RIT

**Rochester Institute of Technology**
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# Intellectual Property Licensing Opportunity Disclosure to REMADE Members

**Automated Clothing Dismantling Technology**

**31 March 2026**

## Overview

Rochester Institute of Technology (RIT) developed and demonstrated an **automated system for dismantling post-consumer apparel** to enable high-purity textile-to-textile recycling. The system addresses a major barrier to circular textiles: the lack of scalable, economical methods to remove trims (e.g., zippers, elastics, screen prints, buttons) and disruptors (e.g., polyester tag on cotton shirt) from used garments before recycling. This solution was created under REMADE Institute project #21-01-RR-5107; thus, it is "REMADE IP" as defined in the Intellectual Property Management Plan (IPMP) of the REMADE Membership Agreement.

The REMADE IPMP states the Inventing Member(s) of any REMADE IP shall grant an option to license the REMADE IP to REMADE Members. This document serves as the disclosure to REMADE Members and provides the opportunity to license this technology from RIT in accordance with the terms of the REMADE IPMP.

Please note – the option to license the IP expires based on member participation in the project and membership level. Please refer to the REMADE Membership Agreement IPMP for further details.

## Technology Description

The solution developed is a **fully integrated, automated garment pre-processing system** that combines:

- **Artificial Intelligence (AI) and computer vision** based on a customized pipeline for AI algorithms to classify garment type, detect trims/contaminants, and segment high-value fabric regions
- **Multispectral / shortwave-infrared (SWIR) imaging** to identify material composition (e.g., cotton, polyester, blends) at millimeter-scale resolution
- **Automated laser cutting** to precisely remove contaminant areas based on AI-generated cut paths
- **Automated sorting** to separate high-value textile feedstock from low-value waste

The system images garments (front and back), digitally maps material and contaminant regions, generates optimized cut paths, and physically separates recyclable fabric with minimal manual intervention.

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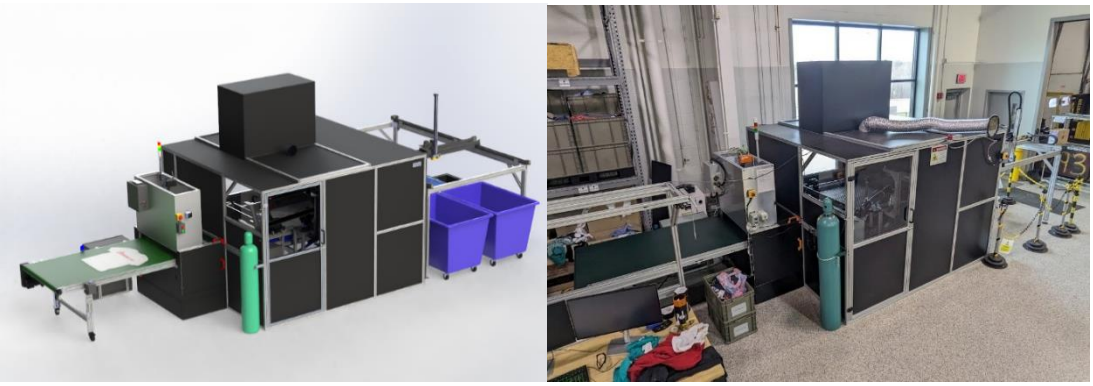

**Figure 1 -Left, Model of System; Right, Fully Functional System**

**Key Performance Results**

Trials of the system were performed at RIT to determine key performance parameters:

- **Material purity:**
    - *98% average output purity* for cotton feedstock (exceeds typical recycler requirements of ≥95%)
- **High-value material yield:**
    - *~84% yield* of recoverable high-value textile material
- **Processing speed:**
    - 6× higher throughput than manual dismantling
- **Economic viability:**
    - Projected 1–4 year ROI, depending on material mix (cotton vs polyester), throughput, and market value of textile materials
- **System capability:**
    - Single button operation to run the system
    - Tunable AI for customized processing per individual recycler requirements- tradeoff in purity vs. throughput
    - Detects material differences and disruptors down to ~5 mm
    - Removes high-risk contamination zones (waistbands, cuffs, collars, pockets, graphics)

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**Technology Readiness Level (TRL)**

- The system was **designed, fabricated, integrated, and validated in a production-like environment**, with real garments and recycler-relevant metrics. Industrial-grade components and methods were used for the prototype design.
- **Development Status: TRL 5–6**
    - *TRL 5/6:* Component and subsystem validation in a relevant environment

**Current Status** The technology is **pilot-validated and ready for industry transition**, with complete engineering documentation (drawings, models, schematics, code), a working prototype, and active engagement with recyclers, sorters, and sustainability organizations for commercialization and scale-up.

**If you are interested in learning more about this system or would like to exercise your option to license the IP, please contact Mark Walluk, Engineering Manager, Rochester Institute of Technology at mrwasp@rit.edu.**

**Option Windows (Per IPMP)**

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|---|---|
| March 31, 2026 – May 30, 2026 | Tier 1 Industry Members |
| May 31, 2026 – June 29, 2026 | Tier 2 Industry Members |
| June 30, 2026 | Open to all members and non-members |