

Recycling of E-plastics in India

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E-plastic scenario



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- India reportedly generates around 1.85 million tonnes of e-waste annually
- On an average 21% of this would be plastics
- Literature suggests presence of ABS, PE, PP, PC, PVC and HIPS
- Mechanised sorting of E-Plastics cost prohibitive

Recycling E-plastics



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- 90% of e-waste is still recycled in informal sector
- Even in formal sector plastic recycling is challenge as
 - **Mixed nature of plastics**
 - **Presence of FRs**

Potential value in recycling e-waste



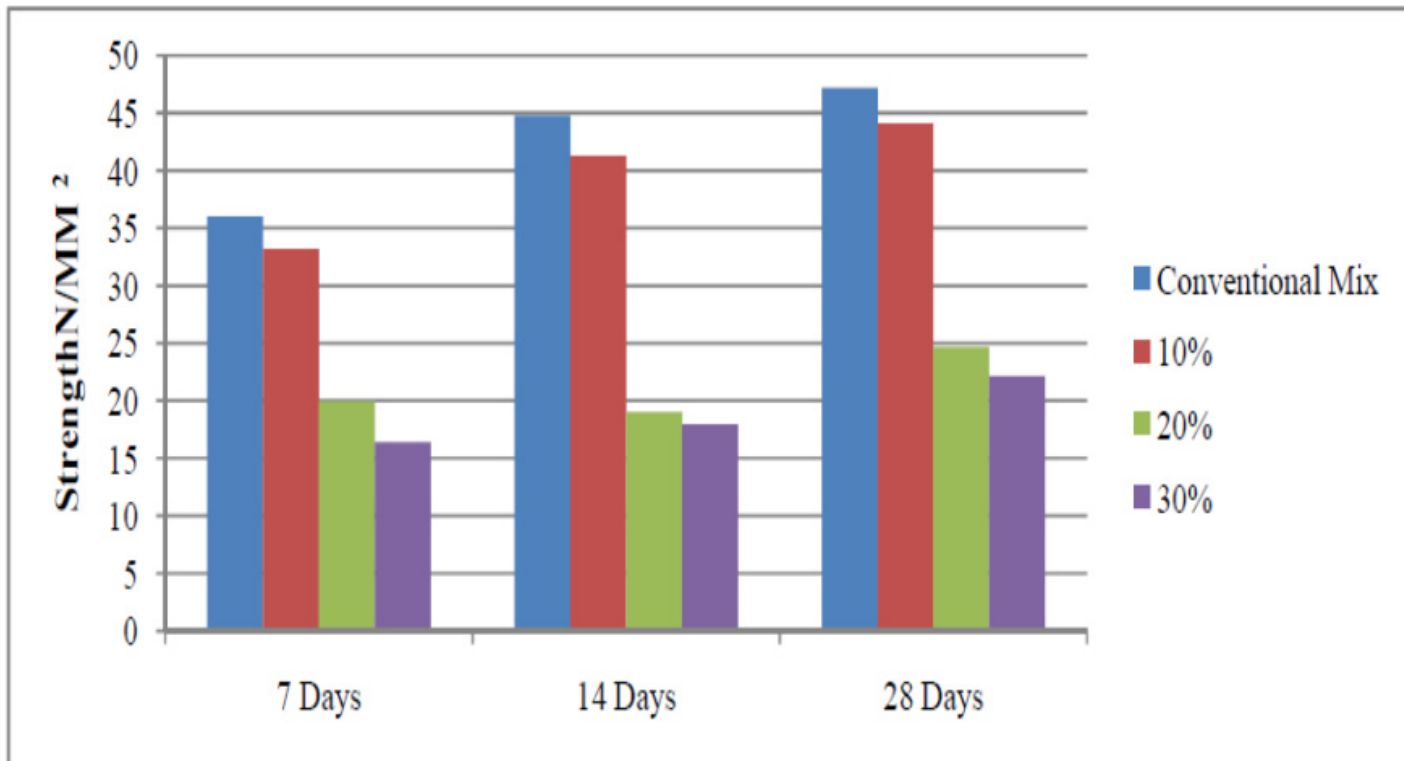
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Material	kilotons (kt)	Million €
Fe	16,283	3,582
Cu	2,164	9,524
Al	2,472	3,585
Ag	1.6	884
Au	0.5	18,840
Pd	0.2	3,369
Plastics	12,230	15,043

Data for 2016, **source:** The Global e-waste Monitor, 2017, Baldé, et.al

Laboratory research

E-plastics in course aggregate



B.T. Ashwini Manjunath / Procedia Environmental Sciences 35 (2016)

- **Similar was trend for tensile strength**

E-plastic compression moulding

- Research in ABS indicate that improper mixing, entrapped gases can result in lower flexural strength than virgin counterpart
- Lower strength is also attributed to degradation of butadiene rubber at higher temperature
- Similar results were seen in ABS/PC mix moulding



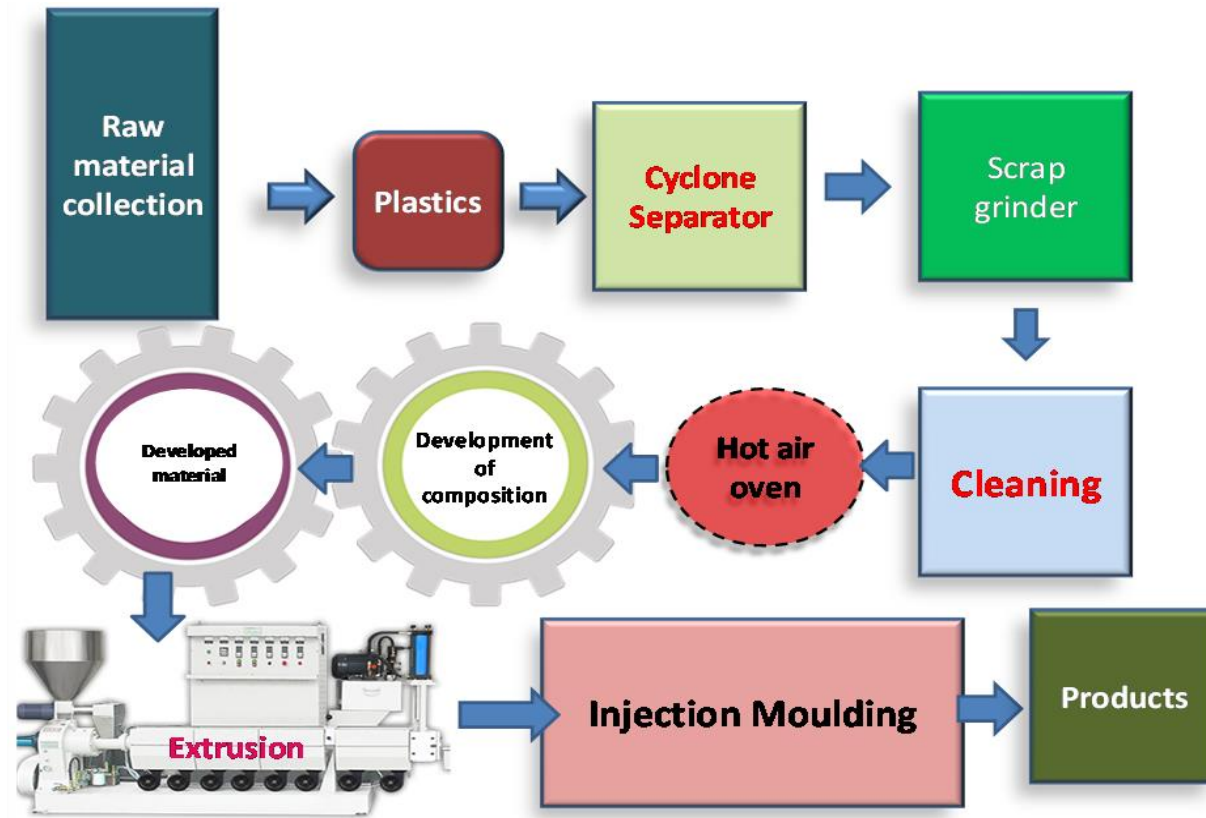
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Recycling pilots in India

Technology by CIPET



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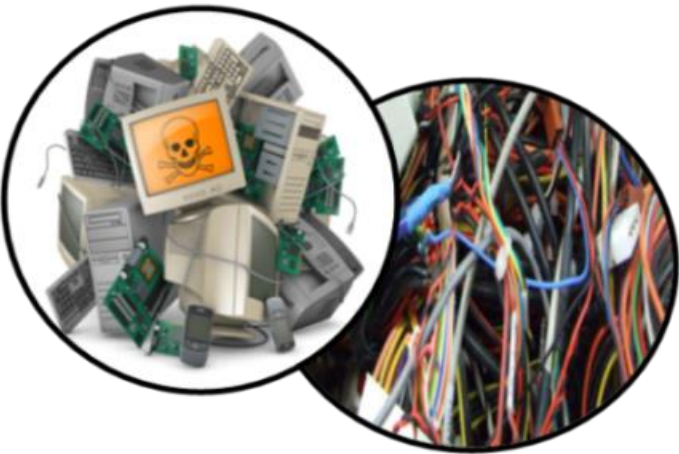


Source: DST

Various applications



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Technology by C-MET



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- Recycling of PCBs @ 100 kg/day
- Manual removal of metallic parts
- Depopulation of solder and components connected to PCB
- Shredding to 40 to 50 mm pieces
- Controlled calcination/pyrolysis to remove organic components
- Smelting to remove inorganic fillers and obtain black copper
- Electro-refining to get 99.99 copper while other precious metals go to anode slime
- Hydrometallurgy of anode slime to recover Au, Ag and Pd by selective leaching and precipitation

Thank you

