



WASTE SORTING AND RECYCLING



The energy consumed by the automatic sorting process is higher than by the manual one. Conversely, by improving sorting quality, the automatic process increases the possibility of recycling materials, which avoids greenhouse gases emissions. It is therefore reasonable to assume that automated sorting contributes to globally reducing these emissions.

INDUSTRIALIZING THE SORTING PROCESS, SECURING TREATMENT PROCESSES, PRODUCING MATERIALS FROM WASTE

Faced with the accumulation of residue generated by human activities, depletion of fossil resources (energy and raw materials) and pressure from the sharp increase in emerging countries on international markets, recycling the materials contained in waste has become a necessity in order to access new resources. Their reintegration into a production cycle reduces the final waste quantity and potential nuisances. In addition to the reduced use of virgin raw materials, it generally results in energy and water savings in the processes. It also limits environmental damage related to mining extraction or unsustainable forest management. Finally, by limiting the depletion constraint, it contributes to global development.

Sorting is a strategic step in waste management, in particular for recycling. Its quality determines treatment efficiency and recovery possibilities. The development of material recognition and separation technologies enhances the recovery potential - material, agricultural or energy recovery. Beyond the separation at source carried out by households and businesses, the sorting processes used by the Group must therefore be optimized.

Sorting and recycling must become socially accepted in order to develop. This requires guaranteeing the quality and harmlessness of materials and new products generated by waste. This is the case in particular for metal recovery, the use of which must comply with stringent environmental standards.

IN SHORT

Our research aims at industrializing sorting centers, securing waste treatment processes and making the manufacturing and use of secondary raw materials viable. Our work notably focuses on: evaluating and monitoring sorting machines' performance (optical, aerualic, etc.), for municipal waste from collective selection as well as ordinary industrial waste; developing detection, extraction and remote operation tools capable of removing the sorting and quality control operators' contact with waste; optimizing the organization of sorting centers; designing an automated selective recovery system to isolate hazardous or unwanted waste and recyclable materials from the stream of bulk collected waste; evaluating, from a technical and economical point of view, the recovery processes and carrying out the production's energy and environmental audit.

PROBLEMS

Sorting is successful when the product output complies with the quality criteria related to their distribution. The improvement in process conditions (1) and control of incoming product quality (2) are the pre-requisite for this success.

[1] Industrializing sorting centers

Sorting industrialization must make it possible to:

- increase the amount and type of materials recovered;
- improve hygiene and safety in the workplace;
- guarantee and control the production of quality materials;
- be economically compatible with the markets.

Therefore, we are striving to automate sorting centers, whether treating waste pre-sorted by households or from the bulk collection of ordinary industrial waste, by using more and more advanced technologies. The Group's objective is to equip its sorting centers processing municipal waste generated by selective collection by 2010. This objective will then be applied to other streams, in particular ordinary industrial waste.

[2] Securing treatment and recovery processes

To prevent environmental and health hazards and avoid wasting natural resources, we must isolate hazardous or unwanted waste as well as recyclable materials from the stream of bulk collected waste entering our treatment plants (landfills, incineration plants, composting facilities). The development of an automated selective recovery system must allow Veolia Environmental Services to transfer hazardous waste to the facilities complying with the most stringent environmental standards, reduce pollutant dispersion, improve compost quality produced from municipal waste and optimize material collection.



PARTNERS

External partners:

- New vision
- Pellenc
- Titech

Internal partners:

- Veolia Environmental Services
- OTV Sud (CAD'eau)

SCHEDULE

- Sorting bench tests: 2005-2009
- Man/waste interface and related tools: 2005-2008
- Sorting simulator: 2006-2010

Waste sorting center



PROGRAM DETAILS

Sorting center industrialization

- Optimization of sorting processes via more in-depth knowledge and better integration of technologies and improvement in organizational schemes: test bench evaluation (scale 1:1) of sorting machines' performance, identification of optimization parameters, modification completion and testing, development of a sorting simulator.
- Improvement in hygiene and safety by developing tools allowing operators to remotely identify objects and extract them mechanically: objects/materials identification interface, extraction systems, related control/command tool.

Incoming waste control optimization

- Development of a selective recovery tool made up of a cell detecting/locating the objects to be extracted through advanced techniques, extraction/handling systems and control/command processes required to prepare waste for treatment (incineration, composting, landfill, etc.).

HEALTH

1-In order to preserve our employees' health, we are conducting surveys to characterize sorting centers' working environments. An initial survey allowed us to identify exposure levels to bioaerosols. A second survey focused on the impact of the spraying process on air quality.

2-The employees working on the collection of residual municipal waste and household bio-waste were monitored to determine the potential exposure levels to microbiological agents depending on the type of waste, waste temperature and storage time. This survey's purpose is to compare the exposure levels of the different collection types and come up with targeted recommendations to protect our employees.