How Top Companies are Using GreenScreen

Hewlett-Packard Inc. and Steelcase

Webinar 1 - February 22, 2017
Clean Production Action

Together, we’re creating a safer and healthier future
Webinar Objectives

• Hear directly from leading businesses that use GreenScreen for Safer Chemicals about the value of GreenScreen to their business.
• Become familiar with GreenScreen training courses available to you, and the value of the training courses to attendees.
Webinar Agenda

1. Introduction to GreenScreen
2. Industry Speakers
   – Jon Smeija, Steelcase
   – Cory Robertson, Hewlett-Packard Inc.
3. GreenScreen Training Offerings
4. Questions & Answers
Everyone Chooses Chemicals

- Chemicals are building blocks
- Chemical selection
  1. Direct
  2. Indirect
Why Consider Chemical Hazard when Choosing Chemicals?

Avoid business risks
• Regulatory
• Financial
• Reputational

Save money
Example: Business Risk
Lots to Consider
Chemical Hazard is Complex

1. How toxic?

2. To humans? In what way(s)?

3. To the environment?
GreenScreen provides a simple and consistent way to talk about chemical hazard.

- **Benchmark 1**: Avoid – Chemical of High Concern
- **Benchmark 2**: Use but Search for Safer Substitutes
- **Benchmark 3**: Use but Still Opportunity for Improvement
- **Benchmark 4**: Prefer – Safer Chemical
- **Benchmark U**: Unspecified due to insufficient data
Hazard First Approach

Risk is a function of hazard and exposure

Reduce Risk by Reducing Hazard as a Priority

Hazard Assessment answers the question:
Which chemical is inherently safer/lower hazard?
Value of Hazard First Approach

“A basic premise of Green Chemistry is that chemical risk is most effectively managed by reducing hazards because exposure controls can and do fail, products are used in unintended ways and end-of-life management of obsolete equipment is often problematic.”


E-waste end of life fate and dioxin generation is a global concern (POPs)
GreenScreen Tools for Chemical Hazard Assessment

1. GreenScreen List Translator
   - Identifies many problematic chemicals
   - Review of lists only
   - Minimal time and expertise
   - Automated databases available

2. GreenScreen for Safer Chemicals
   - Identifies all problematic chemicals and safer alternatives
   - Review of all data and information
   - High level of time and expertise required to assess
Why GreenScreen?

• GreenScreen simplifies complex information.  
  – It is designed to effectively identify and communicate the overall hazard profile of chemicals in a product or raw material.

• GreenScreen charts a path to safer chemicals economy.  
  – The information output from this tool offers a clear pathway for assessing and decision making with respect to substituting safer chemicals and mitigating risk.

• GreenScreen builds confidence and collaboration in the supply chain.  
  – This tool helps ensure the trust and confidence paramount to customer expectations for the safest products and materials.
Key Attributes of GreenScreen

- Transparent
- Comprehensive
- Scientifically robust
- Hazard-based
- Requires rigorous disclosure
- Developed by an NGO
Key Attributes of GreenScreen Results

• Offers standard approach for comparing chemicals based on intrinsic hazards
• Identifies hazardous chemicals AND safer alternatives
• Summarizes complex hazard information into straightforward Benchmarks that facilitate clear communication
• Provides information to avoid regrettable substitutions
• Provides information to avoid unintended consequences
Steelcase and GreenScreen

Jon Smieja, PhD
Sustainable Design & Development Leader
Steelcase: An Overview

For over 100 years, Steelcase Inc. has helped create great experiences for the world’s leading organizations, across industries. We offer a comprehensive portfolio of architecture, furniture and technology products and services designed to unlock human promise and support social, economic and environmental sustainability. We are globally accessible through a network of channels, including over 800 dealer locations. Steelcase is a global, industry-leading and publicly traded company with fiscal 2016 revenue of $3.1 billion. We demonstrate all this through our family of brands – Steelcase, Coalesse, Designtex, PolyVision and turnstone.
My role at Steelcase

• Joined the Global Sustainability team in 2013 in the role of Environmental Chemist
• In that role, served to connect with suppliers, product development teams, and customers on all things chemistry, hazard and toxicity
• Have since transitioned, slightly, to a Leader of Sustainable Design and Development role
• Now I lead our North American team responsible for product sustainability (chemistry/toxicity, life cycle assessments, recyclability, circular economy, etc.)
Drivers for GreenScreen

NOW
• Quick screens of chemicals
• Customer demands
• Product development questions… this material or that material?

FUTURE
• Regulatory demands
• Larger scale deployment of GreenScreen?
How Steelcase selected GreenScreen

• I participated in a full day GreenScreen training at a conference in Chicago before I got my job at Steelcase, and brought that experience with me.

• At Steelcase, we have a 10+ year history of working with the Cradle to Cradle program and assessing our materials and have >1,800 materials assessed and 50+ products certified.

• Our internal aspirations as well as demands from customers brought us to GreenScreen as a methodology because it is robust, transparent, and widely accepted in the market. We needed a way to tell our story in our own words.
How Steelcase uses GreenScreen

- Steelcase uses GreenScreen in some fashion every day:
  - What are the toxicity endpoints for this chemical?
  - What data exists to support that endpoint designation?
  - Between these two options, which chemical has a more favorable toxicity profile?
  - Are the claims we (and our competitors) are making supported by the data?
- We also use GreenScreen assessments completed by others as a means to compare chemicals. If looking beyond the benchmark score itself, expertise is needed to dig into the data by endpoint.
Steelcase has long been concerned about the chemicals in our products and how they affect environments and the people in them.

GreenScreen provides us with a tool to communicate our challenges, our progress, and our ideas about materials chemistry.
TO ME:
• More language to speak across industries
• Get brought into a lot of discussions as a result and have something to contribute
• More effective in my job

TO STEELCASE:
• Able to quickly screen chemicals to weed out worst actors and put data behind arguments to optimize
• Provides credibility to turning down other programs and propositions
Thank You
HP Inc.’s use of GreenScreen®

Cory Robertson
Environmental Chemist
Sustainability & Product Compliance Organization
February 2017
About HP

- Electronics Sector
- $50B revenue
- Consumer, SMB & Enterprise
- ~50,000 employees
- HP shipped 64M PCs and 52M Printers in 2010
- 14,400 per hour
My Role at HP

• Environmental Chemist
• Materials Sustainability and Compliance Org.
• Subject Matter Expert for materials
  - Restricted Substances
  - Alternative Materials
  - Substances of Concern (example REACH SVHCs)
• Battery Compliance
Restriction of Hazardous Substances Directive (RoHS)

The Law That Changed Everything
EU 2006

- Lead (Pb)
- Mercury (Hg)
- Cadmium (Cd)
- Hexavalent Chromium (Cr\(^{6+}\))
- Polybrominated Biphenyls (PBB)
- Polybrominated Diphenyl Ethers (PBDE)

Are the alternatives better?

Logo from companion regulation
Waste Electrical and Electronic Equipment (WEEE) Directive
More Regulations Coming

Substance restrictions have become a major class of regulation for finished electronic products

- More substances
- More jurisdictions
- More reporting

HP wants to use materials no one cares about (plug for Chemical Footprint Project)
Avoiding extra substitutions saves money

DEHP

Any unrestricted

- Phthalate 1: $X
- Phthalate 2: $X
- Non-phthalate: $X

Transition Costs

$3X

Incrementally better

- Phthalate 1: $X
- Non-phthalate: $X

$2X

Best

Non-phthalate: $X

$1X
Why GreenScreen®?

Aligns with Regulators

<table>
<thead>
<tr>
<th>Chemical</th>
<th>CASRN</th>
<th>Acute Toxicity</th>
<th>Skin Sensitizer</th>
<th>Cancer Hazard</th>
<th>Immunotoxicity</th>
<th>Reproductive</th>
<th>Developmental</th>
<th>Neurological</th>
<th>Systemic</th>
<th>Genotoxicity</th>
<th>Acute</th>
<th>Chronic</th>
<th>Persistence</th>
<th>Bioaccumulation</th>
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<tbody>
<tr>
<td>Additive Flame Retardants³</td>
<td></td>
<td></td>
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<td></td>
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<td></td>
<td></td>
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<td></td>
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<tr>
<td>Aluminum hydroxide</td>
<td>21645-51-2</td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>H</td>
<td>M</td>
<td>H²</td>
<td>L</td>
<td></td>
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</tr>
<tr>
<td>Exolit OP 930 (phosphoric acid, diethyl, aluminum salt) (Clariant)</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>H²</td>
<td>L</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Melapur 200 (Melamine polyphosphate) (Ciba)⁴</td>
<td></td>
<td>L</td>
<td>L</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>L</td>
<td>M</td>
<td>M</td>
<td>H²</td>
<td>L</td>
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<tr>
<td>Melapur 200</td>
<td>21870-84-4</td>
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<td>Polyphosphoric acid</td>
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<td>Melamine</td>
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<tr>
<td>Silicon dioxide amorphous⁵</td>
<td>7631-86-9</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>L</td>
<td>H²</td>
<td>L</td>
<td>L</td>
<td>H²</td>
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<tr>
<td>Silicon dioxide crystalline⁵</td>
<td>1317-95-9</td>
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<td>H¹</td>
<td>L</td>
<td>L</td>
<td>H²</td>
<td>H¹</td>
<td>L</td>
<td>L</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

GHS
Why GreenScreen®?

• Meaningful results

• Many faces of the GreenScreen®
  • Open source, anyone can use the method
  • Training available for Authorized GreenScreen Practitioners
  • 3rd Party assessors available
  • Certified assessments are available to suppliers

• Simple 1 to 4 score and scientifically robust
Procurement is Very Good with Numbers

$1

$2
You get a raise!

$1

$2
Not as Good with Environmental Criteria

Aquatic Toxicity

R50/53

Bioaccumulation

Persistent

LD50 = 2150mg/kg

Mutagenicicy
Helps Procurement Make Decisions

Benchmark 4
$1

Benchmark 2
$1
You get a raise!

Benchmark 4

Benchmark 2
PVC-Free Power Cord
GreenScreen® Pilot
Circa 2009

- PVC being phased out voluntarily
- GreenScreen® mandatory, in addition to all standard and regulatory requirements
- Full disclosure under CDA
- Supplier Training
- Over 30 materials screened
- Approved material list
What has changed?

If we articulate environmental requirements to our suppliers we get better materials
## Ecolabels

### TCO Certified Accepted Substances List

<table>
<thead>
<tr>
<th>Substance name</th>
<th>CAS</th>
<th>Benchmark</th>
<th>Sunset date</th>
<th>Report public</th>
<th>Comments</th>
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</thead>
<tbody>
<tr>
<td>Aluminum diethylphosphinate</td>
<td>225789-38-8</td>
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<tr>
<td>Aluminum Hydroxide</td>
<td>21645-51-2</td>
<td>2</td>
<td>-</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Melamine Polyphosphate</td>
<td>15541-60-3</td>
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<td>-</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Poly[phosphonate-co-carbonate]</td>
<td>77226-90-5</td>
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<td>-</td>
<td>Yes</td>
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<tr>
<td>Resorcinol Bis-Diphenylphosphate</td>
<td>125997-21-9; 57583-54-7</td>
<td>2</td>
<td>-</td>
<td>Yes</td>
<td>Interchangeable CAS numbers</td>
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<tr>
<td>Red Phosphorus</td>
<td>7723-14-0</td>
<td>2</td>
<td>-</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Bisphenol A diposphate</td>
<td>181028-79-5; 5945-33-5</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td>Interchangeable CAS numbers</td>
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<tr>
<td>Substituted Amine Phosphate mixture</td>
<td>66034-17-1</td>
<td>2</td>
<td>-</td>
<td>Yes</td>
<td></td>
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<tr>
<td>Triphenyl Phosphate</td>
<td>115-86-6</td>
<td>2</td>
<td>-</td>
<td>Yes</td>
<td></td>
</tr>
<tr>
<td>Tetraakis (2,6-dimethylphenyl)-m-phenylene biphosphate</td>
<td>139189-30-3</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>Siloxanes and silicones, di-Me, di-Ph, polymers with Ph silsesquioxanes</td>
<td>68648-59-9</td>
<td>2</td>
<td>-</td>
<td>-</td>
<td></td>
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<tr>
<td>Ammonium Polyphosphate</td>
<td>68333-79-9</td>
<td>3</td>
<td>-</td>
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<tr>
<td>Magnesium Hydroxide</td>
<td>1309-42-8</td>
<td>3</td>
<td>-</td>
<td>Yes</td>
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<tr>
<td>Polyphosphonate</td>
<td>68664-06-2</td>
<td>3</td>
<td>-</td>
<td>Yes</td>
<td></td>
</tr>
</tbody>
</table>

All substances of a Flame retardant mixture shall be accounted for. Non-accepted components shall not exceed concentration levels of 0.1% by weight of the flame retardant. All substances on this list have been reviewed and the benchmark set by CPA licenced profilers.
Ecolabels
Value of GreenScreen® Training

• Personalized coaching and feedback while conducting GreenScreen assessments for Practicum
• Gained greater appreciation for data preferences and documenting data sources for a high quality assessment
• Adds credibility personally and to GreenScreen® as a whole
• Ecolabel requirements
Future

• Ecolables

• Repository & White Lists

• More Users – Infrastructure needed

• Lots of Benchmark 2 chemicals
  - Superior performance
  - Superior Cost
  - Better for human health & the environment
Thank You!
Education & Training

• Clean Production Action provides a broad range of educational materials in the forms:
  – In-person trainings
  – Live web-based trainings
  – Online trainings
  – Webinars

• Trainings are designed to help you:
  – Reduce your chemical footprint
  – Understand transparency in your supply chain
  – Identify hazardous chemicals and safer alternatives
# GreenScreen Training Offerings

http://www.greenscreenchemicals.org/learn/training

<table>
<thead>
<tr>
<th>GreenScreen for Safer Chemicals</th>
<th>Delivery</th>
<th>Training Hrs</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introductory Webinars</strong></td>
<td>Recording</td>
<td>1 each</td>
<td>FREE</td>
</tr>
<tr>
<td><strong>Introductory Course</strong></td>
<td>Online</td>
<td>6</td>
<td>$599¹</td>
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<tr>
<td><strong>Advanced Topics Course</strong></td>
<td>Live web-based</td>
<td>14</td>
<td>$3000</td>
</tr>
<tr>
<td><strong>Authorized Practitioner Program</strong></td>
<td>Live web-based</td>
<td>20+</td>
<td>$6000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>GreenScreen List Translator</th>
<th>Delivery</th>
<th>Training Hrs</th>
<th>Cost</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Introductory Webinars</strong></td>
<td>Recording or Live</td>
<td>1 each</td>
<td>FREE or $19</td>
</tr>
<tr>
<td><strong>Introductory Course</strong></td>
<td>Live web-based</td>
<td>3</td>
<td>$389</td>
</tr>
<tr>
<td><strong>Introductory Workshop</strong></td>
<td>In-person</td>
<td>6</td>
<td>$79²</td>
</tr>
<tr>
<td><strong>Advanced Course</strong></td>
<td>Live web-based</td>
<td>3</td>
<td>$425</td>
</tr>
</tbody>
</table>

¹- This course is currently FREE to you for a limited time due to generous funding from California Department of Toxic Substances Control and a USEPA Pollution Prevention Grant.
²- This course is offered at a nominal fee and is sponsored by Washington State Department of Ecology and a Foundation grant.
Upcoming Trainings

1. **GreenScreen Advanced Topics Course**
   - Register NOW until March 15
   - Offered once per calendar year
   - 2017 Course starts April 17
   - Online Introductory Course as prerequisite
   - NEW “A la carte” offering by topic of interest

2. **Authorized GreenScreen Practitioner Program**
   - Apply NOW until March 15
   - Professional credentialing
   - Support your organization in reducing cost, increasing sales, and reducing risk
   - Several bullets above also apply

3. **GreenScreen List Translator Workshop**
   - March 15 in Seattle, WA
   - June 6 in Portland, OR
Question & Answer
Contact Us

Website: [http://www.greenscreencleanproduction.org/](http://www.greenscreencleanproduction.org/)

GreenScreen Email: [greenscreen@cleanproduction.org](mailto:greenscreen@cleanproduction.org)

Training Email: [training@cleanproduction.org](mailto:training@cleanproduction.org)

Shari Franjevic

*Education & Training Leader*

[Shari@cleanproduction.org](mailto:Shari@cleanproduction.org)
Thank You for Participating!

How Top Companies are Using GreenScreen

Next Webinar in the series:
Webinar 2 - February 28, 2017
GOJO, Roxul, Valspar