Frequently Asked Questions About Insulation

Information from NAIMA

NAIMA
North American Insulation Manufacturers Association

FAQs About Fiber Glass Insulation

What are the major uses of fiber glass insulation?

Fiber glass serves a number of useful purposes, but the most important application of wool-type fiber glass is as insulation used primarily to control temperature and sound in homes, commercial buildings and industrial operations. Wool-type fibers are also used to manufacture a variety of sound-control products and insulation for air ducts, pipes, roofs, walls, floors, automobiles, mobile homes, aircraft, refrigerators, domestic cooking appliances, as well as other appliances and equipment. For additional information, visit the NAIMA web site.

What are the benefits of fiber glass insulation?

Fiber glass insulation is a cost-effective, energy-saving product that saves money for individuals and businesses through lower utility bills while increasing the comfort levels for all building occupants.* In addition, adequate levels of fiber glass pipe insulation for industrial processes have helped make industry more efficient and more profitable by cutting energy losses and decreasing production costs. By avoiding the added energy generation necessary to heat and cool buildings, fiber glass insulation continues to be a benefit to the environment by helping to reduce pollution emissions.

Fiber glass insulation products play a significant energy-savings role by reducing energy use in homes, office buildings, businesses and manufacturing plants. In 1996, a study was conducted jointly by the Alliance to Save Energy and Energy Conservation Management, Inc. regarding the energy and environmental benefits of insulation. The report, entitled "Green and Competitive," found that insulation currently in place in residential buildings throughout the United States saves 10.41 quadrillion Btu's each year. That is enough energy to generate 36% of America's annual electric consumption or the equivalent of a 255-day supply of gasoline for the entire United States.

While the energy savings from fiber glass insulation are significant, so are the environmental benefits. By making

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* Savings vary. Higher R-value means greater insulating value.

buildings more energy efficient, fiber glass insulation helps reduce the amount of fossil fuel combustion needed to heat and cool homes, businesses, and factories. That, in turn, decreases the amount of carbon dioxide emitted into the atmosphere.

Because carbon dioxide is one of the principal "greenhouse gases" contributing to global warming, insulation plays a significant role in protecting the environment. For example, according to the "Green and Competitive" report, insulation currently in place in residential buildings reduces the amount of carbon dioxide emissions into the atmosphere by 1.35 trillion pounds each year. Almost 300 million acres of trees would have to be planted to remove this much carbon dioxide naturally from the atmosphere.

How does fiber glass insulation compare with other insulation materials?

Thermal Performance – Installed R-value

When insulating a home, it is important to get the R-value specified by the local energy code or the Department of Energy recommendations. It's also important that the product provide long-lasting thermal performance. For more information on insulation recommendations for a specific area, contact the local building department or the local gas or electric utility for their recommendation.

While R-value "per inch" is promoted by some manufacturers, the overall R-value installed is what counts. Fiber glass insulation products come in R-values ranging from R-11 to R-38 for fiber glass batts and rolls. Fiber glass insulation can be blown in an attic to nearly any R-value. More R-value alternatives provide greater flexibility in meeting code energy requirements in your area.

Lifetime Performance

In order to ensure the expected energy savings, it is important that the insulation does not deteriorate, or settle, over time. Fiber glass batts and rolls do not settle. Fiber glass loose-fill insulations may settle slightly (1-3%) resulting in virtually no impact on the thermal performance of the insulation.

In contrast, cellulose insulation not only settles to a much greater degree (approximately 20%), but also at a higher rate. If cellulose insulation is being considered, make sure the installer understands that most cellulose insulations settle in attic loose-fill applications – that's a significant loss of insulating effectiveness. In fact, the Insulation Contractors Association of America recommends that an additional 25% of thickness be added for cellulose insulation to compensate for this extreme loss of R-value.

Fire Safety

Fiber glass and cellulose perform very differently in terms of fire safety. Fiber glass insulation is naturally non-combustible because it is made from sand and recycled glass. The insulation requires no additional fire-retardant chemical treatments.

Most facings attached to fiber glass insulation are combustible and should never be left exposed. Other special flame-resistant facings may be left exposed where desired, such as on a basement or crawl space wall.

Cellulose insulation is made primarily of ground-up or shredded newspaper, which is naturally combustible. To protect against fire, cellulose insulation is heavily treated with fire retardant chemicals. Though cellulose is treated with fire retardants, it is not fire proof. This means the insulation could still burn if exposed to a heat source. Also some tests have shown that fire retardant chemicals can lose their effectiveness over time.

Tests conducted by the California Bureau of Home Furnishings and Thermal Insulation demonstrated that most cellulose samples failed the standard fire safety test only six months after installation. Smoldering and re-ignition problems present additional concerns with cellulose insulation should a fire start.

Moisture

Insulation will lose its insulating efficiency or R-value when wet. Fiber glass insulation is not absorbent and, if exposed to moisture, will not wick up or hold water. It will dry out and retain its original R-value.

Because cellulose is made from shredded newspaper, it will absorb and hold moisture, reducing energy savings. If soaked, cellulose will mat down and the thermal performance can be permanently reduced.

Some cellulose insulations are actually applied with water added by what is called a wet-spray method. Wet-spray applications do not achieve their R-value until dry. A study conducted by the NAHB Research Center in 1997, found that cellulose insulation had installed

moisture content greater than 40%. According to the study, under summer conditions, the walls dried rapidly to below 30% in the first day, but under fall and spring conditions, the walls dried much slower and were still above 30% when the drywall was installed.

Waiting until the cellulose is dry to cover up is difficult with today's building construction schedules. If wet-spray applications are covered up too soon, moisture problems will occur. Not only does the insulation efficiency suffer, but moisture can affect other building components, such as wood studs, drywall and metal building components which can suffer corrosion from moisture and salts. Moisture can also lead to a number of additional indoor air quality problems by promoting mold and mildew growth.

Air Infiltration

Thermal insulation, whether fiber glass or cellulose, when installed in side walls has very little to do with air infiltration. The U.S. Department of Energy estimates that up to 40% of a home's heat loss can be from air infiltration. But only 14% of the total loss from air infiltration occurs through side wall cavities, and most of that is around electrical outlets, a problem easily solved with inexpensive, easy-to-install electrical insulated outlet gaskets.

Air infiltration generally occurs in the areas of a home that are not insulated, such as around windows, doors, fireplaces, HVAC ductwork and perimeter joints. It can, and should, be controlled with the use of housewrap, proper caulking, and sealing of band joists, sill plates, header plates, and insulation around doors, windows, electrical outlets and other openings.

Recently there have been claims that some insulation products are better because they reduce air infiltration. Numerous research studies have been conducted to investigate this issue, among them studies by the National Association of Home Builders Research Center, researchers at Penn State University, and by a St. Louis utility. The research consistently demonstrated that if a wall cavity has been properly constructed, using drywall, sheathing and caulking, very little air will flow through the wall cavity regardless of the type of insulation.

Environmental Benefits

As the environmental consciousness of Americans has been heightened, the building industry has responded. This kind of rethinking has led to a strong push to use building materials with lower environmental impact.

Fiber glass insulation manufacturers have responded to this call for conservation by using increasing amounts of recycled materials in their products. As an industry, fiber glass insulation manufacturers recycle more material by weight (glass cullet – up to 40%) than any other type of insulation used in the building and construction sector.

The environmental benefits of fiber glass insulation, however, go far beyond its recycled content when analyzed from a life-cycle perspective. A life-cycle analysis is an appraisal of the environmental impacts connected with a product through an examination of the product's environmental traits during many stages including pre-manufacturing; manufacturing; distribution/packaging; use, reuse, maintenance; and waste management. In reviewing each of these stages, a life-cycle evaluation of fiber glass clearly shows its environmentally beneficial attributes. As an example, consider fiber glass versus cellulose insulation.

Cellulose manufacturers claim environmental benefits, even though they may be removing newsprint from an existing recycling loop. More trees must be cut and more energy used to make new newsprint and cardboard to make up for what has been used for cellulose insulation. And when it comes to insulating the same size home, pound for pound, it takes up to three times more cellulose than fiber glass to achieve the same insulating efficiency. Both insulations use the same amount of virgin material but the virgin material in fiber glass is sand – which is classified by the U.S. Environmental Protection Agency as a "rapidly renewable resource."

NAIMA has developed a brochure outlining the various life-cycle characteristics that specifiers should consider in determining the most relevant attributes of an environmentally preferable insulation product:"Using Recycled Material Is Just the First Step...(N016)"

For additional information, see the following NAIMA publications:

- Union Electric Field Test Pits Cellulose Against Fiberglass... and the Winner Is... (RP029)
- Insulation Facts #14 Wet-Spray Cellulose Insulation Systems (BI460)

- Insulation Facts #30: Insulation and Fire Safety (BI472)
- Facts #54: Fire & Thermal Performance of Reflective Insulations in Metal Building Applications (MB313)
- Attic Insulation Performance: Full Scale Tests of Conventional Insulation and Radiant Barriers (Executive Summary) (RP051)

What types of fiber glass insulation are available?

There are two types of fiber glass insulation: fiber glass loose-fill (blown in) insulation, and fiber glass blanket insulation. Fiber glass loose-fill insulation comes in bags. Fiber glass blanket insulation comes in batts and rolls in various densities, widths and lengths to fit particular home insulation applications.

What is the function of the 'facing' on insulation?

The facing material is generally a vapor retarder and is usually applied toward the "warm-in-winter" portion of the home to help resist the movement of moisture vapor to cold surfaces where it can condense. This means that in the ceilings the vapor retarder faces down; in the walls, it faces the inside; and in the floors over unheated spaces, it faces up. In hot, humid climates, a vapor retarder may not be needed. Check local building practices or building codes in your area.

Is fiber glass insulation safe to use?

Yes. Fiber glass may cause itchiness and temporary skin irritation in many people handling the products. With respect to more serious effects, fiber glass insulation is one of the most thoroughly tested building materials in use today. Nearly 70 years of extensive research and comprehensive reviews by independent research organizations have concluded that there is no convincing evidence that exposure to fiber glass is associated with respiratory disease or cancer in people. Other insulation materials do not enjoy the same long history of testing as fiber glass insulation.

Cellulose, for example, remains a largely untested commodity. Even though it is composed of approximately 20% chemicals by weight, the cellulose industry has performed little, if any, health and safety testing on its products. Questions about the health and safety aspects of cellulose insulation persist in the building industry. The limited scientific testing conducted on cellulose to date provides no assurance as to the safety of the material, particularly given its high exposure levels. For example, documented worker exposures to respirable cellulose fibers have been measured at 50 to 200 times higher than fiber glass. Clearly, more research is needed. For a complete review of the health and safety information on fiber glass, visit the NAIMA web site.

Is it safe to live in a home insulated with fiber glass?

Yes.

Do glass fibers contribute to problems with indoor air quality?

Fiber glass insulation products have a positive impact on the indoor environment by: controlling heat loss or gain; reducing condensation which can lead to air pollutants; and by providing sound control. In 1990, the World Health Organization Working Group on Indoor Air Quality reviewed all previous scientific studies and concluded: "Current airborne man-made mineral fiber concentrations in indoor environments are considered to represent an insignificant risk." More than 20 other studies conducted at noted universities and laboratories, examining concentrations of fiber glass and other synthetic vitreous fibers (SVFs) – in residential and commercial buildings, consistently found that SVFs from insulation products in residential and commercial buildings do not significantly contribute to indoor air pollution, and would not be expected to adversely impact the health and/or well-being of occupants of such buildings.

What does the research show about the health and safety of fiber glass?

Fiber glass is one of the most thoroughly tested building products in the world with health and safety research on fiber glass spanning nearly 70 years. This research has been designed to investigate the possible human health effects of fiber glass and other SVFs. Recently, the International Agency for Research on Cancer removed fiber glass from its list of substances believed to be possibly carcinogenic to humans, based on the last 15 years of research.

Still, misinformation about the safety of fiber glass persists. Four areas of research have been especially important in helping to further

the understanding about the safety of these products. They include exposure assessments of current production workers and end-users; analyses of the rates and causes of death among former production employees; animal inhalation studies; and studies on the biosolubility of glass fibers.

In the exposure studies, airborne levels of respirable glass fibers have been demonstrated to be very low, with occupational exposures less than 1 fiber per cubic centimeter (1f/cc) in most instances, and consumer exposures much lower still.

Studies of more than 40,000 workers over a 40-year time frame have shown no dose-related or causal association between lung cancer or nonmalignant respiratory disease and occupational exposure to fiber glass.

Numerous animal inhalation studies using massive doses of insulation glass wool fibers, hundreds to thousands of times greater than human exposures, have not shown a relationship between inhalation of glass fibers and cancer or respiratory disease. In one recent inhalation study, where hamsters were exposed to a very high dose of a special application glass fibers, the hamsters developed lung-scarring (fibrosis) and a single hamster showed a cancer of the lining of the lung (mesothelioma). This result is in contrast with six previous inhalation studies with the same fiber in which no fibrosis or disease resulted.

In research on the biosolubility of glass fibers, studies have shown that building insulation glass fibers generally dissolve in the lung in approximately the same time it takes for clearance of the nuisance dust people breathe every day.

In summary, the safety of fiber glass insulation is supported by 70 years of research, which shows that exposures are low during manufacture, installation, use and removal; manufacturing workers are healthy; and, if inhaled, insulation fibers are quickly removed from the body.

For more details on recent scientific studies on the health aspects of fiber glass insulation, visit the NAIMA web site.

Does fiber glass cause cancer in people?

No. The International Agency for Cancer Research recently removed fiber glass from its list of possible carcinogens, based on its review of more than 15 years of research. Research conducted over the past 70 years shows that exposure levels are low, and that, even if inhaled into the lung, most fibers disappear quickly with no adverse health effects.

Is fiber glass like asbestos?

Fiber glass is fundamentally different from asbestos, both in its physical and chemical properties. Fiber glass is a man-made material. In contrast, asbestos is a naturally occurring, inorganic fiber. Our bodies can remove most types of fiber glass through a variety of mechanisms (it dissolves in the lungs, for example), while asbestos is more durable and stays in the body a lifetime. The American Conference of Governmental Industrial Hygienists (ACGIH), representing over 1,600 academic and government officials engaged in occupational safety and health programs, estimates that MMVFs are hundreds of times less durable in the body than asbestos.

If fiber glass is safe, why are there health warnings on package labels?

Manufacturers have voluntarily provided warning labels on fiber glass products for years, even before they were required. Our industry strongly believes in full disclosure of all information related to our products and labels are one of the ways of providing information to workers and the public.

Labels are also required by the Occupational Safety and Health Administration (OSHA) as part of its Hazard Communications Standard. Fiber glass industry labels are in full compliance with these regulatory requirements. Many commonly used products including paint, cleaners, and artificial sweeteners also carry warning labels. The primary purpose of the labels is to offer appropriate health and safety warnings and to provide instructions on the safe use of the product.

Are there safer alternatives to fiber glass?

While fiber glass manufacturers have responsibly tested their products for health and safety, the same cannot be said of all other insulation products. Cellulose insulation, for example, is made from shredded newspaper that is naturally flammable and must be treated with toxic, fire-retarding chemicals like boric acid. Fiber glass, made from sand and recycled glass, is naturally nonflammable.

The public should also be concerned about the unknown risks associated with high exposures to cellu-

lose installation. Despite repeated requests by scientists, unions and contractor groups for basic health effects testing of cellulose insulation, cellulose manufacturers have conducted no published study on the health effects of cellulose insulation. In fact, the cellulose insulation industry markets its products as "safe" and as an "environmentally friendly" alternative to fiber glass, despite a lack of testing. Yet, several studies by independent scientists have identified the potential for significant health effects from exposure to cellulose fibers, including lung fibrosis and other respiratory effects. And in 1997, prompted by the lack of health testing by cellulose manufacturers, the Environmental Defense Fund placed cellulose on its list of 100 compounds that should be tested.

Are there any special handling guidelines for working with fiber glass?

Fiber glass, by its very nature, can cause itching during handling, a temporary, "mechanical" irritation that can result when fibers come in contact with the skin. If sufficient amounts of glass fibers are released into the air, some workers may experience temporary upper respiratory irritation. Like skin irritation, upper respiratory irritation is a "mechanical" reaction to the fibers. The irritation will subside after exposure is discontinued. Some people are more sensitive, some less, some not at all.

Fiber glass manufacturers have put together work practices that provide practical safety measures designed to minimize any potential irritation.

In all cases, however, manufacturers' safe handling recommendations as outlined in their Material Safety Data Sheets (MSDSs) should be consulted.

For additional information, see the following NAIMA publications:

- Working Smart with Fiber Glass, Rock Wool and Slag Wool Product – Recommended Work Practices for the Installation of Synthetic Vitreous Fibers (SVF) (N027)
- Play it Smart, Play it Safe (N028)
- HSPP – A Voluntary Program Designed to Assure Greater Worker Protection (N030)
- Facts #62: Health and Safety Facts for Fiber Glass (N040)

Where Can I Go For More Information?

For more information on the health and safety of fiber glass and rock and slag wool insulations, visit NAIMA's web site.

FAQs About Mineral Wool (Rock and Slag Wool) Insulation

What are the major uses for rock and slag wool insulations?

The physical and chemical properties of mineral wool insulation, also known as rock and slag wool, are major factors in their utility. Because the fibers are non-combustible and have melting temperatures in excess of 1800–2000º F, they are used to prevent the spread of fire. As a primary constituent of ceiling tile and sprayed fire proofing, rock and slag wool products supply fire protection, as well as sound control and attenuation.

The excellent thermal resistance of these wools is a major factor in their use as residential and commercial insulation, pipe and process insulation, insulation for ships, mobile homes, domestic cooking appliances, and a wide variety of other applications. In addition, the use of rock and slag wool as a horticultural growing medium has increased in recent years.

What are the benefits of rock and slag wool insulations?

Rock and slag wool insulation products play a significant energy-savings role by reducing energy use in homes, office buildings, businesses and manufacturing plants. Insulating to proper economically efficient levels helps our homes and businesses use substantially less energy. According to a 1996 report on the energy, environmental and economic benefits of fiber glass, rock wool and slag wool insulations, conducted jointly by the Alliance to Save Energy and Energy Conservation Management, insulation produced each year saves about 400 trillion Btu annually, or more than 12 times the energy used to manufacture insulation.

The report, entitled "Green and Competitive" found the insulation currently in place in residential buildings throughout the United Sates could help cut residential energy bills by 40 percent. The energy savings from insulation also help the environment. By reducing the energy needed to heat and cool

homes and commercial buildings, installed fiber glass and mineral wool insulation in U.S. buildings helps prevent the emission of over 1.56 trillion pounds of carbon dioxide annually. The report goes on to say that if all residential buildings were insulated up to the latest version of the International Model Energy Code (IMEC), another 1.9 quadrillion Btu of energy could be saved and another 249 billion pounds of carbon dioxide emissions avoided annually.

Are rock and slag wool insulation products safe to use?

As with any product capable of producing airborne dust, concerns regarding the health and safety effects of rock and slag wool are understandable. However, few materials have been studied as extensively as mineral wool. The weight of scientific research confirms that these materials are safe to manufacture, install and use when manufacturers' recommended work practices are followed.

Health and safety research on rock and slag wool has been ongoing for nearly 70 years. NAIMA member companies have invested tens of millions of dollars in research projects with leading independent laboratories and universities in the United States and abroad. This research has been designed to investigate the possible human health effects of rock and slag wool as well as other MMVFs.

For a complete review of the health and safety information on rock and slag wool, visit NAIMA's web site.

What does the research show about the health and safety of rock and slag wool?

The health aspects and safe use of mineral wools have been examined for nearly 70 years. NAIMA and its member companies have invested tens of millions of dollars in research projects – with leading independent laboratories and universities in the United States and abroad – to investigate the possible human health effects of rock and slag wool as well as other synthetic vitreous fibers (SVFs), such as fiber glass.

Industry studies, as well as studies by governments and others, have examined the following:

- Airborne levels of rock and slag wool fibers during their manufacture, installation and use;
- The health of more than 13,000 current and former workers engaged in the manufacture of rock and slag wool in the United States and Europe; and
- The effects of rock and slag wool on laboratory animals.

Findings from all types of studies have been consistent. Airborne levels of respirable rock and slag wool fibers have been demonstrated to be very low, less than one fiber per cubic centimeter of air (1 f/cc) in most instances. Studies among workers have demonstrated no consistent association between lung cancer or non-malignant respiratory disease and occupational exposure to rock and slag wool.

For more details on recent scientific studies on the health aspects of rock and slag wool insulation, visit the NAIMA web site.

Do rock or slag wools cause cancer in people?

Studies examining possible health effects and safe use of mineral wools have found no consistent association between exposure to rock and slag wool and respiratory disease or cancer in humans. The weight of the scientific evidence confirms that rock and slag wool are safe to manufacture, install and use when manufacturers' recommended work practices are followed.

Do rock and slag wool fibers contribute to problems with indoor air quality?

Rock and Slag wool fibers actually improve the indoor environment by controlling heat loss or gain while reducing condensation and also providing acoustical insulation. Once rock or slag wool products are installed, no significant fiber release occurs.

The majority of airborne fiber levels in buildings containing one or more rock and/or slag wool products are very low, generally less than 0.001 f/cc. In fact, in 1990 the World Health Organization's Working Group on Indoor Air Quality reviewed all scientific studies and concluded: "Current airborne man-made mineral fiber concentrations in indoor environments are considered to represent an insignificant risk."

Are there any special handling guidelines for working with rock and slag wool?

If sufficient amounts of rock and slag wool are released into the air during manufacture and handling, some workers may experience temporary upper respiratory irritation. Like skin

irritation, upper respiratory irritation is a "mechanical" irritation to the fibers. The irritation will subside once the exposure is discontinued. Some people are more sensitive, some less, some not at all.

Manufacturers of rock and slag wool products have recommended a number of safety measures designed to minimize any potential irritation. Rock and slag wool manufacturers have put together work practices that provide practical safety measures designed to minimize any potential irritation. In all cases, however, manufacturers' specific recommendations as outlined in their Materials Safety Data Sheets (MSDSs) should be consulted.

For additional information, see the following NAIMA publications:

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Where Can I Go For More Information?

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FAQs About Home Insulation

What does insulation actually do for my home?

Fiber glass insulation keeps your home cool in the summer and warm in the winter, because insulation resists the flow of heat. Heat is a form of energy and always seeks a cooler area – flowing out of the home in the winter and into the home in the summer. By reducing heat flow, a properly insulated home uses less energy for heating and cooling.

In addition to being an energy saver, fiber glass insulation also acts as a sound absorber. When installed in walls and ceilings, it can reduce the transmission of sound from one room to another or from the outside. In today's noise-laden environments, more and more homeowners are soundproofing their homes.

A well-insulated home increases the overall comfort of the home and adds to its resale value. Whether your home is new or old, it pays to insulate.

What areas of my home should be insulated?

Insulation is not just for attics and outside walls. Insulation should also be installed in other areas of your home such as ceilings with unheated spaces, basement walls, floors above vented crawl spaces, cathedral ceilings, floors over unheated garages or porches, knee walls, and in between interior walls (especially bathrooms), ceilings or floors for extra sound control.

How do I know how much insulation I need for my home?

The amount of insulation in a home varies depending upon where you live. You can check with your utility company or state energy office. In addition, the U.S. Department of Energy (DOE) has put together thermal (or R-value) recommendations for homes. These recommended insulation levels are based on geographic zones. Visit SimplyInsulate.com to learn what zone your home is in and how much you should insulate.

What is R-value?

Insulation is identified and labeled by R-value. "R" stands for resistance to heat flow. The higher the R-value, the greater the insulating power.

Manufacturers of insulation products print the R-values of their products either on bags or on labels attached to plain bags. In most cases, R-values are also printed on the facings of batts and rolls. On unfaced insulation, the R-value is printed on the product or indicated by stripe coding.

Where do I find R-value information when I go to buy insulation?

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What are the options when choosing insulation?

There are a variety of insulations to choose from including fiber glass, mineral wool, cellulose, foam and cotton. The two most common types of insulation for residential applications are fiber glass and cellulose. There are several things to consider before making an insulation decision:

Thermal Performance – Installed R-value

When insulating a home, it is important to get the R-value specified by the builder or the local building code. It's also important that the product provide long-lasting thermal performance. For more information on insulation recommendations for a specific area, contact the local building department or the local gas or electric utility for their recommendation.

While R-value "per inch" is promoted by some manufacturers, the overall R-value installed is what counts. Fiber glass insulation products come in R-values ranging from R-11 to R-38 for fiber glass batts and rolls. Fiber glass insulation can be blown in an attic to nearly any R-value. More R-value alternatives provide greater flexibility in meeting code energy requirements in your area.

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NAIMA has developed a brochure outlining the various life-cycle characteristics that specifiers should consider in determining the most relevant attributes of an environmentally preferable insulation product:"Using Recycled Material Is Just the First Step...(N016)."

How can I be sure I'm getting the best performance from the insulation in my home?

Perhaps the most important consideration of all is the installation of the insulation. Regardless of the insulation type, the full R-value can only be achieved with proper installation. To help ensure the proper installation of fiber glass, rock and slag wool insulation, the North American Insulation Manufacturers Association (NAIMA) provides strong outreach support for professional contractors. It provides training programs to recruit, train and place men and women in careers as residential insulation installers. In addition, NAIMA acts as an industry resource for architects, builders, homeowners and the general public. If you intend to install fiber glass, rock wool or slag wool insulation yourself, follow product installation instructions carefully.

Are there rebates available for installing insulation?

Yes. Financial incentives are currently being offered in many states for the purchase and installation of insulation.

To find out about financial incentives in your area, visit www.simplyinsulate.com.

If I am adding more insulation to my home do I need to remove what I already have?

Since R-values are cumulative, there is no need to remove what you already have. By layering two different batts together, you get the combined R-value of both batts. For example, two layers of R-19 batts will give you a total of R-38. Be sure to use unfaced R-19, R-25 or R-30 fiber glass batts and lay them cross-wise to the existing insulation covering the joists. Do not put a product with a vapor retarder or facing on top of existing insulation. If there is no insulation in your attic, use R-30 or R-38 full width, faced batts, or fiber glass loose-fill installed to the required R-value.

FAQs About Metal Building Insulation

What is the benefit of adding insulation to a metal building?

Insulation provides energy savings, condensation control, noise control and enhanced light reflectivity that will remain with the building over the life of the structure.

Builders and designers are using NAIMA 202-96® fiber glass metal building insulation because it is a technology that makes code compliance easier.

Are there guidelines for installing metal building insulation?

Yes. See NAIMA's publication Recommendations for Installing Fiber Glass Insulation in Metal Buildings (MB316).

What are NAIMA 202-96® Certified Metal Building Insulations?

NAIMA 202-96 Certified Metal Building Insulations are fiber glass insulations intended to be laminated, manufactured and marketed specifically for the metal building market. As such, they must meet the requirements of the NAIMA 202-96 standard. This standard is supported by NAIMA to assure that these insulations are distinguished from insulations produced for other uses. A copy of the standard is available from NAIMA or member companies: NAIMA 202-96 Standard For Flexible Fiber Glass Insulation to be Laminated for Use in Metal Buildings (MB311).

Why is it necessary to certify insulation for metal buildings?

All fiber glass insulations are not made the same and some are not designed for use in metal buildings. The requirements for metal building insulations are unique. Some fiber glass products made for other purposes are being offered and used in metal buildings. After laminating they may not deliver the same thermal performance and integrity as NAIMA 202-96 insulations.

What requirements must an insulation meet to be certified for metal buildings?

NAIMA 202-96 insulation must have additional tensile strength and greater thickness recovery after compression. When a vapor retarder facing is applied to the blanket, the insulation is compressed and tightly wound in rolls for shipment or storage. It takes a special manufacturing process to give it the structural integrity it needs to recover thickness and withstand the rigors of shipping and installation. This process is used by NAIMA Metal Building Committee members for NAIMA 202-96 insulations to meet these extra requirements.

Who certifies NAIMA Metal Building 202-96 insulations?

The National Association of Home Builders (NAHB) Research Center makes quarterly unannounced inspections of NAIMA member plants where they witness quality control procedures and records. Then they test randomly selected specimens of products from stock. Tests are conducted in accordance with ASTM (American Society for Testing and Materials) methods on the factors that affect thermal performance, such as thickness and thermal resistance. During an in-plant inspection, the weight, length, width, thickness, and thermal conductivity of each product are measured. The results must meet the requirements of the NAIMA 202-96 Standard in order to be certified. Additional tests are performed by Underwriters Laboratories and other laboratories according to ASTM methods for fire hazard classification, odor emission,

corrosiveness and moisture sorption. All test requirements are detailed in the NAIMA 202-96 Standard.

How can I be sure of getting NAIMA 202-96 Certified Metal Building Insulation?

Fiber glass insulations that are made to the NAIMA 202-96 Standard and certified to the NAHB Research Center criteria are imprinted on the surface of the insulation opposite the facing with "NAIMA 202-96 (Rev. 2000)," the R-value and the NAIMA member company. "(Rev. 2000)" denotes the date of the most recent version of the standard.

Where can I buy and how should I specify?

Member companies sell unfaced imprinted NAIMA 202-96 Certified Metal Building Insulations nationwide to qualified independent laminators. They are experienced in providing NAIMA 202-96 certified insulations faced with a choice of attractive light-reflective vapor retarder facings in widths and lengths to fit specific building needs. Make sure to specify NAIMA 202-96 Certified Metal Building Insulations with the NAIMA 202-96 imprint on the surface of the insulation.

Which NAIMA members sell metal building insulation?

CertainTeed Corporation, Knauf Fiber Glass, Johns Manville, and Owens Corning.

FAQs About Commercial Insulation

What is the benefit of adding insulation to a plant or industrial facility?

Insulation brings fast return to plants and industrial facilities looking to reduce energy consumption, save costs, and minimize emissions output. These benefits help owners and operators comply with codes, and meet standards for energy efficiency tax breaks and other incentives. NAIMA's 3E Plus® software program helps owners and operators quickly assess the economic and environmental impacts of adding insulation to a facility. For more information on this free software tool visit www.PipeInsulation.org.

What is the payback of insulating an industrial plant?

Payback varies based on the type of facility, fuel type and a number of other factors. NAIMA's free 3E Plus® software can help assess the payback on adding insulation to an existing or new facility. NAIMA and NIA have also created case studies of facilities that have enjoyed the benefits of increased insulation. To read about these real-world examples see the following publications.

- Facts #51 – Insulation Upgrade Program Reduces Fuel Costs and Increases Process Efficiency at Georgia-Pacific Plant (CI211)
- Slashing Steam-System Costs (RP049)

FAQs About Air Handling Systems

What types of insulation are available for air handling systems?

Fiber glass insulation comes in four forms for air handling systems – Duct Board, Duct Liner, Commercial Duct Board and Duct Wrap. Each has specific uses and benefits.

What are the benefits of fiber glass insulation in air handling systems?

Occupant comfort is the goal of an air handling system, and fiber glass duct insulation is a key component of providing these benefits. Fiber glass insulation products help maintain a consistent air temperature throughout the system, reduce condensation and the opportunity for microbial growth, absorb noise from the system's operation and conserve energy.

Does insulation cause mold in air handling systems?

Fiber glass insulation helps to reduce moisture accumulation in ducts, which in turn, helps to prevent mold growth. The fact is, mold will grow on any surface if water and food are available, and if the right temperature is achieved. Since food sources and appropriate temperatures are found in virtually every duct system, controlling moisture is the key to controlling mold. Fiber glass insulations help to minimize condensation by maintaining a consistent temperature throughout the system.

How can I learn to fabricate and install fiber glass duct board?

Fabrication of duct board requires a trained craftsman and skills need to be refreshed periodically to ensure quality fabrication and installation. NAIMA supports duct board fabrication training through a variety of sources. Additionally, contractors can read more about proper fabrication and installation in several of NAIMA's brochures on air handling. Visit NAIMA's web site for more information.

FAQs About Insulation and the Environment

How do fiber glass and rock and slag wool insulations benefit the environment?

Fiber glass and rock and slag wool insulations benefit the environment in a number of ways. Insulation is a key to energy efficiency in commercial, residential and industrial facilities of all kinds. Insulation in factories can help reduce emissions of green house and other gases, and reduce energy consumption. Because these products use a high level of post-consumer, recycled products, NAIMA members help reduce reliance on virgin resources.

How do I know which insulation products are the most environmentally-friendly?

There are a number of so-called green products on the market, but to be truly environmentally friendly a product must do more than just use recycled goods. Fiber glass and mineral wool insulation manufacturers have improved their manufacturing processes to reduce transportation loads and energy usage. Because these products are highly compact, fewer bags are needed on the jobsite and packaging these products creates less waste.

Fiber glass relies on post-consumer glass and uses millions of pounds every year, creating one of the largest markets for recycled glass according to the Glass Packaging Institute. Since glass is made from sand, any new glass used in insulation comes from a rapidly renewable resource, unlike insulation products that rely on secondary wood products as their base material.

Slag wool insulation uses raw materials derived from a secondary source – blast furnace slag – and does not deplete any natural resources. In many cases, NAIMA members recover blast furnace slag from landfills to use in their manufacturing process.

Glossary of Insulation Industry Terms

1 f/cc – One fiber per cubic centimeter of air. On this site, 1 f/cc refers to the permissible exposure limit identified as the appropriate exposure level for fiber glass and rock and slag wool insulation products to significantly reduce potential irritation to throat and eyes.

Batts – Pre-cut pieces of fiber glass insulation; batts may have a facing of paper or aluminum foil.

Blow-in-Blanket Systems® (BIBS) – A patented application process that combines loose-fill insulation with a fine adhesive mist, then blows it into a home's cavities behind netting.

Cavity – The empty space between studs or joists to place insulation batts.

Energy Audit – A thorough assessment of a home's thermal efficiency, often conducted free of charge by most utility companies.

Energy Efficient Mortgage (EEM) – A special type of mortgage that takes into account the monthly operating cost savings realized by living in an energy-efficient home, thereby enabling mortgage underwriting guidelines to be adjusted to reflect the economic effect of lower monthly payments for energy.

Face Staple – Stapling facing flange to the front side of a stud or rafter, along the 1-1/2" dimension.

Faced Insulation – Insulation with an attached vapor retarder (kraft paper or foil-backed paper).

Fiber Glass or Glass Fibers – Glass in a strand form.

Fiber Glass Insulation – An effective resistor of heat flow that is spun from molten sand and recycled glass into fibers.

High-Performance Insulation – Fiber glass insulation with densely packed fibers, resulting in higher R-values for a given thickness. Most commonly used in confined spaces such as walls or cathedral ceilings.

HSPP – Health and Safety Partnership Program, NAIMA's voluntary worker protection program developed in concert with OSHA.

HVAC – Acronym for Heating, Ventilation and Air-Conditioning systems

Inset Staple – Stapling to the inside portion of the stud or rafter.

Insulation Density – Denser insulation products have more fibers per square inch and, therefore, give you greater insulating power through higher R-values.

Insulation – A material used to separate the interior of your home from the outside environment, thereby preventing the transfer of heat.

Loose-Fill Insulation – Particulate insulation, made from either fiber glass or cellulose, that is blown into a home using a motor and hose

Man-Made Vitreous Fibers (MMVF) – (See also SVF) A generic term for a group of man-made materials reflecting the glassy, non-crystalline nature of these materials. This group was historically referred to as man-made vitreous fibers. Most definitions include fiber glass and rock and slag wool products used to make insulation in this category.

Mineral Wool – A broad term used to refer rock wool and slag wool.

NAIMA – North American Insulation Manufacturers Association, a trade organization representing manufacturers of fiber glass and rock and slag wool insulation products in North America.

R-Value – Measure of resistance to heat flow. Insulation materials have tiny pockets of trapped air. These pockets resist the transfer of heat through material. The ability of insulation to slow the transfer of heat is measured in R-values. The higher the R-value, the better the insulation material's ability to resist the flow of heat through it.

Rock Wool – Man-made material comprised of natural minerals like basalt or diabase.

Slag wool – Man-made material made primarily from iron ore blast furnace slag.

Synthetic Vitreous Fibers (SVF) – (See also MMVF) A generic term for a group of man-made materials reflecting the glassy, non-crystalline nature of these materials. This group was historically referred to as man-made vitreous fibers. Most definitions include fiber glass and rock and slag wool products used to make insulation in this category.

Sound Transmission Class (STC) – A numerical rating of the sound control performance of a wall or ceiling; the higher the number, the better the sound control.

Stapling Flange – A protruding edge on faced insulation used to staple the insulation to the framing.

Unfaced Insulation – Insulation with no attached vapor retarder.

Vapor Retarder – Helps control the amount of moisture passing through the insulation and collecting inside exterior walls, ceilings and floors.

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.

In May 1999, NAIMA began implementing a comprehensive voluntary work practice partnership with the U.S. Occupational Safety and Health Administration (OSHA). The program, known as the Health and Safety Partnership Program, or HSPP, promotes the safe handling and use of insulation materials and incorporates education and training for the manufacture, fabrication, installation and removal of fiber glass, rock wool and slag wool insulation products.

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