TCE Roundtable

Wichita, KS
September 25, 2019
Welcome and introductions

• Around the table

• Virtual participants (please toggle your mute buttons so we avoid background noise)

• Supported by EPA Pollution Prevention grant funds – thank you EPA
Overview of today’s program

• **Welcome** - Nancy Larson, K-State PPI

• **EPA TCE update based on Toxic Substance Control Act (TSCA) assessment** - Toni Krasnic, U.S. EPA

• **KDHE overview of TCE impacts in state** - Randy Carlson, KDHE

• **TCE alternative research** - Richard Starkey, SafeChem Europe

• **International Aerospace Environmental Group** - invited to provide update

• **Discussion – next steps**
TCE

- Carcinogen to humans by all routes of exposure
- Toxic; clear, colorless, sweet odor & evaporates quickly
- Estimated 250 millions pounds/year
- Intermediate for refrigerants (84% use)
- Solvent for metals degreasing (15% use)


- Halogenated, aliphatic organic compound
- “Universal” degreaser
- Microorganisms can break it down

Source: [https://www.epa.gov/remedytech/tce-removal-contaminated-soil-and-ground-water](https://www.epa.gov/remedytech/tce-removal-contaminated-soil-and-ground-water)
Physical/Chemical Properties

- VOC
  - moderate boiling point, 87.2°C
  - high vapor pressure, 73.46 mm Hg at 25 °C
- Moderately water soluble (1.280 g/L at 25 °C)
- Denser than water, 1.46 g/cm³ at 20°C
  - About 12.11 lbs/gal at 70°F
Featured speakers

**Toni Krasnic**, Office of Pollution Prevention and Toxics, U.S. Environmental Protection Agency

**Randy Carlson**, Bureau of Environmental Remediation, Kansas Department of Health and Environment

**Richard Starkey**, Industry Manager – Aviation, SAFECHEM Europe GmbH
International Aerospace Environmental Group

• Shanying Zeng, Boeing (U.S.) – IAEG Work group
  • Spring meeting in U.S.
  • New TSCA resources from IAEG at http://www.iaeg.com/tsca/
  • Fall meeting in Prague
VIDEO: Vapor Degreasing Process Uses TCE Replacement to Eliminate Hazardous Waste

Originally titled 'Good Chemistry Helps Vapor Degreasing Process Become Greener'

A solid relationship with a solvent manufacturer has aided Electro-Spec Inc. with the implementation of a trichloroethylene replacement material in its vacuum degreasing unit to clean a customer's micromachined parts more efficiently.

Greg Wilkinson, Yangsheng Zhang and Ben McKnight discuss the vacuum vapor degreasing system at Electro-Spec Inc.

Source: Production Machining, 2019
<table>
<thead>
<tr>
<th>Facility Name</th>
<th>Address</th>
<th>Year</th>
<th>Prior Year Release</th>
<th>Current Year Release</th>
<th>Percent Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>THE BOEING CO (THE BOEING CO)</td>
<td>AIRPORT &amp; MCDONNELL BLVD, BERKELEY, MO 63134</td>
<td>2016</td>
<td>15,000.00</td>
<td>9,900.00</td>
<td>-34%</td>
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<tr>
<td>Source Reduction: W2: Modified equipment, layout, or piping: -20-69% - Added valves to allow separation of contaminated TCE from clean TCE, which allows longer use of the remaining TCE. The contaminated and clean TCE naturally lay in the tanks, so the addition of valves allowed the permanent separation to remove the contaminated TCE and add small amounts of fresh TCE rather than replacing the entire tank. Source Reduction: W3: Changed to mechanical stripping/cleaning devices from solvents or other: -5-94% - Utilizing pellet blasting to clean inside of tube throughout cutting and bending process of -1/2 of tubes. Methods to Identify SR Opportunities: T06: Employee Recommendation (Under A Formal Company Program) - During a team event, employee raised the concept/Methods to Identify SR Opportunities: T04: Participative Team Management - Team created to reduce hazardous waste at the site to meet hazard waste reduction goals. Methods to Identify SR Opportunities: T10: Vendor Assistance - Vapor degreaser manufacturer offered the suggestion to a maintenance employee who recommended it to the environmental engineer.</td>
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<tr>
<td>GKN AEROSPACE NA INC (GKN AEROSPACE NA INC)</td>
<td>142 JS MCDONNELL BLVD, HAZLEWOOD, MO 63042</td>
<td>2014</td>
<td>22,000.00</td>
<td>17,000.00</td>
<td>-22.73%</td>
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<td>Source Reduction: W3: Modified stripping/cleaning equipment: -4-94% - Methods to Identify SR Opportunities: T11: Other - Replacing an existing batch vapor degreaser with an now more efficient unit.</td>
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<tr>
<td>GLOBE ENGINEERING CO INC (NA)</td>
<td>1539 S SAINT PAUL, MICHITA, KS 67213</td>
<td>2014</td>
<td>18,330.65</td>
<td>16,490.39</td>
<td>-10.04%</td>
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<td>Source Reduction: W3: Other process modifications</td>
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<td>Source Reduction: Source Reduction - In March of 2014 Globe Maintenance replaced the old Terrieve steam control valve on our Trichloroethylene vapor degreaser with an electronically controlled Flow-Tek Triad steam valve. This has enabled us to run more parts through the degreaser while reducing our Trichloroethylene consumption.</td>
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<tr>
<td>GLOBE ENGINEERING CO INC (NA)</td>
<td>1539 S SAINT PAUL, MICHITA, KS 67213</td>
<td>2015</td>
<td>16,490.39</td>
<td>15,340.13</td>
<td>-6.98%</td>
</tr>
<tr>
<td>Source Reduction: Source Reduction - The Source Reduction activities implemented in 2014 have continually reduced our consumption of trichloroethylene even with an increase in overall production in 2015.</td>
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But what does the TRI data mean to health?

- Are all chemicals reported equally dangerous?
- How does the release or disposal method effect exposure?
- Are people potentially exposed to these releases?
- How many people are potentially exposed?

EPA used TRI data, along with other data, to produce an environmental Risk-Screening tool.

It’s called Risk-Screening Environmental Indicators (RSEI)
RSEI scores are unitless numbers that model the relative risk to human health based on the size of the chemical release, the fate and transport of the chemical through the environment, the size and location of the exposed population, and the chemical’s toxicity.
National Data

RSEI Score ( Millions) and Corresponding Releases

Year


Air Releases (Score)
Water Releases (Score)
Transfers to POTWs (Score)
Off-Site Incineration (Score)

Millions of Pounds Released

0  500  1,000  1,500  2,000  2,500

1,500.00
1,000.00
500.00
0.00
2017 data. Top 5 facilities for top 5 chemicals
2017 data. Top 5 facilities for top 5 RSEI scores.
PPI Interns

Possible option to assist with on-site research

Since 2006, intern projects have identified the following potential savings:

• 88.9 million kWh of electricity and natural gas
• 382 million gallons of water
• 16,500 tons of solid and hazardous waste
• $14.6 million in operating/disposal costs
• 83,500 metric tons of CO₂ equivalent
Needs, Interests?

• PPI can host an update in 2020

• Next steps?

• Do industries want to learn more about RESI (Chromium)?
Thank you for participating today

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*Thanks to EPA for providing Pollution Prevention (P2) funds to support this meeting.*