The Changing Materials Landscape: Emerging Trends in Green Buildings

Bill Walsh, Executive Director
Healthy Building Network

The Next Five Years in Fire and Electrical Safety
Washington, DC November 13, 2013
Fire Safety Challenges of Green Buildings

Final Report

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THE FIRE PROTECTION RESEARCH FOUNDATION
Research in support of the NFPA mission
Most Important Rating System You’ve Never Heard Of

- Nearly 100 Projects
- Performance-Based
- Zero Net Energy
- Zero Net Water
- Materials “Red List”
- Requires Active Engagement
Materials Red List

Mercury
Lead
Cadmium
Chlorinated Products
Formaldehyde
Halogenated Fire Retardants
& more
The project obtained code variances for solar and water systems as part of a city pilot program to encourage the development of ultrahigh-performance buildings.
Unprecedented Emphasis On Materials & Human Health

Nov. 2012  $3 million Google Grant to USGBC To Promote Healthy Building Materials

Jan. 2013  Human Health & Well Being Summit

Jul. 2013  LEED v4 Passes Member Ballot

Aug. 2013  Five LEED Senior Fellows Appointed with materials expertise

Nov. 2013  Materials & Human Health Summit

Nov. 2013  LEED v4 Launch & more
LEED v.4 Materials Credits

MRc = Materials & Resources credit
EQ = Environmental Quality credit

• MRc2 – How was it made?
• MRc3 – Where did it come from?
• MRc4 – What is inside?
• EQ c2 – What is emitted?
Option 1 - Declaration (1 point)
(Manufacturer disclosure)

Option 2 - Optimization (1 point)
(Better products)
New Reporting System: Health Product Declaration

Standardized Reporting Format – Not a Rating System
The Big Idea!

Ingredients: Dehydrated Potatoes, Modified Food Starch, Corn Oil, Sugar, Salt, Soy Lecithin, Leavening (Monocalcium Phosphate and Sodium Bicarbonate), and Dextrose. No Preservatives.

Nutrition Facts
Serving Size 1 oz. (28g/About 10 crisps)
Servings Per Container 10

Amount Per Serving
Calories 120 Calories from Fat 30

% Daily Value*
Total Fat 3g 5%
  Saturated Fat 0g 0%
  Trans Fat 0g
Cholesterol 0mg 0%
Sodium 200mg 8%
Total Carbohydrate 21g 7%
  Dietary Fiber 2g 6%
  Sugars 2g
Protein 2g

Vitamin A 0% • Vitamin C 6%
Calcium 4% • Iron 0%
Thiamin 4% • Niacin 6%
Vitamin B6 4% • Phosphorus 8%
Zinc 2%

* Percent Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or lower depending on your calorie needs:
  Calories: 2,000 2,500
  Total Fat Less than 65g 80g
  Sat Fat Less than 20g 25g
  Cholesterol Less than 300mg 300mg
  Sodium Less than 2,400mg 2,400mg
  Total Carbohydrate 300g 375g
  Dietary Fiber 25g 30g

Calories per gram:
  Fat 9 • Carbohydrate 4 • Protein 4
Standardized reporting format for each ingredient:

- Substance name
- Health Hazard Warnings (authoritative listings)
- CAS number (or species)
- % of weight of the product
- GreenScreen Benchmark
- Recycled content
- Uses nanotechnology
- Role or function

<table>
<thead>
<tr>
<th>Ingredient Name</th>
<th>CAS number</th>
<th>% Weight</th>
<th>GS</th>
<th>RC</th>
<th>r</th>
<th>Role or function</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphenol A diglycidyl ether (BADGE)</td>
<td>293733-21-8</td>
<td>35-42.6%</td>
<td>P1</td>
<td>No</td>
<td>No</td>
<td>Resin</td>
</tr>
<tr>
<td>Alkyl (C12, C14) Glycidyl Ether</td>
<td>66609-97-2</td>
<td>16.52-20.3%</td>
<td>P1</td>
<td>No</td>
<td>No</td>
<td>Viscosity reducer</td>
</tr>
<tr>
<td>Phenyl Glycidyl Ether</td>
<td>122-60-1</td>
<td>10-12%</td>
<td>BM1</td>
<td>No</td>
<td>No</td>
<td>Diluent</td>
</tr>
<tr>
<td>ACME Zap It</td>
<td>Unknown</td>
<td>6.0%</td>
<td>No</td>
<td>No</td>
<td></td>
<td>Antimicrobial</td>
</tr>
</tbody>
</table>

Example data for different ingredients with specific health hazard warnings and properties.
Summary

- All ingredients disclosed?
- All hazards disclosed?
- Level of residuals disclosed?
- Explanation

Ajax is committed to full disclosure and intends to reformulate with disclosed ingredients by 2014.
<table>
<thead>
<tr>
<th>Ingredients</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Bisphenol A diglycidyl ether, Kaolin, Phenyl Glycidyl Ether, Butyraldehyde, Acme Zap-It, Electronics, Mixed hardware, Formaldehyde, Palladium.</td>
<td></td>
</tr>
</tbody>
</table>

**Summary of hazards**

- PBT (Persistent Bioaccumulative Toxic)
- Cancer
- Gene mutation
  - Development
  - Reproductive
  - Endocrine
  - Aquatic toxicity

**List of certifications**

- SCAQMD Rule 1113
- Indoor Advantage - Gold (Residential)
- Cradle to Cradle - Silver
Open Format: Freely Available To All
Customer-Led “Open Innovation”

**LEED Material Credit Strategy**

**Option 1 - Declaration** (1 point)
(Manufacturer disclosure)

**Option 2 - Optimization** (1 point)
(Better products)

- **Innovation**
- **Necessitates Reporting**
- **Evaluation Enables**
- **Selection**

**Evaluation Enables Preferential Selection**

**Preferential Selection Guides Innovation**
1 YEAR LATER

- HPD Collaborative Board of Directors = $45 million Annual Billings
- Referenced by LEED and Living Building Challenge
- 20+ Leading Companies Requiring HPDs
- 40 Manufacturing Companies Recruited to HPD Collaborative Manufacturer’s Advisory Board
Our Sponsors

Level 5
- ASID Foundation
- The Burset Organization
- HDR
- Interface
- SmithGroup JJR

Level 4
- Google
- Pankow

Level 3
- ASSA ABLOY
- Perkins+Will
- Turner

Level 2
- CannonDesign
- ProSoco
- SOM

Level 1
- CertainTeed
- Fyfe
- Shaw
“...life cycle assessment, chemical hazard assessment and supply chain transparency as part of the new normal for manufacturers in every sector.”
The New Normal

Project Management Tools

Materials Evaluation Tools

green wizard
Search, Compare, Document

Pharos

Green Screen
for Safer Chemicals

Cradle to Cradle® Certified
Welcome to the Sustainable Products Database

UL Environment offers this free resource to help people find more sustainable products and verify UL Environment certification/validation claims. UL Environment is not affiliated with any manufacturer or product.
MH09: Materials and Human Health Summit
Closing Session: How Information Improves Performance

The availability of accurate, comparable data is a necessity for enabling evaluation and decision-making. Two formats for reporting information about building products—what they are made of and how they impact the environment—are Health Product Declarations and Environmental Product Declarations. How have these tools influenced your company or firm's decision-making process? Share you examples of successes and failures.

John Knott, Executive Director, Health Product Declaration Collaborative
Sara Greenstein, President, UL Environment
Scot Hart, Senior Vice President, LEED, U.S. Green Building Council

Designers are constantly searching for the latest advancements in building products and materials. Manufacturers strive to keep pace with that demand.
Search Results for Board Insulation

CSI Masterformat 2004 Designation: 07 21 13

There are 30 products that meet your search criteria.

Filter by Minimum Manufacturer Participation Level
- No Participation
- Participation In Process
- Incomplete Participation
- Complete Using Common Ingredients
- Complete Participation

Filter by Restricted Substance List
- No EPA Chemicals of Concern
- No Living Building Challenge Red List
- No LEED Pilot Credit 11 Chemicals

Filter by Attributes
- No Bisphenol A
- No Added Formaldehyde
- No Phthalates
- No Halogenated Flame Retardants
- No Perfluorocarbons

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Manufacturer</th>
<th>Participation Level</th>
<th>VOC</th>
<th>ToxCon</th>
<th>MfrTox</th>
<th>RnMtrl</th>
<th>RnEnerg</th>
<th>Product Title</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roxul ComfortBatt mineral semi-rigid batt insulation (Grand Forks, BC only)</td>
<td>Roxul</td>
<td>No Manufacturer Participation</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>1</td>
<td>1</td>
<td>Roxul ComfortBatt mineral semi-rigid batt insulation</td>
<td>Grand Forks, BC</td>
</tr>
<tr>
<td>Knauf Insulation Board with Ecore technology (Unfaced)</td>
<td>Knauf Insulation</td>
<td>No Manufacturer Participation</td>
<td>7</td>
<td>1</td>
<td>1</td>
<td>4</td>
<td>1</td>
<td>Knauf Insulation Board with Ecore technology (Unfaced)</td>
<td>No Manufacturer Participation</td>
</tr>
<tr>
<td>FOAMULAR® Rigid Board Insulation</td>
<td>Owens Corning Sales LLC</td>
<td>Complete Manufacturer Participation</td>
<td>7</td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>FOAMULAR® Rigid Board Insulation</td>
<td>Owens Corning Sales LLC</td>
</tr>
<tr>
<td>Roxul ComfortBatt mineral semi-rigid batt insulation (Milton, Ontario only)</td>
<td>Roxul</td>
<td>Manufacturer Participation In Process</td>
<td>7</td>
<td>3</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>Roxul ComfortBatt mineral semi-rigid batt insulation (Milton, Ontario only)</td>
<td>Milton, Ontario only</td>
</tr>
</tbody>
</table>
There are 4 products that meet your search criteria.
New Scrutiny For Halogenated Flame Retardants

LEED v4 optimization credits incentivize reductions in halogenated flame retardants and other chemicals that are persistent, toxic, and also associated with a host of serious adverse health effects including:

- reduced fertility
- sex organ changes
- altered motor behavior
- cancer
- endocrine disruption
- decreased memory
- learning deficits
Ikonomou, MG, S Rayne and RF Addison. 2002.
97% of XPS/EPS in Sweden, Norway is non-flame retarded
19 October 2012, Geneva—A UN expert body has recommended that the industrial flame retardant hexabromocyclododecane (HBCD) be eliminated from the global marketplace to protect human health and the environment.

To date, 21 chemicals banned under Convention in 180 countries.
Flame Retardants Under Fire

Recommendations

Given the many concerns about PBDEs and other halogenated flame retardants, EBN recommends that architects, specifiers, and builders minimize or eliminate the use of all halogenated flame retardants in buildings they work on. The highest-priority products are those made with PBDEs, including decaBDE, but any halogenated flame retardant should be considered suspect until thorough life-cycle toxicity testing has been conducted and the compound is demonstrated to be safe.
Respected building industry leaders calling for changes in fire codes
Chemical Industry credibility suffers as a result of Chicago Tribune exposé on furniture flammability standards
"Citizens for Fire Safety" Smoked Out: Front Group Folds After Exposé

Manufacturers of flame retardant chemicals, an industry that got a boost from Big Tobacco's shadow money decades ago, are being exposed to increased public scrutiny. In the fallout, a front group formed by the three biggest manufacturers, calling itself "Citizens for Fire Safety," has been shuttered.

The Chicago Tribune published its "Playing with Fire" series in May 2012, catapulting highly toxic flame retardants — present in many household consumer products — into the national spotlight. In the process, it not only highlighted the work of a handful of chemists who've been fighting to ban the most toxic of these chemicals, but it also exposed the "deceptive tactics" of the industry's main front group.
Chemical Companies Seek to Limit Federal Green Building

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**Two Steps Forward**

**Will the plastics industry kill LEED?**

By Joel Makower
Published July 19, 2012
Tags: Buildings, Standards & Certification

The latest skirmish in a decade-old battle broke out this week, as 20 trade groups announced a new coalition to challenge the U.S. Green Building Council’s LEED rating system as the dominant standard for buildings. In many respects it’s déjà vu all over again.

The new coalition, the American High-Performance Buildings Coalition, includes the American Chemistry Council, the American Gypsum Association, the American Iron and Steel Institute, the Commercial Vehicle Industry Association, the National Association of Home Builders, and the Tile Council of North America. Its core objective is to convince the council to abandon its preservation of the LEED system, which the coalition claims is biased against its members' materials.
Commentary: Don’t let green standards wither

By mike mcnally, Published: June 30

Construction firms have a responsibility to customers and shareholders, but long-term success requires a longer view. At Skanska, the intersection of that responsibility and profitability is in green buildings, and that’s why we are members of the U.S. Green Building Council and proponents of Leadership in Energy and Environmental Design, the most recognized and widely used green building system in the world. To me, it is inconceivable that a few single-minded businesses are creating a false debate in Washington about LEED and attempting to slow down the green building boom.

A limited number of chemical companies — principally in the booming plastics business — have been hiding behind the American High Performance Buildings Coalition and trying, unsuccessfully, to gut progressive green chemistry provisions of a proposed update to the green standards called LEED v4. The latest version is currently being considered by the building council’s nearly 13,000 members through its transparent public comment and balloting process.
The Changing Materials Landscape: Emerging Trends in Green Buildings

• Definition of Green Changing: Human Health An Emergent Priority

• Dramatically Increased Disclosure Of Chemicals In Materials

• Architects, Designers & Owners Committed To Chemical Hazard Avoidance

• End-Product Manufacturers Committed To Chemical Hazard Avoidance ~ “New Normal”

• Increasing Engagement With Building Codes & Fire Codes

• Join Me In The HPD Collaborative

• Join Me At The Living Future Conference
• Is there a fire safety benefit to chemical flame retardants?
• Are they overused—below grade and behind thermal barriers?
• Do chemical companies have too much influence in testing and standards development?

... reduce the worldwide burden of fire and other hazards on the quality of life
Resources

Healthybuilding.net

Pharosproject.net

Buildinggreen.com

Saferinsulation.org

Greensciencepolicy.org

HPDCollaborative.org

Thank You!