EMERGING AND NEW TECHNOLOGIES

By Arnold Black,

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Key finding and conclusions

- Recovery of the plastics fraction essential to meet the recovery targets
- Sophisticated Collection and handling facilities required
- Training of operators and senior staff through the supply chain.
- Developing solutions for anticipated problems

Dioxins and Furans in WEEE Plastics

- Incineration of plastics filled with Brominated Flame Retardants (BFR) creates Dioxins and Furans (PBDD/F) which can be above the threshold limits of German ChemVV
- Dioxins are also produced within hot shredder/granulation equipment when processing BFR plastics. The smaller the particle size of the plastics, the more Dioxins and Furans are produced
- Higher BFR levels were found in Monitor & TV housings than in Mixed Shredder residues
- Imports of plastics from Asia are raising the levels of BFRs in WEEE

The Creasolv® Process

- The Creasolv® Process can turn mixed plastics waste into polymers such as ABS and HIPS
- Flame retardants, Dioxins and Furans can be reduced by 70-93%
- Polymer product has properties similar to virgin polymers
- Currently on a lab scale, the Creasolv® process needs to be commercialised on an industrial scale

WEEE plastic fractions

2 types of polymer fractions available

Manual dismantling (CRT glass)

Metal recovery, shredder

Monitors & TV housing polymers
>95% polymers
Few polymer types
High BFR-levels

Mixed shredder residues
~80% polymers
Many polymer types
Lower BFR-levels

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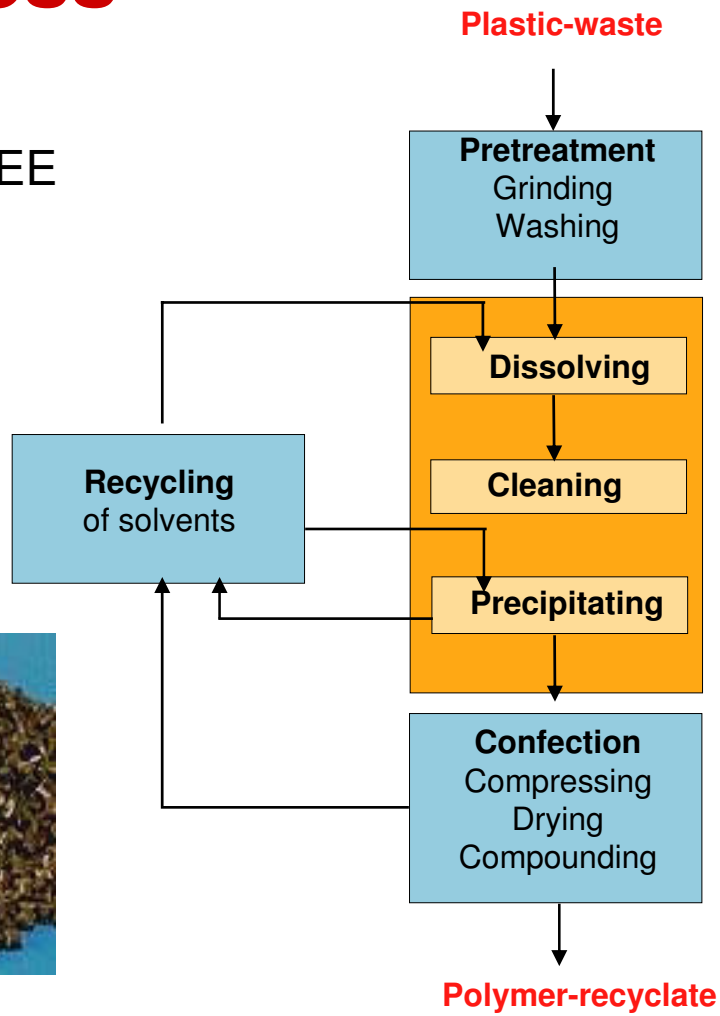
CreaSolv® process

Aim:

Recycling BFR-containing WEEE plastics to top quality technical polymers

- free of other polymers
- free of contaminants
- genuine specifications



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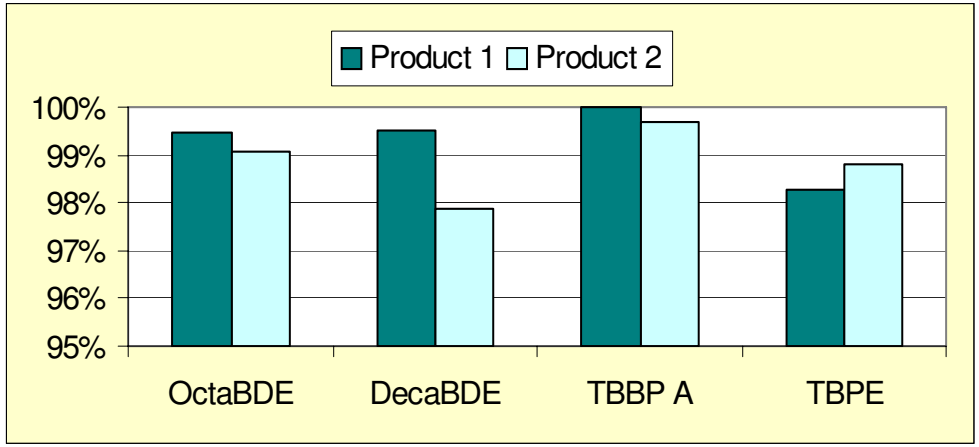
CreaSolv® Products from shredded TV-set casings (BFR fraction)

CreaSolv® product

Regranulate



Elimination rates

mg/kg	OctaBDE	DecaBDE	TBBPA	TBPE
Product 1. run	168	48	<30	130
Product 2. run	288	210	102	90

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Results of KERP Project:

Pilot production on a small technical scale

Input
100%

By-products
20%

Products
80%
ABS/HIPS=6/4
Mixed product
Purified polymers

Yield of single process steps:

Filtration ~85% BFR elimination ~95%

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KERP Research Elektronik & Umwelt

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Results of KERP Project:

RoHS compliance

	TBBP A ppm	OctaBDE ppm	TBPE ppm	DecaBDE ppm	Br, calc ppm
Input	5428	861	1478	1198	5920
HIPS product	244	98	156	392	657
ABS product	295	111	155	323	639
Mix product	236	94	126	288	542
Threshold limit	-	1000	-	-	-

Results of KERP Project:

ChemVV compliance

	Sum 4 ppb	Sum 5 ppb
HIPS product	0,16	< 0,30
HIPS MFI	0,48	< 0,65
Threshold limit	1	5

Thanks for Listening!

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