



RECYCLING FROM PLASTICS

Sorting and Seperating Plants



Plastics have become indispensable in modern everyday life. Plastics are in packaging for food and drinks, car- or electronic-industries.

There are many different plastic types in use, f.e. polyvinyl chloride (PVC), polystyrene (PS), polypropylene (PP), polyethylene (PE), acrylonitrile/butadiene/styrene (ABS), polycarbonate (PC), polyamide (PA), polyurethane (PUR), polyphenyloxide (PPO), polybutylene terephthalate (PBT) and polymethyl methacrylate (PMMA).

A dominant type of plastic in excess of 50%, such as the polyolefins, PP and PE in household waste, does not exist. In addition there are products made of plastic mixtures (blends), parts with layers of paint and black bodies whose identification so far cause great difficulties. Another problem in the sorting of waste from car and electronic waste is the variety of shapes and sizes.

All trends prove that the use and consumption of plastic will continue to increase in the future. These facts require rethinking with a focus on high quality recycling of plastic waste, because

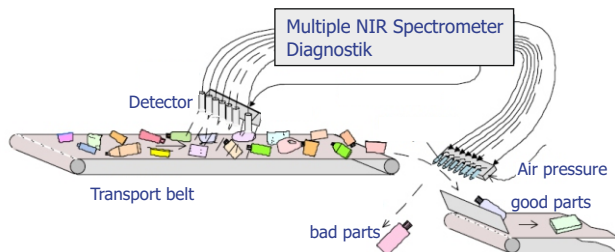


- there is only a limited landfill space available
- Thermal treatment plants are not a real alternative and meet with municipal rejection and
- the resources, including air, are to be conserved for the next generations, incineration residues are often contaminated with pollutants and can only be disposed of in special landfills.

Recycling processes are economical when a high quality recyclate is achieved. Important for this is a sorted plastic separation. The large number of different plastics requires highly selective separation processes that exploit the advantages of automation in terms of sorting quality and productivity. A premise for the automation of the sorting process is the shredding of plastic parts on one uniform size range by shredder or crusher as well as extremely fast identification of the plastics.



Sorting and separating by near-infrared-spectrometer (NIR-spectrometer)

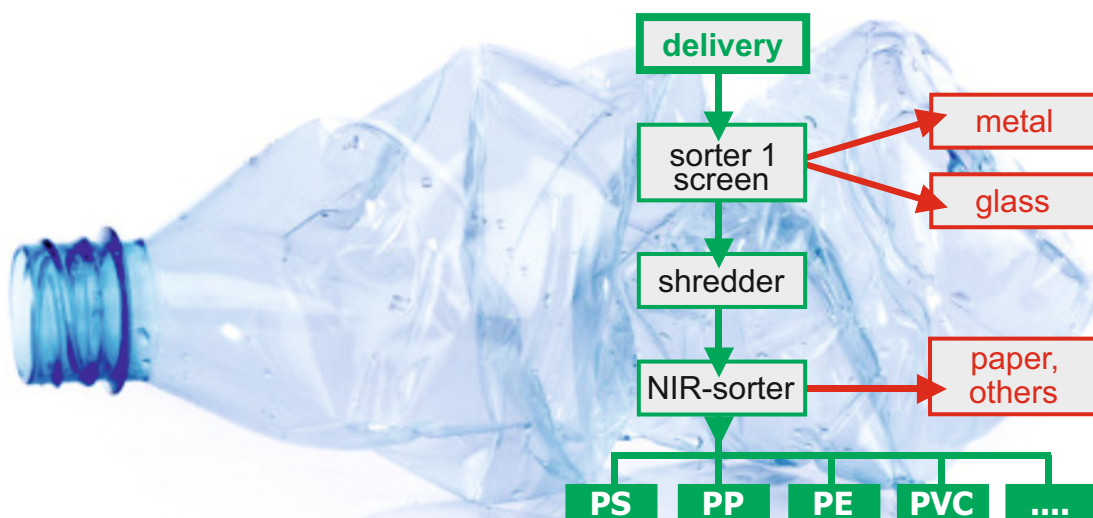


For the separation of the plastics into the individual fractions rapid identification procedures are necessary, for which usually NIR spectrometers are used. In the near infrared spectral range (NIR) of 0.7 to 2.5 μm , absorption bands occur that correspond to the overtone or combination vibrations of the molecules and allow identification of the plastics. They are much weaker than the bands of the fundamental vibrations.

However, the key advantages of spectroscopic measurement in NIR are

- a high measuring speed and thus high productivity of sorting,
- the safe identification of moving plastics from a large distance and
- Insensitivity to impurities and surface structure.

The plastic waste in household waste or from the industry are contaminated with other waste. The layout show you a coarse structure how a sorting plant can work.



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Steuer-Nr.: 030/6941 - UID-Nr.: ATU57786257