

**Epoxy/Silicon Potting Material Removal for Greater Recovery of Circuit Boards** – Rochester Institute of Technology, Caterpillar, Inc., CoreCentric

Node Alignment: Remanufacturing & End-of-Life Reuse

Project Type: Exploratory

- The electronics industry currently uses a variety of potting materials to encapsulate electronic circuit boards to protect the boards against damage from impact, vibration, and corrosion, and by design, the mat'ls are difficult to remove. Conformal coatings are thin layers primarily for protection from moisture, while potting is typically applied in thick layers within a housing. Common potting material categories are: silicon (soft) and epoxy (typically harder).
- Current removal processes are manual and slow, and while there are work-arounds for conformal coating, practical and cost-effective approaches for repairing potted boards do not exist. Furthermore, when potting removal is attempted with current methods, the board is often damaged, resulting in scrap.
- This project will address a technical and economic challenge that is limiting the ability to reuse components in remanufacturing, which is a lack of knowledge of how to effectively and cost-efficiently remove silicon and epoxy potting material without damaging the circuit board.
- REMADE Technical Performance Metrics (TPMs) Being Addressed:
  - Reducing primary material consumption in (re)manufacturing operations by 30%.
  - Improving embodied energy efficiency by 25% within 5 years.
- Technology/Knowledge Gaps Being Addressed:
  - There are no cost-effective technologies for removing the conformal coating or potting from circuit boards, limiting the ability to repair and reuse circuit boards.