

Recovery of Electronic Waste through Advanced Recycling and Demonstration (REWARD)

■ ■ ■ The project started with the observation that after a first shredding step WEEE is reduced in size and plastic particles are sufficiently liberated. This shredding technique with fast running hammer mills is causing also a lot of fines and

Mild Size Reduction

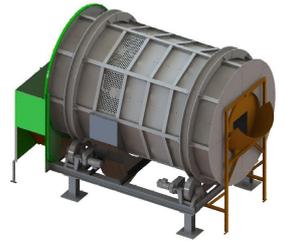
other problems (copper wires). ■ ■ ■ This fact led us to believe that it must be possible to find a technique which we call mild size reduction. This technique is found in the rotating drum, a technique marketed all over Europe by Key Machinery and other manufacturers. The waste material is tumbled and cracked in larger particles that easily can be sorted into fractions for further processing.

■ ■ ■ From this crushed material a mix of plastics is taken for further study. With RTT in Zittau a demonstration was given of the separation of different plastics with Near Infra Red (NIR) technique.

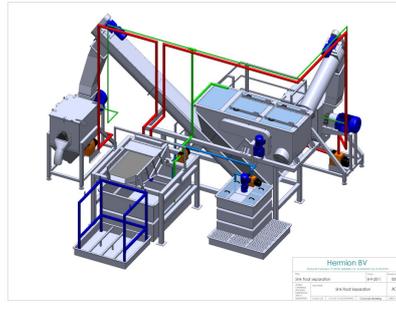
However, the problem of sorting is still not fully solved. ■ ■ ■ Most plastics have a black color and NIR cannot recognize this type of plastic. Other types of sorting are investigated: sink-float being the most suitable. At present widely exploited by a variety of sorting recycling companies.

■ ■ ■ Other plastics contain flame retardants, bromine compounds or phosphor are the additives. How to separate these additives? Currently density sorting is a solution. However, for

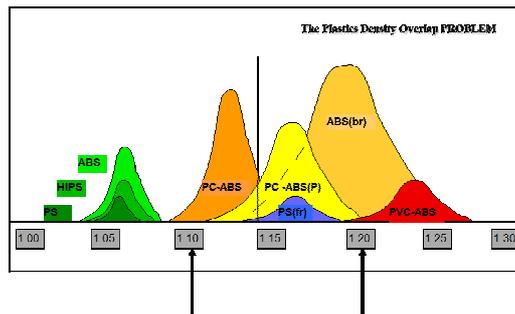
instance polystyrene with additive bromine is then mixed with PC-ABS. The solution is found with advanced sensor sorting based on X-Ray.



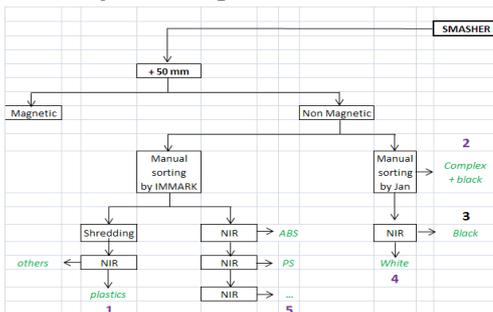
■ ■ ■ Plastics are manufactured by a number of plastic producers. These producers together with OEMs (Original Equipment Manufacturers) seek for possibilities to recycle plastics. This being a complex activity takes a number of measures to produce blends of virgin and recycled plastics.



■ ■ ■ The project started with black back covers from LCDs. The covers are cleaned and in an idealized way recycled. New plastics are produced by mixing 5-20% with virgin plastics with the aid of a mixing chart. These tests are successful. The next step is to recycle shredded



plastics from LCDs, separate them, clean them and mix them with virgin plastics. This study is still on-going with EFRA and the partners.



	ABS	ABS +BFR	HIPS	HIPS +BFR	PMMA	PC/ABS	SAN	PC/ABS +PFR	HIPS/PPE	HIPS/PPE +PFR
ABS	Green									
ABS+BFR	Green	Green								
HIPS	Green		Green							
HIPS+BFR	Green	Green	Green	Green						
PMMA					Green					
PC/ABS	Green	Green	Green	Green	Green	Green				
SAN	Green	Green	Green	Green	Green	Green	Green			
PC/ABS+PFR	Green	Green	Green	Green	Green	Green	Green	Green		
HIPS/PPE	Green	Green	Green	Green	Green	Green	Green	Green	Green	
HIPS/PPE+PFR	Green	Green	Green	Green	Green	Green	Green	Green	Green	Green