RoAF: the world’s first fully-automated sorting plant for municipal solid waste

Waste and recycling company Romerike Avfallsforedling IKS (RoAF) has installed 16 of TOMRA’s AUTOSORT optical sorters to separate green bio-waste bags and recyclable fractions from municipal solid waste (MSW).

This award-winning installation is the first fully-automated sorting plant for MSW worldwide, requiring no manual labour for the sorting and quality control of recyclable materials. German plant builder Stadler Anlagenbau GmbH received the 2014 German-Norwegian business award for the project and, in the same year, RoAF was awarded the innovation prize by Avfall Norge for its state-of-the-art operation.

RoAF is responsible for the collection of household waste and operates one of the most sophisticated and advanced sorting plants for mixed MSW in the world today. Located at Skedsmokorset near Oslo in Norway, the plant began operating in January 2014 and now serves more than 190,000 inhabitants with its capacity to manage 40 tonnes per hour.

Substantial targets for RoAF’s pioneering plant

The Norwegian company had three main objectives for building a modern MSW sorting plant:

- To increase the overall recovery of recyclable materials, in particular plastics and bio-waste, which has been separately collected in green bio-waste bags since the opening of the plant in 2014 to supplement RoAF’s existing separate collection systems for paper, glass and metals.
- To meet RoAF’s sorting targets of 2500 tons of plastic for recycling and a minimum of 6000 tons annually of source-separated bio-waste collected in green plastic bags.
- To combine efficient automated technologies in order to achieve a large amount of high-quality recyclable materials from waste without using manual labour in the sorting process.

97%-plus of incoming green bio-waste bags sorted

Three AUTOSORT sorting units have been installed in the plant’s waste reception hall. Here, both green bags containing bio-waste and other waste bags enter the bag sorting line via a dosing bunker. The AUTOSORT systems separate and clean the green bags from the remaining waste bags by material and colour using near-infrared (NIR) and visual spectometry (VIS). This initial sorting process can successfully separate more than 97% of the incoming green bio-waste bags.

These bags are collected in containers and sent to a bio-gas site. The bio-gas, which is produced from the organic waste, is used by RoAF as fuel for its waste collection trucks. Before the opening of the plant in 2014, organic waste was not collected separately and was consequently landfilled and burned.

Meanwhile, the bags containing other types of waste are opened and transported to different drum screens where the waste is separated by size into different streams. This waste is then subjected to a further sort, using a combination of mechanical processing such as ballistic separators and 13 AUTOSORT optical machines provided by TOMRA Sorting Recycling. It is at this point that plastics such as PE LD film, PE HD, PP, PET, mixed plastics and paper are separated from other waste.

Finally, magnets and eddy-current separators are used to recover ferrous and non-ferrous metals from the waste.

Recyclable fractions are stored in bunkers and baled before being sent to different material recyclers. Any residual fractions are collected in the output hall and sent for energy recovery.

Significantly improved recovery of high-quality recyclable plastics and paper fractions

Since its opening in January 2014, RoAF’s plant has been a pioneer of fully-automated sorting. In delivering high-quality recyclable plastics and paper fractions which can be further marketed in the recycling industry, it
has become possible to ensure that high EU target rates can now be met. As noted above, the bio-gas produced from the organic waste is also used by RoAF as fuel for its waste collection trucks.

An effective plant, well supported by TOMRA’s sorting technology

“We are very satisfied with the professional collaboration with TOMRA Sorting in many respects,” says Tom Roger Fossum, department director production and development at RoAF. “The experienced TOMRA team persevere with their tasks and challenges, ensuring their work is always completed. As a result of this work ethic, we now have a very effective plant, well supported by TOMRA’s sorting technology. The equipment itself is user-friendly, with the reprogramming of the PET fraction being just one example - now, we only have to press a few keys and we receive a different quality.”

Enhanced recovery, thanks to TOMRA Sorting Recycling’s innovation, means more waste materials can be used as secondary raw material. The sorting technology installed at the site allows RoAF to deliver a significantly higher volume of material suitable for recycling from its MSW than ever before.

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Oliver Lambertz is business development manager at TOMRA Sorting Recycling.

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