GreenScreen® for Safer Chemicals and LEED v4 Material Ingredient Credits

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Webinar

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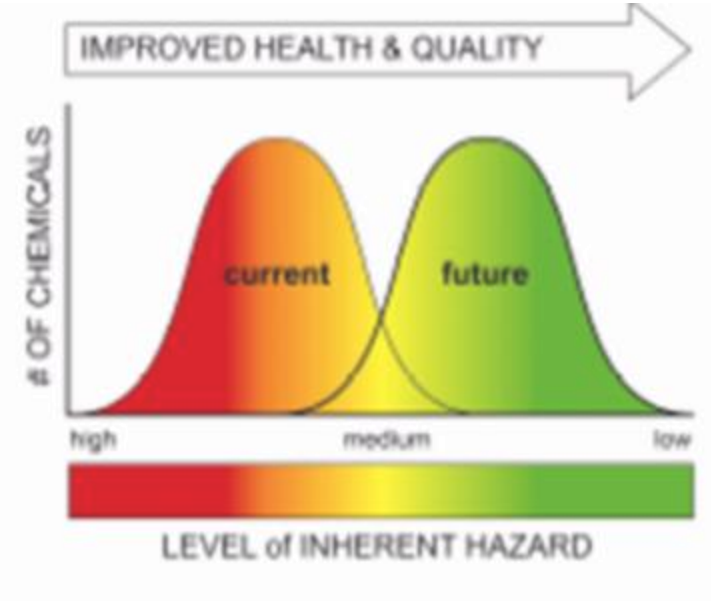
What is GreenScreen® for Safer Chemicals?

- A method for Chemical Hazard Assessment (CHA) developed by Clean Production Action
- Supports the 12 Principles of Green Chemistry
- Builds on USEPA Design for Environment (DfE) and other national and international precedents i.e., Globally Harmonized System (GHS) and OECD
- Open, transparent, freely accessible and peer reviewed



All supporting resources at: www.greenscreenchemicals.org

GreenScreen (GS) Tools

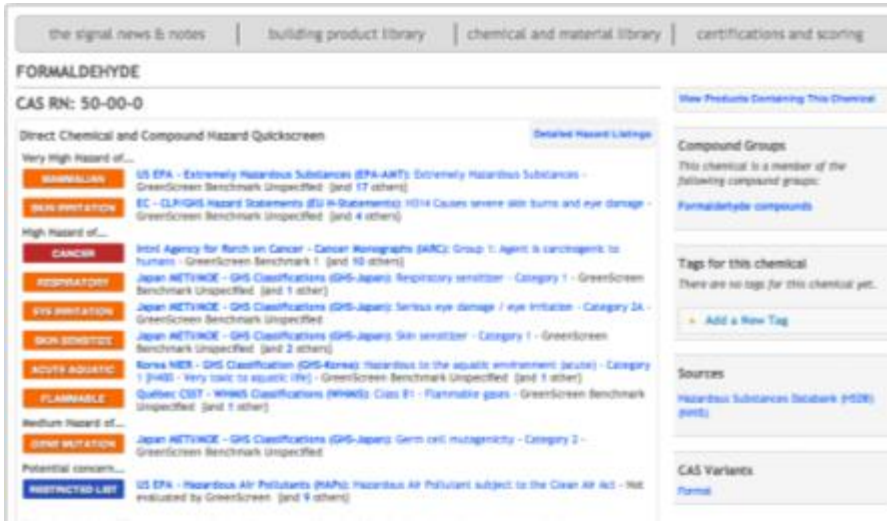
- **Full GreenScreen**
  - Systematic evaluation of chemicals based on 18 hazard endpoints
  - Standard hazard assessment format
  - Identifies inherently safer chemicals
  - Requires technical expertise
  - Best to use licensed GS Profiler
- **GS List Translator**
  - Readily identifies known hazards
  - Based on authoritative hazard lists
  - Doesn’t require toxicology expertise
  - Automated!

What GreenScreen List Translator Is

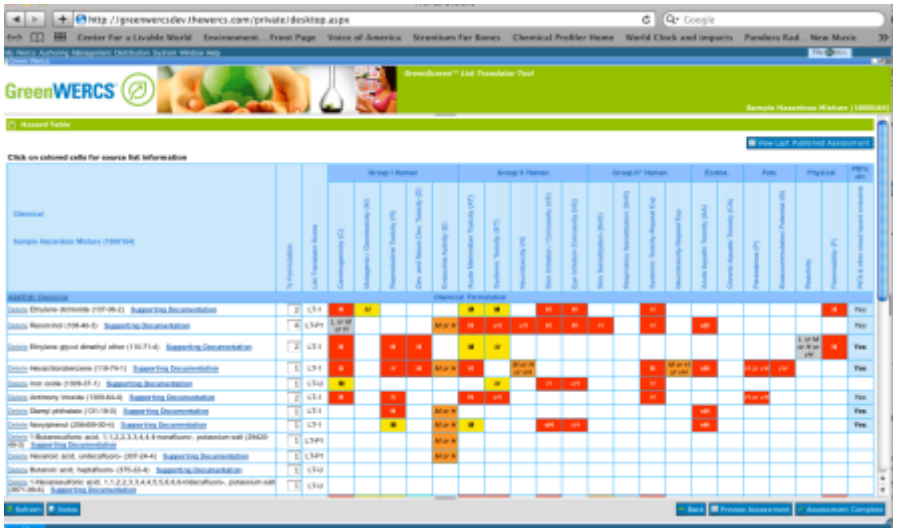
- Maps chemicals on GS specified lists to GS hazard criteria and overall scores
- Identifies known “bad actor” chemicals using authoritative and screening hazard lists
- Provides a useful “sandbox” for reviewing formulations
- Aided by software automation

Automation of the GS List Translator: Software Partners

Pharos Chemical and Material Library (CML)



The Wercs GreenWERCS



What the GreenScreen List Translator Is Not

- It does NOT include a full assessment of data
- It does NOT represent a comprehensive review
- It does NOT review transformation products
- It does NOT identify safer chemicals

To identify safer alternatives, **need to perform a full GreenScreen assessment**

Why Perform a Full GS Assessment?

- Uses ALL available data
  - Scientific literature, test data, analogs, “read-across”, hazard lists, Q/SAR models
- Increases confidence in results
- Identifies safer alternatives…
  - not just chemicals of concern
- Helps to “know what you know …and what you don’t know”
  - Hazards AND data gaps

How to Do a Full GreenScreen™ Assessment

1. Assess and classify hazards
2. Apply the Benchmarks
3. Make informed decisions

Step 1: Assess Hazards and Populate Hazard Summary Table

Green Screen Hazard Ratings																			
Group I Human					Group II and II* Human									Ecotox		Fate		Physical	
Carcinogenicity	Mutagenicity	Reproductive Toxicity	Developmental Toxicity	Endocrine Activity	Acute Toxicity	Systemic Toxicity		Neurotoxicity		Skin Sensitization*	Respiratory Sensitization*	Skin Irritation	Eye Irritation	Acute Aquatic Toxicity	Chronic Aquatic Toxicity	Persistence	Bioaccumulation	Reactivity	Flammability
						single	repeated *	single	repeated *	*	*								
L	**L**	**L**	**M**	*M*	**L**	**L**	**L**	**vH**	*H*	**L**	**L**	**L**	**L**	**H**	**H**	**vL**	**L**	M	*L*

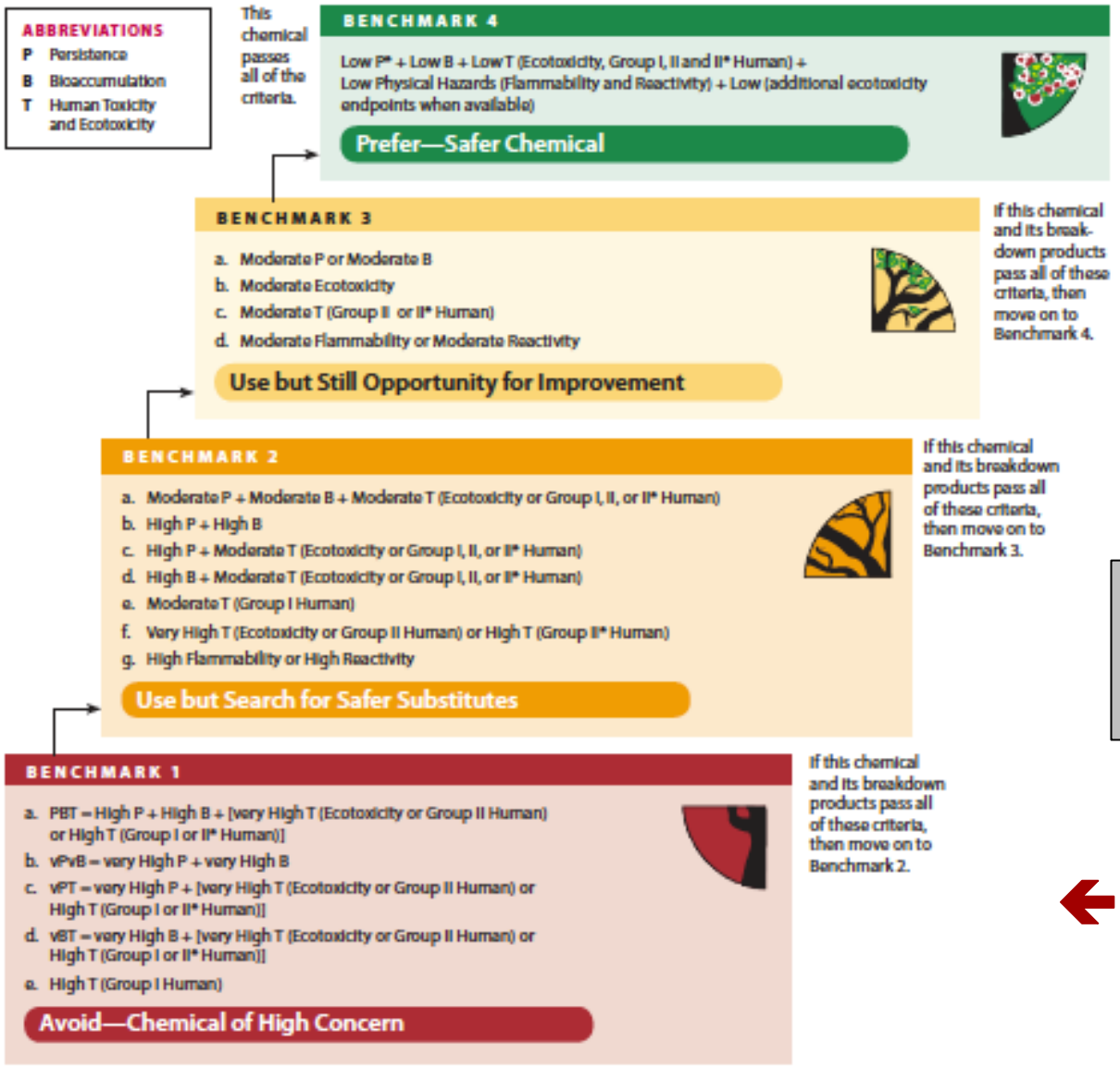
Level of Concern:

- vH = very High
- H = High
- M = Moderate
- L = Low
- vL = very Low
- DG = Data Gap

Level of Confidence:

- **Bold = High confidence**
- *Italics = Low confidence*

Step 2: Benchmarks Support Continual Improvement

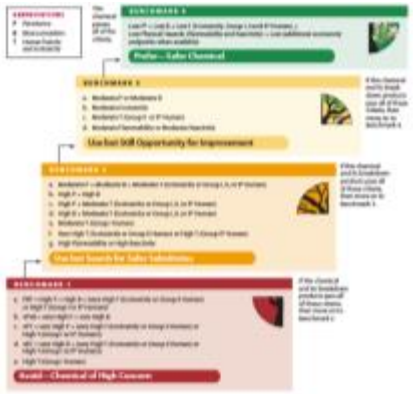


Benchmark U = Undetermined due to insufficient data

← **BM 1 Aligned with Regulatory Drivers**

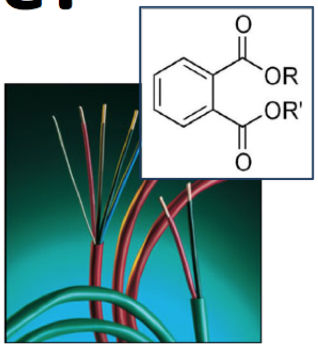
Step 3: Make Informed Decisions

- Benchmarks provide a simple 1-4 score that supports taking action
  - BM1 – avoid/phase out
  - BM2 – manage, to use safely
  - BM3 – getting there
  - BM4 – inherently low hazard



- Can be used by non experts in toxicology to support product design, procurement, policies and regulations

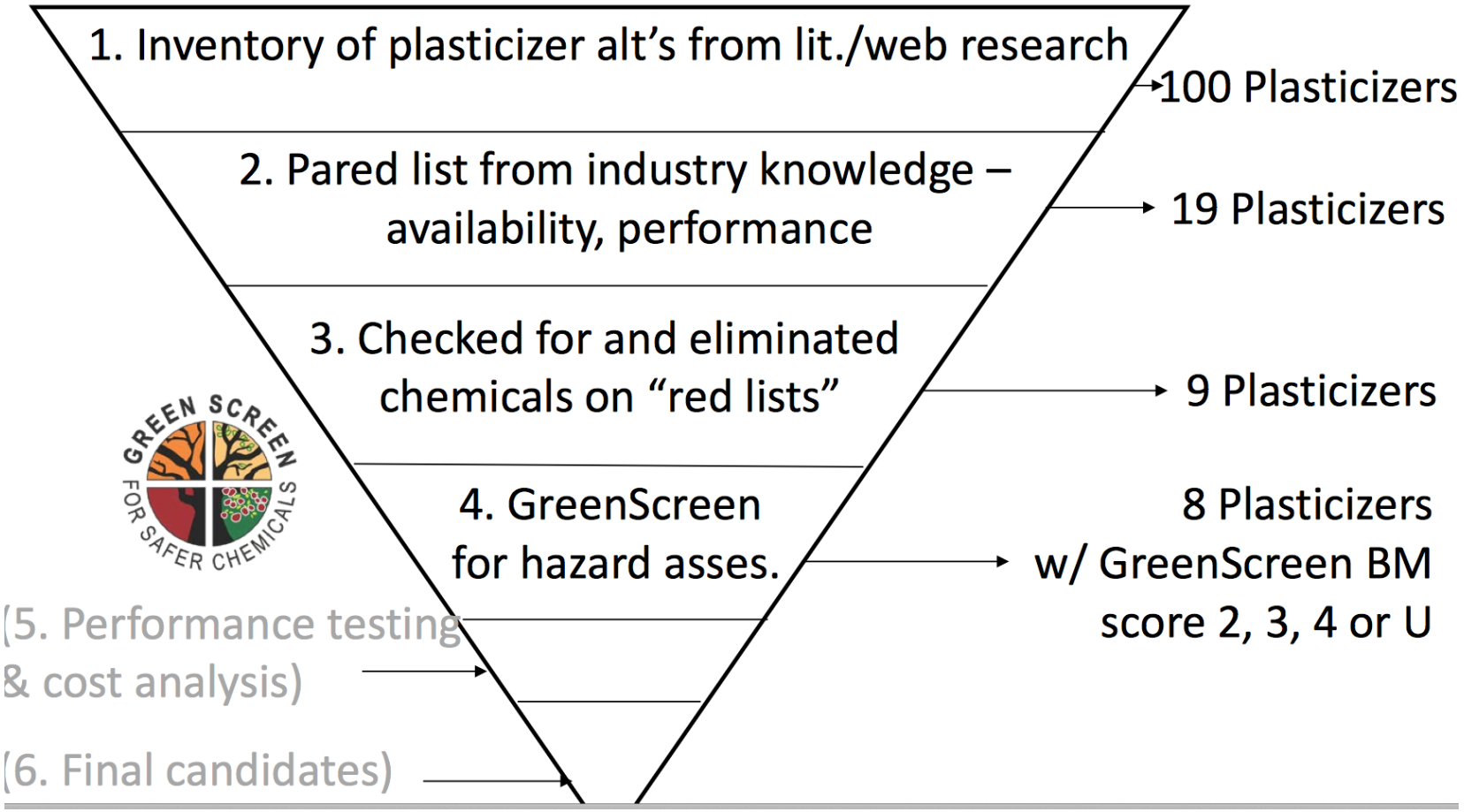
Why did the GC3 focus the pilot on DEHP phthalate plasticizer & wire and cable?



- Phthalates are of interest to many GC3 members
  - Many are toxic
  - High exposure potential from plastics
  - Used in many different plastic products
  - Focus of numerous regulations
  - Many companies need to eliminate them and find safer substitutes
- Wire & cable is of interest to many GC3 members
- DEHP is the most commonly used plasticizer for wire and cable
- Leverages Univ. of Mass. Lowell's expertise in plastics engineering

Download from: http://www.greenchemistryandcommerce.org/gc3-publications

Project Approach



Download from: http://www.greenchemistryandcommerce.org/gc3-publications

Applications for GreenScreen

1. IC2 Alternatives Assessment Guidance and Regulations in various US State governments
2. Materials Procurement to identify chemicals of concern and safer alternatives
3. Product Development -- new chemicals and new formulations
4. Corporate Policies
5. Normative Reference in various standards, scorecards and ecolabels

Two Paths to LEED v4 Credit

Material Ingredient Reporting

Material Ingredient Optimization

LEED for New Construction and Major Renovations (v4-draft)

		POSSIBLE: 1
IPc1	Integrative process	1

LOCATION & TRANSPORTATION — POSSIBLE: 16

LTc1	LEED for Neighborhood Development location	16
LTc2	Sensitive land protection	1
LTc3	High priority site	2
LTc4	Surrounding density and diverse uses	5
LTc5	Access to quality transit	5
LTc6	Bicycle facilities	1
LTc7	Reduced parking footprint	1
LTc8	Green vehicles	1

SUSTAINABLE SITES — POSSIBLE: 10

SSp1	Construction activity pollution prevention	REQUIRED
SSc1	Site assessment	1
SSc2	Site development - protect or restore habitat	2
SSc3	Open space	1
SSc4	Rainwater Mgmt	3
SSc5	Heat island reduction	2
SSc6	Light pollution reduction	1

WATER EFFICIENCY — POSSIBLE: 11

WEp1	Outdoor water use reduction	REQUIRED
WEp2	Indoor water use reduction	REQUIRED
WEp3	Building-level water metering	REQUIRED
WEc1	Outdoor water use reduction	2
WEc2	Indoor water use reduction	6
WEc3	Cooling tower water use	2
WEc4	Water metering	1

ENERGY & ATMOSPHERE — POSSIBLE: 33

EAp1	Fundamental commissioning and verification	REQUIRED
EAp2	Minimum energy performance	REQUIRED
EAp3	Building-level energy metering	REQUIRED
EAp4	Fundamental refrigerant Mgmt	REQUIRED
EAc1	Enhanced commissioning	6
EAc2	Optimize energy performance	18
EAc3	Advanced energy metering	1
EAc4	Demand response	2
EAc5	Renewable energy production	3
EAc6	Enhanced refrigerant Mgmt	1
EAc7	Green power and carbon offsets	2

MATERIAL & RESOURCES — POSSIBLE: 13

MRp1	Storage and collection of recyclables	REQUIRED
MRp2	Construction and demolition waste Mgmt planning	REQUIRED
MRc1	Building life-cycle impact reduction	5
MRc2	Building product disclosure and optimization - environmental product declarations	2
MRc3	Building product disclosure and optimization - sourcing of raw materials	2
MRc4	Building product disclosure and optimization - material ingredients	2
MRc5	Construction and demolition waste Mgmt	2

INDOOR ENVIRONMENTAL QUALITY — POSSIBLE: 16

EQp1	Minimum IAQ performance	REQUIRED
EQp2	Environmental tobacco smoke control	REQUIRED
EQc1	Enhanced IAQ strategies	2
EQc2	Low emitting materials	3
EQc3	Construction IAQ Mgmt plan	1
EQc4	IAQ assessment	2
EQc5	Thermal comfort	1
EQc6	Interior lighting	2
EQc7	Daylight	3
EQc8	Quality views	1
EQc9	Acoustic performance	1

INNOVATION — POSSIBLE: 6

INc1	Innovation	5
INc2	LEED Accredited Professional	1

REGIONAL PRIORITY — POSSIBLE: 4

RPc1	Regional priority	4

TOTAL	110

40-49 Points	50-59 Points	60-79 Points	80+ Points
CERTIFIED	SILVER	GOLD	PLATINUM

LEED v4 Material Disclosure and Optimization Credits

Total 2 points possible (achieve both or either)

Requirements	Material Ingredient Reporting Credit OPTION 1 (1 LEED point)	Material Optimization Credit OPTION 2 (1 LEED point)
✓ 20 different permanently installed products (≥ 5 mfrs.)	YES	NO
✓ 25% of permanently installed building products by cost	NO	YES
✓ Disclosure level for ingredients (via product inventory)	1000 ppm	100 ppm

LEED v4 Credit Language for Option 1

Requirements

Option 1. material ingredient reporting (1 point)

Use at least 20 different permanently installed products from at least five different manufacturers that use any of the following programs to demonstrate the chemical inventory of the product to at least 0.1% (1000 ppm).

- Manufacturer Inventory. The manufacturer has published complete content inventory for the product following these guidelines:
  - A publicly available inventory of all ingredients identified by name and Chemical Abstract Service Registration Number (CASRN)
  - Materials defined as trade secret or intellectual property may withhold the name and/or CASRN but must disclose role, amount and GreenScreen benchmark, as defined in GreenScreen v1.2.
- Health Product Declaration. The end use product has a published, complete Health Product Declaration with full disclosure of known hazards in compliance with the Health Product Declaration open Standard.
- Cradle to Cradle. The end use product has been certified at the Cradle to Cradle v2 Basic level or Cradle to Cradle v3 Bronze level.

- *USGBC approved program. Other USGBC approved programs meeting the material ingredient reporting criteria.*

LEED v4 Credit Language for Option 2

Requirements

Option 2: material ingredient optimization (1 point)

Use products that document their material ingredient optimization using the paths below for at least 25%, by cost, of the total value of permanently installed products in the project.

- GreenScreen v1.2 Benchmark. Products that have fully inventoried chemical ingredients to 100 ppm that have no Benchmark 1 hazards:
  - If any ingredients are assessed with the GreenScreen List Translator, value these products at 100% of cost.
  - If all ingredients are have undergone a full GreenScreen Assessment, value these products at 150% of cost.
- Cradle to Cradle Certified. End use products are certified Cradle to Cradle. Products will be valued as follows:
  - Cradle to Cradle v2 Gold: 100% of cost
  - Cradle to Cradle v2 Platinum: 150% of cost
  - Cradle to Cradle v3 Silver: 100% of cost
  - Cradle to Cradle v3 Gold or Platinum: 150% of cost
- International Alternative Compliance Path – REACH Optimization. End use products and materials that do not contain substances that meet REACH criteria for substances of very high concern. If the product contains no ingredients listed on the REACH Authorization or Candidate list, value at 100% of cost.

- ***USGBC approved program***. *P*roducts that comply with USGGBC approved building product optimization criteria.

Understanding Ingredients, Hazards and Product Impacts

Product Content Inventory

What is inside?

Ingredient Hazard List Screening

Is it a listed hazard?

What else do we know about the hazards?

Ingredient Hazard Full Assessment

What are the other product impacts?

C2C Product Assessment

Understanding Ingredients, Hazards and Product Impacts

DIY

Product Content Inventory

Ingredient Hazard List Screening

Ingredient Hazard Full Assessment

C2C Product Assessment

GS Profiler or C2C Assessor

GreenScreen Centric Compliance Pathways: Material Ingredient Reporting

Material Ingredient Reporting (1 point)

- (DIY) Do It Yourself!
  - Manufacturers can earn **disclosure credit** by using HPD to disclose (inventory to 1000ppm)
  - Manufacturers can earn **disclosure credit** by fully disclosing material ingredients (inventory to 1000ppm)- NO trade secret ingredients

All supporting resources at: www.greenscreenchemicals.org

GreenScreen Centric Compliance Pathways: Material Ingredient Reporting

Material Ingredient Reporting (1 point)

- Use GreenScreen Profiler
  - Manufacturer Option -- **assess those ingredients that are trade secret** using full GreenScreen method (conceal chemical identity but disclose function, amount and GS Benchmark score in redacted GS template); supplement disclosure on non-trade secret ingredients.

All supporting resources at: www.greenscreenchemicals.org

GreenScreen Centric Compliance Pathways: Material Ingredient Optimization

Material Ingredient Optimization (1 point)

Products valued at 100% of cost

- (DIY) Do It Yourself!
  - Earn **optimization credit** by screening ingredients with GS List Translator (inventory to 100ppm)
    - Use HPD Builder which is linked to GS List Translator via Pharos Chemical and Material Library (CML) or use GS List Translator directly
    - Earn credit for products with No LT-1 or LT-P1 chemicals.
      - Print report as documentation.

GreenScreen Centric Compliance Pathways: Material Ingredient Optimization

Material Ingredient Optimization (1 point)

Products valued at 100% of cost

- Use GS Profiler
  - For **products containing LT-P1 (Possible Benchmark 1)** chemicals, engage GS Profiler to resolve relevant endpoints and report results

GreenScreen Centric Compliance Pathways: Material Ingredient Optimization

Material Ingredient Optimization (1 point)

Products valued at 150% of cost

- Use GS Profiler Only
  - Earn **optimization credit by** engaging GS Profiler to screen ingredients using full GreenScreen method (inventory to 100ppm); Credit for product with no Benchmark 1 chemicals

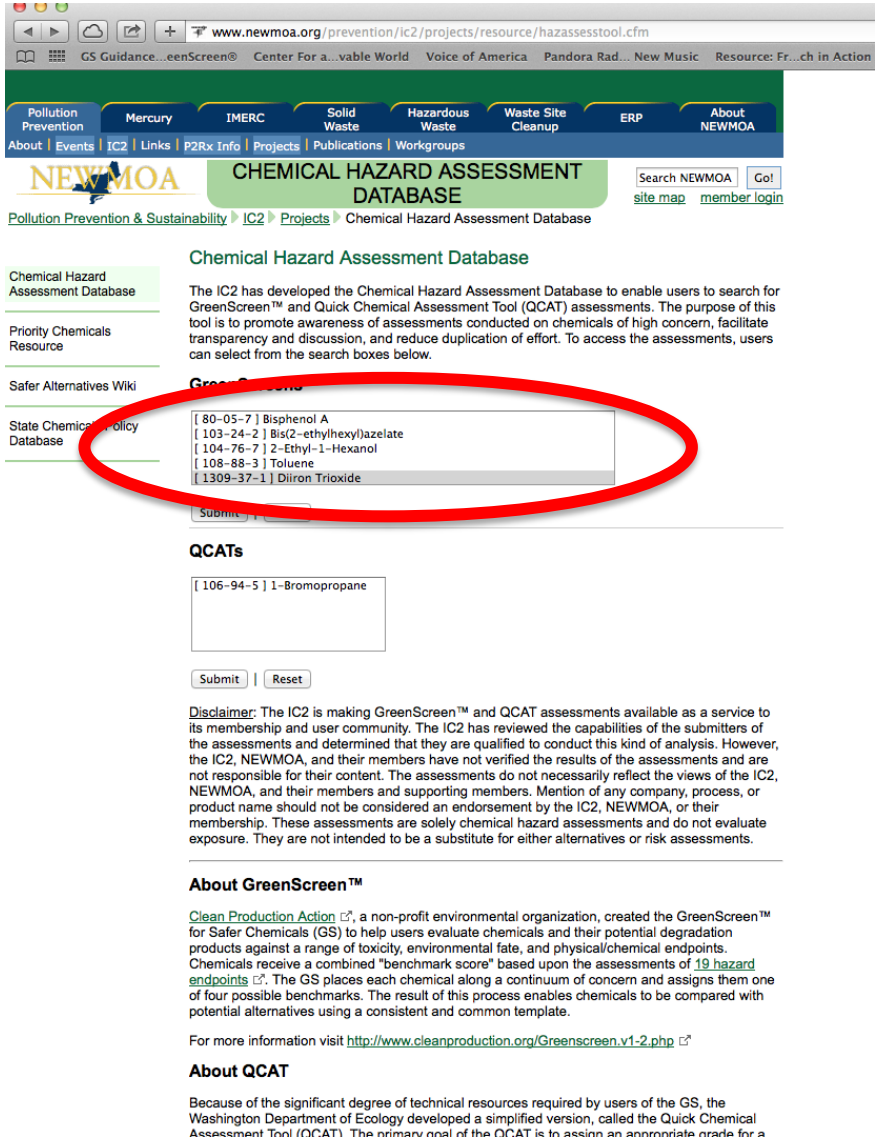
Training and Assessment Resources

- Training opportunities
  - Upcoming 1-Day Workshops in Cleveland (April 3) Buffalo (June 4)
  - Customized trainings available
  - Certified Practitioner Program; starting soon.
  - See GreenScreen website for webinars, continuing education credit, etc.

- Value of engaging a licensed GS Profiler
  - Qualified to perform full GS assessments
  - Resolve GS List Translator Possible Benchmark 1 (LT-P1) classifications
  - Obtain and protect supplier CBI

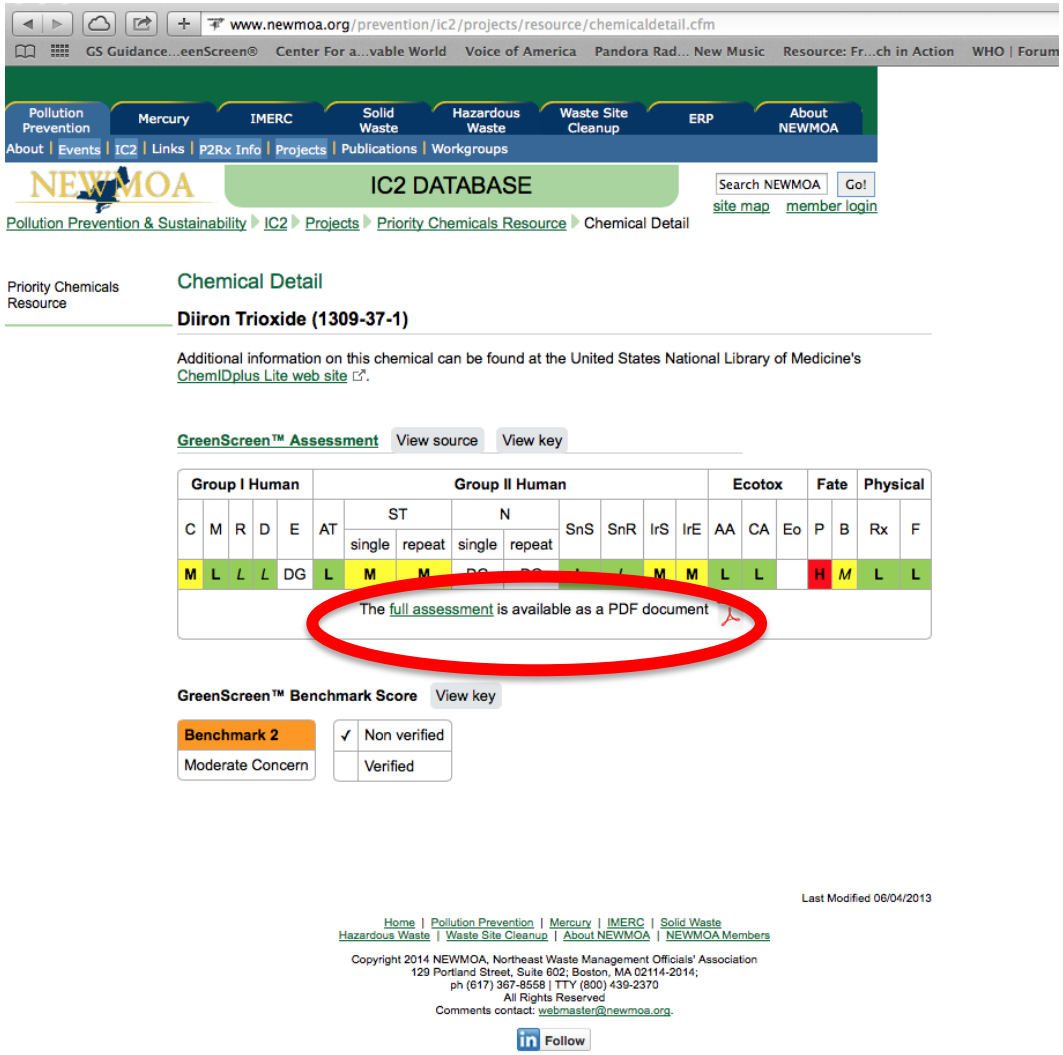
- Licensed Profilers include:
  - ToxServices LLC
  - NSF International
  - SciVera Services

GreenScreen Repositories



http://www.newmoa.org/prevention/ic2/projects/resource/hazassesstool.cfm

GreenScreen Repositories



GreenScreen™ Assessment for Diiron Trioxide (CAS# 1309-37-1)

GreenScreen™ Version 1.2 Criteria, Information Sources and Specified Lists - Draft Assessment
Note: Validation Has Not Been Performed on this Green Screen Assessment

Chemical Name: Diiron Trioxide (Fe2O3)

Green Screen Assessment Prepared By:
Name: Patricia Beattie, PhD, DABT
Title: Vice President
Organization: SciVera, LLC
Date: August 8, 2012
Revised: September 10, 2013

Quality Control Performed By:
Name: Wiebke Droege, PhD
Title: Director, Research
Organization: SciVera LLC
Date: August 8, 2012

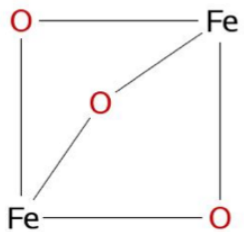
Confirm application of the *de minimus* rule[1]: (if no, what *de minimus* did you use?) Yes

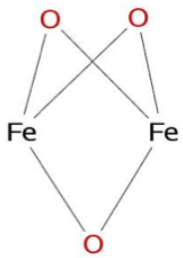
Chemical Name (CAS #): Diiron Trioxide (CAS# 1309-37-1)

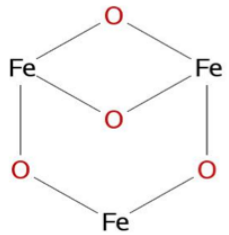
Also Called: Ferric Oxide, Hematite, C. I. Pigment 101, Red Iron Oxide, Iron(III)oxide, C.I. 77491, Red Iron Oxide 190, Iron Oxide (Fe2O3), Bayferrox 130, Blood stone

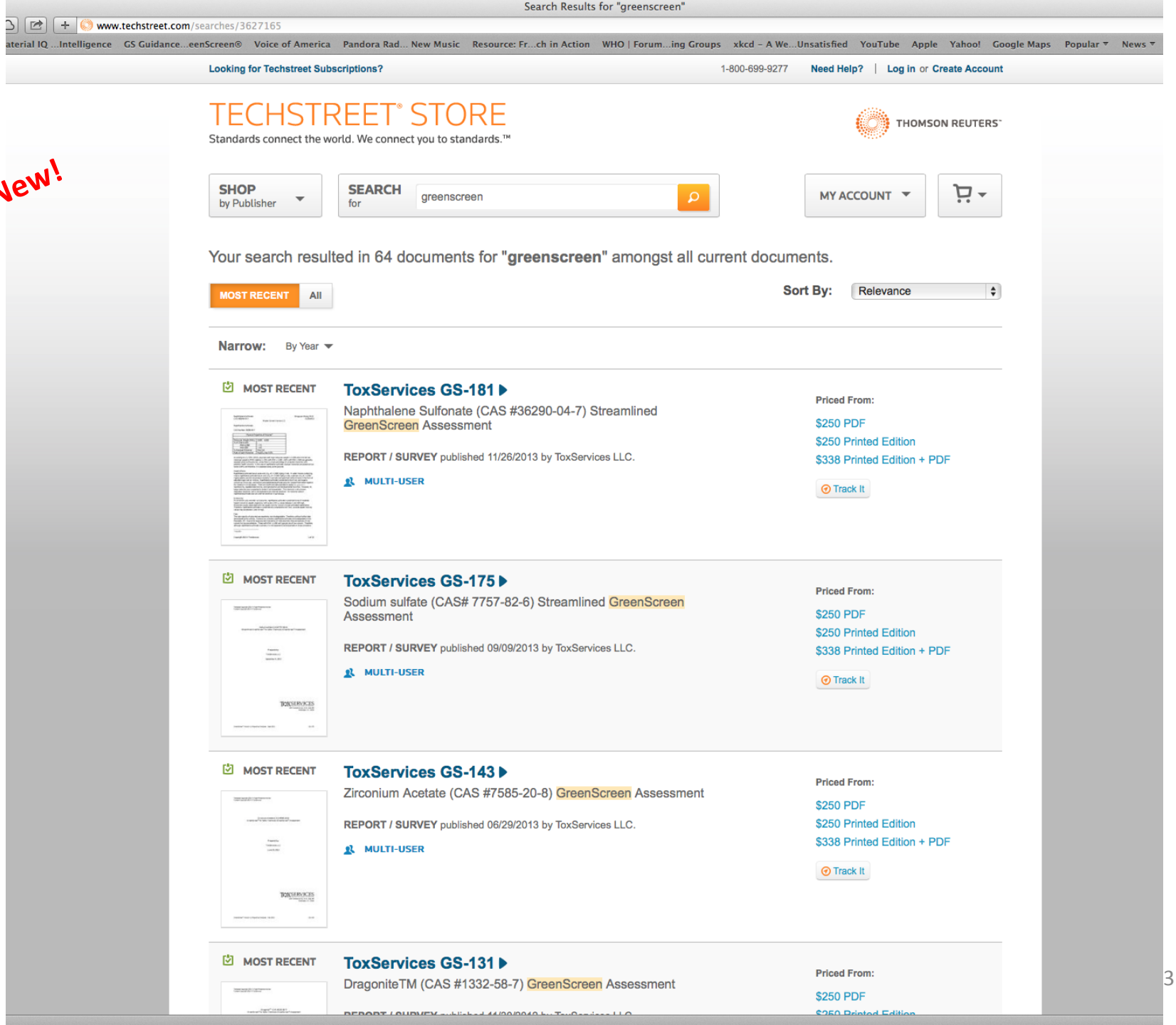
Chemical Surrogates, analogs or moieties used in this assessment (CASs #): Triiron tetraoxide (Fe3O4, CAS# 1317-61-9)

Chemical Structure(s):
*Note: Include chemical structure(s) of all surrogates, analogs (and /or moieties) used in the assessment.





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MOST RECENT
All
Sort By: Relevance
Narrow: By Year
MOST RECENT
ToxServices GS-181
Naphthalene Sulfonate (CAS #36290-04-7) Streamlined GreenScreen Assessment
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ToxServices GS-175
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New!

Summary

- GreenScreen is a versatile chemical hazard assessment method that is open, transparent, freely available and scientifically credible – builds on DfE, GHS, and other national and international precedents.
- It is being integrated into standards, ecolabels, alternatives assessment guidance, product design, development and procurement
- Working to make it accessible via different options including “DIY” and licensed third parties GS Profilers
- USGBC LEED v4 credits for ingredient disclosure and optimization are increasing demand for greater transparency of ingredients and associated hazards and setting the stage for product optimization to promote greater health and safety in the build environment.

Contact Information

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