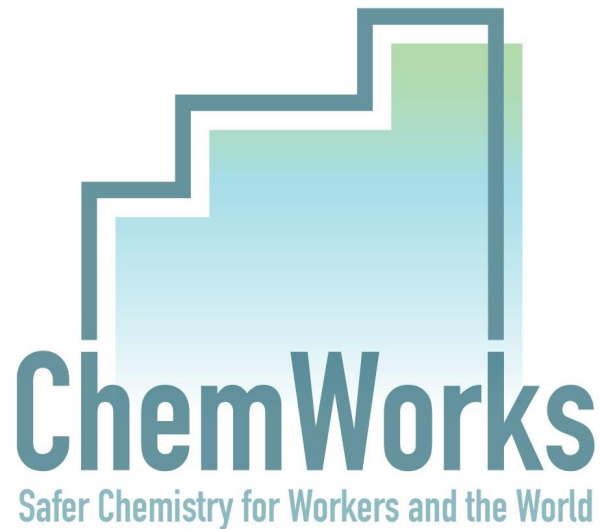


Optimizing Cleaning Products for Safety and Sustainability





**VISHAAL
GOPAL,**
Chem*FORWARD*
Program Manager -
Electronics Safer
Chemistry Collaborative

Meeting Agenda

- Welcome
- ChemFORWARD and data trust
- ChemWorks Hub overview
- CleanScreen: Screening, Optimization, Reporting
- Certifying Cleaners & Degreasers
- IPC 1402 Standard and Reporting
- Next Steps, Q&A

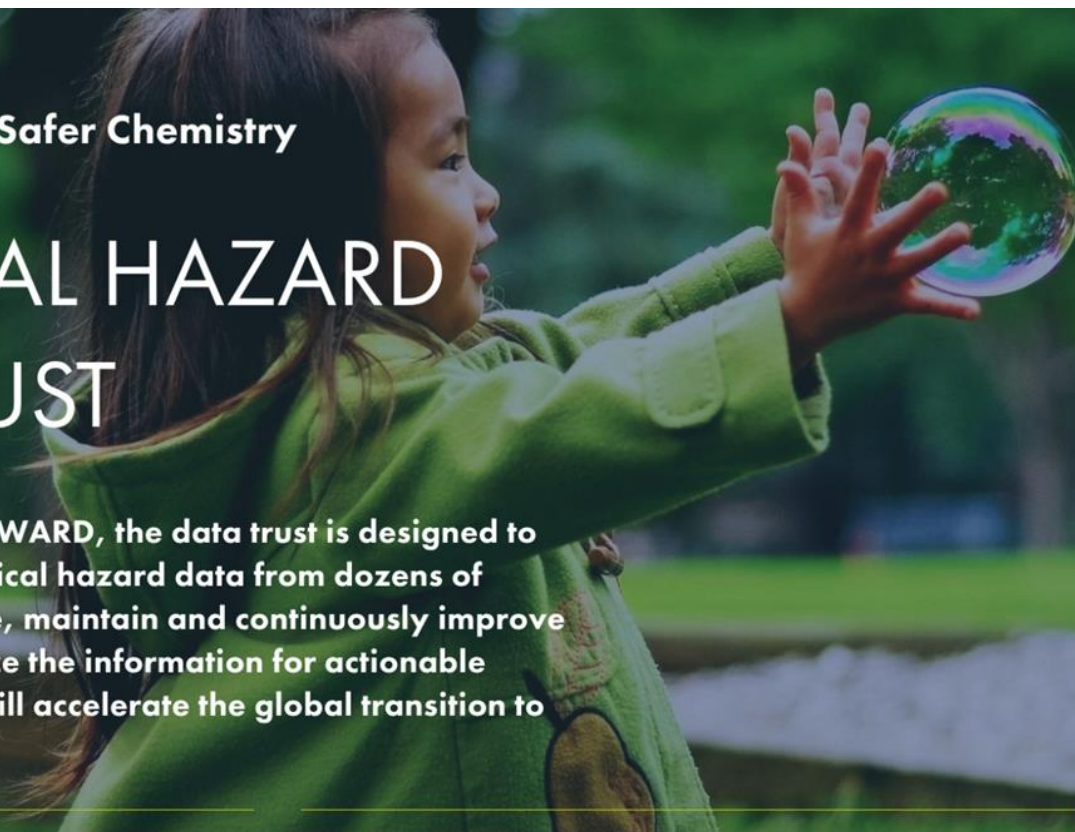


Science-based, data-driven, non-profit

Create and Access Safer Chemistry

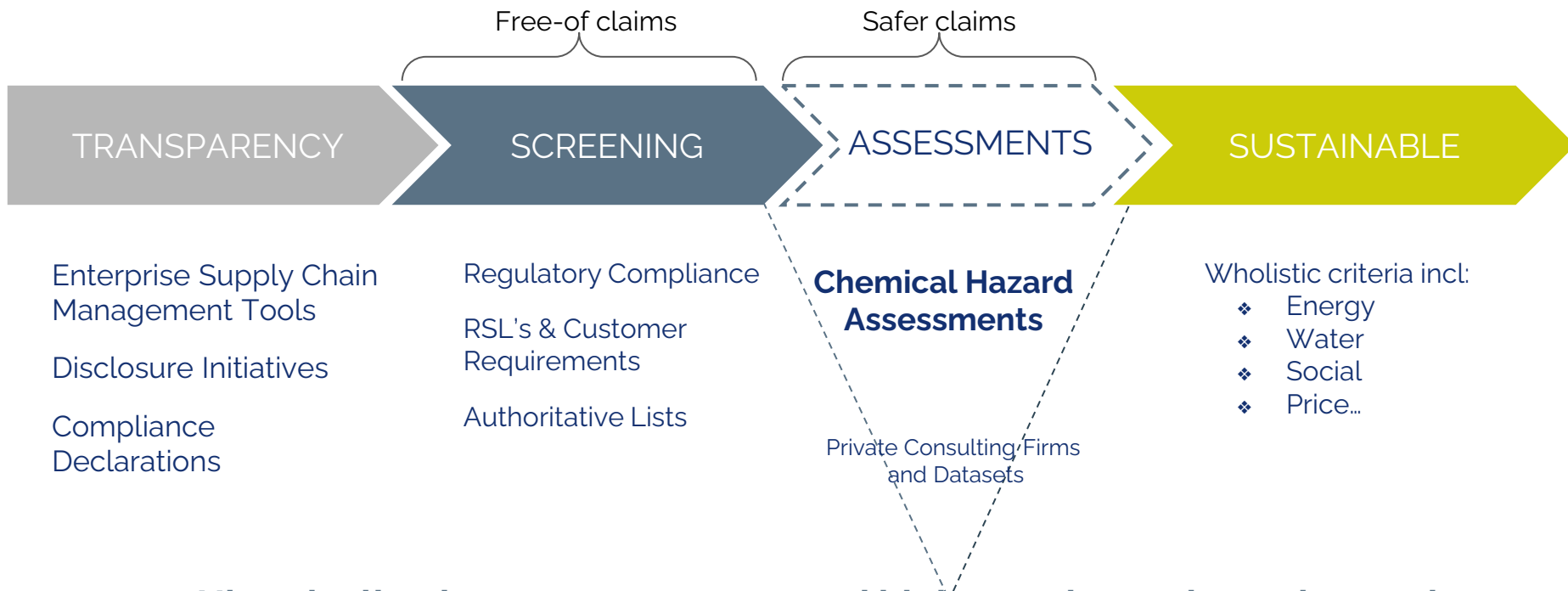
CHEMICAL HAZARD DATA TRUST

Managed by ChemFORWARD, the data trust is designed to simplify access to chemical hazard data from dozens of credible sources, curate, maintain and continuously improve the data, and harmonize the information for actionable decision support that will accelerate the global transition to safer chemistry



Bridging the chasm to safer chemistry

Lack of cost-effective, high-quality, chemical hazard data has been a barrier for most companies



Historically, the system perpetuated high cost, inconsistencies, and slowed the transition to inherently safer chemistry

WHY CHAs? TOXIC IS EASY, SAFE IS HARD

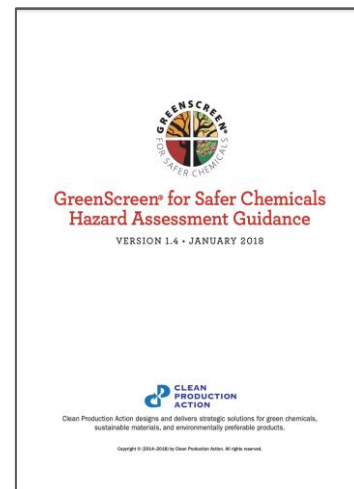
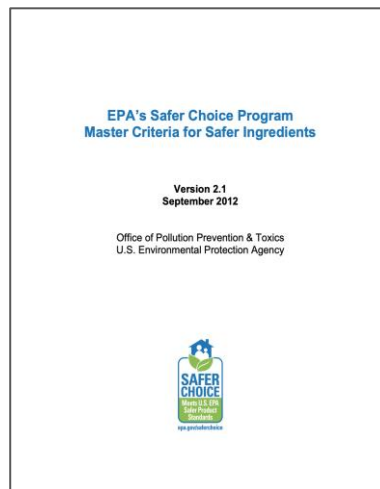
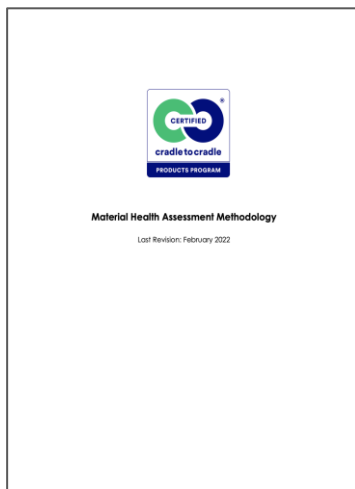
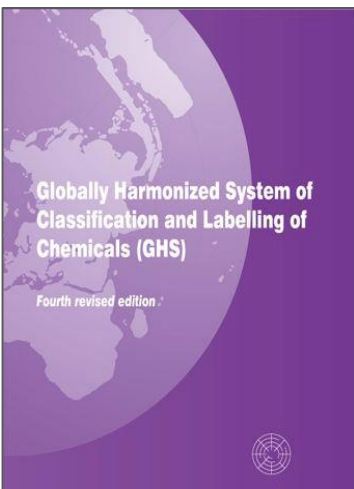
“It takes a lot more information to prove that a chemical is inherently safe than it does to prove that it is toxic. Just knowing that a chemical is a known carcinogen or that it causes skin sensitization can be enough to rule it out as a good candidate for product applications. But to be sure that it is inherently benign for its intended use means that data gaps must be filled. A lack of hazard data does not mean that a chemical is inherently benign,”

Lauren Heine, Ph.D., Co-Founder and Strategic Advisor

Human Health											Environmental							Other			
	Carcinogenicity	Mutagenicity	Reproductive & Developmental Toxicity	Endocrine Disruption	Oral Toxicity	Dermal Toxicity	Inhalation Toxicity	Neurotoxicity	Skin, Eye, and Respiratory Corrosion/Irritation	Sensitization of Skin and Airways	Fish Toxicity	Daphnia Toxicity	Algae Toxicity	Terrestrial Toxicity	Persistence	Bioaccumulation	Climatic Relevance	Other (Human Health)	Organohalogenes	Toxic Metals	Other (Environmental Health)
Oral	-	G	R	Y	G			-			Y	Y	-	G	G	G	G	G	G	G	G
Dermal	G		G			G		-	Y	G											
Inhalation	-		-				G	-													G

Chemical Hazard Assessment

A systematic process of assessing and classifying hazards across a spectrum of hazard endpoints and severity



All credible methods are based on GHS, but interpretation and reporting vary creating market confusion. The underlying GHS classifications still apply and are captured and displayed in ChemFORWARD

Building Trust in the Science of CHAs

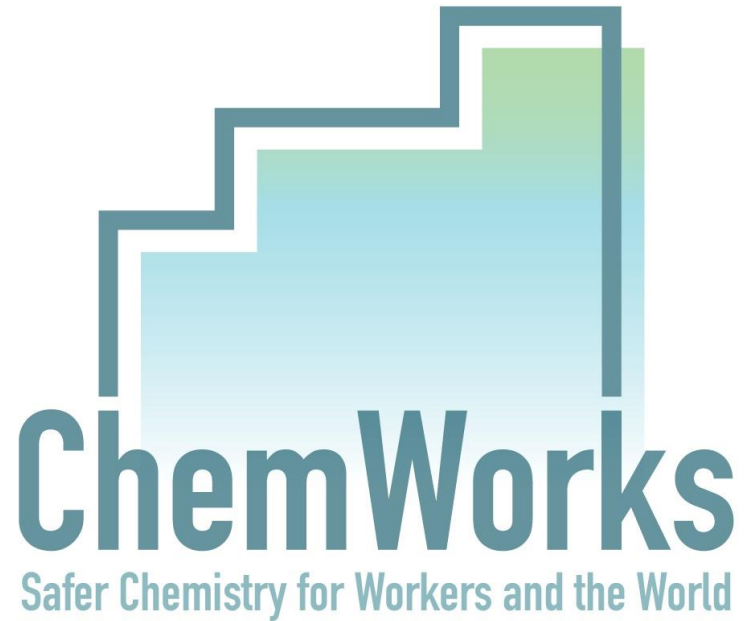
Quality and continuous improvement are necessary for shared data:

- One profile per chemical
- Built on proven existing hazard classification methodologies (starting with GHS, C2CC). ChemFORWARD is NOT a new CHA method.
- Qualified Assessors own and maintain the data they create and participate in a community of practice
- Peer review/verification by independent toxicologists who assure assessments are comprehensive, consistent, and credible - thereby increasing user trust
- A technical challenge process that promotes continuous improvement and results in a definitive dataset that justifies having one CHA per chemical
- A policy for reviewing, incorporating, and protecting unpublished private data into CHAs

Overview

ChemWorks is an industry collaboration to scale the availability of chemical hazard information, identify safer chemical alternatives and to accelerate the adoption of safer cleaners and degreasers used in electronics manufacturing that protect workers and the environment.

ChemWorks is managed by an advisory group of brands and staffed by ChemFORWARD.



What makes a safer cleaner?

01

Restricted Substances

Exclude substances on the following RSLs:

- Apple RSS Section 6
- CEPN Priority Chemicals
- GreenScreen Certified for Cleaners & Degreasers

02

Health & Environment Hazards

Avoid ingredients linked to:

- Carcinogenicity, Mutagenicity, Repro/Dev Toxicity, PBT, and vPvB
- Classified as high concern based on GHS criteria supported by comprehensive CHAs

03

Certified Products

Adhere to third-party standards:

- GreenScreen Certified
- ToxFMD by ToxServices
- US EPA's Safer Choice program

One-stop shop for safer cleaners resources!

5. Promotion of Certified Products

4. Certification

- Choose and connect with an approved assessor to evaluate your products

3. IPC-1402 Standard:

- Use CleanScreen reporting to demonstrate compliance

2. Chemical Optimization & Alternatives

- Access ChemFORWARD's platform to find safer alternatives

1. Formulation Screening & Reporting

- Use the free CleanScreen app to assess your cleaner's safety profile

Getting Started with **CLEANSCREEN**

Powered by **CHEMFORWARD**

- **Quickly Check Your Formulation:**
 - Assess against common safer cleaner criteria.
 - Pre-screen for certification and IPC-1402 compliance.
- **Generate Documentation:**
 - Share screening results with customers.
- **Prepare for Certification:**
 - Identify blockers and areas for improvement.
 - Optimize formulation for safer chemistry.
- **Demonstrate Progress:**
 - Showcase incremental improvements to your products.

Formulation screening

Fast and Easy:

- Enter chemical names or CAS numbers for instant results.

Comprehensive Chemical Hazard Data:

- Access previously expensive and time-consuming data.
- Receive pass/fail designations for ingredients.
- Get detailed profiles for 95% of common cleaning ingredients.

Actionable Results:

- Assess compliance with IPC 1402 or certification standards.
- Identify optimization or substitution needs.
- Receive resources for next steps.

ChemFORWARD

Chemical Optimization Platform - Alternatives Finder

- **Free Access:** Limited-time offer to access ChemFORWARD platform.
- **Extensive Database:** 100's of common ingredients used in commercial cleaners and beyond. Searchable by chemical name, CAS#, or function.
- **Comprehensive Hazard Assessments:** Find safer alternatives based on human and environmental toxicology.
- **Simple Letter and Color-Coded System:** Easily identify safer options.



- **Vast Chemical Library:** Over 220,000 chemicals and thousands of safer alternatives.

Reporting

- **Communicate Safety to Customers:** Use the reporting function to share human and environmental safety information.
- **Protect Confidential Business Information:**
 - Option to redact chemical names for confidentiality.
 - Generalize Formulation Details with concentration ranges
- **Provide Hazard Transparency:** Customer have assurance of safety even if formulation information is redacted
- **Self-Declare IPC-1402 Conformance:** Showcase compliance with the standard

Certified Safer Products

- **Differentiation & Trust**
Stand out in the market and boost customer confidence.
- **Streamlined Process**
Save time and resources with CleanScreen and ChemFORWARD.
- **Facilitate Certification**
CleanScreen app facilitates introductions to assessors.
- **CleanScreen Report**
Will help the assessor provide an estimate for certification.
- **Leading Programs**
GreenScreen Certified, ToxFMD by ToxServices, or US EPA's Safer Choice.
- **Visibility & Promotion**
Get listed on the ChemWorks certified product registry for OEM exposure

IPC 1402 Standard Integrated with CleanScreen

- **CleanScreen Integrates IPC-1402:**
Simplify compliance demonstration.
- **Highlight Proactive Commitment:**
Showcase dedication to safer chemistry.
- **Gain Trust with Global OEMs:**
Increase market reach and credibility.



3. IPC-1402 Conformance Reporting

2. Chemical Optimization & Alternatives

1. Formulation Screening & Reporting

4. Certification



5. Promotion of Certified Products



Next Steps

We will be sharing an email to all webinar attendees with relevant information on how to request login credentials to CleanScreen and how to get started using the web application.

ChemFORWARD looks forward to supporting you in your safer chemistry journey with the ChemWorks hub.

Thank you so much!

Please reach out to **vishaal@chemforward.org** if you have any questions

Questions?

Contact:

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Electronics Safer Chemistry Collaborative

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