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Printed circuit boards (PCB)

Mechanical Treatment Concepts



Factory Karlstadt



Shop Assembly



After-Sales-Service

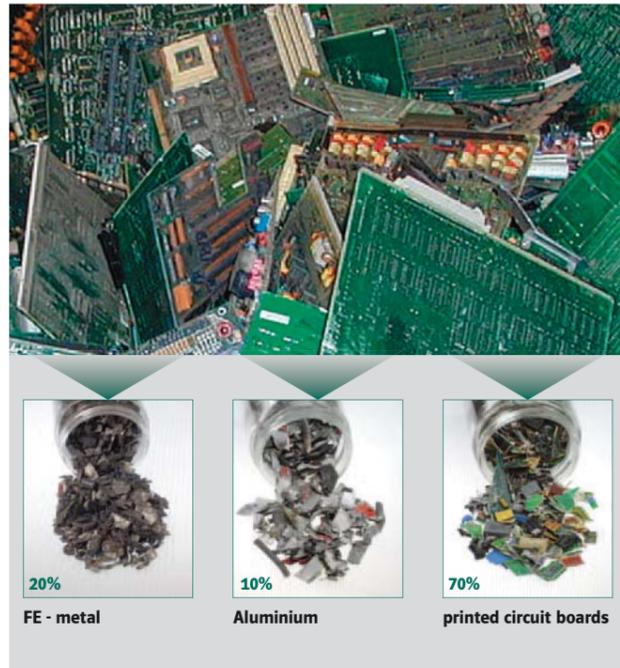


Design Department



URT Umwelt- und Recyclingtechnik GmbH
Am Hammersteig 5a, 97753 Karlstadt, Germany
Fon: +49 (0) 9353 9068-0, Fax: +49 (0) 9353 9068-68
www.urt-recycling.com, info@urt-recycling.de

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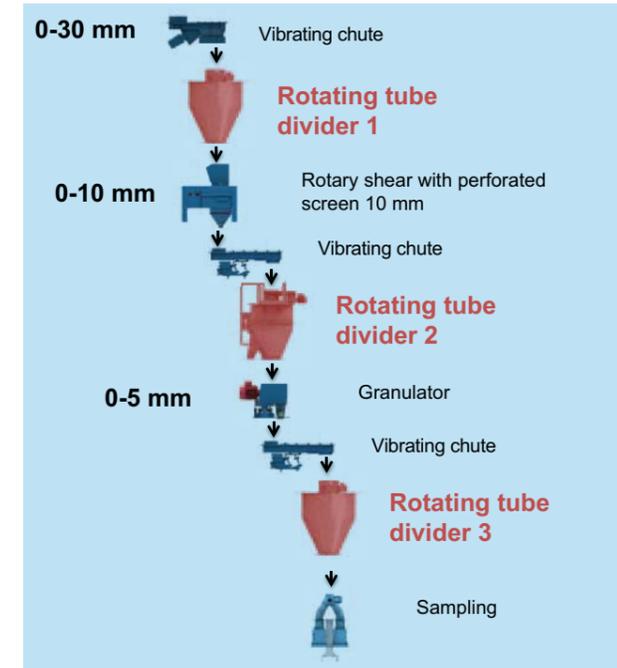
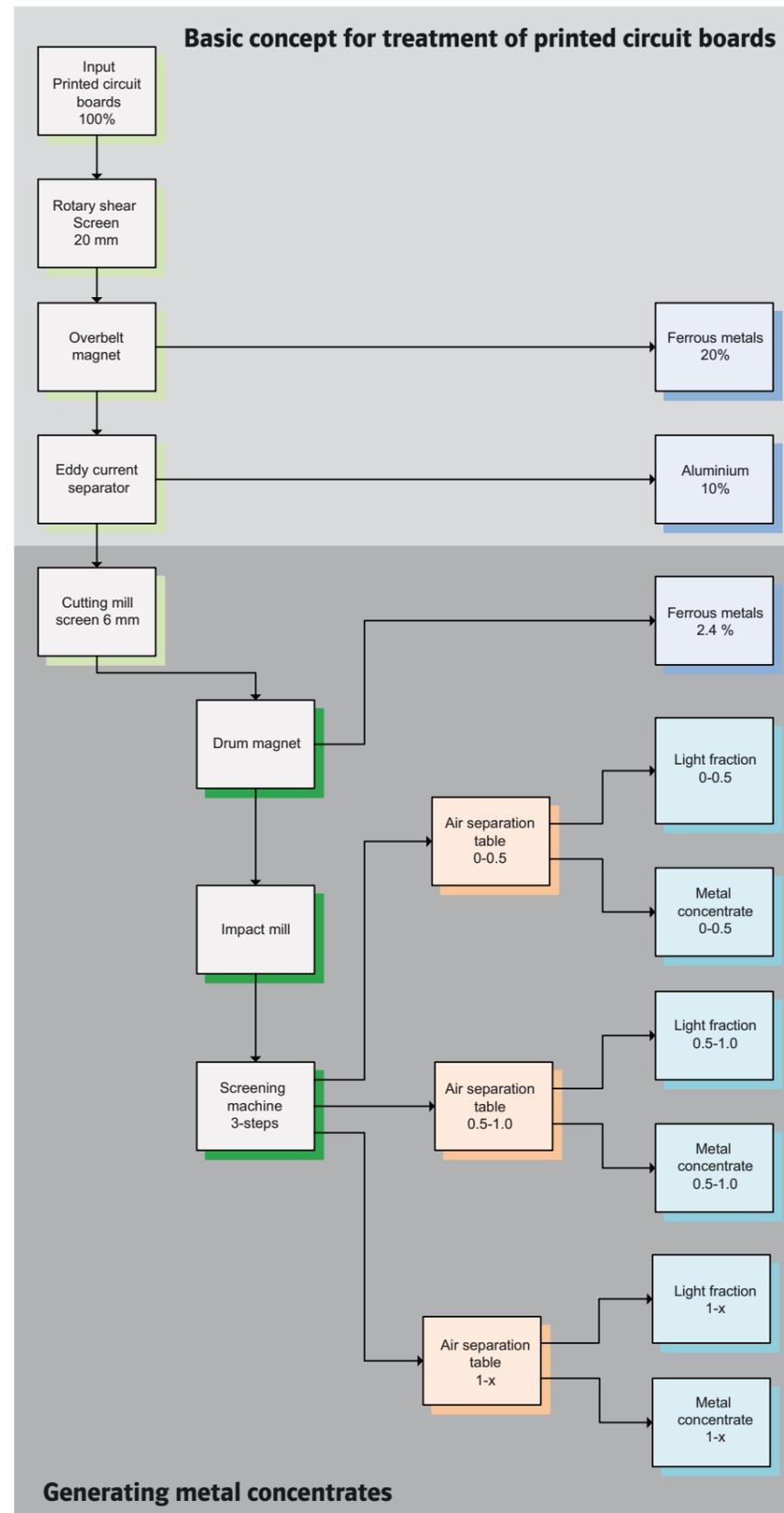
Basic concept for treatment of printed circuit boards

Mechanical treatment of printed circuit boards:

Recovery of precious metals from recycling of electrical- and electronic waste is of increasing importance especially due to decreasing primary occurrence of precious metals and as the consequence thereof the continuously increasing costs at initial recovery. Significant concentrations of precious metals can be found especially in printed circuit boards. Furthermore these printed circuit boards are also containing usable and marketable ferrous- and aluminium fractions, not to be underestimated in percentage. URT is concentrating especially on the topic of printed circuit boards and is offering mechanical treatment concepts with different processes.

Basic concept for treatment of printed circuit boards:

URT Umwelt- und Recyclingtechnik GmbH is offering a basic concept with which the complete printed circuit boards will be shredded in one step. This will be done with a slowly rotating rotary shear which is producing a granule of approx. 20 mm. With this granule size ferrous metals and aluminium can be separated now. Already 30 % metals will be obtained which can be directly marketed. In comparison with the original material mass started, the remaining residue of printed circuit boards is now containing concentrated precious metals (copper, gold, silver and palladium). Normally these material fractions will be sold to copper smelters.



Schematic diagram of sampling by means of triplicate sample splitting with intermediate shredding

Generating metal concentrates:

A good material separation will be obtained by further shredding with cutting and impact mills. By means of a screening machine different particle size (spectra) distributions will be generated. Each particle size spectrum is feed into a subsequently arranged density separation stage. The respective heavy fraction is a metal concentrate consisting of copper and precious metals, which can be directly melted. Copper and precious metals can be recovered by means of downstream arranged electrolysis- and hydrometallurgical processes.

Pyrolysis plants for printed circuit boards:

A further technical challenge regarding the treatment of printed circuit boards has been already realized by URT. Thus pyrolysis plants have been designed, with which metal concentrates are generated in a pyrolysis furnace, under exclusion of air. All organic substances are directed in a gaseous form into a post combustion chamber for being burned. The metal concentrate generated will be treated in melting furnace downstream arranged.

Sampling and sample divider:

At all mentioned methods sampling of printed circuit boards is of prime importance. For this purpose URT has developed a process by which the PCB fractions are separated by sample dividers. Statistically correct samples are resulting, even from large lot batches, which are then used for material analyses.



Basic concept with separation of Al and Fe



Pre-shredding and dust exhaust



Pyrolysis furnace during assembly



Rotating tube divider above sampling tower