

As Good as New: Plastics from Waste Electrical Devices

A new recycling process trial proves cost-effective

Vienna, – Austrian Center of Excellence in Electronics and Environment KERP and German Fraunhofer Institute for Process Engineering and Packaging IVV have launched a joint project to optimize the recycling of plastics from waste electrical devices. A pilot plant in Freising has been producing recycled plastics of a quality grade which is very close to virgin raw materials. The trial has demonstrated that this process called CreaSolv®¹ is also commercially viable.

Hazardous substances and flame retardants washed away

Old washing machines, mobile phones, etc. contain large fractions of various plastics which, for the most part, are heavily polluted and contaminated by hazardous substances. Bromine-containing flame retardants are particularly problematic in terms of an ecologically adequate recycling, since they may release toxic dioxins during reprocessing. CreaSolv®, a process developed by IVV Freising and adapted by KERP for the use with waste electrical devices, is the first successful technique for the separation of plastics from hazardous substances, dirt deposits and flame retardants by means of an eco-friendly solvent. The result: cleanly sorted "second-hand" plastic granulates. The quality grade of this secondary raw material is comparable to virgin plastics.

Efficient plastics recycling in a pilot plant

Since February 2006, KERP and IVV have been conducting recycling tests on a pilot plant scale which ranges between laboratory scale and commercial operation. "We managed to process two and a half tons of plastics from waste electrical devices into more than one ton of granulate in the Freising pilot plant. We are more than happy with this rate of yield," said Thomas Leitner, managing director with KERP Center of Excellence. "At present we manage to remove 90 percent of all pollutants. However, we should be able to achieve even higher quotas." stated IVV's Andreas Mäurer. Also, in terms of commercial viability, the process proved efficient, since the extraction solvent is reused on several occasions during the cycle. UK-based non-profit organization for sustainable management WRAP (The Waste and Resources Action Programme), too, is convinced that the CreaSolv® process is a meaningful invention. A study of various recycling technologies conducted by WRAP presents the CreaSolv® process as the winner, both in terms of ecology and commercial viability.

¹ Registered trademark of CreaCycle GmbH

Commercial plant scheduled for 2007

"We have successfully applied the process on a small scale and together with IVV, we plan to implement it in a commercial plant in 2007," said Thomas Leitner, explaining IVV's and KERP's future plans. The new plant is to recycle close to 6,500 tons of plastics per year, which will help to conserve resources in the electrical and electronics industries. Reclaimed plastics will be used as raw materials in new products. Accordingly, the process ensures compliance with European Union Directives: The WEEE Directive which requires recycling rates of up to 80 percent and RoHS which, as of 1 July 2006, has banned the use of hazardous substances, such as lead, cadmium, mercury, hexavalent chromium and certain bromine-containing flame retardants in electrical and electronic devices.

Since its foundation in 2002, the Center of Excellence in Electronics and Environment KERP of Vienna has been a provider of research, development and consulting services for the electronics and automotive industries. The focus is clearly on environmentally appropriate product design and on recycling. Projects are undertaken and implemented in collaboration with KERP's partners – scientists, manufacturers and waste management companies.

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