



www.knaufinsulation.us

PE-PL-20

Introducing Knauf Mechanical Insulation *with ECOSE® Technology*

Be sure your specs are up-to-date and include the new technology that improves the sustainability of traditional fiber glass mechanical insulation.





Our Commitment To Sustainability

We are a leader in providing sustainable solutions for energy efficiency, productivity and comfort in the environments in which people live and work, providing products and services that conserve energy and preserve natural resources for a sustainable future.

As a family-owned company, we're proud of the Knauf name and what it stands for. Customers worldwide have put their trust in the quality, consistency and performance of our products and our business values. So, everyone who does business with us recognizes the importance that, in our quest to become more sustainable, there are certain principles that we will not compromise:

- The quality, consistency, and performance characteristics for which our products are known.
- Our ability to apply any technological advances across all product lines.
- The safe and efficient manufacture of our products.
- Our goal of reducing emissions from plant operations.
- Our commitment to cost-effectively produce our products.

That's why we are proud to introduce Knauf mechanical insulation with ECOSE® Technology.

ECOSE Technology is a revolutionary, new more sustainable binder technology born from five years of intensive research and development.

It is based on rapidly renewable bio-based materials rather than non-renewable petroleum-based chemicals such as phenol, formaldehyde, and acrylics commonly used in traditional fiber glass insulation products.

By reducing the binder embodied energy by up to 70% compared to our traditional fiber glass insulation binder, ECOSE Technology reduces both the expected Global Warming Potential and total embodied energy of our mechanical insulation products by approximately 4%.





Our new Engineering and Development office building uses 30% less energy than a conventional office while accommodating 50 offices and housing a 126-seat classroom and training center.



Regenerative Thermal Oxidizers installed at our Shasta Lake and Shelbyville plants have reduced the amount of energy it takes to cure our products and reduced CO₂ emissions from the curing ovens by up to 90%.



All Knauf Insulation products are made from renewable and abundant resources, such as recycled glass and sand.

Our Sustainability Initiative

To meet the challenge of providing sustainable, innovative solutions that improve energy efficiency we continually strive for improvements in both manufacturing operations and product design and performance.

- In our operations, we look for ways to advance our glass formulations and increase the use of post-consumer recycled bottle glass in all our products.
- To reclaim and reuse vented heat and to control emissions, we have invested millions of dollars in regenerative thermal oxidizers (RTOs) and the best available control technology (BACT) for pollution control. Our goal is to have RTOs on all our plants by 2010.
- By converting our products to ECOSE Technology, we have eliminated non-renewable petroleum-based chemicals like phenol and formaldehyde from the manufacturing process, which in turn eliminates their plant emissions and reduces cost instability associated with those chemicals.



Our commitment to sustainability goes beyond our manufacturing floor.

- Our new 24,860 square foot Engineering and Development office building has been awarded a LEED Gold certification from the U.S. Green Building Council and will use 30% less energy than a conventional office building.

Our commitment also goes beyond our company.

- We funded an unrestricted research grant for Purdue University to develop HESTIA, the world's first data-driven model to quantify, visualize, and analyze fossil fuel emissions down to the street level.
- HESTIA is designed to educate building owners and consumers on how they can help the environment by lessening their carbon footprints.

Our insulation products have an inherent impact on energy consumption; they save hundreds of times more energy in use than required to make them, and all our products are made from renewable and abundant resources, such as recycled glass and sand. Through the development of revolutionary solutions like ECOSE Technology we continually focus our efforts on providing solutions that save energy and resources to positively affect the lives of people today and tomorrow.



The Answer Is Insulation

Why energy efficiency is important in building design

Energy efficiency affects the operating costs of a building for its entire life. A building that is thermally efficient reduces the amount of energy required to keep that building comfortable. By making buildings as energy efficient as possible from the outset, we can conserve energy and reduce utility costs while preserving precious natural resources. At the same time, this also reduces the amount of greenhouse gases that are produced by the building.

Why sustainability is important in building design

The architects and engineers of today are focused on sustainability—building for longevity while conserving the environment. Buildings contribute 40% of greenhouse gas emissions. Designing for sustainability means choosing building materials that minimize the impact on the environment, helping to preserve valuable natural resources while reducing emissions. Growth in new sustainable techniques as compared to conventional techniques means that now, more than ever, it is important to be sure your specs are up to date.

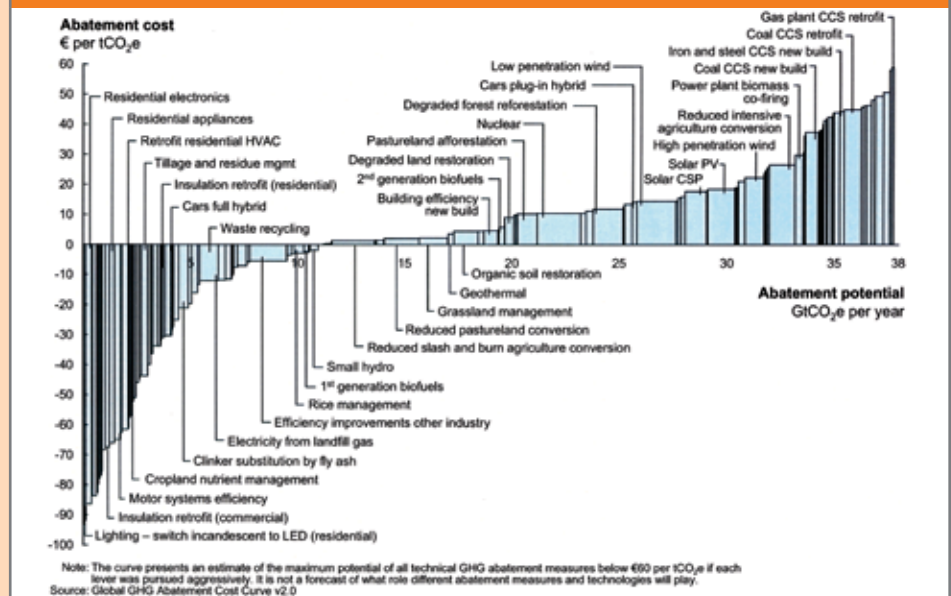
—We can help you stay current.

The important role of insulation

By increasing the level of insulation, buildings can be made significantly more energy efficient, sustainable and functional—all while giving you new design options. Insulation is often specified “to code”, and its real benefits are overlooked.

- Energy conservation through improved insulation is one of the least expensive and most secure forms of energy available to us.
- It also has one of the biggest impacts on reducing greenhouse gases, cutting carbon dioxide emissions by up to 780 million tons each year.
- The most economically beneficial way to minimize energy consumption during a building’s lifetime is to install optimum amounts of insulation in all required areas during initial construction.
- Increased insulation allows you to:
 - Increase window area to meet day lighting objectives, reducing building operating costs and improving occupant productivity and comfort.
 - Reduce HVAC equipment size, and deliver conditioned air more efficiently for greater comfort and reduced operating costs.
- Insulating mechanical systems allows you to:
 - Conserve energy by reducing heat loss or gain, control surface temperatures for increased personnel protection and comfort, facilitate process temperature control, prevent condensation on cold surfaces, control noise and prevent or reduce damage to equipment from exposure to fire or corrosive atmospheres.
- Insulation can have a significant impact on a building project in regard to green building standards, LEED Certification or other certifications.

Global GHG Abatement Cost Curves Beyond Business-As-Usual – 2030



Properly insulating buildings is one of the most effective ways available to address ambitious targets for reducing Greenhouse Gases across the globe.

Bottles



Sand

We Didn't Choose Brown, It Just

Introducing Knauf Mechanical Insulation With ECOSE® Technology

It doesn't look like any insulation you've ever seen, but that's because its natural brown color represents a level of sustainability we've never before achieved.

New Knauf mechanical insulation with ECOSE Technology combines:

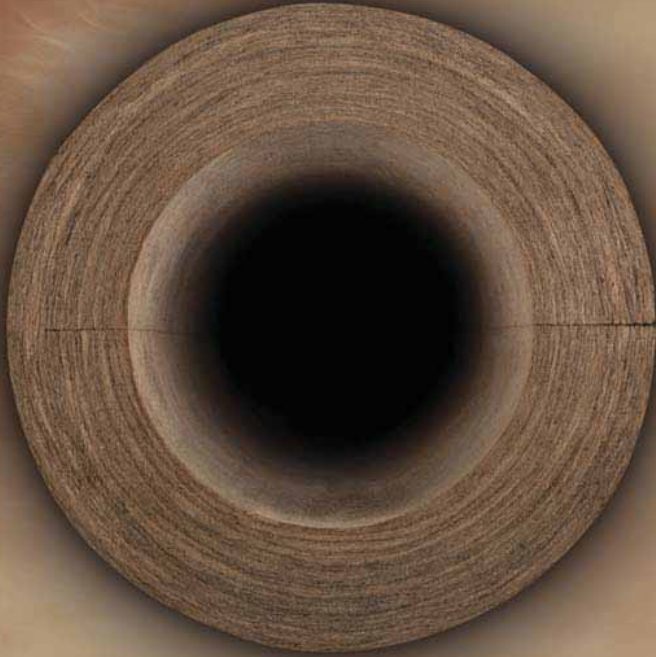
- Sand, one of the world's most abundant and renewable resources,
- Minimum 35% post-consumer recycled bottle glass and
- ECOSE Technology, a revolutionary new highly sustainable, bio-based binder.

This is our next generation of sustainable insulation... naturally from Knauf.

Revolutionary New ECOSE® Technology

Knauf mechanical insulation with ECOSE Technology's natural brown color comes from a revolutionary more sustainable bio-based binder:

- Proprietary technology born from five years of intensive research and development.
- Based on rapidly renewable bio-based materials rather than the non-renewable petroleum-based chemicals commonly used in other insulation products.
 - Does not contain phenol, formaldehyde, acrylics or artificial colors.
- Reduces binder embodied energy by up to 70% and Global Warming Potential (GWP) and total embodied energy by an approximately 4% to reduce our carbon footprint.



Knauf Mechanical Insulation With ECOSE Technology—A More Sustainable Solution

Knauf mechanical insulation with ECOSE Technology embodies several key characteristics that define a more sustainable fiber glass insulation product:

Use of renewable and abundant resources:

- Sand is sustainable and one of the world's renewable and most abundant natural resources.
 - Man's total industrial consumption of sand is approximately 0.1 to 0.3 billion tons per year compared to about 5 billion tons generated every year through natural processes!

High post-consumer recycled content:

- Knauf mechanical insulation with ECOSE Technology always contains a minimum of 35% post-consumer recycled glass. We use as much recycled glass as possible in our process, and current production actually contains approximately 50% post-consumer recycled glass.
- ALL the recycled glass we use is post-consumer glass collected at curbside—not pre-consumer or post-industrial cullet like most other insulation manufacturers?

Based on bio-based materials:

- Exceeds the proposed USDA BioPreferred Program label minimum bio-based content requirements³

Eliminates non-renewable petroleum-based chemicals:

- Significantly reduces or eliminates non-renewable petro-chemical binder ingredients...such as phenol, urea and formaldehyde commonly used as fiber glass insulation binder for over 30 years⁴
- Some fiber glass insulation products are also made using a non-renewable petro-chemical acrylic binder.

Reduces our embodied energy and carbon footprint:

- Reduces binder embodied energy by up to 70% compared to the traditional binder it replaced.
- It is anticipated to reduce its Global Warming Potential (GWP) by approximately 4% which corroborates a similar reduction in mechanical insulation total embodied energy by approximately 4%, a significant reduction in our carbon footprint.

Reduces workplace exposures and manufacturing emissions:

- By eliminating phenol and formaldehyde from our manufacturing process, workplace exposures and manufacturing emissions are consequently eliminated as well.

Indoor air quality excellence:

- Knauf mechanical insulation with ECOSE Technology is certified to GREENGUARD for Children & SchoolsSM, the industry's most stringent IAQ standard, as well as California CHPS Section 01350.

Cost competitive:

- Knauf mechanical insulation with ECOSE Technology is cost competitive with our traditional fiber glass pipe insulation to facilitate the market transformation to more sustainable construction.

ame Naturally.

Knauf Mechanical Insulation With ECOSE® Technology Is Your Best Choice

It delivers:

- Improved sustainability:
 - Uses renewable and abundant resources.
 - Contains an industry-leading percentage of post-consumer recycled glass.
 - Replaces non-renewable resources with renewable ones.
 - Based on rapidly renewable bio-based materials.
 - Eliminates non-renewable petroleum-based chemicals, such as phenol and formaldehyde.
 - Reduces binder embodied energy.
 - Contains no artificial colors.
- Unsurpassed performance:
 - Cost-effective way to improve thermal and performance and condensation control.
 - Is interior friendly—GREENGUARD certified for Children & Schools.
 - Helps projects achieve LEED green building certification.



Contribution to LEED Requirements		
LEED Credit Category	Contribution	Points
Materials and Resources		
MR Credit 4.1 Recycled Content: 10%	All Knauf fiber glass insulation products are manufactured using a minimum of 35% "post-consumer" recovered materials.	1 point
MR Credit 4.2 Recycled Content: 20%	All Knauf fiber glass insulation products are manufactured using a minimum of 35% "post-consumer" recovered materials.	1 point in addition to MR Credit 4.1
MR Credit 5.1 Regional Materials: 10% Extracted, Processed and Manufactured Regionally	All Knauf fiber glass insulation products are produced in Shelbyville, IN, Lanett, AL or Shasta Lake, CA which may be within 500 miles of the project.	1 point
MR Credit 5.2 Regional Materials: 20% Extracted, Processed and Manufactured Regionally	All Knauf fiber glass insulation products are produced in Shelbyville, IN, Lanett, AL or Shasta Lake, CA which may be within 500 miles of the project.	1 point in addition to MR Credit 5.1
Energy and the Atmosphere		
EA Credit 1 Optimize Energy Performance	All Knauf fiber glass insulation products help reduce building energy demand and compliance with energy codes.	1-10 points
Indoor Environmental Quality		
EQ Credit 3.2 Indoor Air Quality	All Knauf fiber glass insulation products are GreenGuard Children and School Certified for low VOC emissions.	1 point
EQ Credit 7.1 Thermal Comfort	Knauf building and HVAC distribution insulations are critical components for increased thermal comfort.	1 point
Innovation and Design		
ID Credit 1-1.4 Innovation in Design	GREENGUARD Children and Schools Certified Knauf Insulation products can be used in innovative designs that have both environmental and health benefits.	1 point



Knauf's Family Of Residential, Commercial And Industrial Products

Superior products for sustainability, thermal and acoustical efficiency and installer productivity.

Knauf's family of quality Commercial and Industrial products with ECOSE Technology

Knauf offers a full line of Pipe & Equipment products with ECOSE Technology to control temperature, sound and condensation in commercial facilities.

- Knauf 1000° Pipe Insulation
- Knauf RediKlad™ 1000° Pipe Insulation
- Knauf KwikFlex™ Pipe and Tank Insulation
- Knauf Insulation Board
- Knauf Friendly Feel® Duct Wrap
- Knauf Elevated Temperature Insulation
- Knauf Pipe & Tank Insulation

Knauf Air Handling Insulation provides quiet, efficient air delivery, cost-effective energy conservation and quality indoor environments.

- Knauf Friendly Feel® Duct Wrap
- Knauf Eclipse™ Air Duct Board
- Knauf Air Duct Board-M
- Knauf Insulation Board
- Knauf Sonic XPT™ Duct Liner
- Knauf Rigid Plenum Liner

Knauf Commercial Building Insulation products with ECOSE Technology

Knauf offers a full range of insulation products for your commercial building needs—cost-effective solutions for both the thermal envelope and as an acoustical treatment for interior walls and ceilings.

- Knauf EcoBatt® Insulation
- Knauf Insulation Board
- Knauf Black Acoustical Board
- Knauf Wall & Ceiling Liner
- Knauf Metal Building Insulation

Knauf mechanical insulation with ECOSE Technology is the best choice you can make for your projects.

Specify it today!

For more information call (800) 825-4434 ext. 8283

or visit us online at www.knaufinsulation.us

KNAUF INSULATION
its time to save energy

KNAUFINSULATION

it's time to save energy



Knauf Insulation GmbH
One Knauf Drive
Shelbyville, IN 46176

Sales and Marketing (800) 825-4434, ext. 8283

Technical Support (800) 825-4434, ext. 8212

Fax (317) 398-3675

Information info.us@knaufinsulation.com

World Wide Web www.knaufinsulation.us

© 2010 Knauf Insulation GmbH.

Knauf Insulation—A World Leader

With nearly 5,000 employees in more than 50 countries, Knauf Insulation is the fastest growing and one of the largest insulation manufacturers in the world. In the United States, we manufacture a wide range of insulation materials to meet North America's growing demands for energy efficiency and acoustic performance. Since our founding 30 years ago in Shelbyville, Indiana, we have grown to become an industry leader by creating products that make the world a better place today and for future generations. That growth has been driven by our commitment to sustainable products, operations and corporate responsibility.



At Knauf Insulation, we manufacture a wide variety of products that serve a common goal, helping to make the most of our planet's energy resources. A family-owned global company, we understand and are committed to high standards in quality, performance and environmental responsibility. Every step we take today toward energy conservation helps ensure better lives for generations to come.



- 1 A Global Sand Budget—A discussion of Sand Generation, Consumption and Destruction. Abstract, N.R. Shaffer, March, 2009.
- 2 OC certifies 10% post-consumer, 30% pre-consumer recycled content; JM certifies 20% post-consumer, 5% pre-consumer recycled content; CertainTeed reports 35% recycled content (CT 30.29.083 dated 9/08); Guardian reports 30% post-consumer, 5% post-industrial recycled content (GFM028 dated 2008)
- 3 See Federal Register Vol. 73, No. 131 / Tuesday, July 8, 2008 / Notices pg. 38968 for proposed minimums
- 4 Verified using carbon dating per using ASTM-D6866, (Report of Biobased Content Analysis Nov. 3, 2008)