Solvent Substitution Resources
from the
Toxics Release Inventory

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Overview

- Reporting source reduction to TRI
- Methodology for solvent substitution analysis
- Accessing the resources
- Findings
- TRI solvent substitutions and the Safer Chemical Ingredients List
- Live demo of Solvent Substitution Tool
- Questions?

Why must facilities report their source reduction activities to TRI?

The Pollution Prevention Act of 1990

- Established source reduction as a national priority
- Expanded the TRI reporting requirements to collect information on source reduction activities at facilities that report to TRI

Facilities are **required by law** to report their newly implemented source reduction activities to the Toxics Release Inventory on their Form R.

How do facilities report source reduction to TRI?

Facilities use the Form R to report their releases, waste management, and new source reduction activities to TRI

Source reduction information is collected in Sections 8.10 and 8.11 of the Form R

Section 8.10

Reporting Source Reduction

Select from 24 codes organized into five categories to describe the source reduction activity

Example: *S02 Substituted an organic solvent*

Indicate the method(s) used to identify the activity

Section 8.11
Optional details

- Barriers to Source Reduction
- Optional Comments
  - **Source Reduction**
  - Waste Management
  - Other information

Section 8.11 Optional Comments

As facilities add source reduction activities and barriers, they have the option to report additional information in open-ended text fields

This is an opportunity to provide greater details about source reduction activities, waste management practices, or other pollution prevention activities, as well as barriers that prevented P2 implementation.

Comment Analysis for Solvent Substitutions

For many years, comments data had been underutilized

- Only explorable in downloadable formats
- Limited keyword filtering options in public-facing tools

TRI facilities reported **46,035 source reduction comments** from 2005 to 2020

Comment Analysis for Solvent Substitutions

Created a methodology to automate analysis of optional comments to find information about solvents substitutions

- Used an R script to extract and process comments data based on filtering and keyword matches
- Identified **1,926 comments related to solvent substitutions** during this 15-year timespan

Accessing Solvent Substitution Information Reported to TRI

Solvent Substitution Comments Reported to TRI, 2005–2020

No selections applied

Selections

Industry Sectors with Substitutions	Specific Substitution Comments	Distinct Substitution Combinations
16	391	116

Sub to TRI
TSCA Flag
SCIL Flag

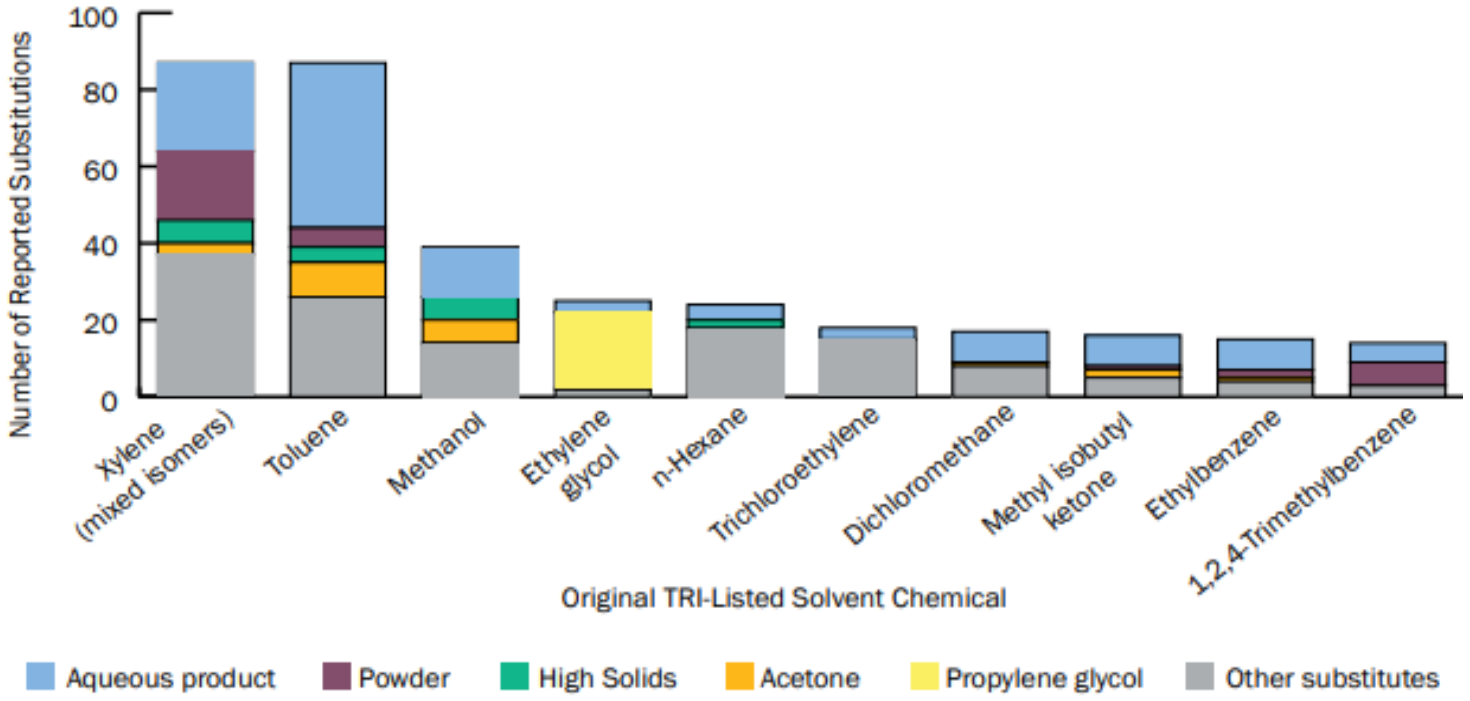
Download current data
Download all data
Definitions

To narrow results, use the flags or the table headers to filter.

TRI Chemical ID	Original Chemical	Substitute Chemical	Substitute Chemical 2	Comment	Year	TRI Facility	TRI Industry Sector	NAICS
0000079005	1,1,2-Trichloroethane	Aqueous product		Installed and brought on line an aqueous washing system to replace the degreaser.	2019	K & G MANUFACTURING CO - 55021KGMNF226PA	332 Fabricated Metals	332710 Machine Shops
0000095636	1,2,4-Trimethylbenzene	Aqueous product		Aquaous parts cleaner replaced solvent based cleaner in early 2011 should see significant reductions for 2011 RY.	2010	RIKER PRODUCTS INC - 4361WRKRPR491ST	336 Transportation Equipment	336399 All Other Motor Vehicle Parts Manufacturing
0000095636	1,2,4-Trimethylbenzene	Aqueous product		Converted to waterbase finish	2013	FLEXSTEEL INDUSTRIES INC - 39759FLXST500IN	337 Furniture	337121 Upholstered Household Furniture Manufacturing
0000095636	1,2,4-Trimethylbenzene	Aqueous product		Internal practices to reduce solvent content of vehicle coatings. Switched from solvent to water based coatings for a significant portion of vehicle manufacturing process.	2012	HONDA DEVELOPMENT & MANUFACTURING OF AMERICA LLC - ALABAMA - 35096HNDMF1800H	336 Transportation Equipment	336112 Light Truck and Utility Vehicle Manufacturing
0000095636	1,2,4-Trimethylbenzene	Aqueous product		Reduction in total amount of chemicals used and going to a water based product for final	2011	SHAFER COMMERCIAL SEATING -	337 Furniture	337211 Wood Office Furniture

Webpage | Handout | Interactive table | Downloadable spreadsheet

391 comments describe specific substitutions, reported by facilities in 16 industry sectors



116 distinct combinations

Most replaced

- Xylene (mixed isomers)
- Toluene
- Methanol

Most common substitutes

- Aqueous products
- Powder coatings
- High solids formulations

TRI Solvent Substitutions and the Safer Chemical Ingredients List

The TRI Solvent Substitution tool can identify cases where a facility has switched from a TRI-listed solvent to a chemical on the **Safer Chemical Ingredients List (SCIL)**

Safer Chemical Ingredients List

- Arranged by functional-use class
- Evaluated by Safer Choice Program
- Determined to be safer for a given functional use than traditional chemical ingredients

Safer Chemical Ingredients List

Color Codes

The chemical has been **verified to be of low concern** based on experimental and modeled data

The chemical is **expected to be of low concern** based on experimental and modeled data. Additional data would strengthen our confidence in the chemical's safer status.

The chemical has **met Safer Choice Criteria for its functional ingredient-class** but has **some hazard profile issues**. A chemical with this code is not associated with a low level of hazard concern for all human health and environmental endpoints.

Safer Chemical Ingredients List

Functional Use Classes

- Antimicrobial Actives
- Chelating Agents
- Colorants
- Defoamers
- Emollients
- Enzymes and Enzyme Stabilizers
- Fragrances
- Oxidants and Oxidant Stabilizers
- Polymers
- Preservatives and Antioxidants
- Processing Aids and Additives
- Skin Conditioning Agents
- **Solvents**
- Specialized Industrial Chemicals
- Surfactants
- Uncategorized

Safer Chemical Ingredients List

LIVE DEMO

TRI Solvent Substitution Homepage

LIVE DEMO

Incentivizing Solvent Substitutions

This resource is a valuable source of information for technical assistance providers and facilities concerning solvent substitutions

- Amplifying consideration of viable alternatives and identifying emerging alternatives
- Evidence of successful changes
- Opportunities for follow up inquiries and greater exchange of information
- Confirming trends

TRI Solvent Substitutions Webpage: www.epa.gov/toxics-release-inventory-tri-program/solvent-substitutions-reported-tri

Questions?

TRI Program Home

https://www.epa.gov/toxics-release-inventory-tri-program

TRI P2 Home

https://www.epa.gov/toxics-release-inventory-tri-program/pollution-prevention-p2-and-tri

Additional questions and follow-up

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