Selecting Building Products — *Alternatives assessment and a precautionary orientation in practice*

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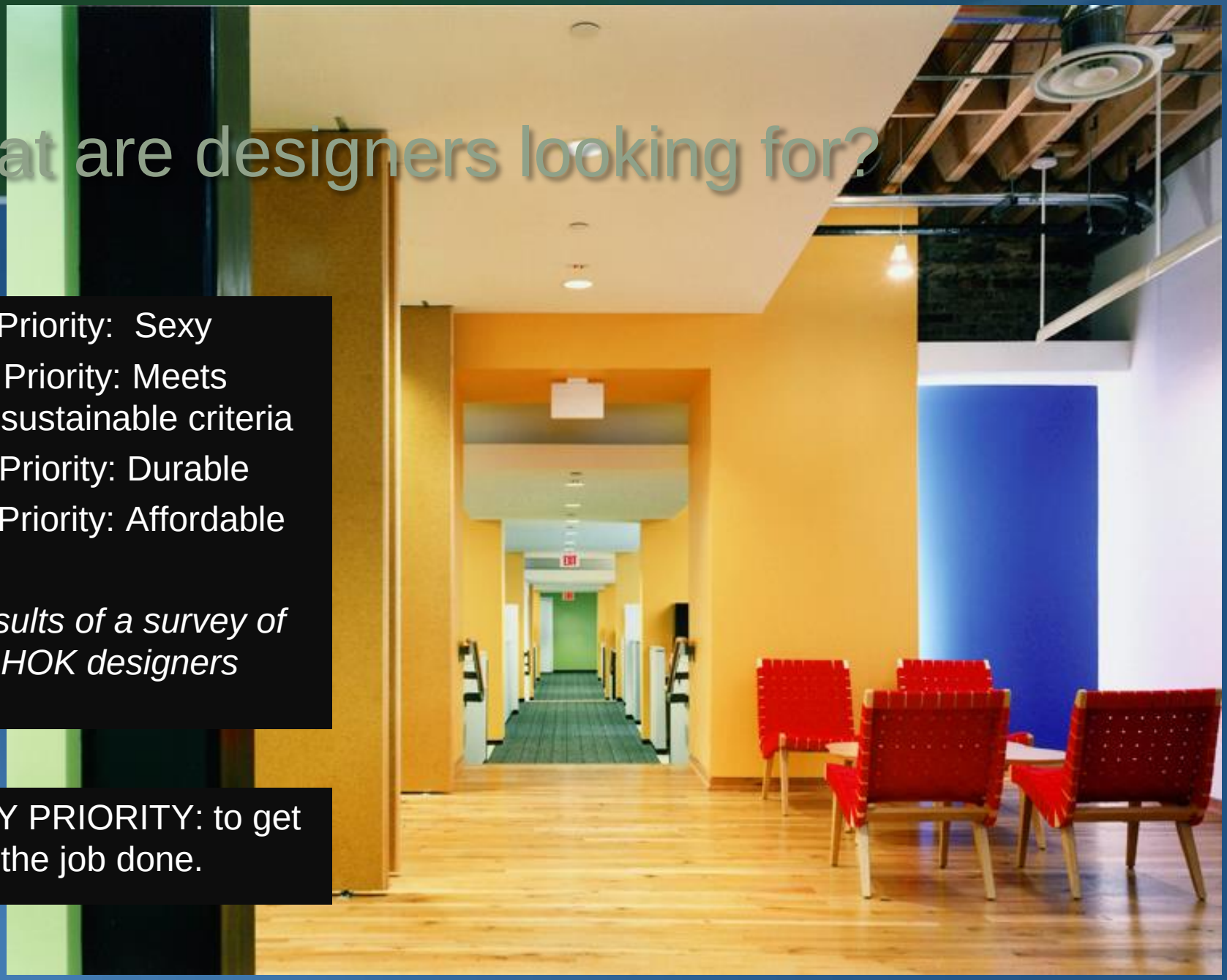
www.BuildingGreen.com

TURA 2009

What are designers looking for?



1st Priority: Sexy

2nd Priority: Meets sustainable criteria

3rd Priority: Durable

4th Priority: Affordable

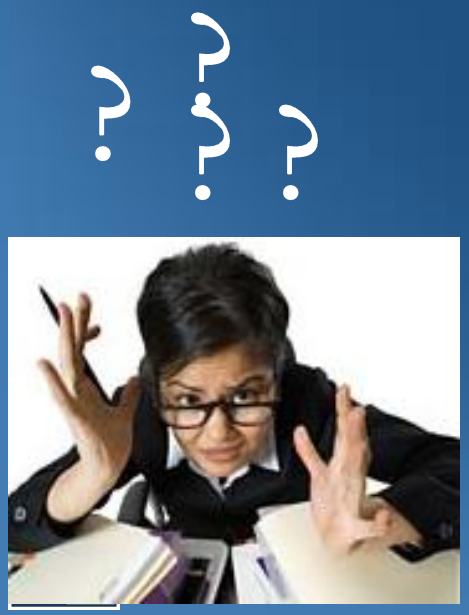
Results of a survey of HOK designers

KEY PRIORITY: to get the job done.

Firm strategies for green product selection

Reactive

- Revert to tried-and-true
- Revert to LEED only
- Toss green product questionnaires



Proactive

- Train staff
- Share knowledge
- Screen the materials library
- Create a ‘red list for specs - and a green list!
- Use buying power

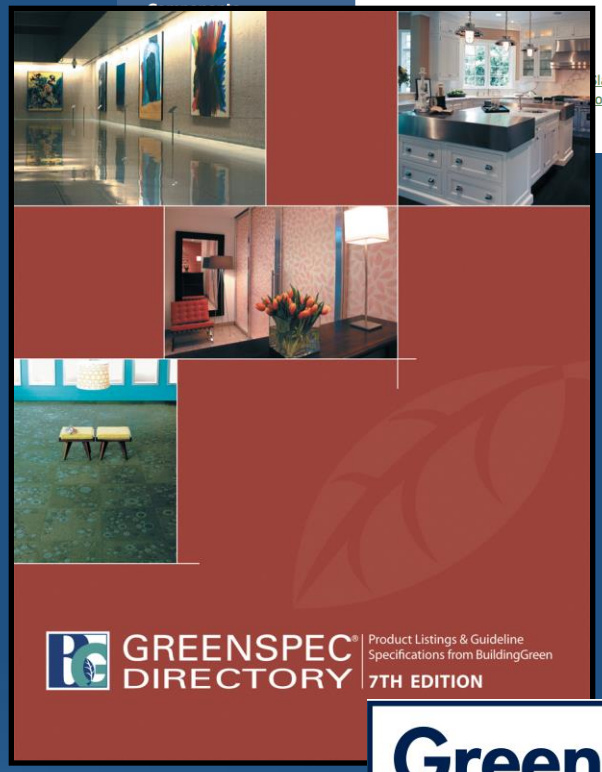
GreenSpec

What it IS:

- Trusted Mark of Approval
- Screened Product Database
- Guide to Product Sectors

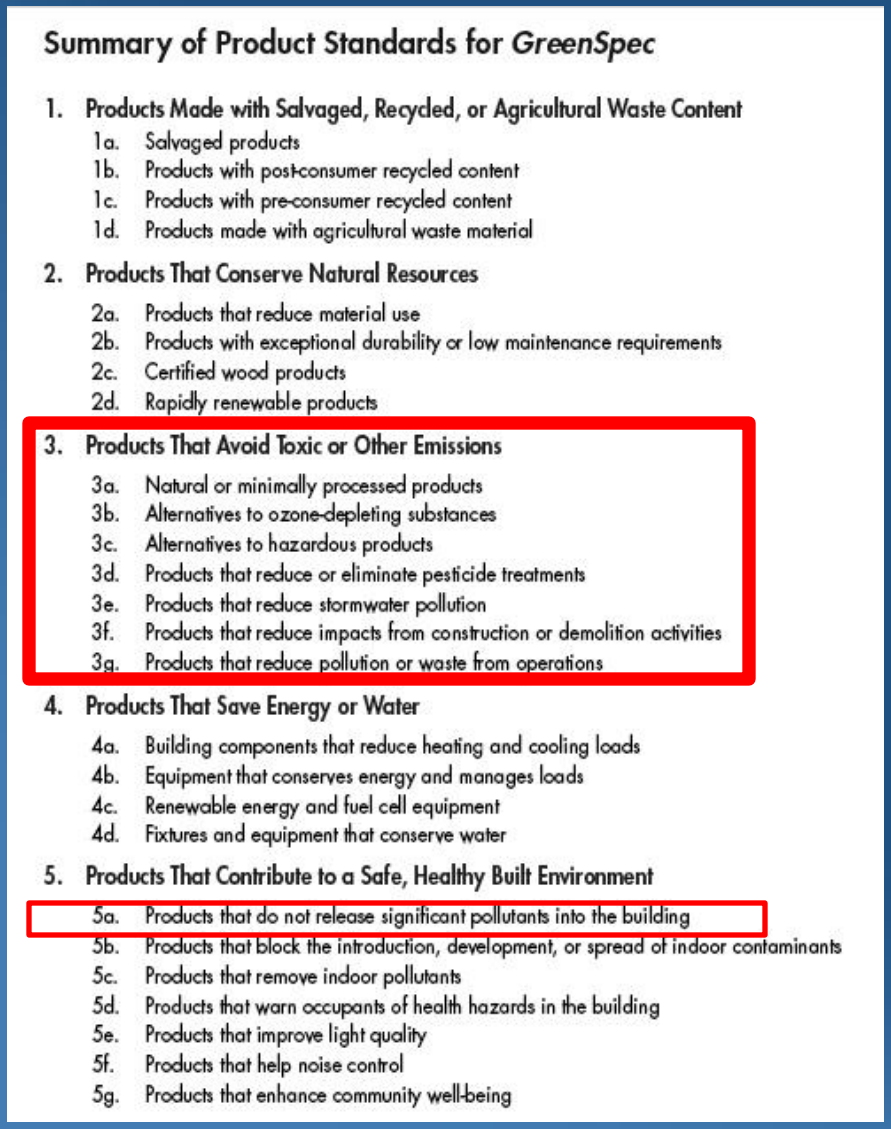
What it is NOT:

- Certification
- Referenced Standard
- Testing Agency



GreenSpec®
LISTED
www.GreenSpec.com

GreenSpec decision process



Summary of Product Standards for *GreenSpec*

1. **Products Made with Salvaged, Recycled, or Agricultural Waste Content**
   - 1a. Salvaged products
   - 1b. Products with post-consumer recycled content
   - 1c. Products with pre-consumer recycled content
   - 1d. Products made with agricultural waste material
2. **Products That Conserve Natural Resources**
   - 2a. Products that reduce material use
   - 2b. Products with exceptional durability or low maintenance requirements
   - 2c. Certified wood products
   - 2d. Rapidly renewable products
3. **Products That Avoid Toxic or Other Emissions**
   - 3a. Natural or minimally processed products
   - 3b. Alternatives to ozone-depleting substances
   - 3c. Alternatives to hazardous products
   - 3d. Products that reduce or eliminate pesticide treatments
   - 3e. Products that reduce stormwater pollution
   - 3f. Products that reduce impacts from construction or demolition activities
   - 3g. Products that reduce pollution or waste from operations
4. **Products That Save Energy or Water**
   - 4a. Building components that reduce heating and cooling loads
   - 4b. Equipment that conserves energy and manages loads
   - 4c. Renewable energy and fuel cell equipment
   - 4d. Fixtures and equipment that conserve water
5. **Products That Contribute to a Safe, Healthy Built Environment**
   - 5a. Products that do not release significant pollutants into the building
   - 5b. Products that block the introduction, development, or spread of indoor contaminants
   - 5c. Products that remove indoor pollutants
   - 5d. Products that warn occupants of health hazards in the building
   - 5e. Products that improve light quality
   - 5f. Products that help noise control
   - 5g. Products that enhance community well-being

+ Critical Assessment

Flexible
"life-cycle thinking"
and life-cycle analysis

Hard thresholds
where appropriate
and available

Judgment calls
frequently necessary

GreenSpec® LISTED
www.GreenSpec.com

Focus on what really matters

	To reduce environmental impact focus on:
Mechanical, Plumbing, Electrical Systems	Efficient operation
Enclosure	Effective moisture and thermal
Massive Structural	Embodied impact
Interior Finish, Non-structural Materials	Indoor emissions Embodied impact

NON NEGOTIABLE: performance

RED ALERT: quantity = big impact

Focus on chemicals varies by product

	How much to pay attention to chemicals?
Mechanical, Plumbing, Electrical Systems **Enclosure** **Massive, Structural** **Interior Finish, Non-structural Materials**	**Sector has other top priorities**. Focus on chemical concerns raised at sector level, and check MSDS of simple products. **Chemicals and emissions are top priority.** Check MSDS and ask about red-list constituents.

GreenSpec process in action

Product Chemical Info

MSDS
Answers on additives, binders...
Redlist questionnaire

Contextual Relevance

Redlists + PBT profiler
GreenScreen + EU
Sector's lifecycle concerns
Availability of alternatives

Possible Outcomes

Present easy alternatives
Accept mixed-bag products
Make a statement

always highlight 'stretch' alternatives

Product LIMBO

low-priority product with uncertainty about a constituent, not enough time or info to clarify, and insufficient understanding of alternatives.

Building Wire and Cable

SMED Access Floor

Issue:

Halogenated flame retardants ubiquitous

Context:

No alternatives

No other differentiating factors

Decision:

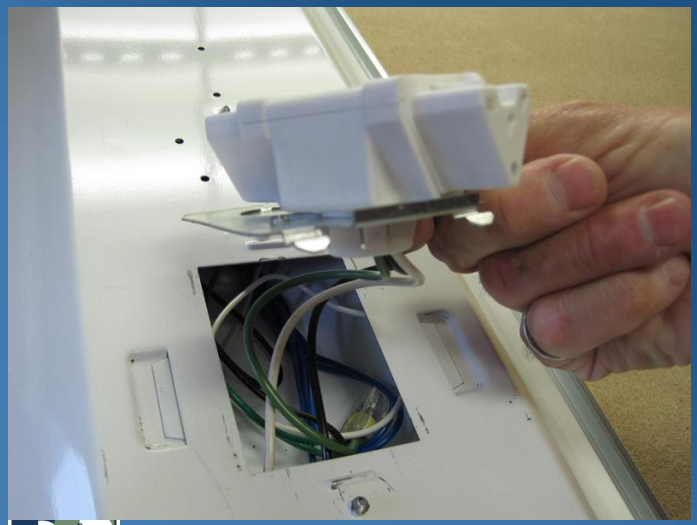
Make a statement –

No halogenated wire in GS

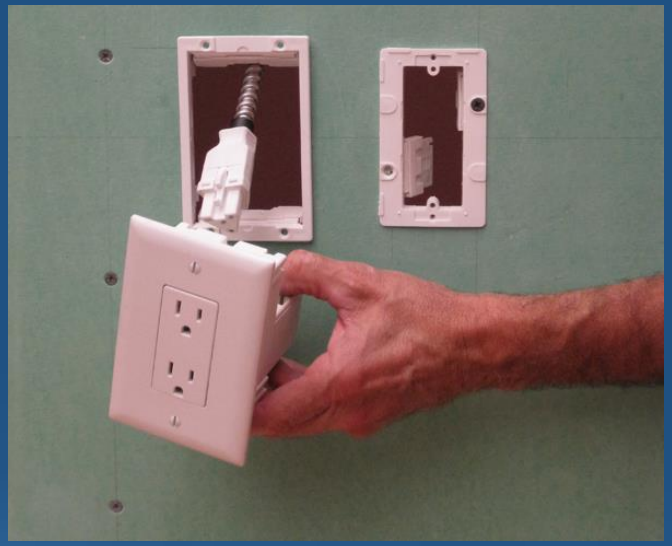
Electrical and data cable

Green Alternative: Electec EZ Wire

- Manufactured wiring systems
- RoHS compliant
- “Low-smoke, zero halogen”
- Reusable



Wiring a ballast



Commercial Carpet

Manufacturer	Brands	Applications	Face Fiber	Backing	Recycled Content	End of Life
Earth Weave www.earthweave.com	Bio-Floor	Residential broadloom and area rugs	Wool, with no dyes or moth-proofing	Hemp or cotton primary backing, jute secondary backing, and natural rubber adhesive	No recycled content	Materials are biodegradable; company encourages composting.
Interface www.interfacefloor.com	InterfaceFLOR, FLORtile	Commercial and residential carpet tile	Nylon 6,6	Polyvinyl chloride (PVC) with fiberglass	Regular GlassBac carpet tile includes 41% pre-consumer recycled content as flyash. GlassBacRE offers 100% recycled content backing from used PVC carpet tile, making overall carpet tile 60%–80% recycled content.	Interface takes back carpet from any manufacturer through its Reentry program. Some backing is recycled into backing, and some face fiber into face fiber. Other material is incinerated in a waste-to-energy plant.
	Bentley Prince Street	Broadloom	Nylon 6,6	SB latex, polypropylene	Backing is 10% post-consumer recycled content from waste paper. Nylon includes some post-industrial content.	
Milliken www.millikencarpet.com	Milliken, private labels	Commercial and residential, tile and broadloom	Primarily nylon 6,6	Polyurethane, latex, and polyolefins	Contains up to 35% pre-consumer recycled content, mostly in backing	Milliken offers carpet reuse through Earth Squared and Redo programs; carpet recycled for other uses through reclamation program.
Mohawk www.themohawkgroup.com	Bigelow, Karastan, Durkan, Lees, Mohawk.	Commercial and residential, tile and broadloom	Nylon 6 or nylon 6,6	Encycle, the new environmental brand for backing, uses EVA and non-chlorinated vinyl. SB latex is also used.	Some nylon 6 has pre-consumer recycled content. 35% pre-consumer recycled content in backing from flyash.	Company helps customers find a recycling path for any carpet through Recover program, usually not into new carpet. Mohawk has plans to recycle Encycle into new carpet backing.
	Everstrand	Residential broadloom	Polyester	Polypropylene	Face fiber is 100% recycled from PET containers.	No takeback or recycling program.
Shaw www.shawindustries.com	Shaw Contract, Designweave, Patcraft	Commercial and residential, tile and broadloom	Nylon 6, nylon 6,6, polypropylene	SB latex is most common. The Ecoworx polyolefin backing system is available on carpet tile and broadloom.	EcoSolution Q commercial nylon face fiber is guaranteed to have 25% recycled content. Anso residential nylon fiber does not have a standard. Ecoworx backing contains 40% recycled content, mostly pre-consumer.	Carpet will be taken back free of charge if replaced with Shaw carpet. Some nylon 6 from carpet is being recycled at the Evergreen facility into new carpet fiber following depolymerization.
Tandus (C&A) www.tandus.com	ER3	Commercial tile and 6-foot (1.8-m) roll good	Nylon	PVC	Backing includes 100% post-consumer and post-industrial recycled content in backing.	Tandus will buy back any PVC-backed carpet from any manufacturer to recycle into new carpet backing.
	Ethos	Commercial tile and broadloom	Nylon	Polyvinyl butyral (PVB)	Contains at least 31% certified post-consumer content—PVB recycled from automobile safety glass	

Issue:

Fluorochemicals ubiquitous for stain resistance

Context:

No alternatives

Many other differentiating factors

Decision:

Include, with caution on fluorochemicals

(list NSF-140 platinum carpet)

Greener Alternatives?

- Invista Antron carpet
  - In EU available without fluorocarbons?
  - In US, can't call it Antron without fluorocarbons
- GreenShield
  - Micro/nano fluoro
  - Bonds with surface

Polystyrene Insulation

Environmental Building News™
The Leading Newsletter on Environmentally Responsible Design & Construction

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Polystyrene Insulation
Does It Belong in a Green Building?
by Alex Wilson

POLYSTYRENE, IN BOTH EXTRUDED and expanded forms, is very widely used as rigid insulation in North America and worldwide. In below-grade applications, owing to its good insulation value, superb moisture resistance, strength, performance, and affordability, polystyrene dominates the market.

But a chemical that's added to polystyrene to provide fire resistance has recently raised significant concerns. Indeed, the European Union may be on the verge of significantly restricting the use of this chemical—HBCD. Given other environmental concerns about polystyrene, this latest development raises the question of whether this insulation material belongs in green buildings at all.

This article describes why polystyrene is such a popular insulation material, reports on new information about health and environmental concerns about the material, and examines alternatives that are available to the building industry—especially in below-grade applications where polystyrene is ubiquitous.

About Polystyrene

Polystyrene had its origins in 1839 when a German apothecary, Eduard Simon, accidentally formed a jelly-like substance from resin he had collected from a Turkish sweetgum tree. It was not until the early 1920s that another German chemist, Hermann Staudinger, figured out that the mysterious substance Simon created was a polymer and developed his theories of polymer chemistry, for which he was later awarded the Nobel Prize in chemistry. In 1930, scientists at the pioneering German company Badische Anilin & Soda-Fabrik (known today as BASF) figured out how to synthesize this hard plastic—polystyrene—and the company remains one of the leading manufacturers of polystyrene chemicals today.

In 1937, Dow Chemical introduced polystyrene plastic to the United States, and in 1953 the company introduced a lightweight, *foamed* version of the polymer as an insulation material, trademarked Styrofoam. Dow chemist Ray McIntire invented Styrofoam by accident when he sought to make a new

(continued on p. 10)

Rigid mineral wool can be an excellent substitute for polystyrene, owing to its moisture repellency and insect resistance. Photo: Rockwool International A/S

In This Issue

Quote of the month:

"It is absolutely essential that we introduce this issue of performance into LEED."

– Scot Horst, U.S. Green Building Council, on new energy- and water-performance reporting requirements.

(page 2)

Issue:

HBCD flame retardant
Benzene chemistry, etc.

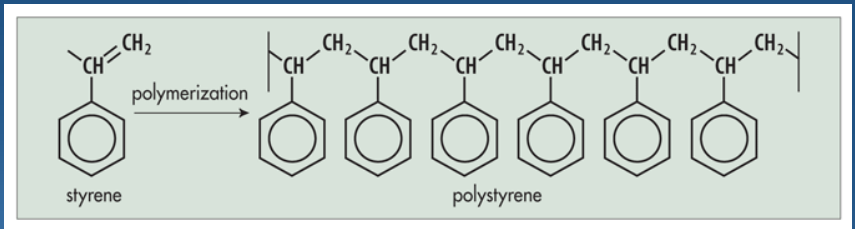
Context:

Energy efficiency key
Reasonable alternatives?

Decision:

Delist polystyrene
List alternatives…

… *"When we can do so without sacrificing energy performance"…*



Greener Alternative: Rigid Mineral Wool

Rockwool International

Several Manufacturers

- Roxul
- Thermafiber
- Fibrex

Positive attributes

- No flame retardant
- Totally fire-safe
- Inert
- Superb drainage below-grade
- Termite resistant
- Recycled content
- Contains phenolic binder, but very low emissions

‘Greener’ up for debate…

Research by the Green Science Policy Institute has found that two of your recommendations —polyurethane (both spray and rigid) and polyisocyanurate—often contain the halogenated flame retardant TCPP or other halogenated flame retardants. Although TCPP likely causes less harm than HBCD, it is structurally similar to three chemical compounds that have been identified as causing cancer. Chemicals used to manufacture polyurethane and polyisocyanurate have been found to be carcinogenic or have other adverse

Changing Practices
EBN: Letters - October 2009

Polystyrene Chemicals Widespread
EBN: Letters - October 2009

Watch for Other Toxics
EBN: Letters - October 2009

HBCD Isn’t the Only Problem
EBN: Letters - October 2009

Polystyrene's Track Record
EBN: Letters - October 2009

Rethinking Polystyrene Insulation
EBN: From the Editors - August 2009

Add a comment

"Green" rock wool *Posted by Brent Ehrlich on Oct 2, 2009, 10:34 AM* [hide]
[pick]
Hi Francois. Yes, the MSDS does report those formaldehyde levels, but as required that is the raw amount added at the start of manufacturing. Through a chemical reaction and heat curing, there is little formaldehyde left in the final product. Roxul's batt products, for instance, are Greenguard Children and Schools certified to levels less than 0.0135 ppm in the final product. The other manufacturers use similar production methods so should have comparable formaldehyde levels.


What do we really want?

“Angel” Products

O Ecotextiles Fabrics

- Premium line of organic textiles
- Careful attention to toxicity (in growing and processing)
- Company discourages potentially toxic finishes
- Focus on social justice, including living wage

Ō ecoTEXTILES™

INDULGENT YET RESPONSIBLE

“Angel” Constituents

All constituents disclosed

Constituents tested safe

Understood and/or long history of use

Finding angels –

GreenScreen Benchmark 4 “Safer”…

BASTA certified “Free of listed hazards”

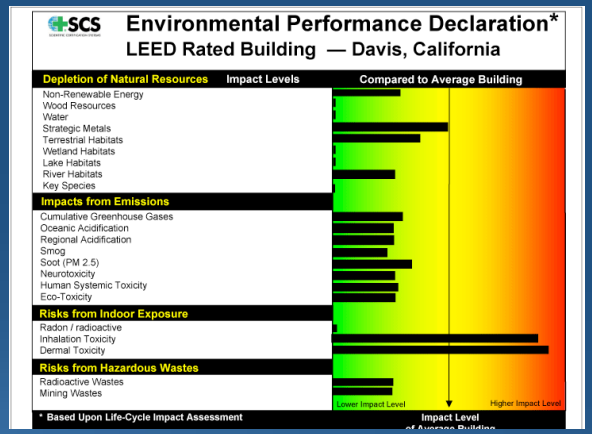
30,997 products – but in Sweden

C2C – but not transparent

Not always free of listed hazard (by level)

Comprehensive verified info

- Life cycle analysis (LCA)
- Environmental Product Declaration (EPD)
- Pharos *(info mapped to end-goal)*
- 3rd party multi-attribute certifications *(helpful if transparent)*



Better guidelines

- Life cycle comparisons
- Sector benchmarks
- One chemical database
- Proactive legislation

GREEN SCREEN FOR SAFER CHEMICALS

- 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

BEES® 4.0

Plastics Scorecard *v. 1.0 beta*

Grade F	Grade D	Grade C-	Grade C+	Grade B-	Grade B+	Grade A-	Grade A+
PVC*		PET	PLA*[1]			PP* PLA*[2]	

AVOID → PREFER

* = Maximum attainable grade
*[1] = Maximum attainable grade if grown with atrazine or GMOs
*[2] = Maximum attainable grade if grown without atrazine and GMOs

Thank you!

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