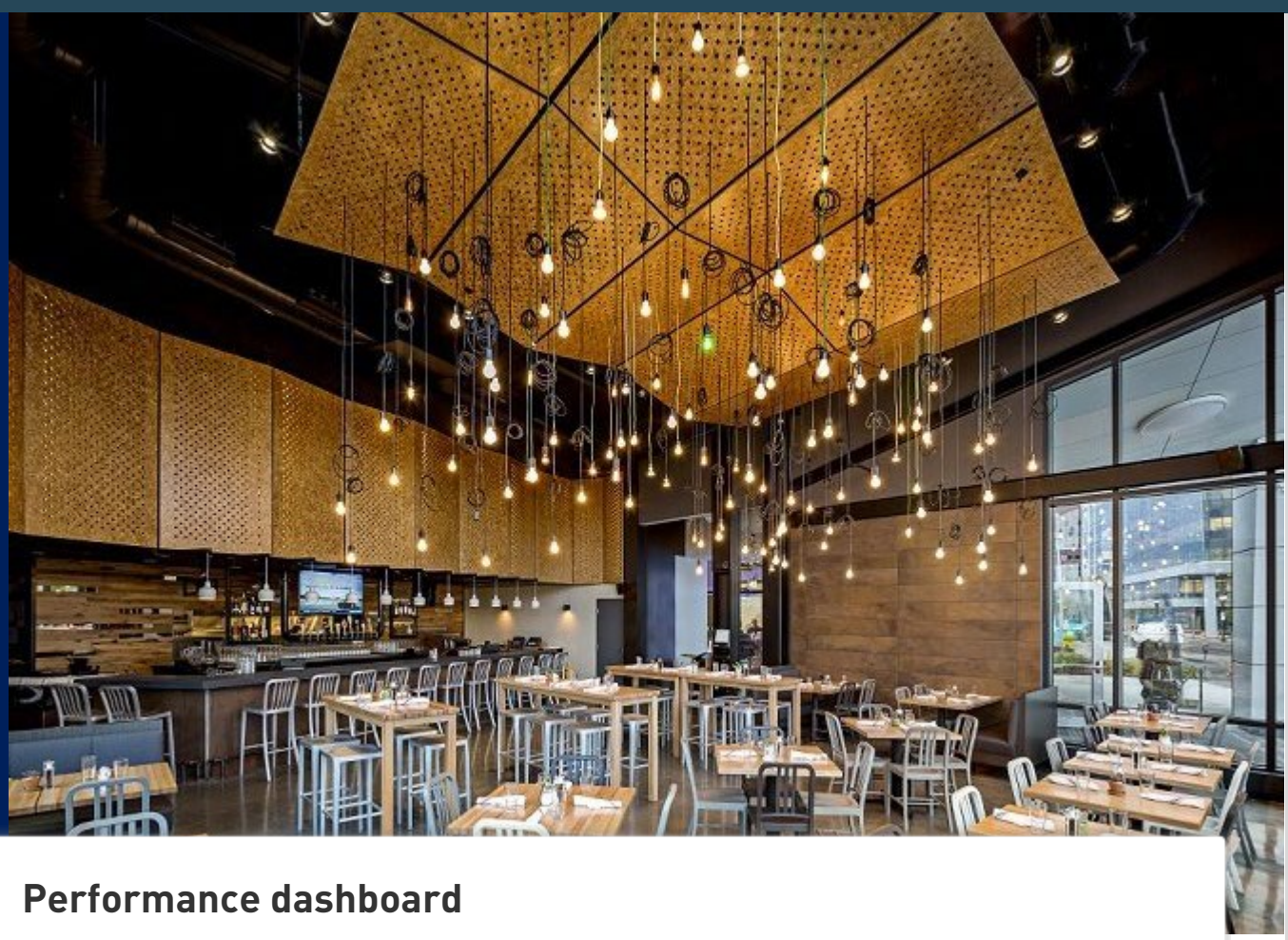
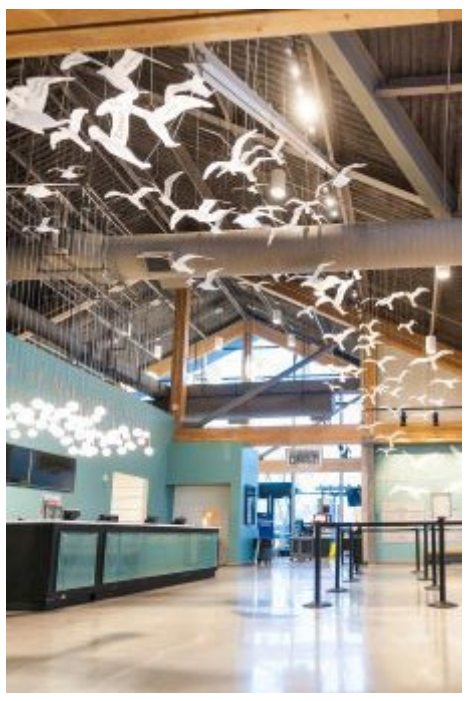
K-13 spray-on systems®

K-13 and K-13 High-R System

K-13 is a high-performance, spray-applied, thermal and acoustical finish system, consisting of natural, plant-based fibers, and specialty water-based adhesive. K-13 is spray-applied to substrates of ribbed metal decking, wood, concrete, gypsum/drywall, and can adhere to complex surfaces such as domes. Common applications include: restaurants, parking structures, gymnasiums, museums, recording studios, worship centers, classrooms, retail and more. The High-R System is a mechanically supported system for projects requiring a higher R-value. K-13 is efficiently spray-applied up to 10” thick to achieve up to R-37.5.





Performance dashboard

Features & functionality

Contributes to occupant comfort

High thermal R-value

Exceptional acoustic performance; high NRC value Class I Class A rated per ASTM E 84

Available in standard & custom integrated colors Durable/damage resistant finish

Can be used to provide high light reflectance values

Visit ICC for more product information:
K-13, K-13 High-R System

Environment & materials

Improved by:

Contains over 50% pre-consumer recycled content

Cellulose is made from renewable resources

Carbon sequestering material

Red List Free

Manufactured in the USA

Certifications, rating systems & disclosures:

GREENGUARD Gold (1)

Health Product Declaration (HPD)

Environmental product declaration (EPD)

Rated & approved by Factory Mutual for use in categories I-V

M1 classification of low emitting building materials

UL classified

Factory Mutual approved

CSI MasterFormat® 07 21 29 & 09 83 16
Technical Data Sheet, Guide Specs
For spec help, contact us or call 800.444.1252

See LCA, interpretation & rating systems

See materials, interpretation & rating systems

SM Transparency Report (EPD)™ + Material Health Overview™

VERIFICATION	LCA
3rd party reviewed	✓ NSF
Transparency Report (EPD)	
3rd party verified	✓ NSF
Material evaluation	
Self-declared	✓

Validity: 2020/10/16 – 2025/10/16
ICC – 20200122– 003

This environmental product declaration **(EPD)** was independently verified by **NSF** to **ISO 21930:2017, EN 15804, the ULE PCR and ISO 14025:2006.**

NSF Certification, LLC
P.O Box 130140
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734 769 8010

SUMMARY
Reference PCR
UL Building Envelope Thermal Insulation, 04/18 – 02/23

Regions; system boundaries
North America; Cradle to grave

Functional unit / reference service life:
1 m^2 of installed insulation w/packaging; thickness that gives an avg thermal resistance of RSI = 1 m^2·K/W over 75 years.

LCIA methodology: TRACI 2.1

LCA software; LCI database
SimaPro Analyst 8.5.2.0
EcoInvent 3.1, 2.2

LCA conducted by: Sustainable Minds

Public LCA:
ICC Cellulose Spray-Applied Thermal Insulation and Acoustical Finishes

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Houston, TX 77045
www.spray-on.com
(800) 444-1252

Contact us

LCA & material health results & interpretation

K-13

Life cycle assessment | Material health

Scope and summary

○ Cradle to gate ○ Cradle to gate with options ✓ **Cradle to grave**

Application

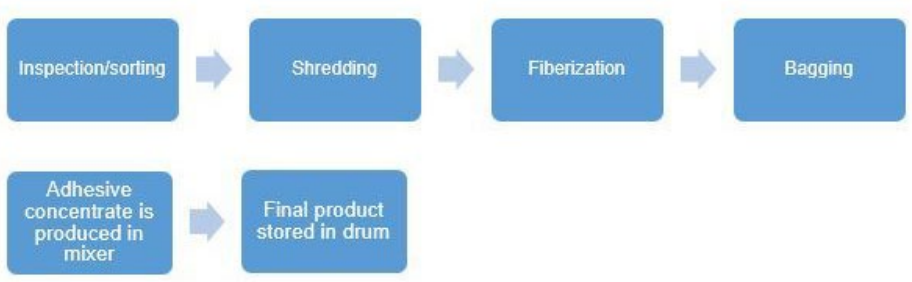
K-13 is a total system of recycled natural fibers, chemical treatment, binding system and application method. The K-13 system begins with specially prepared cellulose fibers which are chemically treated. K-13 is produced in a strict, quality controlled manufacturing process. K-13 is applied by an international network of licensed applicators through approved fiber machines and nozzles for control of the fiber/binder ratio.

Functional unit

Reference service life: 75 years. One square meter of installed insulation material, packaging included, with a thickness that gives an average thermal resistance of RSI=1m2·K/W over a period of 75 years.
Reference flow: 2.1502 kg of product
Thickness: 0.0384 m

Manufacturing data

Reporting period: January--December 2018
Location: Houston, TX



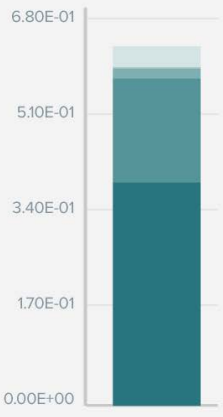
Default installation, packaging, and disposal scenarios

At the installation site, insulation products are unpackaged and installed with a blowing machine. The insulation blower is used to spray on the fiber and adhesive. The potential impact of the blower is included in this study. Plastic packaging waste is disposed (100% to landfill), and no maintenance or replacement is required to achieve the product's life span. 1,233,844 kWh of electricity and 8,205,350 kg of water are used annually for installation. After removal, the insulation is assumed to be landfilled.

Material composition greater than 1% by weight

PART	MATERIAL	AVG % WT.
Batch	Post-consumer cullet	59.0%
Batch	Internal cullet	11.0%
Batch	Sand	8.1%
Batch	Borax	7.0%
Batch	Soda ash	3.2%
Batch	Sugars	2.5%
Batch	Limestone	2.3%
Packaging	Plastic film	1.4%
Batch	Dolomite	1.2%
Batch	Nepheline syenite	1.2%
Facing	Facing adhesive	1.8%
	Other	1.8%

Total impacts by life cycle stages [mPts/func unit]



LIFE CYCLE STAGE	MPTS/FUNC UNIT
Raw material acquisition	4.07E-01
Manufacturing	1.90E-01
Transportation	1.81E-02
Installation and maintenance	1.64E-03
Disposal/reuse/recycling	3.91E-02

Total impacts = 6.55E-01 mPts
per 75 years installed

What's causing the greatest impacts

All life cycle stages

The raw material acquisition and manufacturing stages (A1-A3) dominate the results for all impact categories except for ecotoxicity, where the transportation stage dominates. Following these two stages, the next highest impacts come from the construction and installation stage (A5), which have a similar contribution.

Data used for this project represents a mix of primary data collected from ICC on the production of the insulation products (gate-to-gate) and background data from SimaPro databases. Overall, the quality of the data used in this study is considered to be high and representative of the described systems. Data on processing materials and manufacturing the insulation products were collected in a consistent manner and level of detail to ensure high quality data. All submitted data were checked for quality multiple times on the plausibility of inputs and outputs. All questions regarding data were resolved with ICC. Data were collected at ICC's Houston, TX facility.

No substances required to be reported as hazardous are associated with the production of this product. This is a product free of Red List ingredients.

Raw materials acquisition stage

The impact of the raw material acquisition and manufacturing stages are mostly due to the raw material ingredients. Some raw material ingredients such as boric acid and ethylene vinyl acetate copolymer (data set used for PVA) have slightly higher impacts than other ingredients. This is because of the high material weights used in manufacturing.

How we're making it greener

ICC has energy, waste and water management policies in place and subscribes to third-party environmental services, which includes inspections, audits, and environmental monitoring.

Water management: Water is utilized only in the manufacturing of the adhesives- which are produced in concentrated form and diluted at the job site. No wastewater is generated from the manufacturing process.

Waste management: ICC practices onsite recycling and has partnered with local business to reduce and reuse packaging materials.

Energy management: Products are manufactured in an electrically driven mill, using a process that requires low embodied energy. Electricity use is monitored and processes to conserve energy have been instilled. These products and the manufacturing of these products does not use ozone depleting substances such as CFC's or HCFC's; ozone depletion may occur in the transportation phase or raw material extraction phase.

See how we make it greener

LCA results

LIFE CYCLE STAGE	RAW MATERIAL ACQUISITION AND MANUFACTURING	TRANSPORTATION	INSTALLATION AND MAINTENANCE	TRANSPORTATION	DISPOSAL/REUSE/ RECYCLING
Information modules: Included | Stages C1, C3, and D are being excluded *In the installation and maintenance phase, packaging waste and electricity or gas used by the insulation blowing machines in module A5 are the only contributors to the potential impacts.	**A1 Raw Materials**	**A4 Transporation/ Delivery**	**A5 Construction/ Installation**	**C2 Transportation**	**C4 Disposal**
	A2 Transportation		**B1 Use**		
	A3 Manufacturing		**B2 Maintenance**		
			B3 Repair		
			B4 Replacement		
			B5 Refurbishment		
			B6 Operational energy use		
			B7 Operational water use		
					

SM 2013 Learn about SM Single Score results

Impacts per 75 years of service	1.05E-04 mPts	5.70E-05 mPts	2.50E-05 mPts	5.58E-06 mPts	1.62E-06 mPts
Materials or processes contributing >20% to total impacts in each life cycle stage	boric acid and ethylene vinyl acetate copolymer used in the production of the insulation.	Truck and trailer, 53ft used to transport product to building site.	Transportation to disposal, energy required for installation with a blowing machine, and disposing of packaging materials.	Transportation to landfill.	Landfilling of product.

TRACI v2.1 results per functional unit

LIFE CYCLE STAGE	RAW MATERIAL ACQUISITION AND MANUFACTURING	TRANSPORTATION	INSTALLATION AND MAINTENANCE	TRANSPORTATION	DISPOSAL/REUSE/ RECYCLING

Ecological damage

Impact category	Unit					
Acidification	**kg SO_2 eq**	8.35E-03	2.25E-03	2.15E-03	2.21E-04	1.48E-04
Eutrophication	**kg N eq**	1.03E-03	3.21E-04	7.99E-04	3.14E-05	1.70E-05
Global warming (Embodied carbon)	**kg CO_2 eq**	1.37E+00	6.03E-01	4.25E-01	5.90E-02	1.86E-02
Ozone depletion	**kg CFC-11 eq**	3.30E+00	1.23E+00	5.80E-01	1.20E-01	5.82E-02

Human health damage

Impact category	Unit					
Carcinogenics	**CTU_h**	1.27E-08	4.40E-09	2.81E-09	4.31E-10	1.77E-10
Non-carcinogenics	**CTU_h**	1.49E-07	1.30E-07	2.62E-08	1.27E-08	1.78E-09
Respiratory effects	**kg $PM_{2.5}$ eq**	1.19E-03	4.09E-04	1.80E-04	4.00E-05	1.81E-05
Smog	**kg O_3 eq**	9.75E-02	4.58E-02	2.93E-02	4.48E-03	3.54E-03

Additional environmental information

Impact category	Unit					
Fossil fuel depletion	**MJ, LHV**	3.30E+00	1.23E+00	5.80E-01	1.20E-01	5.82E-02

USEtox percent contribution

LIFE CYCLE STAGE	RAW MATERIAL ACQUISITION AND MANUFACTURING	TRANSPORTATION	INSTALLATION AND MAINTENANCE	TRANSPORTATION	DISPOSAL/REUSE/ RECYCLING

Additional environmental information

Impact category	Unit					
Ecotoxicity	%	89	7	3	1	0

References

LCA Background Report
ICC Insulation Products LCA Background Report (public version), ICC 2020. SimaPro Analyst 8.5.2.0, Ecoinvent 3.1, 2.2 database.

PCRs
ISO 21930:2017 serves as the core PCR along with EN 15804 and UL Part A.

ULE PCR Part A: Life Cycle Assessment Calculation Rules and Report Requirements v3.1
May 2, 2018. Technical Advisory Panel members reviewed and provided feedback
on content written by UL Environment and USGBC. Past and present members of
the Technical Advisory Panel are listed in the PCR.

ULE PCR Part B: Building Envelope Thermal Insulation
Version 2.0, April 2018. PCR review conducted by Thomas Gloria, PhD (chair, t.gloria@industrial-ecology.com); Andre Desjarlais; and Christoph Koffler, PhD.

ULE General Program Instructions v2.1, April 2017

ISO 14025, "Sustainability in buildings and civil engineering works -- Core rulesfor environmental product declarations of construction products and services",ISO21930:2017

SM Transparency Reports (TR) are ISO 14025 Type III environmental declarations (EPD) that enable purchasers and users to compare the potential environmental performance of products on a life cycle basis. Environmental declarations from different programs (ISO 14025) may not be comparable. They are designed to present information transparently to make the limitations of comparability more understandable. Limitations of LCA results for the products represent production volumes for the Houston, TX facility only.TRs/EPDs of products that conform to the same PCR and include the same life cycle stages, but are made by different manufacturers, may not sufficiently align to support direct comparisons. They therefore, cannot be used as comparative assertions unless the conditions defined in ISO 14025 Section 6.7.2. 'Requirements for Comparability' are satisfied. Comparison of the environmental performance of building envelope thermal insulation using EPD information shall be based on the product's use and impacts at the building level, and therefore EPDs may not be used for comparability purposes when not considering the building energy use phase as instructed under the PCR. Environmental declarations from different programs based upon differing PCRs may not be comparable. Full conformance with the PCR for building envelope thermal insulation allows EPD comparability only when all stages of a life cycle have been considered, when they comply with all referenced standards, use the same sub-category PCR, and use equivalent scenarios with respect to construction works. Compliance with model building codes does not always ensure compliance with state or local building codes, which may be amended versions of these model codes. Always check with local building code officials to confirm compliancHowever, variations and deviations are possible. Example of variations: Different LCA software and background LCI data sets may lead to different results upstream or downstream of the life cycle stages declared.

Rating systems

The intent is to reward project teams for selecting products from manufacturers who have verified improved life-cycle environmental performance.

LEED BD+C: New Construction | v4 - LEED v4
Building product disclosure and optimization
Environmental product declarations

○ Industry-wide (generic) EPD	½ product
✓ Product-specific Type III EPD	1 product

LEED BD+C: New Construction | v4.1 - LEED v4.1
Building product disclosure and optimization
Environmental product declarations

○ Industry-wide (generic) EPD	½ product
✓ Product-specific Type III EPD	1 product

Green Globes for New Construction and Sustainable Interiors
Materials and resources

✓ NC 3.5.1.2 Path B: Prescriptive Path for Building Core and Shell	
✓ C 3.5.2.2 and SI 4.1.2 Path B: Prescriptive Path for Interior Fit-outs	

Collaborative for High Performance Schools National Criteria
MW 7.1 – Environmental Product Declarations

✓ Third-party certified type III EPD	2 points

BREEAM New Construction 2018
Mat 02 - Environmental impacts from construction products
Environmental Product Declarations (EPD)

○ Industry average EPD	.5 points
✓ Multi-product specific EPD	.75 points
○ Product specific EPD	1 point

SM Transparency Report (EPD)™ + Material Health Overview™

VERIFICATION	LCA
3rd party reviewed	✓ NSF
Transparency Report (EPD)	
3rd party verified	✓ NSF
Material evaluation	
Self-declared	✓

Validity: 2020/10/16 – 2025/10/16 ICC – 20200122–003

This environmental product declaration (EPD) was independently verified by NSF to ISO 21930:2017, EN 15804, the ULE PCR and ISO 14025:2006.

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EcoInvent 3.1, 2.2

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Public LCA:
ICC Cellulose Spray-Applied Thermal Insulation and Acoustical Finishes

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Houston, TX 77045
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(800) 444-1252

Contact us

LCA & material health results & interpretation

K-13

Life cycle assessment | Material health

Assessment scope and results

Health Product Declaration®

K-13 Acoustical/Thermal Insulation System

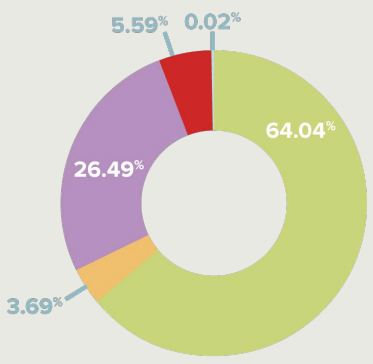
Inventory threshold: 100 ppm

Full disclosure known hazards: Yes

Based on the selected content inventory threshold:

☑ Characterized ☑ Screened ○ Identified

TOTAL INTENTIONAL INGREDIENTS



GreenScreen® List Translator Scores

- List Translator Likely Benchmark 1 / Benchmark 1
- List Translator Possible Benchmark 1
- List Translator Benchmark Unknown
- Benchmark 2
- Benchmark 3
- Benchmark 4
- No GS data available

Learn about the GreenScreen® List Translator

Total VOC Content

VOC Content data is not applicable for this product category.

The Health Product Declaration®

The HPD Open Standard provides a consistent, and transparent format to accurately disclose the material contents and associated hazard classifications for a building product.

How it works

Material ingredients are screened and categorized according to the hazards that international governmental bodies and toxicology experts have associated with them, based on two listings:

- Authoritative lists maintained or recognized by government bodies
- Screening lists, which include chemicals that government bodies determined need further scrutiny, as well as chemical lists not recognized by any government body.

What's in this product and why

K-13 is a spray-applied thermal and acoustical insulation typically used as an exposed ceiling finish requiring no additional barriers or materials. K-13 meets project requirements for thermal insulation, noise control with an attractive natural texture that is available in standard and custom colors.

The K-13 system begins with specially prepared cellulose fibers combined with natural fire retardants in a strict, quality-controlled manufacturing process to produce a Class A, Class 1 rated material. K-13 is then spray-applied by an international network of professional contractors licensed by ICC to ensure consistent and predictable results. During application, the K-13 fibers combine with a patented water-based adhesive resulting in a durable, exposed finish.

How we're making it healthier

K-13 is made from 3.99% mixed pre-consumer recycled papers and inventoried to 1,000 PPM in accordance with the HPD Collaborative.

K-13 is UL GREENGUARD Gold certified and compliant with LEED v4: Low-Emitting Materials, CDHP/ California Section 01350, SCAQMD Rule 1168, and CHPS- Acoustical Ceiling. Additionally, K-13's thermal and acoustical performance may contribute to sustainable credit categories for green-building initiatives.

K-13 does not contain silica dust, asbestos, mineral or glass fibers, or PCB's.

See how we make it greener

References

Health Product Declaration®
K-13 Acoustical/Thermal Insulation System

Health Product Declaration Open Standard v2.1.1
The standard provides guidance to accurately disclose the material contents of a building product using a standard, consistent, and transparent format.

Rating systems

LEED BD+C: New Construction | v4 - LEED v4
Building product disclosure and optimization
Material Ingredients

Credit value options	1 product each
☑ 1. Reporting	○ 2. Optimization ○ 3. Supply Chain Optimization

Living Building Challenge
Materials petals imperatives

☑ 10. Red List Free ○ 12. Responsible Industry ○ 13. Living Economy Sourcing

WELL Building Standard®
Air and Mind Features

○ Air, 26. Enhanced Material Safety

☑ Mind, 97. Material Transparency ○ **Mind,** 98. Organizational Transparency

Collaborative for High Performance Schools National Criteria
MW 10.1 — Building Product Health Related Information Reporting

☑ Product Health Related Information Report 1 point

SM Transparency Report (EPD)™ + Material Health Overview™

VERIFICATION	Material evaluation
Self-declared	☑

ICC – 07292019 – 002

The material health evaluation is self-declared and done in accordance with the HPD Open Standard 2.1

HPD Collaborative
401 Edgewater Place, Suite 600
Wakefield, MA 01880
www.hpd-collaborative.org
781.876.8871

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Houston, TX 77045
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Contact us

How we make it greener

K-13

See LCA results by life cycle stage

RECYCLED CONTENT AND CARBON SEQUESTRATION

ICC's line of spray-applied systems, consisting of natural, plant-based fibers and specialty, water-based adhesives, are carbon-storing materials that contain over 50% recycled content. Cellulose, the primary raw ingredient, has an exceptional embodied carbon profile and contains wood, cotton, hemp and other rapidly renewable resources. During their useful life, these raw material ingredients sequester carbon reducing the amount of harmful greenhouse gasses in the atmosphere. Cellulose takes less energy to make compared to other building insulation materials.

INGREDIENT OPTIMIZATION AND AVOIDANCE OF HAZARDOUS SUBSTANCES

K-13, SonaSpray, Ure-K, and SonaKrete spray-on systems are M1 Classified as Low Emitting Building Material and are compliant with CDPH/CA Section 01350. They are also GREENGUARD Gold Certified per UL Environmental which ensures that a product has met the most rigorous and comprehensive standards for low emissions of volatile organic compounds (VOCs) into indoor air.

ICC products have met the Living Building Challenge requirement that they do not contain chemicals on the Red List. The Red List contains some of the worst materials prevalent in the building industry; for transparency purposes, ICC has provided an ingredient list for 98% of the total product and all proprietary material chemicals have been disclosed to third party to verify they are non-hazardous. K-13, SonaSpray, Ure-K, and SonaKrete spray-on systems are free of heavy metals such as Lead (Pb), Cadmium (Cd), Mercury (Hg), and Hexavalent Chromium (Cr(VI)) or other metals. Furthermore, there are no ozone depleting substances such as CFC's/HCFCs, Isocyanate or any Brominated Flame Retardants (PBTs).

TRANSPORTATION AND MANUFACTURING

K-13, SonaSpray, Ure-K, and SonaKrete are manufactured in the United States under the ISO 9001:2015 Quality Management System by International Cellulose Corporation in Houston Texas. Adhesives are produced and shipped in concentrated forms and are diluted with water sourced from the job site. Local sourcing and manufacturing allow for a reduction in transportation costs and emissions.

INSTALLATION & MAINTENANCE

International Cellulose Corporation’s thermal and acoustical finish systems are spray-applied to common substrates through specialized equipment using approved application techniques. ICC's products are installed by a network of licensed applicators, trained by ICC and supported by their field services team. During the installation, fibers and adhesives are combined forming a durable, monolithic coating over the substrate.

END OF LIFE

International Cellulose Corporation’s thermal and acoustical finish systems are spray-applied to common substrates through specialized equipment using approved application techniques. ICC's products are installed by a network of licensed applicators, trained by ICC and supported by their field services team. During the installation, fibers and adhesives are combined forming a durable, monolithic coating over the substrate.

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3rd party reviewed	NSF
Transparency Report (EPD)	
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Material evaluation	
Self-declared	✓

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Additional EPD content required by: ULE PCR Parts A and B for Building Envelope Thermal Insulation

K-13 & ThermoCon

Data

Background This product specific declaration was created by collecting product data over the course of a year for each product at each location the product was manufactured. For products with multiple manufacturing locations, data are a weighted average by production volume at each location. The reference service life applies for the reference in-use conditions only.

Allocation: No allocation was necessary in this project. ICC provided data for four different products from one facility. All the data provided was specific to each product.

Cut-off criteria For the inclusion of mass and energy flows are 1% of renewable primary resource (energy), 1% nonrenewable primary resource (energy) usage, 1% of the total mass input of that unit process, and 1% of environmental impacts. The total of neglected input flows per module does not exceed 5% of energy usage, mass, and environmental impacts. The only exception to these criteria is substances with hazardous and toxic properties, which must be listed even when the given process unit is under the cut-off criterion of 1% of the total mass. No known flows are deliberately excluded from this declaration.

Scenarios and additional technical information

PARAMETER	VALUE	UNIT
Transport to the building site [A4]		
Vehicle type	Truck	
Average distance from Houston to installation site	1,610	km
Installation into the building [A5]		
Vehicle type	Truck	
Distance from installation site to disposal	161	km
Mass of plastic packaging waste to disposal	7.02E-06	kg
GWP based in biogenic carbon content of plastic packaging	0	kg CO_2e
Disposal/reuse/recycling [C1-C4]		
Vehicle type	Truck	
Distance from installation site to disposal	161	km
Mass of product waste to disposal	0.0084	kg

Resource use, output and waste flows, and carbon emissions and removals for K-13 & Thermocon insulation per functional unit

Parameter	Unit	A1-A3	A4	A5	B1	B2	B3	B4	B5	B6	B7	C1	C2	C3	C4
Resource use indicators															
Renewable primary energy used as energy carrier (fuel)	MJ, LHV	3.47E-01	5.98E-02	1.34E-01	0	0	0	0	0	0	0	0	5.86E-03	0	3.21E-03
Renewable primary resources with energy content used as material	MJ, LHV	1.96E-01	0	3.77E-02	0	0	0	0	0	0	0	0	0	0	0
Total use of renewable primary resources with energy content	MJ, LHV	5.43E-01	5.98E-02	1.72E-01	0	0	0	0	0	0	0	0	5.86E-03	0	3.21E-03
Non-renewable primary resources used as an energy carrier (fuel)	MJ, LHV	2.92E01	9.66E00	7.04E00	0	0	0	0	0	0	0	0	9.46E-01	0	4.61E-01
Non-renewable primary resources with energy content used as material	MJ, LHV	1.58E-01	0	0	0	0	0	0	0	0	0	0	0	0	0
Total use of non-renewable primary resources with energy content	MJ, LHV	2.94E01	9.66E00	7.04E00	0	0	0	0	0	0	0	0	9.46E-01	0	4.61E-01
Secondary materials	kg	1.18E00	0	0	0	0	0	0	0	0	0	0	0	0	0
Renewable secondary fuels	MJ, LHV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-renewable secondary fuels	MJ, LHV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Recovered energy	MJ, LHV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Use of net fresh water resources	m3	3.03E00	6.61E-01	5.58E-01	0	0	0	0	0	0	0	0	6.47E-02	0	3.49E-02
Output flows and waste category indicators															
Hazardous waste disposed	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Non-hazardous waste disposed	kg	0	0	3.57E-02	0	0	0	0	0	0	0	0	0	0	2.15E00
High-level radioactive waste, conditioned, to final repository	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Intermediate- and low-level radioactive waste, conditioned, to final repository	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Components for re-use	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for recycling	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Materials for energy recovery	kg	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Exported energy	MJ, LHV	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon emissions and removals															
Biogenic Carbon Removal from Product	kg CO_2	1.51E-05	0	0	0	0	0	0	0	0	0	0	0	0	0
Biogenic Carbon Emission from Product	kg CO_2	1.37E-02	0	0	0	0	0	0	0	0	0	0	0	0	4.71E-04
Biogenic Carbon Removal from Packaging	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biogenic Carbon Emission from Packaging	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Biogenic Carbon Emission from Combustion of Waste from Renewable Sources Used in Production Processes	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Calcination Carbon Emissions	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbonation Carbon Removals	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Carbon Emissions from Combustion of Waste from Non-Renewable Sources used in Production Processes	kg CO_2	0	0	0	0	0	0	0	0	0	0	0	0	0	0