



**KNAUF**

# **DISCOVER Performance+<sup>®</sup> FIBERGLASS PIPE INSULATION**

**Feel Confident Specifying Performance+<sup>®</sup> Earthwool<sup>®</sup> 1000<sup>°</sup>  
Pipe Insulation for Your Next Commercial or Industrial Project**

## **WHAT'S INSIDE:**

- Performance+ Earthwool 1000<sup>°</sup> Pipe Insulation
- Applications
- Performance
- Sustainability
- ASJ+ Jacket Attributes
- Thermal Performance
- Cost Factors
- About Knauf

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## **WHY SPECIFY PERFORMANCE+® EARTHWOOL® 1000° PIPE INSULATION TO INSULATE PIPES IN HARSH INDUSTRIAL OR COMMERCIAL ENVIRONMENTS?**

Performance+ Earthwool 1000° Pipe Insulation from Knauf is proven in industrial and commercial applications. Constructed by melting sand and recycled glass and bound together by ECOSE® Technology, it provides thermal performance and personnel protection.

For years, mechanical engineers and contractors have used fiberglass products to insulate HVAC, plumbing, and process systems, in commercial and industrial environments.

Fiberglass insulation delivers proven performance and durability in harsh conditions while reducing costs for installation, maintenance and overall operation. Performance+ Earthwool 1000° Pipe Insulation is the benchmark that stands apart for its sustainability attributes, proven performance, and consistently high product quality.

Explore this e-book to learn how Performance+ Earthwool 1000° Pipe Insulation can deliver outstanding performance with cost-effective installation and what you need to know to confidently specify Knauf fiberglass insulation for your next project.

## **WHAT IS PERFORMANCE+ EARTHWOOL 1000° PIPE INSULATION?**

Performance+ Earthwool 1000° Pipe Insulation is a mandrel-wound, heavy-density, one-piece insulation made from inorganic glass fibers bonded with the revolutionary ECOSE® Technology.

Knauf products with ECOSE Technology use our patented, bio-based binder – an alternative to the phenol-formaldehyde (PF) binder traditionally used in fiberglass products. This bio-based binder holds our product together.

Performance+ Earthwool 1000° Pipe Insulation was the first fiberglass pipe insulation with an [Environmental Product Declaration \(EPD\)](#), a transparency document that quantifies environmental information about the life cycle of a product.



## ***WHAT'S THE BEST MATERIAL FOR INSULATING PIPING?***

### **Fiberglass Makes Performance+® Earthwool® 1000° Pipe Insulation Suitable to Industrial, Commercial or Institutional Applications**

Produced in three-foot lengths, with or without a factory-applied jacket, Performance+ Earthwool 1000° Pipe Insulation can meet design requirements for hot, cold, concealed and exposed piping systems.

Performance+ Earthwool 1000° Pipe Insulation is used because it provides thermal performance and personnel protection for piping systems (copper, iron, stainless steel, PVC and CPVC pipe) and equipment operating at temperatures from 0° F to 1000° F (-18°C to 538°C).

Additional weather protection is required for outdoor applications.

### **When Should You Specify Performance+ Earthwool 1000° Pipe Insulation?**

Performance+ Earthwool 1000° Pipe Insulation can be used for various applications, including:

- Steam and condensate lines
- Hot and cold domestic water or process systems
- Petrochemical processes
- Power plants



## DOES FIBERGLASS MEET PERFORMANCE STANDARDS IN COMMERCIAL AND INDUSTRIAL ENVIRONMENTS?

### Performance+® Earthwool® 1000° Pipe Insulation Has Delivered Proven Performance for Over a Decade

Performance+ Earthwool 1000° Pipe Insulation is a highly effective insulation that can be specified across a variety of applications and environments, both outdoor (with protective jacketing) and indoor, where operating temperatures range from 0° F to 1000° F (-18°C to 538°C).



## PERFORMANCE IN KEY AREAS:

### SAFETY

**Protects workers** by reducing the risk of burns and the loss of productive work time due to injury.

### THERMAL

**Reduces heat loss or gain** to maintain required temperature for industrial processes.

### MOISTURE

**Condensation control** can be maintained if properly installed on cold piping with either the factory applied ASJ+ or field applied vapor retarder jacket.

### FIRE

**UL/ULC Classified FHC 25/50** (faced and unfaced) and USCG certified noncombustible material (unfaced).

### ACOUSTICS

**Acoustical treatment** for piping to reduce the transfer of sound energy.



## FIBERGLASS WILL HELP MEET SUSTAINABILITY GOALS

### Knauf Provides an Environmental Product Declaration (EPD) for Performance+® Earthwool® 1000° Pipe Insulation

Building owners expect their projects to be constructed to last. Choosing sustainable materials helps safeguard the health and safety of building occupants.

Product transparency is important to Knauf. The Earthwool® 1000° Pipe Insulation [EPD](#) is third party verified. An EPD is a comprehensive document that reports the environmental impacts of a product, calculated via a Life Cycle Assessment (LCA). These transparency documents enable our products to contribute towards achieving green building certifications (e.g. LEED, Living Building Challenge, WELL, etc.) and allow our customers to make informed decisions.

### 46-Day\* Carbon Payback Period

In less than two months, the carbon needed to create the insulation product is offset by the carbon saved during the operation of the building because of reduced energy use. Fiberglass insulation products are a low carbon construction building material.

\*Carbon Payback Scenario Analysis, NAIMA, Oct. 2024



Performance+ Earthwool 1000° Pipe Insulation is made with 55%\* UL Certified recycled content by weight, as verified annually by UL Environment.

\*2025 UL Certified

The wide variety of documentation for Earthwool 1000° Pipe Insulation not only helps with **green building programs** such as **LEED**, but showcases sustainability attributes:

- **EPDs** report the environmental impact of products.
- **HPDs** bring awareness to what is in the products.
- **GREENGUARD® Gold** offers insight into the low emissions of products.
- **Recycled content** in products diverts waste from landfill and reduces reliance on natural resources.
- **Asthma & Allergy Friendly®** certification proves products meet high indoor air standards.

The Asthma & Allergy Friendly® Certification Mark is a Registered Certification Mark of the Asthma Allergy Foundation of America (AAFA) and Allergy Standards Ltd (ASL).



## ***ARE YOU LOOKING FOR A SUSTAINABLE INSULATION?***

### **Performance+® Earthwool® 1000° Pipe Insulation Can End Your Search**

Knauf developed a rapidly renewable bio-based binder called **ECOSE® Technology**, which replaced non-renewable petroleum-based chemicals such as phenol-formaldehyde or acrylics. ECOSE® Technology is the binder that holds Performance+ Earthwool 1000° Pipe Insulation fibers together.

All Knauf insulation products with ECOSE® Technology have been certified under the **UL Environment GREENGUARD Gold standard**. The GREENGUARD Gold Certification Standard includes health-based criteria for additional chemicals and also requires lower total volatile organic compound (VOC) emissions levels to ensure that products are suitable for use in environments such as schools and healthcare facilities.

As an **ISO/IEC 17065:2012** accredited third-party certification body, UL's GREENGUARD scheme certifies products and materials for low chemical emissions and provides a resource for choosing products and materials to create healthier indoor environments. All GREENGUARD certified products must meet stringent chemical emissions standards based on established criteria from key public health agencies.

## CERTIFICATIONS

Our badges of honor: proof of our commitment to creating a better space for all the places we live, work and play.

### INDOOR AIR QUALITY

We're raising the standard for indoor air quality. Knauf products that are Certified **Asthma & Allergy Friendly**<sup>®</sup> and **Verified Healthier Air**<sup>™</sup> have been rigorously tested by a third-party to ensure they reduce allergen exposure and limit pollutants in the indoor environment.



### TRANSPARENCY & HEALTH PRODUCT DECLARATION<sup>®</sup> (HPD)

HPDs are voluntary disclosures that help architects and builders make informed decisions about material safety. They offer transparency about chemical composition and any known health risks. We have nothing to hide in our products, which is why we provide HPDs.



### GREENGUARD<sup>®</sup> CERTIFICATION

The status of a **GREENGUARD<sup>®</sup> Certification** means products have been tested and proven to meet some of the world's most rigorous chemical emissions standards. We offer more lines of formaldehyde-free fiberglass insulation products than any other fiberglass insulation company and have earned **GREENGUARD Gold Certification** for all ECOSE Technology products.



### LEED

Specifying Knauf fiberglass insulation can put your project on the right track for **LEED certification** – a symbol of sustainability achievement. Meeting these standards means creating a building that is better for occupants, the community and the environment.



### ENVIRONMENTAL PRODUCT DECLARATION (EPD)

An **EPD** is a comprehensive document that reports the environmental impacts of a product, calculated via a life cycle assessment (LCA). These transparency documents enable our products to contribute towards achieving green building certification such as LEED, Living Building Challenge, WELL, etc., and allow our customers to make informed decisions.



### OUR COMMITMENT DOESN'T STOP THERE

We never tire of creating high-quality products that not only meet but exceed our customers expectations. Our insulation is engineered to meet an array of industry standards.



## WHAT ARE THE ADVANTAGES OF ALL SERVICE JACKET (ASJ+)?

Performance+® Earthwool® 1000° Pipe Insulation is available with ASJ+ (all-service jacket), which has a **0.01 permance rating** with the following attributes.

ASJ+ is an all-service jacket composed of aluminum foil reinforced with a glass scrim bonded to a kraft paper interleaving with an outer film layer leaving **no paper exposed**. ASJ+ provides a durable, cleanable and paintable\* finish.

**You can maintain that appearance by cleaning the surface of ASJ+ with a damp cloth and soapy water.** However, ASJ+ is not designed to be used where steam or high pressure water cleaning methods are utilized.

Third party testing indicates that ASJ+ has substantially **less degradation and discoloration** after 1,000 hours of continuous UV light exposure in xenon bulb chamber than traditional ASJ. Performance+ Earthwool 1000° Pipe Insulation with ASJ+ is not intended for unprotected outdoor use.

Performance+ Earthwool 1000° Pipe Insulation with ASJ+ reduces construction labor and material costs. The SSL+ Advanced Closure System creates a strong and lasting bond allowing for one piece installation. **Performance+ Earthwool 1000° Pipe Insulation ASJ+/SSL+ eliminates the need for additional bands or wires for closure, which speeds up installation.** No special tools or equipment are needed to repair or replace damaged sections.

\*Painting may alter surface burning characteristics

## TOUGH ENOUGH FOR YOUR MOST DEMANDING APPLICATIONS

ASJ+ is tough, as evidenced by the following test results that demonstrate its durability:

### ASJ+ vs. Standard All Service Jacket

MULLEN BURST STRENGTH IS

**54% BETTER**

TENSILE STRENGTH  
MACHINE DIRECTION IS

**36% BETTER**

TENSILE STRENGTH  
CROSS-MACHINE DIRECTION IS

**20% BETTER**



## DOES PERFORMANCE+ EARTHWOOL 1000° PIPE INSULATION MEET ASHRAE 90.1 THERMAL REQUIREMENTS?

Performance+ Earthwool 1000° Pipe Insulation meets or exceeds all requirements for ASHRAE 90.1-2022

PERFORMANCE+® EARTHWOOL® 1000° PIPE INSULATION THERMAL CONDUCTIVITY   ASTM C335		
Mean Temperature	k	k (SI)
75° F (24° C)	0.23	0.033
100° F (38° C)	0.24	0.035
200° F (93° C)	0.28	0.040
300° F (149° C)	0.34	0.049
400° F (204° C)	0.42	0.061
500° F (260° C)	0.51	0.074
600° F (316° C)	0.62	0.089

### ASHRAE 90.1-2022 REQUIREMENTS

MINIMUM PIPE INSULATION THICKNESS							
Fluid Operating Temperature Range and Usage	Insulation Conductivity		Nominal Pipe or Tube Size				
	Conductivity Range BTU-in./(hr · ft <sup>2</sup> · °F)	Mean Temperature Rating	<1"	1"-<1½"	1½"-<4"	4"-<8"	≥8"
<b>Heating and Hot Water Systems (Steam, Steam Condensate, Hot-Water Heating and Domestic Water Systems)<sub>a, b, c, d</sub></b>							
Above 350° F	0.32–0.34	250° F	4½"	5"	5"	5"	5"
251–350° F	0.29–0.31	200° F	3"	4"	4½"	4½"	4½"
201–250° F	0.27–0.30	150° F	2½"	2½"	2½"	3"	3"
141–200° F	0.25–0.29	125° F	1½"	1½"	2"	2"	2"
105–140° F	0.22–0.28	100° F	1"	1"	1½"	1½"	1½"
<b>Cooling Systems (Chilled Water, Brine, Refrigerant)<sub>a, b, c, d</sub></b>							
40–60° F	0.21–0.27	75° F	½"	½"	1"	1"	1"
Below 40° F	0.20–0.26	50° F	½"	1"	1"	1"	1½"

a. For insulation outside the stated conductivity range, the minimum thickness (T) shall be determined as follows:  $T=r\{(1+t/r)^{k/k'}-1\}$ , where T=minimum insulation thickness (in.), r=actual outside radius of pipe (in.), t=insulation thickness listed in this table for applicable fluid temperature and pipe size, K=conductivity of alternate material at mean rating temperature indicated for the applicable fluid temperature {Btu · in. / (hr · ft<sup>2</sup> · °F)}; and k=the upper value of the conductivity range listed in this table for the applicable fluid temperature. b. These thicknesses are based on energy efficiency considerations only. c. For piping smaller than 1½" and located in partitions within conditioned spaces, reduction of these thicknesses by 1" shall be permitted (before thickness adjustment required in footnote a) but not to thicknesses below 1". These thicknesses are based on energy efficiency considerations only. Issues such as water vapor permeability or surface condensation sometimes require vapor retarders or additional insulation. d. The table is based on steel pipe. Non-metallic pipes schedule 80 thickness or less shall use the table values. For other non-metallic pipes having thermal resistance greater than that of steel pipe, reduced insulation thicknesses are permitted if documentation is provided showing that the pipe with the proposed insulation has no more heat transfer per foot than a steel pipe of the same size with the insulation thickness shown on the table.

## **IS PERFORMANCE+® EARTHWOOL® 1000° PIPE INSULATION A COST-EFFECTIVE CHOICE FOR PIPE INSULATION?**

### **Reduce Construction, Operation and Maintenance Expenses by Choosing Performance+® Earthwool® 1000° Pipe Insulation with ASJ+**

Specifying Performance+ Earthwool 1000° Pipe Insulation with ASJ+ jacketing enables, mechanical engineers and contractors to **reduce overall costs** for installing, operating and maintaining pipe insulation.

Performance+ Earthwool 1000° Pipe Insulation is manufactured as a one-piece, factory pre-slit, pipe insulation which provides ease of installation and is available with or without factory applied ASJ+.

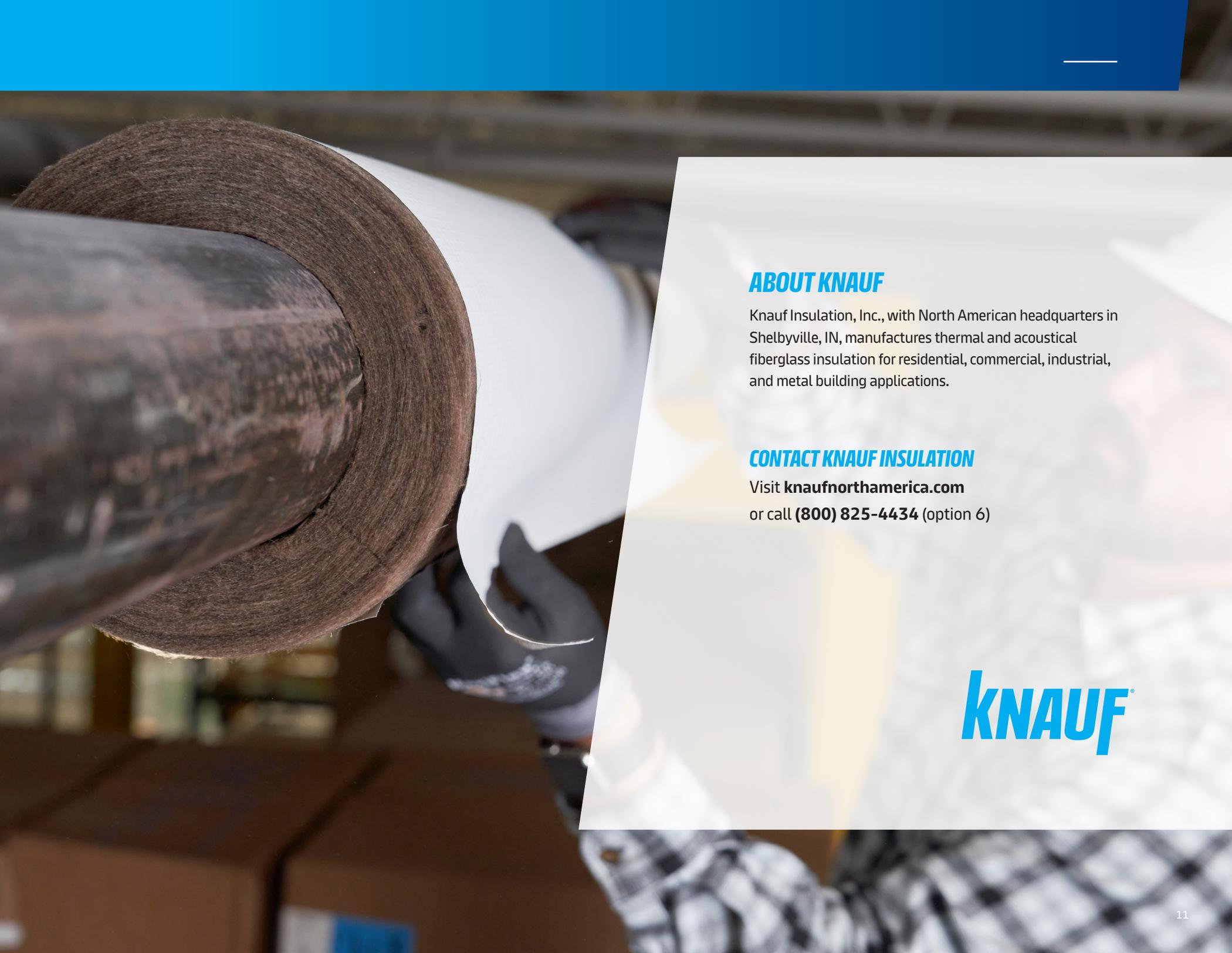
### **UP TO A 20% REDUCTION**

in energy consumption during the manufacturing process by utilizing recycled materials, such as glass.

## **PERFORMANCE+ EARTHWOOL 1000° PIPE INSULATION WITH ASJ+ REDUCES CONSTRUCTION LABOR AND MATERIAL COSTS**

The SSL+, self sealing lap, Advanced Closure System provides pre-applied adhesive to the jackets for efficient closure. Performance+ Earthwool 1000° Pipe Insulation with ASJ+ eliminates the need for additional fastening materials which speeds up installation.





## **ABOUT KNAUF**

Knauf Insulation, Inc., with North American headquarters in Shelbyville, IN, manufactures thermal and acoustical fiberglass insulation for residential, commercial, industrial, and metal building applications.

## **CONTACT KNAUF INSULATION**

Visit [knaufnorthamerica.com](http://knaufnorthamerica.com)  
or call **(800) 825-4434** (option 6)

**KNAUF**<sup>®</sup>