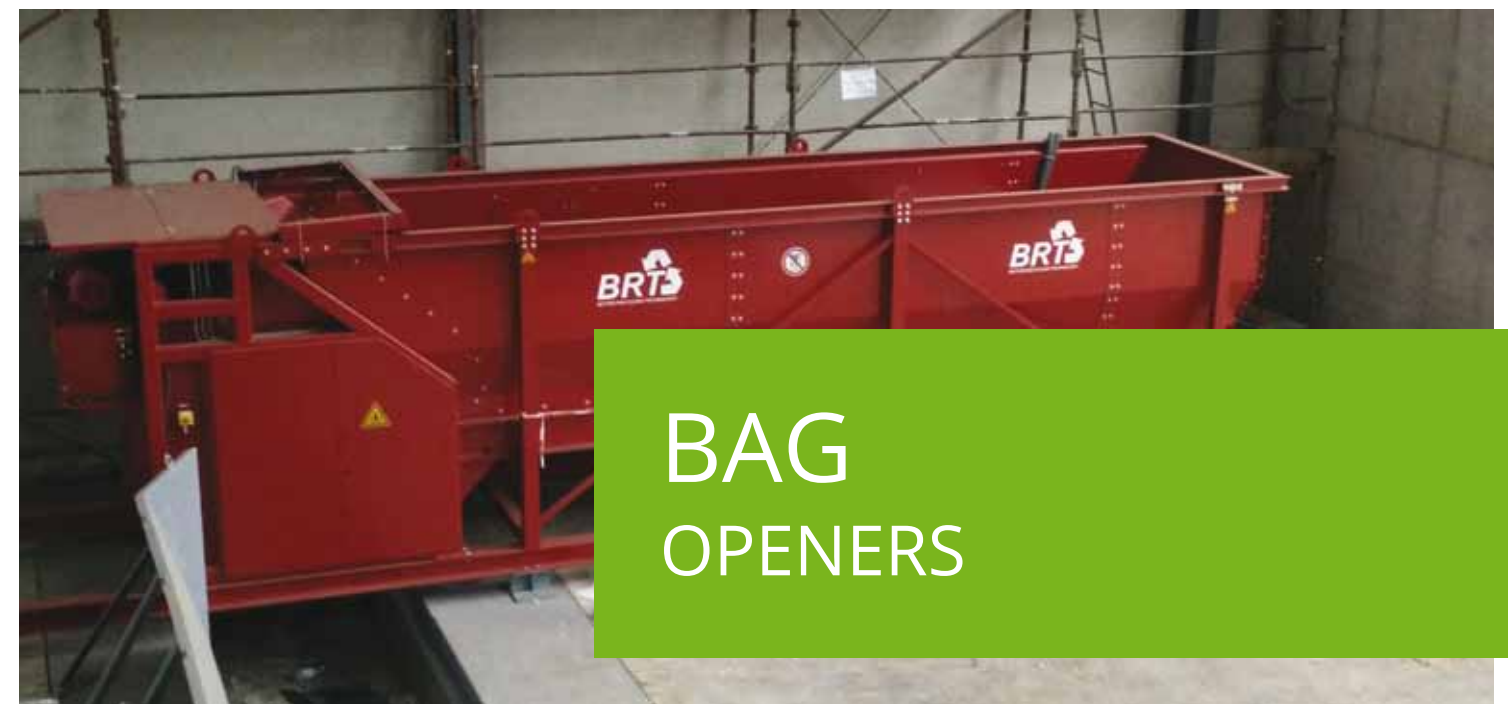
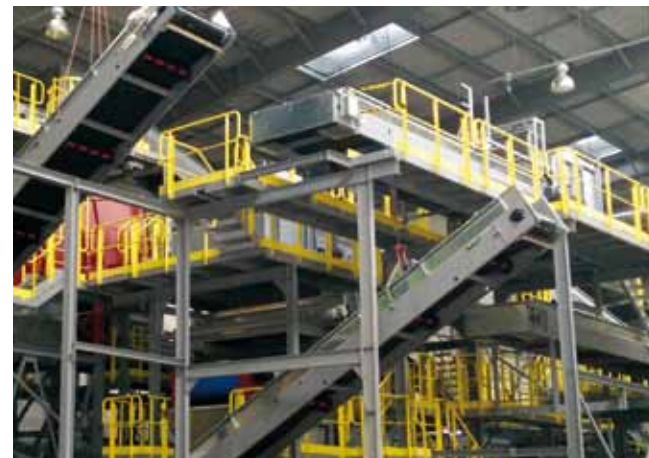
The main objective of waste sorting facility is to recover recyclable materials and reduce the retained fraction sent to landfills. For municipal solid waste sorting facility can be totally automatic, semi-automatic or manual. The level of automation of the facility is depend of different parameters, principally the plant's treatment capacity - annual tonnes to be processed, considering the densities of the material to be treated.

CONTROL PROCESS designs and manufactures comprehensive waste sorting lines, including among others:

- bag openers
- ballistic separators
- electromagnetic separators
- waste segregation cabins
- pneumatic material conveying systems
- optical separation systems
- shredders

By integrating own experience and technology with the best available equipment, produced on top European know-how, CONTROL PROCESS ensuring op-

timum efficiency of the process, maximize availability and minimize maintenance costs.



BAG OPENERS

Automatic mechanical bag opening is the first step of a process which is carried out in a modern waste management plant. Equipment offered by CONTROL PROCESS are designed to open and emptying plastic bags filled with all kinds of waste and recyclable materials.

Characteristic of bag opener we supply:

- almost 100 % effectiveness in opening and emptying plastic bags
- big effectiveness in „bags in bag“ opening
- protection against screwing items in machine mechanism
- strings, wires and foil resistance
- reliability of working in case of big items
- abrasion resistance, lack of cutting elements
- reliability low-speed engine
- small costs of maintenance
- low noise level, about 75-76 dB/A





SHREDDERS

Shredders can be important elements of each installation that perform a function of waste management facility. Shredders can work as a preliminary shredders (shredding of large-size components for further processing) or final shredders that shredding of processed waste stream to the fine fraction to energetic use (RDF or pre-RDF). CONTROL PROCESS provides stationary devices that can be implemented within the sorting line and also mobile shredders.

Characteristic of shredders we supply:

- shredding even the most difficult materials (tires, railway sleepers, carpets, large size waste, industrial waste),
- variable size of shredding fraction due to adjustable cutting gap,
- mechanical drive for highest efficiency
- stationary or mobile devices
- high capacity (up to 100 t/h)



DRUM SIEVES

Drum sieves are implemented within the sorting lines to partition waste stream for waste of different fraction (size), especially to separate small waste (fine fraction) from waste stream that is used as a recyclable materials. Through the rotary motion of drum sieve, fine fraction is removed from drum sieve and goes directly to conveyor or container.

Characteristic of sieves we supply:

- ability of using the dedusting removal installation
- square or round meshes depending to waste type
- sieve body prevent excessive dustiness and noise





Ballistic separator is an element of sorting line that separate flat fractions (2d) with large surface, like card-boards, foil, paper, from sizeable fractions that roll (3d) like PET bottles, PE, multimaterial packages.

Characteristic of ballistic separators we supply:

- wide range of application: municipal waste (mixed waste, industrial waste) recyclable materials (waste paper, pet foil), building materials waste
- ability of configuration to get different fractions
- drive with low power consumption
- strong structure with long liveliness and small exploitation costs



CONTROL PROCESS provide wide range of metal separators. Within the sorting lines the company develop magnetic and electromagnetic separators that separate ferrous materials or materials containing iron, and eddy current separators that separate non-ferrous metals like aluminium, copper, brass, zinc and other.

Characteristic of ferrous metal separators we supply:

- separation by magnet or electromagnet
- line or block separator
- adapted to width and speed of conveyor belt
- self-cleaning from caught metals
- big power and large range of separator

Characteristic of separators non-ferrous metals we supply:

- separation of non-ferrous metals from fraction larger than 1 mm
- the latest protection systems including electronic rotor braking



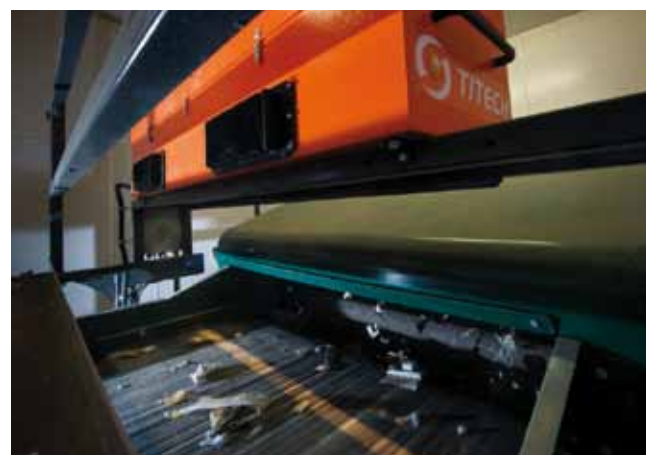


OPTICAL SEPARATORS

Optical separators are used to separation of waste stream into fractions categorized according to colour and material type. The idea of working: the material is exposed by infrared light and length of beam is analysed in light reflected from material. Some of length range of beams are absorbed according to material composition. The detectors measure light intensity of different wave length and create spectrum. By using mathematical algorithms the separator can identify each kind of material. Additionally there is possibility to equip separators in metal detectors to identify and throw off ferrous and non-ferrous metals.

Possible application of separators we supply:

- sorting PET/PE according to colours
- sorting of packaging (HDPE, PC, PLA, PP, PET, PS, PCV, Tetra Pak, labels, etc.)
- removing paper from input stream
- separating RDF fractions (separation of all kinds of plastic, wood and paper)
- stream division on organic and inorganic substances



WASTE SORTING CABINS

Sorting cabins are stations to manual waste segregation. Inside the cabin is waste transporting conveyor through area of individual stations (for each worker) to manual waste segregation. Number of positions is adopted to client needs. Under the cabin is a place for containers of selected waste.

Characteristic of cabins we supply:

- possibility to equip into ventilation, heating, light and air conditioning installations
- performance in multilayered boards technology with polystyrene, polyurethane or mineral wool core
- each position is equipped in emergency switch which can stop sorting process in case of material dam or other threats
- equipped in first-aid kit or fire-fighting equipment





BALING PRESSES

Baling presses are the last stage of waste management plant, they are used to „pack up“ sorted wastes. CONTROL PROCESS within the provided sorting lines, delivers complete packing installations consisting of press and wrapper. Thanks to baling, sorted fraction reducing its capacity and can be easily transport and store.

Characteristic of baling presses we supply:

- wrapping by synthetic or metal wire
- capacity adjusted to Client's requirements
- possibility of plastic foil wrapping for extra protection
- ball in standard sizes: 75 x 110 cm or 110 x 110 cm and to 250 cm length
- very small electric power consumption
- small maintain costs



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COGENERATION

CONTROL PROCESS offers to implement in a waste treatment plants the cogeneration installations based on engines fired by biogas. Installations we offer can use methane from outgassing of landfills and biogas which is produced into methane fermentation processes offered by CONTROL PROCESS within the biological processes conducted in MBT plants.

Characteristic of provided solutions related to cogeneration installations we supply:

- using of biogas produced on landfills and in fermentation processes
- possibility to implement on new landfills and to develop on existing landfills (develop of outgassing wells)
- scalability solution due to application of modular engines
- possibility of develop valorization and conditioning station for low methane content biogas
- reduction of plant and landfill exploitation costs due to own power and heating production
- possibility to achieve profits through heat and power sales to network





ANAEROBIC FERMENTATION TECHNOLOGY

Anaerobic fermentation is one of waste treatment processes and it involves gradual bacterial decomposition of organic waste (without using oxygen) into process products: methane, carbon dioxide and water. Main purpose of this process is to reduce organic activity and potential organic acid reaction from waste and biogas production to use as a fuel for power generation.

Characteristic of anaerobic fermentation technology we supply:

- possibility of process of wet waste like gastro-nomic waste and waste from food processing and agriculture
- anaerobic systems produce less side emission than aerobic systems, calculated on kilogram of waste, because the main gas emission is desirable product (methane)
- energetic potential of biogas can be used to produce electric power and heat
- fermented substrate can be recycle in liquid and solid condition
- installation take relatively little space
- processing in closed circuit enable to reduce

- unpleasant smells and installation can be located closer to built-up area and reducing transport costs
- anaerobic fermentation reduce waste volume that need to be transport on landfills
- anaerobic fermentation can be carried out as a thermophilic or mesophilic process
- offered technologies also allow for their use on biofraction separated from mixed municipal waste




WASTE COMPOSTING

Composting is natural method of neutralize and waste treatment that involves decomposition of organic substances by microorganisms. It is a process of substances treatment in controlled conditions with use oxygen (air) in right temperature and humidity.

Characteristic of waste composting technology we supply:

- producing of organic fertilizer with right parameters
- reduce of waste capacity about 30-50 %
- stored waste are completely neutral for environment
- using compost for example to restoration of green areas (squares, parks, restoration of illegal landfills)





AIR DEODORIZATION INSTALLATIONS

Air deodorization systems are solutions to remove unpleasant smell. CONTROL PROCESS provides comprehensive installations intended to remove gaseous air pollutions that are producing industrial and municipals installations. Equipment provided by CONTROL PROCESS eliminate pollutions emission that is bothersome for environment.

Characteristic of air deodorization systems we supply:

- reduction of specific pollution concentration or specific pollutions from issued gases
- reduce gas smell intensity
- reduction of the distance from odorant source where the smell is perceptible
- reduction of intensity in specific point of surrounding of odorant source (or change of smell quality)
- reduction of complaints from citizens living near the plant or negative opinion about air quality



BIOGAS INSTALLATIONS

Biogas management installations provided by CONTROL PROCESS includes both storage and transportation systems, gas desulfurization and biogas combustion flares.

Characteristic of biogas management installations we supply:

- storage tanks made of steel or membrane (single, double, triple)
- biogas treatment installations (removing i.e. hydrogen sulfide, siloxanes, etc.)
- flares with open or closed flame, and also with closed combustion chamber
- pumping stations with blowers
- possible of integration with cogeneration installation





BIODRYING

Biodrying is one of biological waste treatment processes. This process consists of using heat energy which is produced during aerobic biodegradable waste decomposition to dry waste in bioreactors (including both biodegradable organic fractions and inorganic fractions).

Characteristic of biodrying technology we supply:

- humidity reduction to about 20 %
- due to achieving low humidity there is possibility of using biological stabilized waste stream to produce alternative fuel (RDF)
- modular construction system of bioreactors enable to extend in case of increase of plant capacity
- possibility of manual (wheel loader) or automatic (conveyor system) loading of bioreactors



LANDFILLS

Modern waste landfill successfully replacing traditional waste landfills, which the performance standards did not ensure right environment protection from damaging substances infiltrating to soil, surface waters and air. CONTROL PROCESS design and build environmental safe waste landfill, comprehensive equipped in necessary facilities.

Characteristic of landfills we supply:

- using degassing wells for methane uptake
- possibility to develop cogeneration installations to produce of electric power and heat using uptaken methane
- using drainage installations equipped in pumping stations to take leachates
- possibility to develop of leachates sewage treatment plants or leachates storage tanks
- using materials preventing penetration of pollutions to ground: geotextiles, geomembranes, artificial geological barriers



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WATER TREATMENT PLANTS

Development of the cities, industry and agriculture rapidly increases consumption of the water. In order to balance water cycle, authorities and plant operator need to ensure access to facility that allow to provide safe and quality process of wastewater treatment.

Because of growth contaminations by chemicals, medications (including antibiotics) and organics in municipal wastewater, it can not be issued to the rivers or other water reservoirs without prior treatment.

First stage of process is separation, involving sedimentation and filtration, which removes solids and non-polar liquids from the wastewater. Another phase of treatment is oxidation, which reduces the biochemical oxygen demand of wastewater, and may reduce its toxicity. Last stage of the process is polishing, which may involve chemical reduction, pH adjustment minimizes chemical reactivity of wastewater following chemical oxidation or carbon filtering removes remaining contaminants and impurities by chemical absorption onto activated carbon. After processing in treatment plants and removing of contaminants and pathogens, treated water can be issued back to the environment.

Most important side products of wastewater treatment process are biogas and sludges.

In traditional plants biogas is fired in flares, however CONTROL PROCESS is able to provide comprehensive solutions which allows to use biogas as fuel for cogeneration installations:

- gas treatment installations
- conditioning station for low methane content
- storage installations

CHP plants can be an additional source of income for Investors, by producing heat and power that can be sold.

Sludge management is currently one of the biggest challenge of plants operators. In most cases its con-

tamination disallow to use it in agriculture, but due to UE legislation changes, it can be no longer stored on the lagoons. CONTROL PROCESS is offering wide range of solutions to process sludges:

- dewatering
- digestion (anaerobic, aerobic, and composting)
- drying (solar dryer, drum dryer, belt dryer and fluid bed dryer)
- incinerating

and other technologies that can help to utilize sludges and bring investors additional income from energy recovery, depends on composition and quantity of sludges.

Before providing of water to the citizens from natural intakes, it need to be prior purify. For this application, CONTROL PROCESS is offering wide range of water treatment and purifying processes that can be implemented in provided turnkey water purifying plants:

- pre-chlorination
- aeration
- coagulation
- sedimentation
- filtration
- desalination
- disinfection





RECYCLING PLANTS



Rapid growth of the world population and associated growth of consumption, require supplying more resources to further process into end-client products. To slow the use of natural raw materials, or even replace them in the future, economy began to develop projects associated to recovery of resources from side products of industrial process and municipal wastes.

Process of recovery of raw materials from solid wastes to further process in industry is called recycling. Recycling of municipal solid wastes is especially interested solutions for local authorities, because this process brings lot of benefits for entities responsible for waste management:

- reduction of the volume of wastes stored in landfills
- fulfill required level of recycling governed by the EU Legislation
- receiving income from the sale of recycled materials

CONTROL PROCESS offers solutions for Investors who want to build a modern recycling facilities. Company is providing technology (the fully automated process

lines) and comprehensive plants in "turnkey" system, to materials recovery:

- glass
- metals
- plastics
- paper

CONTROL PROCESS recycling solutions are based on sensor sorting of transparent and non transparent bulk materials. Provided installations can recognise colours, consistency and the most varied materials using the modern sensor engineering and optimized plant design, to provide most suitable recycling installations to Client's requirements.



CONTROL PROCESS is providing turnkey solutions to whole process of transforming mixed municipal solid wastes into secondary raw materials of the highest quality and purity:

- separating systems
 - organic separators
 - metal separators (ferrous and non-ferrous)
 - plastic separators
 - glass separators
 - paper separators
- screening systems
- crushing systems
- dedusting systems
- drying systems



- sorting systems
 - plastic - sensor based sorting of: contaminations, type and colours
 - glass - sensor based sorting of: contaminations, colours and special glasses (heat resistant glasses and lead glass)
 - paper - sensor based sorting of: contaminations, type and colours

Recycling plant might be implemented as development of mechanical-biological treatment plant to reduce its maintenance costs, or independent facility to processing wastes from a variety of sources.





QUALITY ASSURANCE

Providing the highest quality of service has been the main business priority from the outset for the subsidiaries of CONTROL PROCESS Capital Group. All investments are completed on the basis of specified procedures which guarantee the highest quality, a high level of security, and respect for natural resources during operations. Certificates of compliance with standards held by the companies include, among others: PN-EN ISO 9001: 2008, PN-EN ISO 14001: 2004, PN-N 18001: 2004 and AQAP 2110: 2009. Appropriate management of the whole investment process enables the delivery of services to the level expected by the investors in such demanding industries such as energy, gas, the petroleum and chemical industry, environmental protection and the public sector. Companies belonging to the CONTROL PROCESS Capital Group have a many of certificates, permissions, approvals and licenses, all necessary for the implementation of specialized works.

Whatever the nature of the activities carried out by the entity, the procedures used help ensure quality at every stage of the investment process:

- design
- delivery

- prefabrication and installation
- commissioning and start-up
- service and maintenance



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AWARDS AND HONOURS

The quality and professionalism of activity of entities in the CONTROL PROCESS Capital Group have been repeatedly recognized and rewarded by both the

market environment, opinion-forming organizations and centres, as well as by trade associations, which have granted them many awards and honours. The repeatedly rewarded the awards which proves high quality of service, awarded by professional organizations and satisfied customers.

Many of the awards and distinctions are worth quoting, such as:

- „Forbes Diamond”
- „European Medal”
- „Leader of Polish Business”
- „Business Gazelle”
- „Diamond added to the Polish Business Leader Golden Statuette”



Despite having received many prestigious awards, CONTROL PROCESS always has on first place the satisfaction of its customers.





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