Toxics Use Reduction Institute Cleaning Lab: Case Studies

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TURI
TOXICS USE REDUCTION INSTITUTE
UMASS LOWELL
CLEANING LABORATORY

Overview

- TURI Laboratory
  - Background
  - Lab Services
- Case Studies
- Industry Grants
- Questions

TURI Laboratory

- Providing technical assistance since 1993
  - TURI Lab has helped hundreds of companies find safer alternatives to hazardous cleaning solvents
    - Process specific testing
  - The implementation rate for clients of the lab was three times higher than the national average for pollution prevention technical assistant providers
    - Prior to 2007, 33% of the companies fully adopt the lab's recommendations
    - Since 2008, near 80%

TURI Laboratory Cont.

- New Space!
  - Moved Boott Mills Offices in Downtown Lowell
    - New Equipment
      - VPS
    - Microbiology Lab
    - Wet Lab
    - Analytic Lab
    - Demo Lab

New Lab Space

Possible Future TURI Lab Workshops

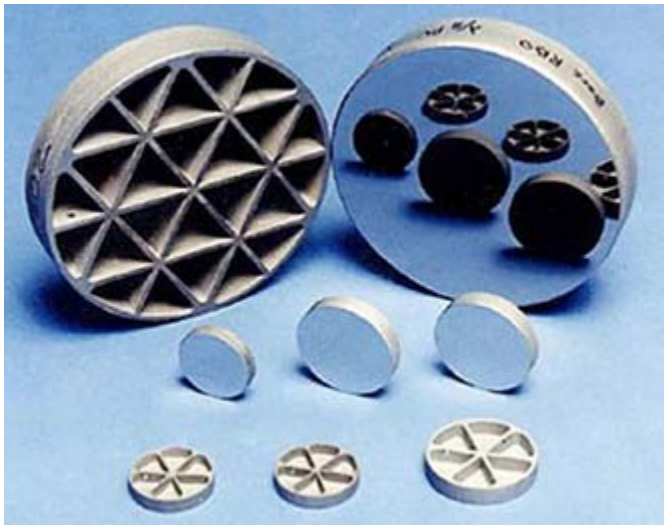
- Workshop for TUR Planners (1 or 2 Day)
  - Hazard Assessment Tools
    - Beyond the SDS
    - Pollution Prevention Options Analysis System (P2OASys)
  - Cleaner Solutions Database
  - Hands-On Performance Testing
  - Hansen Solubility Parameters in Practice (HSPiP) Overview
  - Related Guest Speakers

Lab Services

- Parts Cleaning
  - Cleaning parts during and after manufacturing in Metal Working or Tooling Industries
  - Gross Cleaning Applications
- Precision Cleaning
  - Cleaning parts during and after manufacturing in Semi Conductor and Medical Sectors
  - Critical Cleaning Applications
- Facility Cleaning
  - Janitorial, or housekeeping chores in public/private institutions such as schools or hospitals
  - Institutional Cleaning Applications
  - Disinfection testing

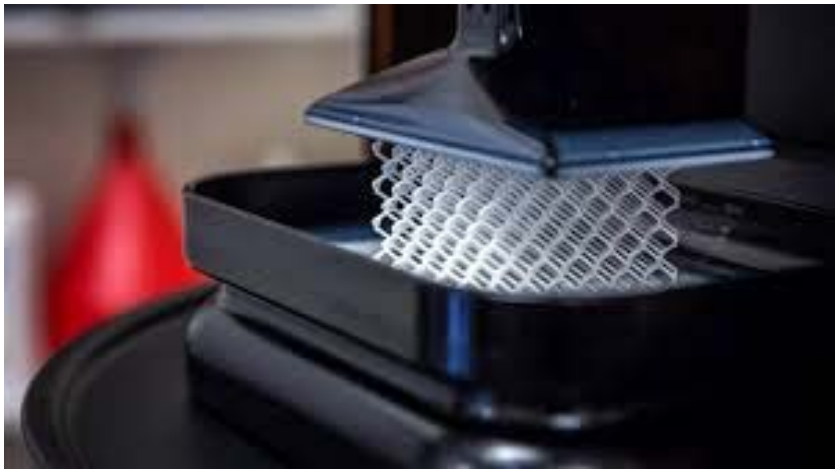
Case Study #1

- Silicon carbon slurry in graphite mold
- Dissolving polystyrene blocks
  - Current: Methylene chloride
- Alternative Requirements:
  - Work at -80C
  - Nonflammable
  - Work within 40 minutes
- HSPiP
  - Dibutyl maleate



Case Study #1 Cont.

- Testing Update
  - Evaluating Alternative Options
  - Replace polystyrene block material
    - 3D Printing – Look at polymeric materials
    - Creating a polymer database for HSPiP



Case Study #2

- White vinyl and aluminum window frames and grids
- Contaminants
  - Cutting oil, machine-fluid, ink, dirt, and dust
  - Hardest to remove: cutting oil and ink
- Manual wipe
  - Toluene
- Measurement of Cleanliness
  - Visual

Aluminum

Vinyl

Case Study #2 Cont.

- Alternative Requirements
  - Must be dry quickly
  - No residue
- Finding Alternatives
  - Cleaner Solutions Database
  - Pollution Prevention Options Analysis System (P2OASys)
- Testing Update
  - Gemtek aqueous cleaners
    - Hard time removing ink
  - Isopropyl alcohol
    - Removed all soils
    - Already had correct PPE to switch it to

Case Study #3

- Brass and nickel parts
  - Complex geometries
  - Very small
- Contaminants
  - Fingerprints, oils from hands, link, dust, dirt, and cutting oil
- Cold Immersion
  - TCE
- Measurement of Cleanliness
  - Microscope (Visual)

Case Study #3 Cont.

- Alternative Requirements
  - Clean all soils
  - Clean within 30 minutes
  - Open to aqueous cleaners
- Testing Update
  - Ultrasonics can’t be used
  - Identified cleaner issues:
    - Not removing all soils
    - Taking too long
    - Leaving Residue
  - HSPiP

TURI Industry Grants

- Who's eligible?
  - Manufacturing facility with MA location for project
  - TURA regulated sector
  - Companies using listed toxic chemicals (www.turi.org/Listed_Chemicals for info)
  - Have at least 10 full time employees
- 2019 Industry Grants
  - Up to $30,000 available
  - Apply at www.turi.org/grants
  - Contact Joy Onasch (joy@turi.org)

Thank you!

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