



Promoting Biomaterials in the Green Market

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ABDC's Conference
What's Next in Green Building



Source: Alberta Biomaterials Development Centre

Government
of Alberta ■

Alberta

Outline



- My Background
- What Makes a Product Green?
- How to Avoid Green-washing - Credibility
- Certifications
- Tools and Information Programs
- Alberta Infrastructure Standards
- A Word about 'Why LEED?'
- Summary / Future Trends

My Background

- Private industry – 2 architectural firms
- City of Edmonton – Buildings and Construction Branch – project management
- Technical Services Branch :

- Design review for capital projects
- Participate in integrated design for larger projects
- Resource group for other Branches
- Research and Development of TSB standards
 - Currently includes studies in sustainability
 - Attending/presenting conferences



What Makes a Product Green?

o Green Attributes

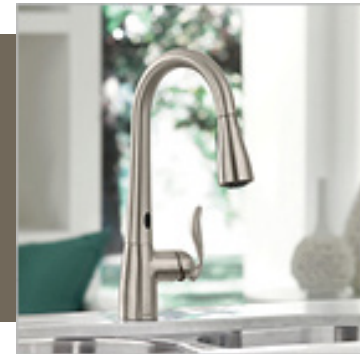
- o Avoid Hazardous Ingredients
- o Low-emitting [VOC's]
- o Bio-based and Sustainably Sourced
- o Responsible Corporate Practices
- o Information Transparency
- o Renewable Energy Equipment



Source: www.buildinggreen.com/auth/article.cfm/2012/2/2/What-Makes-a-Product-Green/

What Makes a Product Green?

o Green Attributes



- o Reduces Material Use
- o Durable or Low Maintenance
- o Reusable, Recyclable or Compostable
- o Prevents Moisture or Air-quality Problems
- o Rapidly Renewable
- o Reduces Heating and Cooling Loads



Source: [www.buildinggreen.com/auth/article.cfm/2012/2/2/What -Makes-a-Product-Green/](http://www.buildinggreen.com/auth/article.cfm/2012/2/2/What-Makes-a-Product-Green/)

How to Avoid Green-washing

- Importance of Credibility
- Nine types of Green-wash



- Green by Association
- Lack of Definition
- Unproven Claims
- The Non Sequitur [using a valid claim to make a further claim that is not supported]
- Forgetting the Life Cycle [the red herring]

How to Avoid Green-washing

○ Importance of Credibility



- **Bait and Switch**
- **Rallying behind a Lower Standard**
- **Reluctant Enthusiast**
- **Outright Lying**

Certifications



Look for the label!

Certifications

o Understanding Certifications

- o Standards development – ISO, ANSI, CSA [standard versus certification]
- o Certifications to labels – 1st, 2nd, 3rd party
- o Indoor Air Quality Certifications
- o Forestry Certifications
- o Energy Certifications
- o Multiple - Attribute Certifications
- o Other Certifications and Performance Labels
- o Remember – certifications are just tools



Certifications

Example – Greenguard certification website

The screenshot shows a web browser window displaying the Greenguard Certification website. The page features a navigation menu with options like 'Manufacturers', 'Architects & Designers', 'Owners & Builders', and 'Consumers'. The main content area is titled 'GREENGUARD Gold Certification' and includes a description of the certification process, a 'Program Mark' image, and a section on 'Chronic Reference Exposure Levels (CRELs)'. A sidebar on the left lists 'Certification Programs' and 'Certification Process'.

GREENGUARD CERTIFICATION
FROM UL ENVIRONMENT

Home | Contact Us | MyULEnvironment | English

Search [] Search

Manufacturers Architects & Designers Owners & Builders Consumers

indoor air quality certification programs technical center find products about us

Certification Programs

Certification Programs

GREENGUARD Certification Gold
Synthetic Turf
Private Label

Certification Process

Certification Standards
Testing Procedures

Get Product Certified

Recognized & Referenced

GREENGUARD Gold Certification

GREENGUARD Gold Certification (formerly known as GREENGUARD Children & Schools Certification) offers stricter certification criteria, considers safety factors to account for sensitive individuals (such as children and the elderly), and ensures that a product is acceptable for use in environments such as schools and healthcare facilities. It is referenced by both The Collaborative for High Performance Schools (CHPS) and the Leadership in Energy and Environmental Design (LEED) Building Rating System.

Program Mark

Products certified under this program bear the GREENGUARD Gold Certification mark.



Chronic Reference Exposure Levels (CRELs)

The exposure to individual volatile organic compounds (VOCs), as detected in the C₆ - C₁₆ mass spectrometric analysis screen, has been adjusted to allow no greater than 1/100 of the currently published ACGIH® Threshold Limit Values (TLVs) and no greater than one-half of the California's Chronic Reference Exposure Levels (CRELs). In many cases, the 1/100 safety factor reduction of TLVs results in the most stringent requirements for an extensive range of VOCs. A total VOC or TVOC maximum allowable limit takes into account the complex mixture of all VOCs found to be emitting from a product, including those with and without TLVs or CRELs.

Source: http://www.greenguard.org/en/CertificationPrograms/CertificationPrograms_ChildrenSchools.aspx

Tools & Programs

o Moving Towards Transparency

- o California Section 01350
- o The Pharos Project
- o GreenSpec Directory
- o BEES 4.0 [Life Cycle Analysis]
- o Athena Institute [Life Cycle Analysis]
- o EPD's [Environmental Product Declaration]
- o HPD's [Health Product Declaration]



Pharos Project

Example – Screenshot for ‘wheatboard’ products

pharos project :: product_search :: search results for wheatboard - Windows Internet Explorer

http://pharosproject.net/product_search/results/cat/96

pharos tool for material evaluation

happy friday Vernon! dashboard | account settings | comment | logout

the signal news & notes | building product library | chemical and material library | certifications and scoring

Search Results for Wheatboard

There are 4 products that meet your search criteria. [Reset Search](#)

Sort by: VOC | ToxCon | MfrTox | RnMtrl | RnEnrg | Manufacturer Participation | Product Title | Manufacturer

ECOR FlatCOR, WavCOR Panels

VOC	ToxCon	MfrTox	RnMtrl	RnEnrg
9	9	9	9	1

Noble Environmental Technologies, Inc. Complete Manufacturer Participation

ECOR WavCOR EXP, WavCOR ESP Panels

VOC	ToxCon	MfrTox	RnMtrl	RnEnrg
8	4	4	8	1

Noble Environmental Technologies, Inc. Complete Manufacturer Participation

ECOR HoneyCOR, HoneyCOR ESP, HoneyCOR ESP Plus Panels

VOC	ToxCon	MfrTox	RnMtrl	RnEnrg
8	4	4	7	1

Noble Environmental Technologies, Inc. Complete Manufacturer Participation

Kirei Wheatboard

VOC	ToxCon	MfrTox	RnMtrl	RnEnrg
1	3	4	7	1

KireiUSA No Manufacturer Participation

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 HBN Priority Asthmagens

Filter by Attributes

- No Bisphenol A
- No Added Formaldehyde
- No Phthalates
- No Halogenated Flame Retardants
- No Perfluorocarbons
- No Antimicrobials
- No Nanotech Materials

Filter by LEED credit

Internet | Protected Mode: On

Source: http://pharosproject.net/product_search/results/cat/96

What's Next in Green Building - Slide 12 of 24

Pharos Project

- Example – Highest rated ‘wheatboard’ product

The screenshot shows a web browser window displaying the Pharos Project website. The page is titled "ECOR FlatCOR, WavCOR Panels" and is for Noble Environmental Technologies, Inc. The browser address bar shows the URL: <http://pharosproject.net/product/show/id/1002427>. The page features a navigation menu with options like "the signal news & notes", "building product library", "chemical and material library", and "certifications and scoring".

Impact Category Scores

Score	Category	Description
9	VOC :: Volatile Organic Compounds	All contents are non-volatile or semi-volatile organic compounds
9	ToxCon :: Available Toxic Content	All content essentially inert
9	MfrTox :: Manufacturing Toxics	All content essentially inert
9	RnMtrl :: Renewable Materials	High amount of high value renewable materials
1	RnEngg :: Renewable Energy	No or insignificant renewable energy used

Material Content

Total renewable content: 50% Post-consumer recycled, 100% Biobased
Highest concern GreenScreen score: Not evaluated by GreenScreen

Material	Min% - Max%	Toxic Content	Manufacturing Toxics	Renewable
Cellulose CAS RN: 9004-34-6	50.0 - 50.0			
Cellulose CAS RN: 9004-34-6	50.0 - 50.0			

Product Certifications

- CA Section 01350 (CHPS) Emission Test (CDPH/EHLB Standard Method V1.1 - Residential + 2012 Formaldehyde) - Berkeley Analytical

Pros

- Complete Manufacturer Participation
- Contributes toward LEEDv4 MRc4 Option 1 (manufacturer inventory in Pharos)
- Contributes toward LEEDv4 MRc4 Option 2 (100% level - no LT Benchmark 1 ingredients in Pharos)
- No LBC Red List chemicals listed
- No EPA Chemicals of Concern listed
- No LEED Pilot Credit 11 chemicals listed
- No HBN Priority Asthmagens listed
- No Bisphenol A (BPA) listed
- No Formaldehyde listed
- No Phthalates listed
- No Halogenated Flame Retardants (HFRs) listed
- No Perfluorocarbons (PFCs) listed
- No Antimicrobials listed
- High amount of renewable material content
- High value renewable material content

Cons

No cons listed.

Unknown

Source: http://pharosproject.net/product_search/results/cat96

What's Next in Green Building - Slide 13 of 24

Pharos Project

- Example – Lowest rated ‘wheatboard’ product

pharos project :: product :: kirei wheatboard - Windows Internet Explorer

http://pharosproject.net/product/show/id/1001527

pharos tool for material evaluation

happy friday Vernon! dashboard | account settings | comment | logout

the signal news & notes | building product library | chemical and material library | certifications and scoring

Kirei Wheatboard

KireiUSA

Impact Category Scores

1	VOC :: Volatile Organic Compounds	No data or no certification applicable
3	ToxCon :: Available Toxic Content	Base score of 3 for Red flagged content 1,3-DICHLORO-2-HYDROXYPROPANE No Adjustment - Content Available. Hazard Sublist: known carcinogen (State of California Environmental Protection Agency)
4	MfrTox :: Manufacturing Toxics	Red Flag Content 1,3-DICHLORO-2-HYDROXYPROPANE Hazard Sublist: known carcinogen (State of California Environmental Protection Agency)
7	RnMtrl :: Renewable Materials	High amount of high value renewable materials
1	RnEnrg :: Renewable Energy	No or insignificant renewable energy used

Material Content

Total renewable content: 90% Pre-consumer recycled , 90.1% Biobased

Highest concern GreenScreen score: Benchmark 1

Material	Min% - Max%	Toxic Content	Manufacturing Toxics	Renewable
Wheat Straw <i>Triticum spp.</i>	90.0 - 95.0			
Common Ingredients: Engineered Wood Binders (no formaldehyde-based resins) Made by Generic Manufacturer	5.0 - 10.0	CANCER	GENE MUTATION	

No Manufacturer Participation, Sufficient Content Record

Product Certifications

There are no certifications listed for this product.

Pros

- High amount of renewable material content
- High value renewable material content

Cons

- No Manufacturer Participation
- Contains GreenScreen Benchmark 1 chemicals
- May contain LBC Red List residuals
- Contains EPA Chemicals of Concern
- Contains HBN Priority Asthmagens
- May contain Formaldehyde residuals

Unknown

- LEED Pilot Credit 11 chemicals unknown
- Bisphenol A (BPA) unknown
- Phthalates unknown
- Halogenated Flame Retardants (HFRs) unknown
- Perfluorocarbons (PFCs) unknown
- Antimicrobials unknown
- Nanomaterials unknown

Source: http://pharosproject.net/product_search/results/cat96

What's Next in Green Building - Slide 14 of 24

GreenSpec

Example – Search for ‘wheatboard’ product

The screenshot shows a Firefox browser window displaying the GreenSpec website. The browser's address bar shows the URL greenspec.buildinggreen.com. The website's navigation bar includes links for GreenSpec, BuildingGreen.com, LEEDuser, EBN, Account, Portfolio, and Log out. The main content area features the GreenSpec logo and a search bar. Below the logo, there are tabs for Product Categories, Green Attributes, LEED, and Blog, along with a My Portfolio link. A large image of a building's roof is displayed. To the right, a 'RECENTLY ADDED PRODUCTS' section lists several items: Air Pohoda HRVs and ERVs, Draper Solar Control Products, Provoton Foam Concrete, FlexWave Light Shelf, Polystar Polypropylene Pipe, and Domus Mineral Paint. A blog post titled 'We installed these in our new' is visible, featuring a toilet and mentioning 'Stealth 0.8 GPF Ultra High-Efficiency Toilet (Niagara Conservation Corp.)'. The footer of the browser window shows a Firefox privacy notice and a 'Choose What I Share' button.

GreenSpec

◦ Example – Select from ‘Product Categories’

The screenshot shows a Firefox browser window displaying the GreenSpec website. The browser's address bar shows the URL: greenspec.buildinggreen.com/search/apachesolr_search?quicktabs_search_results_csi_builder=1. The website header includes the GreenSpec logo, a search bar, and navigation links for 'Account', 'Portfolio', and 'Log out'. The main navigation menu is open, showing 'Product Categories' selected. The 'Product Categories' dropdown menu lists the following categories:

- ▶ Communications
- ▶ Concrete
- ▶ Conveying Equipment
- ▶ Earthwork
- ▶ Electrical
- ▶ Electrical Power Generation
- ▶ Electronic Safety and Security
- ▶ Equipment
- ▶ Existing Conditions
- ▶ Exterior Improvements
- ▶ Finishes
- ▶ Furnishings
- ▶ General Requirements
- ▶ Heating, Ventilating, and Air-Conditioning (HVAC)
- ▶ Masonry
- ▶ Metals
- ▶ Openings
- ▶ Plumbing
- ▶ Process Heating, Cooling, and Drying Equipment
- ▶ Special Construction
- ▶ Specialties
- ▶ Thermal and Moisture Protection
- ▶ Transportation
- ▶ Utilities
- ▶ Waterway and Marine Construction
- ▶ Wood, Plastics, and Composites

Below the 'Product Categories' menu, there are sections for 'Green Attributes' and 'Green Attributes' (repeated). The 'Green Attributes' section lists:

- CI-2009 (2090)
- CS-2009 (2165)
- EBOM-2009 (879)
- NC-2009 (2231)
- NC-v2.2 (2229)
- Schools-2009 (2244)

The 'Green Attributes' section lists:

- Efficient Use of Materials (448)
- Energy and Water Conservation

The browser's status bar at the bottom shows the URL: greenspec.buildinggreen.com/category/csi-sections/06-00-00-wood-plastics-and-composites. A notification at the bottom left states: 'Firefox automatically sends some data to Mozilla so that we can improve your experience.' A 'Choose What I Share' button is visible at the bottom right.

GreenSpec

◦ Example – Scroll through options or ‘Search’

The screenshot shows a Firefox browser window displaying the GreenSpec website. The address bar shows the URL: greenspec.buildinggreen.com/category/csi-sections/06-00-00-wood-plastics-and-composites?page=2. The page features a left-hand navigation menu with the following sections:

- Show more
- LEED Credits**
 - CI-2009 (236)
 - CS-2009 (230)
 - EBOM-2009 (2)
 - NC-2009 (236)
 - NC-v2.2 (236)
 - Schools-2009 (236)
- Green Attributes**
 - Efficient Use of Materials (117)
 - Energy and Water Conservation (33)
 - Healthy Buildings (73)
 - Low-Impact Operations (27)
 - Responsible Sourcing (146)
- Show more
- Certifications**
 - California Section 01350 (8)
 - Cradle to Cradle Silver (1)
 - FloorScore (2)
 - Forest Stewardship Council (FSC) (74)
 - Greenguard Gold (5)
- Show more

The main content area displays a list of products, each with a small image, a title, the manufacturer, a star rating, and a 'Save to your portfolio' button:

- Contact Industries Veneer Millwork and Molding** (Contact Industries, 5 stars)
- Advantage FSC-Certified Trim and Lumber** (Advantage Trim and Lumber Company, 5 stars)
- Accoya Wood** (Accsys Technologies, 5 stars)
- DryGuard OSB** (Georgia-Pacific Building Products, 5 stars)
- Eco Blue Shield** (Eco Building Products, 5 stars)
- Hull Forest Products** (Hull Forest Products, 5 stars)
- X-Board Plus** (EA International Ltd, 5 stars)
- Leatherwood Reclaimed and Salvaged Lumber** (Leatherwood, Inc., 5 stars)

At the bottom of the browser window, there is a notification: "Firefox automatically sends some data to Mozilla so that we can improve your experience." and a "Choose What I Share" button.

GreenSpec

- Example – ‘Search’ for ‘wheatboard’.

The screenshot shows a Firefox browser window displaying the GreenSpec website. The address bar shows the URL: greenspec.buildinggreen.com/search/apachesolr_search/wheatboards?filters=tid%3A104&solrsort=created_desc&retain-filters=1. The page features the GreenSpec logo and a search bar. Below the search bar, there are navigation links for Product Categories, Green Attributes, LEED, and Blog, along with a My Portfolio button. The search results section shows 1 result for "wheatboards". The result is titled "Kirei Wheatboard" by Kirei USA, with a 4.5-star rating and 1 comment. The page also includes a footer with the BuildingGreen logo and tagline "Knowledge that informs practice.", along with social media links for Twitter and Facebook.

GreenSpec

- Example – ‘Click’ on ‘Kirei Wheatboard’.

The screenshot shows a Firefox browser window displaying the GreenSpec website. The browser's address bar shows the URL: greenspec.buildinggreen.com/product/kirei-wheatboard/kirei-usa/1978?_utma=219580298.447378415.1374765023.1386697276.1386974986.15&_utmb=219580298.18.10.1386974986&_utmcc=219580298. The website header includes the GreenSpec logo, a search bar, and navigation links for Account, Portfolio, and Log out. Below the header, there are tabs for Product Categories, Green Attributes, LEED, and Blog, along with a My Portfolio button. The main content area features a large image of the Kirei Wheatboard, a product description, and a list of green attributes: Biobased and sustainably sourced, Uses agricultural waste, and Low-emitting. The page also includes a GreenSpec's Review section and a Similar Products section.

GreenSpec BuildingGreen.com LEEDuser EBN
Account Portfolio Log out

GreenSpec®

Product Categories Green Attributes LEED Blog My Portfolio

Kirei Wheatboard

Kirei USA

Kirei Wheatboard, made from waste wheat straw left after the grain has been harvested, is a substitute for wood-based MDF or particleboard and is appropriate for use in architectural millwork, furniture, cabinetry, and retail displays.

★★★★★ (1 User Rating) | 1 Comment | Add a Comment

- ✓ Biobased and sustainably sourced
- ✓ Uses agricultural waste
- ✓ Low-emitting

Save to your portfolio

GreenSpec's Review GreenSpec Criteria

Kirei Wheatboard, made from waste whe at straw left after the grain has been harvested, is a substitute for wood-based MDF or particleboard and is appropriate for use in archite ctural millwork, furniture, cabinetry,

Similar Products

Firefox automatically sends some data to Mozilla so that we can improve your experience. Choose What I Share

Source: www.greenspec.buildinggreen.com

GreenSpec

- Example – Note other tools and related LEED credits

The screenshot shows a Firefox browser window with the following content:

- Browser Tabs:** BAC Online Moodle 2, BAC Online: Online Services, Search: greenspec - BuildingGreen.co..., Kirei Wheatboard | GreenSpec
- Address Bar:** greenspec.buildinggreen.com/product/kirei-wheatboard/kirei-usa/1978?_utma=219580298.447378415.1374765023.1386697276.1386974986.15&_utmb=219580298.18.10.1386974986&_utmc=2195802
- Main Content:**
 - Text: painted, or stained. Exposed edges are intended to be finished in most applications.
 - LEED Credits:**
 - EQc4.4: Low-Emitting Materials—Composite Wood&Agrifiber Products
 - NC-v2.2
 - IEQc4.4: Low-Emitting Materials—Composite Wood and Agrifiber Products
 - NC-2009 CI-2009 CS-2009 Schools-2009
 - MRc6: Rapidly Renewable Materials
 - NC-2009 NC-v2.2 CI-2009 Schools-2009
 - Ratings and Commentary:**
 - Nadav Malin**
Fri, 2011-09-30 10:16
 - Text: This stuff looks great in person. I noticed benches at Whole Foods at Columbus Circle made of it. They were heavy, but attractive.
 - Add Comment:**
 - Your name: BAC BAC
 - Subject: [input field]
 - Rating: 3 stars
 - Comment: [text area with rich text editor]
- Right Sidebar:**
 - Manufacturer Information:**
 - Kirei USA
 - 412 N. Cedros Ave.
 - Solana Beach, CA
 - www.kireiusa.com
 - Links: General Info, Product Info, Specification
 - More About This Product at:** MSDS
 - Partner Sites:**
 - ecoScorecard™** [View] - ecoScorecard evaluates a product for its contribution to LEED and other rating systems, automatically generating the relevant rating system documentation. Click here to leave BuildingGreen's site and go to the ecoScorecard site for this manufacturer.
 - GreenFormat™** [View] - The Construction Specification Institute's GreenFormat provides comprehensive information on the sustainability properties of a product via a standardized online questionnaire. Click here to leave BuildingGreen's site and go to the GreenFormat listing for this product.
 - Pharos** [View] - Pharos scores products in specific categories based on what they're made of, in a highly transparent, data-rich tool. A subscription to Pharos is required to access this link's content.

Alberta Infrastructure Standards

- **Red Book Standard, Blue Book, Green Book**

- **Sustainability [LEED Silver for larger projects]**
- **Building Envelope [PERSIST standard, ASHRAE]**
- **S/M/E standards**
- **Acoustics**
- **Barrier-Free Design**
- **Site Services**
- **Landscape Development [avoiding flood zones]**
- **Environmental [avoiding hazmat]**
- **Basic Master Specifications**

A Word About 'Why LEED?'

o Embracing LEED

- o Before LEED
- o Each successive version of LEED ups the bar
- o LEED brought credibility to the green movement
- o Claims are 3rd party verified [audited]
- o LEED although a voluntary standard – has become dominant in the world - revolutionary
- o LEED is a community standard
- o LEED asks people to have integrity
- o People are now demanding healthier buildings

Summary / Future Trends

- Building Product Transparency Labels
- Energy and other information dashboards for buildings
- Take Transparency from Best Practice to Standard Practice
- Life Cycle Assessment for buildings and building materials – common practice
- CSR [Corporate Social Responsibility] the leading driver for major companies



Thank you !

Questions ?



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"It's not easy being green"