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# Fiberglass Insulation

A Guide to Better  
Indoor Air Quality





# Safer Products Make Healthier Homes

According to the Environmental Protection Agency (EPA), “Americans, on average, spend approximately 90 percent of their time indoors, where the concentrations of some pollutants are often 2 to 5 times higher than typical outdoor concentrations.”<sup>1</sup>

Since 1970, many homes have been built to help conserve more energy, creating a tighter seal that can trap indoor air pollutants without proper ventilation. The bottom line: **the air in homes impacts every family member’s health**, so it’s important to know and understand the health benefits of cleaner indoor air quality.

It’s often not until homebuyers decide to purchase a new home or remodel their current home that they think about what’s in their building materials. When it comes to insulation, there’s a lot of information out there, but it can be hard to separate fact from fiction. Even after researching what building products are best when

considering indoor air quality, many homebuyers and owners still have questions about the potential health impacts of different insulation types.

Whether you are a builder, installer, or homeowner, if indoor air quality is a concern, **fiberglass home insulation products stand out as excellent choices.**

In fact, *A Guide to Healthier Upgrade Materials*, a report issued by the nonprofit organization Energy Efficiency for All, in partnership with the Natural Resources Defense Council and the Healthy Building Network, recommends fiberglass insulation as one of “the best insulation materials from a health perspective.”<sup>2</sup> ➔



<sup>1</sup> Environmental Protection Agency. 2020. Report on the Environment: Indoor Air Quality. <https://www.epa.gov/report-environment/indoor-air-quality#:~:text=The%20potential%20impact%20of%20indoor,higher%20than%20typical%20indoor%20concentrations.>

<sup>2</sup> Energy Efficiency for All. 2018. Making Affordable Multifamily Housing More Energy Efficient: A Guide to Healthier Upgrade Materials. <https://www.energyefficiencyforall.org/resources/making-affordable-multifamily-housing-more-energy-efficient-guide-healthier-upgrade/>





# Meeting Rigorous Chemical Standards

GREENGUARD or GREENGUARD Gold certify most fiberglass home insulation products.<sup>3</sup>

Products that have achieved GREENGUARD Certification are scientifically proven to meet some of the world's most rigorous third-party chemical emissions standards, helping to reduce indoor air pollution and the risk of chemical exposure from volatile organic compounds (VOCs).

Receiving a GREENGUARD certification means the product has been **tested in laboratory** settings by an independent third-party and found to have a **minimal impact on the indoor environment**. GREENGUARD Gold is designed to define

low-emitting materials suitable for environments where at-risk, chemically sensitive kids or seniors spend extended periods of time, such as daycares, healthcare facilities, homes, and commercial spaces.

You can search for what products receive GREENGUARD and GREENGUARD Gold, along with other health and sustainability certifications, for free at [spot.ul.com](https://spot.ul.com). →

<sup>3</sup> <https://www.ul.com/resources/ul-greenguard-certification-program>



# Reducing Environmental Hazards

Fiberglass home insulation products are produced mostly from a combination of virgin and recycled materials such as sand and recycled glass.<sup>4</sup>

Many decades ago, asbestos was used in some industrial insulation products but was never an ingredient in home fiberglass products.<sup>5</sup>

Since 2010, some home insulation products have eliminated the trace amounts of formaldehyde previously used in the binder that helps fiberglass maintain its shape. And since 2017, **no home fiberglass products made in the United States and Canada have formaldehyde in the binder.**<sup>6</sup> This change was the result of a voluntary effort by manufacturers to produce a formaldehyde-free insulation product.<sup>7</sup>

Fiberglass home insulation also **does not contain isocyanates**. Isocyanates are chemicals found in other insulation types that can cause headaches, dizziness, and eye, nose, and throat irritation. Over time exposure to isocyanates may lead to sensitization, chronic diseases, or cancer. According to the EPA, there is no recognized safe level of exposure to isocyanates for sensitized individuals. Isocyanates have been reported to be a leading attributable chemical cause of asthma in the workplace.<sup>8</sup> ➔



<sup>4</sup> Building for Environmental and Economic Sustainability (BEES) software. 2017. Percentages are based on a generic R-13 fiberglass batt. <https://www.nist.gov/services-resources/software/bees>

<sup>5</sup> If your home was built before 1975, it is possible that the insulation is vermiculite, which can contain asbestos. Vermiculite is a lightweight, pea-size, flaky gray mineral. If you have reason to believe your existing insulation may be vermiculite, do not disturb it and have it tested by a professional. Your local health department, or possibly an insulation contractor, can help you identify means of getting this testing done. If it is determined that asbestos is present, a professional needs to remove the insulation. Insulation Institute. 2020. DIY Insulation or Hire a Professional? <https://insulationinstitute.org/im-a-homeowner/installation/diy-insulation-vs-hiring-a-pro/>

<sup>6</sup> For the purposes of this guide, home insulation products refer to batt and blown-in products. While some fiberglass duct wrap and duct liner products do contain trace amounts of formaldehyde, it is not released for human exposure.

<sup>7</sup> Healthy Building Network. 2015. Residential Fiberglass Insulation Transformed: Formaldehyde is No More. <https://healthybuilding.net/blog/204-residential-fiberglass-insulation-transformed-formaldehyde-is-no-more>

<sup>8</sup> <https://archive.epa.gov/epa/saferchoice/health-concerns-about-spray-polyurethane-foam.html>.

<https://archive.epa.gov/epa/saferchoice/potential-chemical-exposures-spray-polyurethane-foam.html#off-gassing>



# Made from Basic Materials for Proven Results

Here are some common ingredients found in home fiberglass insulation batt and blown-in products:



## Sand

Sand is an abundant renewable resource. The Earth is in constant process of forming sand.



## Glass Cullet

Recycled glass accounts for about 40% of all the raw materials in fiberglass insulation. Next to glass packaging, the fiberglass insulation industry is the largest user of recycled glass.



## Borax

Borax is used to give flexibility to the fibers. Borax comes from natural deposits and is also used in making laundry detergent and soap.



## Soda Ash

Soda ash is made from the mineral trona. Its primary use is for glass but also soaps and detergents as well as pulp and paper.



## Carbohydrate and Acrylic-Based Binder Coatings

This is what allows fiberglass batts to retain their shape. Today many binders are composed of different carbohydrates like sugar or starches.



## Limestone

Limestone is a rock that comprises 15% of the Earth's sedimentary crust. Limestone is also used in water treatment and purification plants, and in the processing of various foods and household items, including medicines.



# A Well-Tested Insulation Solution

After years of research, the International Agency for Research on Cancer (IARC), the US National Toxicology Program (NTP), and the California Office of Environmental Health Hazard Assessment have all confirmed that fiberglass thermal and acoustic insulations are not classifiable as to carcinogenicity and do not appear on their lists of possible carcinogens.<sup>9</sup>

Not all insulation materials have undergone the same level of rigorous testing and scrutiny when it comes to health and safety. **Fiberglass insulation is the most thoroughly tested** insulation material available.<sup>10</sup> Extensive epidemiological, animal, biosolubility, and exposure studies combine to demonstrate that residential fiberglass insulation is safe to manufacture, install, and use when standard recommended work practices are followed to prevent irritation. ➔

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<sup>9</sup> International Agency for Research on Cancer, IARC Monographs on the Evaluation of Carcinogenic Risks to Humans: Man-Made Vitreous Fibres, Vol. 81 (Lyon, France: WHO/IARC, 2002), pp. 334-335.

U.S. Department of Health and Human Services, National Toxicology Program, Report on Carcinogens, Fourteenth Edition, Substance Profile "Certain Glass Wool Fibers (Inhalable)," 2016 (<https://ntp.niehs.nih.gov/ntp/roc/content/profiles/glasswoolfibers.pdf>).

No. 46-Z, California Regulatory Notice Register, November 18, 2011, p. 1878.

Toxicological Profile for Synthetic Vitreous Fibers (U.S. Department of Health and Human Services, Public Health Services, Agency for Toxic Substances and Disease Registry), September 2004, p. 7.

<sup>10</sup> "Historical Cohort Study of US Man-Made Vitreous Fiber Production Workers," Journal of Occupational and Environmental Medicine, September 2001, Vol. 43, No. 9.

Egnot, et al., "Systematic review and meta-analysis of epidemiological literature evaluating the association between exposure to man-made vitreous fibers and respiratory tract cancers," 112 Regulatory toxicology and Pharmacology 104585 (2020).

G.E. Marchant, et al., "A Synthetic Vitreous Fiber (SVF) Occupational Exposure Database: Implementing the SVF Health and Safety Partnership Program," Applied Occupational and Environment Hygiene, 17(4): 276-285, 2002.

Marchant, Gary; Bullock, Christopher; Carter, Charles; Connelly, Robert; Crane, Angus; Fayerweather, William; Johnson, Kathleen; and Reynolds, Janis (2009) "Applications and Findings of an Occupational Exposure Database for Synthetic Vitreous Fibers," Journal of Occupational and Environmental Hygiene, 6:3, 143-150.

Marsh et al., "Historical Cohort Study of US Man-Made Vitreous Fiber Production Workers," Journal of Occupational and Environmental Medicine, September 2001, Vol. 43, No. 9.

L. Daniel Maxim, et al., "Fiber glass and rock/slag wool exposure of professional and do-it-yourself installers," Regulatory Toxicology and Pharmacology, 37 (2003) 28-44.

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# Asthma and Allergy Friendly

**A comprehensive review of the scientific literature confirmed that fiberglass does not cause an allergic reaction.<sup>11</sup>**

Asthma is caused by immune system reactions in the airways to allergens, such as animal dander, certain volatile organic compounds (VOCs), and mold. If asthma is of concern, fiberglass insulation is an excellent product choice.

Fiberglass is the only insulation category to receive the Asthma and Allergy Friendly product certification from Allergy Standards.<sup>12</sup> While mold is an allergen for some people, fiberglass, by itself, cannot provide a food source for mold growth. That's because fiberglass insulation is made from inorganic materials like glass, unlike some other insulation products. However, mold can grow in any environment where there is moisture and food for mold spores, including dirt. That's why it's important to replace any insulation product in an event such as flooding where water and organic materials can get trapped in areas of a home.<sup>13</sup> ➔

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<sup>11</sup> Support on Health Hazard Assessment of Glass, Stone/Rock and Slag Wool Fibres according to the Globally Harmonised System (GHS): Phase II," BiPRO, part of Ramboll, Revised Report, Commissioned by EURIMA, NAIMA, and ICANZ, July 2018.

<sup>12</sup> [https://www.asthmaandallergyfriendly.com/USA/products\\_categories/insulation/](https://www.asthmaandallergyfriendly.com/USA/products_categories/insulation/)

<sup>13</sup> [insulationinstitute.org/wp-content/uploads/2019/02/TechNote-09-NAIMA-Flood-2019-01.pdf](https://insulationinstitute.org/wp-content/uploads/2019/02/TechNote-09-NAIMA-Flood-2019-01.pdf)

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## Safe to Handle

Fiberglass insulation manufacturers are committed to scientific innovation and the safe installation of their products.

Through the North American Insulation Manufacturers Association (NAIMA), the fiberglass insulation industry operates the Product Stewardship Program<sup>14</sup> that includes a living database of exposure data for a vast array of work tasks and product categories. The database is maintained with independent oversight and management from Arizona State University and includes more than 18,000 data points. The exposure database was approved by the Occupational Safety and Health Administration (OSHA) as part of the industry's original Health and Safety Partnership Program.

Fiberglass insulation products are safe to manufacture, install, and use when recommended work practices are followed. Fiberglass may cause temporary irritation without proper protections, but the irritation is mechanical, not chemical, and fiberglass is not regulated as an irritant by OSHA. **Unlike other insulation types**, full-face supplied-air respirators and **chemical protective clothing are not required** to install home fiberglass insulation, and worksites do not require the evacuation of other trades.

Through the industry's Product Stewardship Program, installers can learn how to safely install fiberglass insulation and minimize irritation through the proper use of personal protective equipment (PPE) and correct handling and installation procedures. →

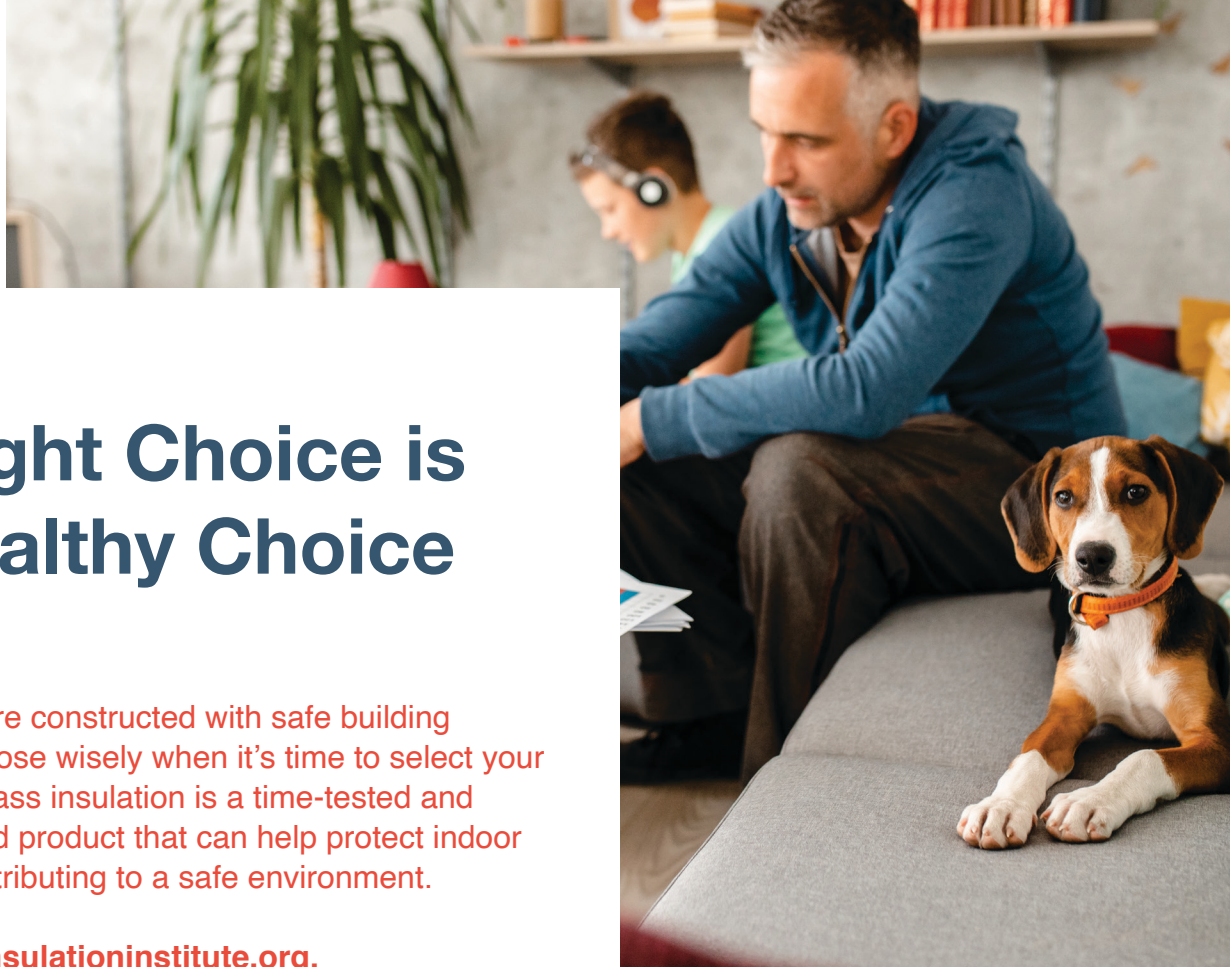


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<sup>14</sup> NAIMA worked with OSHA to create the Health and Safety Partnership Program ("HSPP"), a comprehensive stewardship program that included work practices, training materials, a recommended PEL, and an exposure database. The program lasted for eight years and involved annual reporting to OSHA. Upon completion of the HSPP, the program was converted into the NAIMA Stewardship Program.

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# The Right Choice is the Healthy Choice

Healthy homes are constructed with safe building materials, so choose wisely when it's time to select your products. Fiberglass insulation is a time-tested and third-party verified product that can help protect indoor air quality by contributing to a safe environment.

Learn more at [insulationinstitute.org](https://insulationinstitute.org).

## Insulation Institute™

KNOWLEDGE. LEADERSHIP. CONFIDENCE.

NAIMA is the association for North American manufacturers of fiber glass, rock wool, and slag wool insulation products. Its role is to promote energy efficiency and environmental preservation through the use of fiber glass, rock wool, and slag wool insulation, and to encourage the safe production and use of these materials. Through the Insulation Institute™, we leverage the collective insulation expertise of our organization and our members to empower homeowners and professionals to make informed insulation choices. Our mission is to enable a more comfortable, energy- efficient and sustainable future through insulation — and we are constantly working with building professionals, homeowners, government agencies, and public interest, energy and environmental groups to realize that vision.

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