Cellulose insulation is a natural thermal/acoustical insulation material produced from recovered paper fibers in highly efficient electrically driven mills. Recycled newsprint and cardboard are the principal ingredients, but other paper fibers can be, and often are, used.

Due to its inherent recovered content and high thermal efficiency cellulose insulation is often called "The Greenest of the Green."

### Performance dashboard

#### Features & functionality

An insulation upgrade in the walls, ceilings, and attics of new homes.

A preferred material for installation in walls and attics of existing homes.

Totally fills building assembly cavities, creating a tight, energy-efficient building envelope.

Creates more fire-resistant walls and attics.

A time-proven product with nearly a century of demonstrated durability and thermal performance.

Sequesters carbon for the life of the building—and beyond.

Visit CIMA for more product specifications

#### Environment & materials

Improved by:

85%, or more, recovered content – most of it post-consumer.

Much material used in cellulose insulation is locally-sourced recovered paper and cardboard

Low or zero VOC emissions

Certifications, rating systems & disclosures:

- ASTM Standard C739
- Canada Consumer Product Safety Act 16-2-B Part 1404
- CAN/ULC S703

CSI MasterFormat® 07 21 23

Cellulose Insulation General Specifications

For spec help, contact us or call 888-881-2462

### SM Transparency Catalog

CIMA/CIMAC Conventional Loose-Fill Cellulose Insulation

This environmental product declaration (EPD) was independently verified by NSF to the UL PCR.

**NSF Certification, LLC**

P.O Box 130140

789 N.Disbrowe Road

Ann Arbor, MI 48105, USA

www.nsf.org

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 m² of installed insulation w/ packaging; thickness that gives an avg thermal resistance of RSI = 1 m²·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:**

Cellulose Insulation Manufacturers Association

133 S. Keowee St

Dayton, OH 45402

www.cellulose.org

937-222-2462

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A variation of 10 to 20% | A variation greater than 20%

The EC3 building industry to transparently measure, compare, and reduce impact.

Lower environmental impact is left). When a manufacturer compares its product-specific results, if the were selected because they had the lowest variability (see table to the sample.

Three impact categories are categories used for comparison. The average is representative of data from all 13 manufacturers. This range is the confidence interval. A 95%

After removal, the insulation is assumed to be landfilled. At the installation site, insulation products are unpackaged and installed with a blowing machine. The potential impact of the blower is included in this product differ due to the differences in the data inputs and determine if uncertainty analysis is done to measure how the LCA results of each product.
A variation of 10 to 20% | A variation greater than 20%

Learn about SM Single Score results

LCA results

percentiles. 

upper limit (97.5%) values of the interval to establish the 20 – 80th impact.

be below the industry impact; 

left). When a manufacturer compares its product-specific results, if the representative of all cellulose insulation manufacturers, based on this confidence level demonstrates the confidence that the results are all 13 manufacturers. This range is the confidence interval. A 95% uncertainty analysis was done in SimaPro for each participant. The results of inputs and outputs. All questions regarding data were resolved with CIMA adding the fire retardant in liquid form to the fibers, and then drying and representing 13 locations across the United States and Canada.8-1 kg 0.6697-6.2748 kg 0.3 kg

CIMA and CIMAC Loose-Fill Cellulose Insulation Products LCA Background

Back to the performance dashboard

References

The energy used to make cellulose insulation is referred to as the energy use during its manufacturing stage (A1). This includes the energy used to produce the fibers, make the fire retardant, and transport the product. During the acquisition stage (A2), the energy used is for transport of the raw materials to the manufacturing sites and packaging. The energy used in the installation stage (A3) is for transport and installation of the cellulose insulation. The energy used in the use stage is related to the energy required to maintain the temperature of buildings where cellulose insulation is used. The energy used in the end of life stage is associated with the removal of the insulation from buildings and its disposal in landfills or recycling facilities.

This study is based on the cradle to gate approach, which includes the manufacturing of the product and its packaging. The life cycle impact assessment (LCIA) is performed using the EcoInvent 3.1 and 2.2 databases and the SimaPro Analyst 8.5.2.0 software. The functional unit is defined as 1 m² of ceiling or wall insulation, and the reference service life is 75 years. The study covers the production of all components of the product, including the cellulose fibers, fire retardant, and packaging. The study also includes the energy used in the transport of raw materials and products, as well as the energy used in the installation and end of life stages.

To assess the environmental impact, the study uses the Impact 2002+ method, which is a life cycle impact assessment method developed by the Swedish Environmental Protection Agency. This method is widely used in environmental product declarations (EPDs) and provides a comprehensive assessment of the environmental impacts of a product across its entire life cycle.

The study finds that the energy used during manufacturing and installation is the largest contributor to the life cycle impact of cellulose insulation. The energy used in the use stage, which includes the energy required to maintain the temperature of buildings where cellulose insulation is used, is also significant. The energy used in the end of life stage, which includes the energy required to remove the insulation from buildings and its disposal in landfills or recycling facilities, is relatively small compared to the other stages.

The study also finds that the choice of fire retardant and the energy used in its production have a significant impact on the life cycle impact of cellulose insulation. The study recommends that manufacturers consider using fire retardants that have a lower environmental impact, such as those based on ammonium sulfate, and that manufacturers use energy-efficient processes to produce the fire retardant.

The study concludes that cellulose insulation is an environmentally friendly product due to its low energy use during manufacturing and installation and its ability to sequester carbon in the walls and ceilings where it is installed. The study also finds that the energy used in the use stage, including the energy required to maintain the temperature of buildings where cellulose insulation is used, is significant.

The study recommends that manufacturers consider using fire retardants that have a lower environmental impact, such as those based on ammonium sulfate, and that manufacturers use energy-efficient processes to produce the fire retardant. The study also recommends that manufacturers consider the environmental impact of the energy used to transport raw materials and products, as well as the energy used in the installation and end of life stages.

The study is based on a sample of 13 manufacturers, and the results are representative of the average environmental impact of cellulose insulation. The study also provides a report on the variability of the results, which is useful for understanding the limitations of comparability.

The study is a valuable resource for manufacturers, designers, and engineers who are interested in the environmental impact of building materials. The study also provides useful information for consumers who are looking for environmentally friendly products.
**TRACI v2.1 results per functional unit**

The methodology uses the median, the average lower limit (2.50%), and average higher limit for the range. This approach helps in determining the environmental impact of the insulation products. It is determined to the best of the researchers' knowledge that the boundaries of the functional unit include insulation manufacturing, installation, and disposal. Three impact categories are used for comparison. The PCR requires global warming and the other two impacts of concern.
The European Commission's 6th Environment Action Programme. This change was specifically recognized as early as 2003 in the European Union's decision to implement policies that would effectively lower the carbon footprint of homes. Thus, to realistically lower the carbon footprint of houses, so they become sustainable and energy efficient homes that offer the best solution to minimize our impact on the environment.

Utilizing wood products and cellulose insulation with naturally occurring plant material helps make homes quieter and more fire safe. Low carbon footprint homes have been tested for VOC emission and have been found to be non-irritating cellulose insulation requires no special protective clothing during installation. Many cellulose insulation products are tested to meet formaldehyde limits of zero, which is the same as posing no risk to humans.

Here are hundreds of tons of waste paper that will not be landfilled, incinerated, or deinked using toxic chemicals. Instead, recovered paper fibers——is derived from trees; cellulose insulation each production shift. Since the primary feedstock——truckloads, or more, recovered content, most of which is postconsumer. A medium size cellulose insulation plant will convert three to five truckloads of paper to energy-saving insulation ready for shipment in just a few minutes. This removes the paper from the supply chain and can help participating manufacturers avoid paying taxes on the paper.

The compressive packaging allows for fewer deliveries and more nominal settled density for maximum transportation efficiency. The compressive packaging also allows for better performance and efficiency in energy-saving insulation compared to other types of insulation. Cellulose insulation is compressively packaged to 10x, or more, in cellulose insulation plants. In addition, cellulose insulation on the transportation vehicle compared to energy-saving insulation ready for shipment in just a few minutes. Several manufacturers recycle their dust back into the product. These companies produce no on-site air or solid waste pollution historically low fire retardant content with no loss of fire safety. Fire retardants used in cellulose insulation are nonhazardous to health and the environment. Fire retardant processing and infusion technology have resulted in cellulose insulation manufacturing is a low-energy process, generating no waste, other than dust, which is confined within the environment. Fire retardants used in cellulose insulation are commonly-used insulation products. The production process results in material with the least embodied energy of any of the common insulation products. Low energy manufacturing.

Cellulose insulation is often installed in interior walls to make ceilings of homes, making them more energy-efficient. Insulation sequesters carbon in the walls and ceilings of homes for the life of the building. “Carbon sinks” capable of sequestering carbon for the life of the building. This can reduce the amount of paper going to landfills and limit carbon emissions associated with construction and housing—Building lower carbon footprint homes.

New research on the use of wood-intensive construction and manufacturing shows it is actually possible to lower the carbon footprint of houses, so they become “carbon sinks” capable of sequestering carbon for the life of the building. This can reduce the amount of paper going to landfills and limit carbon emissions associated with construction and housing. In many cases cellulose can be added to walls in older homes. In many cases cellulose can be added to walls in older homes. In many cases cellulose can be added to walls in older homes. In many cases cellulose can be added to walls in older homes.
Carbon emissions and removals

LCIA results

ULE PCR Parts A and B for Building Envelope Thermal Insulation from Non-Renewable Combustion of Waste Carbon Emissions from Processes Used in Production

Biogenic carbon

Removal from product data over the course of a year for each product at each location

Scenarios and additional technical information

Transport to the building site (A4)

LCIA results, resource use, output and waste flows, and carbon emissions and removals for Conventional Loose-Fill Cellulose Insulation are functional unit

Output flows and waste category indicators

Carbon emissions and removals

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

Data

Use of net fresh water

Disposal/reuse/recycling (C1-C4)

Cut-off criteria

Non-hazardous waste

Intermediate- and high-level radioactive waste

Non-renewable primary resource (energy)

Terminology: The industry category description was created by combining product data over the course of a year for each product at each location. The product data were using multiple manufacturing locations, data were then weighted according to production volumes at each location. Each product data was then normalized to a functional unit (A4) using the allocation methods used were re-examined according to the updated allocation rules in ISO 21930:2017 and we were determined to be conformance; no updates to allocation methods were made.

LCIA results include the inclusion of major and minor processes, such as energy production, emissions processes, and noncarbon processes (such as water, land, etc.).

Any biogenic carbon is assumed to be not exceed 5% of energy usage, mass, and environmental impacts. The (energy) usage, 1% of the total mass input of that unit process, and 1% of renewable primary resource used as an energy carrier (fuel).

Carcinogenics

Fossil fuel depletion

Eutrophication

Acidification

Numerical values shown in red have a variation greater than 20%.

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Data

Transport to the building site [A4]

Technical type: JET Track

Distance to site: 124.485 km

Installation to the building [A5]

From manufacture to site (ex-factory):

Fuel Type: ULE-PCR Parts A and B for Building Envelope Thermal Insulation

Additional EPD content required by:

Eutrophication

Emission removals

LCIA results

Carbon emissions and removals

Disposal/reuse/recycling (C1-C4)

LCI results, resource use, output and waste flows, and carbon emissions and removals for Conventional Loose-Fill Cellulose Insulation are functional unit:

Non-renewable primary energy carriers

Resource extraction

Recovery Energy

Output flows and waste category indicators

High-level radioactive waste, final disposal

Carbonation and Final Disposal

Biogenic Carbon

Conventional Loose-Fill Cellulose Insulation

Biogenic Carbon

Non-renewable primary energy resources

Non-renewable primary energy resources

Eutrophication

Transport to the building site

Conventional Loose-Fill Cellulose Insulation

Conventional Loose-Fill Cellulose Insulation

Carbon emissions and removals

Environmental impacts

Non-renewable primary energy resources

RCM

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