

CUSTOMER MAGAZINE 2020

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EXPERIENCE CENTER**

KNAUFINSULATION
Systems Division

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create.
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SUSTAINABILITY AT KNAUF INSULATION

Knauf Insulation has always been defined by sustainability. Our products save energy, cut emissions and are designed to make sure buildings are good for the environment and keep people healthy, safe and well.

Across our company, we have been working on all three pillars of sustainability, balancing profit with people and the planet for over a decade. And we are proud of what we have achieved.

But sustainability is a journey, a process of continuous improvement and we need to build on this success. As we wrap up 10 years of our previous strategy it is time to think about what we need to do next, and what we need to do more.

WHY?

- ✓ Because our people are our priority
- ✓ Because our world can't wait
- ✓ Because our customers want more
- ✓ Because our communities expect more
- ✓ Because our governments demand more
- ✓ Because our children want action



**PUT
PEOPLE
FIRST**

Commitments

- We are committed to zero harm and building a culture of health, safety and wellbeing.
- We will have the most engaged employees and committed and focused leaders in our industry.
- We will build on the diversity that has made the company such a success.
- We will be a positive force in the communities where we work.



**ACHIEVE
ZERO
CARBON**

Commitments

- We will aim to deliver net zero embodied carbon products and solutions.
- We are committed to reducing the environmental footprint of the entire organisation beyond embodied carbon.



**DELIVER A
CIRCULAR
ECONOMY**

Commitments

- We will find ways to use resources that have minimal environmental impact.
- We will send zero waste to landfill.
- We will reduce the environmental impact of our packaging.



**CREATE
BETTER
BUILDINGS**

Commitments

- We will continue to innovate and create new eco-friendly solutions.
- We will continue to campaign for efficient, safer, sustainable buildings that are fit for the future, including our own buildings.



UN SUSTAINABILITY DEVELOPMENT GOALS

For A Better World contributes to meeting 10 of the 17 UN Sustainable Development Goals (SDGs)

The SDGs adopted by United Nations Member States focus on ending poverty, addressing social needs, tackling climate change and ensuring

FRUITFUL COOPERATION SUPPORTED BY FINANCIAL INCENTIVES RESULTED IN DEVELOPMENT OF INNOVATIVE PRODUCT FOR KITCHEN OVENS

Knauf Insulation was the recipient of funding allocated under the public tender by the Slovene Ministry of Economic Development and Technology for the project: **"Incentives for research and development projects 2"**

The purpose of the public tender was to promote R&D and innovation activities in businesses or consortia of companies (Knauf Insulation and FPM Černigoi) within innovative R&D projects for

the development of new or improved products, processes or services in priority areas of the Slovene smart specialization strategy.

The main objective of the notified R&D and Innovation project **"Development of sustainable, energy efficient and high-tech insulation materials for food preparation systems – VIIM"** was to:

- Develop a new product – energy efficient needed felt for kitchen ovens made of natural mineral fibres, which will enable manufacturers of kitchen ovens to achieve Class A energy performance under the new Commission Regulation (EU) No 66/2014. The new product will be competitive and at the same time represent high added value in terms of energy, material and ecological efficiency.
- Assure the following properties of a new product:
 - Density of the insulation body: 50–150 kg/m³
 - specific heat capacity (C_p): 0.84 kJ/kg·K
 - thermal conductivity (λ) at elevated temperatures: < 0.06 W/m·K

The innovative newly developed material will enable to consolidate our position as the main global supplier of insulation for kitchen ovens.

The investment is co-financed by the Republic of Slovenia and EU with funding allocated by the European Development Fund. Details on the European cohesion policy in Slovenia can be found on: www.eu-skladi.si.



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KNAUF INSULATION AJDOVŠČINA PLANT: MANUFACTURING SMALL SERIES OR PROJECT SPECIFIC APPLICATIONS

In order to provide the best and most efficient solutions for both complex and standard insulation requirements, we have decided to prioritize the converting possibilities offered by different insulation materials. As the year turned to 2015, the newly founded company Knauf Insulation Customized Solutions begun its business operations.

It was established on the foundations of the Converting facility in Škofja Loka, which was increasingly overcrowded and was therefore not able to further grow and prosper, while there has been an increasing demand, year after year, for specialized and small-batch products.

A separate converting production unit drives its own innovative development and supplies its customers with intelligent insulation solutions in the manufacture of small series or project-specific applications that go beyond standardized products. The Knauf Insulation Customised Solutions converting unit is located in Ajdovščina (Slovenia), some 100 km from the Skofja Loka Production plant.

"We are focused on industrial companies that have the expertise and facilities to integrate our products into their

finished products or systems, but have requirements that go beyond standardized products. We do our best to offer products and service levels tailored to meet the most demanding customers' requirements in manufacturing small series or project-specific applications, in order to optimize the performance of their applications. Our mission is to ensure appropriate product quality and satisfying the needs of our customers is our prime mission and represents a core principle of our business activities." Miha Keše, Business director Disp. OEM/ DRS

With its processing capabilities the plant in Ajdovščina is supporting all segments within the Knauf Insulation Group (Construction, Technical insulation, OEM and Green Solutions) and provides, through processing or finishing, suitable insulation solutions in all segments, with a focus on those products where large-scale production is not possible. It provides industry business partners with the best and most efficient insulation solutions even in cases of small-batch production or for project-specific applications, using not only rock wool, but also other insulation materials (glass wool, PU, composites, etc.).

equipment. Our equipment for profiling enables us to produce all the various forms of edges up to a maximum product width of 1600 mm. Grinding equipment allows us to offer you products in widths up to 1300 mm. For products with additional facing materials we can offer bonding with both organic as well as inorganic adhesives.

Our highly trained staff can carry out a variety of demanding operations according to your specifications. In order to meet your needs we can also offer other technical solutions, including V-grooving.

Coming soon
New app for easier
inclined roof design
and calculation
of material
coming soon.



MORE INFO: WWW.CUSTOMIZED.KNAUFINSULATION.COM
E-MAIL: CUSTOMIZED@KNAUFINSULATION.COM

TECHNOLOGY

Our technology saves you another step with the converter. We can produce several custom made products. We can supply you with custom-designed products from insulated and composite materials and offer you a variety of cutting technology:

- vertical band saws
- horizontal band saws
- custom-designed band saws
- CNC wire cutting machine
- CNC water cutting machine (clean water cut)

Our water cutting equipment allows high flexibility, especially the quick production of samples, because no tools are necessary for making these. We also offer pneumatic punching

KICS QUALITY CONTROL LABORATORY

At the end of 2017, we were looking for solutions and options to improve the quality control of our products. We have decided to set up an air-conditioned control laboratory with a measuring table. At the time of production, each product needs to be weighted and verified to meet customer requirements. By obtaining a measuring table all measurements are performed in one place now: product length, width, thickness and mass. Density of the product is then calculated based on the measurements. All measurements are stored in the database immediately after completion and are properly archived and available.

KNAUF INSULATION DRS SOUND SUPREME BOARD

Insulation core with outstanding sound performance characteristics

As maintaining a high quality of life requires increasingly strict standards, and as European requirements for sound insulation to protect people and/or the environment are becoming more and more strict, sound insulation and preventing sound pollution are becoming more and more important.

This fact and our awareness that rock mineral wool, due to its structure, provides a highly effective barrier to noise and significantly dampens sound, led Knauf Insulation to develop a state of the art patented product: a **high-performance insulation core**, made of various ecologically oriented materials (so called "composite board"), **delivering our customers superb sound insulation for wooden door systems. We call it KNAUF INSULATION DRS SOUND SUPREME BOARD.**

Knauf Insulation **DRS SOUND SUPREME BOARD (DRS SSB)** is an insulation board, produced with a unique and patented technological process, specially developed for wooden doors' insulation core. It is based on a composition of rock mineral wool and other ecologically oriented materials, which enable **superb sound absorption (up to 43 dB – depending on the core layers and density)** in combination with excellent fire resistance (EI 30 – EI 60) and thermal insulation. The state of the art insulation core can be prepared as a single-, double- or multi-layer board with a **full-core thickness of only 8 – 50 mm** and is custom designed according to customers' specifications and requirements.



APPLICATION

- ✓ **Insulation core for wooden door systems** in the leisure, hospitality, education, health, housing and media / broadcasting markets and in all other places **where high sound performance factors are required**, providing maximum comfort, good working conditions and a pleasant environment.
- ✓ **Insulation core for entrance wooden door systems**, where **high sound performance factors** in combination with **excellent thermal conductivity and high fire resistance** are required, providing sound, thermal and fire insulation of different facilities for maximum comfort, good working conditions and a pleasant environment.

QUIET ROOM® CERTIFICATE

In today's increasingly noisy world, silence is very desirable. Many travelers are looking for quiet holiday destinations as well as quiet spots in the lush metropolis. For many years, noise pollution has been one of the most common complaints from hotel guests.

Dutch Knowledge Center Sound Insulation (KGI) has therefore developed the Quiet Room® sign, which is quite difficult to obtain. It is much easier for hotels, which use products that meet the acoustic requirements for obtaining

a Quiet Room® certification when building. The certificate is a proof of meeting specific standards and guarantees to the hotel industry customers the reliability, safety, quality and durability of the product.

SSB has been certified and has therefor been proved to be suitable for usage in the hotel industry, where a hotel wants to obtain the Quiet Room® sign. Our product is the only one of its kind that meets the 'quiet room' standards for insulating interior and exterior wood door systems.

HOTEL PLAZA TIRANA (ALBANIA)

Hotel Plaza Tirana is located in the centre of the capital of Albania, only 200 m from the main Skenderberg square. Soon after opening, the new 5-star hotel became one of the most visited hotels in Albania, which enjoys the added value of doors with built-in Knauf Insulation DRS SOUND SUPREME BOARD sound-insulation boards. The entire 10th floor of the 23-storey hotel is equipped with these high-end doors.

Door manufacturers Korel Company2 Albania



THE SOLUTION SPELLS DETENTION

Green roofs are generally an excellent stormwater run-off volume reduction tool. Reducing the volume of stormwater run-off has huge benefits on a city scale as less water must be processed by sewage or stormwater treatment plants. This results in substantial savings for the taxpayers.

RETENTION is defined as water that stays on the roof and never becomes runoff. Retained water only leaves as evapotranspired vapour and never as runoff. Retention is great as it re-

establishes the natural water cycle which has been interrupted by intensive urbanization. In the urban areas the rainwater does not infiltrate into the ground, but drains into the sewage systems. This is why many progressive cities have regulations in place that promote green roofs.

Nonetheless, stormwater professionals still do not choose to put a green roof on top of every roof they encounter. The reason for this is that the average

green roof design does not detain water sufficiently. Retention does not work if the roof is already saturated which can happen during extreme storms, storms that carry on for several days or if the weather conditions do not allow for effective evapotranspiration. In these conditions, the green roof works like a cup which is full ... and the water runs off.

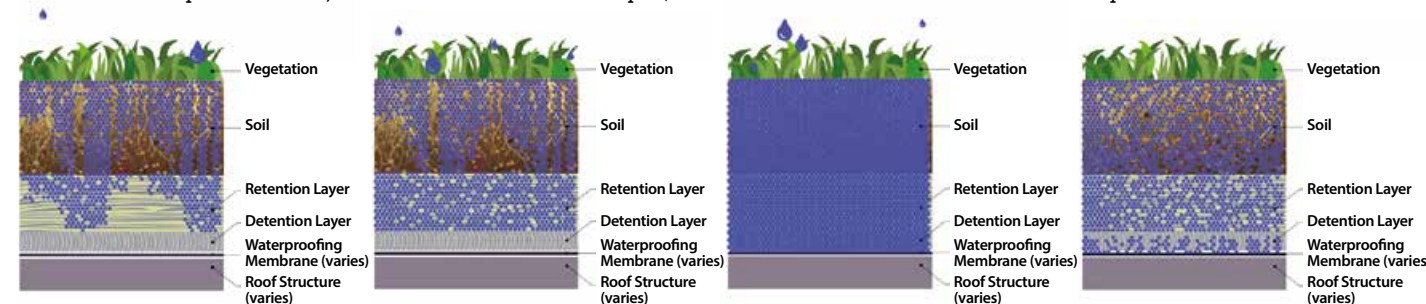


SO WHAT TO DO? THE SOLUTION SPELLS DETENTION.

The trick is to slow down the flow of water when "the cup is full" which usually happens during heavy and intense storms. Such storms cause flooding, pollution and river stream erosion (and headaches for the stormwater professionals).

Detention delays the outflow of the water from the roof and thus reduces the peak volume of water entering the sewers around the building. The water is kept on the roof for a bit longer before it is allowed to run off. Detention buys time which in this case is the critical factor. At Urbanscape®, we offer a new line

of Urbanscape® Detention Green Roof Systems featuring special detention layers functioning as a barrier to slow down run-off. There are several alternatives currently available on the market depending on the types of "super storms" specific to individual countries, regions or even municipalities.



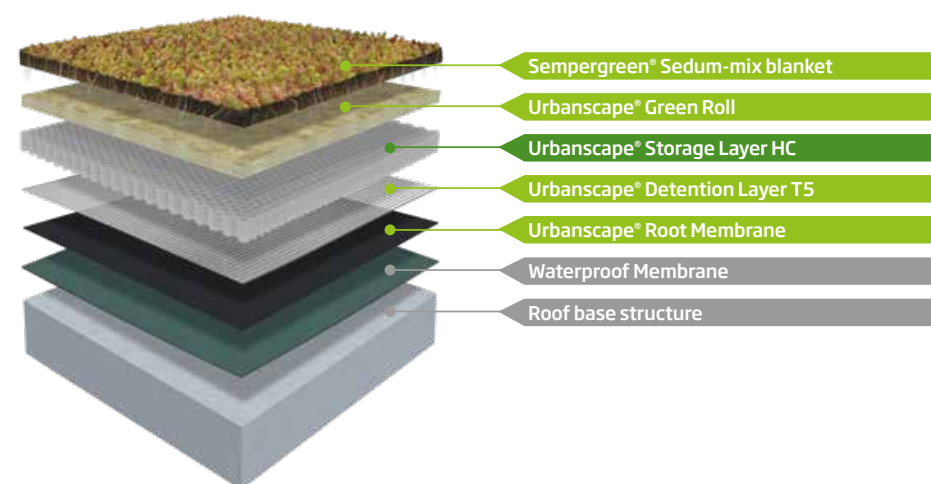
During the storm, water will flood the system.

After the storm, water will slowly run off from the system.

URBANSCAPE® DETENTION GREEN ROOF SYSTEM

This set-up of the Urbanscape® Green Roof System is an optimal solution for intense yet short storms with high rainwater volumes. The detention layer with increased friction will significantly slow down the water run-off.

During the storm, the water table in a green roof will rise and fill all the air space in a full green roof assembly. After the storm ends, the excess water in the system will slowly run off and enter the sewage or stormwater system, leaving the green roof assembly fully saturated to the maximum retention capacity. The system is upgraded by using a special Urbanscape® Honeycomb water storage put on top of the Urbanscape® Detention Layer to become a superior detention and retention tool for longer-lasting and intense storms.



EVALUATION OF PERFORMANCE

To assist stormwater professionals, we use sophisticated green roof modelling software that allows us to simulate the

real retention and detention performances of green roofs for specific areas and specific buildings.

INSULATION FOR 3D PRINTERS: CREATING INNOVATIVE SOLUTIONS THAT CHANGE THE WAY WE WORK

Additive manufacturing (AM), broadly known as 3D printing, is transforming how products are designed, produced and serviced. It is opening up new pathways to production. While many of these are dead ends as economics and logistics limit some of the hoped-for applications, others offer the potential to be game changers in the manufacturing arena.

It bridges the gap between prototyping and mass production, which is an important aspect, especially for the low-volume production. The 3D printing technology is increasingly being adopted in the industrial manufacturing sector, especially automotive and aerospace and defense. Still, there are many untapped markets in manufacturing sectors such as electronics/electrical and foundry and forging.

The 3D printing industry is growing exponentially and is being integrated across more and more industries. The worldwide market for 3D printing products and services is anticipated to exceed 40 billion U.S. dollars by 2024. The industry is expected to grow at a compound annual growth rate of 26.4 percent between 2020 and 2024 (Source: Statista 2020).

Knauf Insulation believes in making a difference, and this growth was a true opportunity for our business. We love to lead the change in smarter insulation solutions that change the way we work and set new standards of quality, performance and sustainability.

Since our aspiration is to be the world's most trusted insulation partner providing high performing insulation solutions, we connected with multinational company Formlabs, designer and manufacturer of professional 3D printing hardware, software, and materials for prototyping and production.

Together, in a joint project, we managed to develop a special insulation solution for their new model of 3D printers – Fuse1. MCH board D12 ALUR in ECOSE® Technology, manufactured in Novi Marof (Croatia) represents the core material, which is additionally cut to the made-to-size pieces, perfectly fit to the Fuse1 3D printer in our own converting unit in Ajdovščina (Slovenia).

Our ECOSE® Technology mineral wool was a Formlabs's first choice due to the usage of revolutionary binder with no added formaldehyde and as it is predominantly based on natural, organic raw materials. Composition of mineral wool with Ecoset Technology also results in lower environmental impact, shown in a number of indicators in Life Cycle Assessment (including Global Warming Potential and energy compared to our traditional Mineral Wool), which was of main importance for the customer.

But there are also plenty of benefits our mineral wool brings to the 3D printer itself – the incorporation of our insulation solutions reduce the noise, caused during the 3D printer operations, protect the very sensitive electronic components inside the 3D printer and prevent the over-heating of the Fuse 1, »industrial power that scales«.



Photo: Formlabs

KNAUF INSULATION TECHNICAL SOLUTIONS NEW EXPER-TEAM SERVICE ON OUR NEW WEBSITE

Online learning has become more and more common, whether for comfort, fitting around working hours or just offering the freedom to study from anywhere. Now, as people are having to stay at home because of the coronavirus pandemic, it has become more important than ever.

Our Specification Managers **Laura Raggi** (Italy, Iberia, UK & Ireland) and **Romain Carayol** (France & Belgium) are delighted to present the new Exper-team area on our new website.

Exper-team is an academy designed to provide an e-learning facility with tutors experienced in insulation to support mainly specifiers and installers.

E-learning videos are **free of charge and available** round the clock. General topics, such as the importance of insulating, BIM, Exper-teK, Ecosse Technology, and ASTM are covered, as well as local topics like energy efficiency regulations in different countries.

The Exper-team section of the website provides new tools, like a lambda value calculator that will enable users to get a specific lambda value for each of our products simply by entering a determined temperature.

And last but by no means least, an interactive blog has been created with the aim to provide quick and accurate technical support to customers who may need it.

Learn more about insulation and discover Exper-team!

EXPER-TEAM TOPICS

- ✓ **General topics about insulation :**
 - Why insulating?
 - Choosing the right insulation products in HVAC
 - Choosing the right insulation products in industry
- ✓ **Digital tools for the design phase**
 - KI TS BIM Objects
 - Dynamo & KI TS Dynamo nodes
 - Specification texts
 - Bill of Quantities texts
- ✓ **Calculation tool Exper-teK**
 - Exper-teK calculation examples
- ✓ **Production process**
 - Stone wool production process
 - Glass wool production process
- ✓ **Environmental topics**
 - Ecosse Technology
 - Indoor air comfort and environmental certifications
- ✓ **Product & System installation**
 - Fire-teK BD installation
 - WM installation
 - Thermo-teK PS installation
 - Thermo-teK BD installation
- ✓ **Regulations & norms**
 - ASTM overview
 - ASTM C547: classification
 - ASTM C612: classification
 - ASTM C592: classification
 - Local regulations
 - Legge 10 – Italy
 - Normación RITE – Spain
 - BS 5422 – UK
 - NF DTU 45.2 – France
- ✓ **Fire protection**
 - Passive fire protection principles
 - Fire protection standards and certifications
 - Fire protection products performance



ISO-WIKI: ASTM STANDARD

ASTM International (formerly known as American Society for Testing and Materials) is an international standard organization that develops and publishes voluntary consensus technical standards for a wide range of materials, products, systems and services. The organization's headquarters is close to Philadelphia (USA). ASTM standards are used in United States of America (USA) or in other regions where USA specifiers or USA companies operate.

Mineral wool insulation materials are a part of the ASTM standard. The following ASTM standards describe the requirements for the following product categories:

- ✓ ASTM C547 – MINERAL FIBER PIPES INSULATION
- ✓ ASTM C592 – MINERAL FIBER BLANKET INSULATION
- ✓ ASTM C612 – MINERAL FIBER BOARD INSULATION

The products have to fulfil different properties to comply with a type of these standards. The requirement is typically a maximum thermal conductivity curve or a maximum density.

Example:

Knauf Insulation WM 640 acc. to ASTM C592 Type I and II. This means the wire mat fulfils the given lambda curve from the standard and is below the maximum density of 160 kg/m^3 (Type I) and 192 kg/m^3 (Type II).

Important is that the properties from ASTM are measured acc. to ASTM standard and can't be compared to measurements from EN standard. This, for example, means that also density is not the same within ASTM and EN rules.

REFINERY PANČEVO, SERBIA

Entering the project „Pančevo refinery" with our Knauf Insulation Power-teK products was a real success for our colleagues in Serbia. The contractor installed **3 Mineral Wool insulation products produced with ECOSE Technology**: 90.000 meters of pipe sections, 50.000 m² of wired mats and 15.000 m² of lamella mats. The refinery, with the capacity of 2.000 tons per day of last

generation of diesel fuel, will benefit to the environment with production of diesel fuel with very low Sulphur content.

KI materials used: Power-teK PS 680 (90.000 m), Power-teK LM 550 ALU (15.000 m²), Power-teK WM 640 GGN/GSN (50.000 m²).



HUF HAUS SHOW HOUSE, HARTENFELS, GERMANY

A fascinating building rises picturesquely on a light plateau in the middle of the HUF village. The outlines of the slim wood-glass construction in the landscape are elegant. Anyone who wonders how the classic components of timbered architecture can be interpreted even more intelligently and in an unprecedented way will find the answer in the crystal-clear HUF show house "Ausblick": Maximum transparency characterizes the appearance of the filigree bungalow as well as the impressive "Butterfly roof" that makes the architecture of the house look even finer and more open.

The **lightweight design of Urbanscape® Green Roof System** does not compromise the structure stability and at the same time provides good stormwater buffer (stormwater management) through natural evaporation, herewith cooling the roof of the house and represent an advanced performance regarding the energy efficiency. Furthermore, the sedum roof increases the biodiversity in the urban area by providing protection and a source of food for bees, butterflies and other insects.



Photo: Huf Haus

HAMMERSMITH ROAD, LONDON, UK



Photos: Courtesy of ©Focchi Group

245 Hammersmith Road (formerly Bechtel House) creates a prominent architectural addition and sequence of new public spaces in the area's Business Improvement District (BID). Rather than being a single structure like the former Bechtel House on the site, its design reduces the mass of the development by forming the building from two parallel wings that are connected by a central core, which houses circulation space and services. The external envelope of the development is characterised by the use of angled anodised aluminium window surrounds, which have been specified to create a dialogue with the architectural language of the adjacent Conservation Area where terracotta brick is commonplace. The tailored to their orientation, minimising solar gain and providing dynamic elevations, which respond to the changing levels of light during the day. **In this building you can find our 1300 m² of CNF boards, produced in our plant Ajdovščina.**

AWARENESS, EDUCATION AND DEMONSTRATION

The Knauf Insulation Experience Center (KIEXC), in Škofja Loka is a case study of European-wide sustainable construction. The building itself was designed to demonstrate our pioneering approach to sustainable future. The 832 m² building operates as both a demonstration and training center where our most innovative insulation solutions and examples of best practices from our partners in sustainable construction are on show.

ABOUT KIEXC

- The demonstration center is a venue for **practical training** available to the interested professional public and to service providers.
- It is also an **education center** for our partner enterprises, architects, retailers and end users.
- It offers a number of **digital experiences** with sustainable construction.
- You also have the opportunity to see our **solutions for HVAC and industrial users** (Technical Solutions / OEM).
- Urbanscape® Green Solutions: green roof, green wall and other green solutions can be found on the roof of the Center.
- We organise a **number of tailored educational programmes** for schools, faculties and other professional institutions.
- By prior agreement, a guided tour of the Center can be complemented with a tour of our production facility.

SUSTAINABLE CONSTRUCTION

The Knauf Insulation Experience Center contributes, first and foremost, to the **increased awareness of sustainable construction in Slovenia and Europe**, as it builds on the criteria for the life cycle assessment of buildings. The experience we have gained through construction thus actively contributes to the efforts of the profession, aspiring to build environmentally- and people-friendly buildings. It is also a guarantee that we will continue to develop quality products and solutions.

The Knauf Insulation Experience Center was planned using **BIM** methodology (Revit) and is constructed to comply with the most strict **DGNB Green building rating schemes**.

Knauf Insulation Experience Center is a Pilot project of sustainable construction for the European Commission known as **Level(s)** - guidelines for sustainable construction.

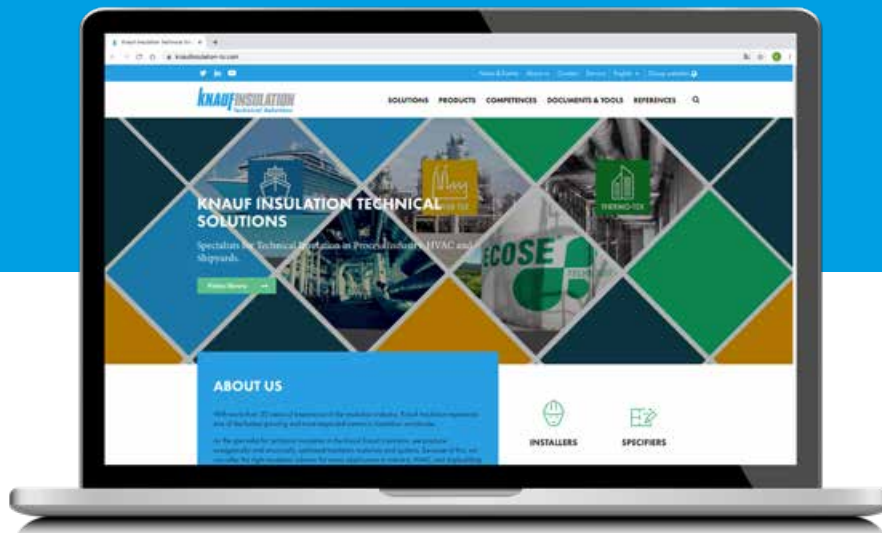


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WWW.URBANSCAPE-ARCHITECTURE.COM



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COMPANY PROFILE Knauf Insulation is one of the most respected names in the insulation industry worldwide with over 40 years of experience and still growing fast. Over 5.500 employees in more than 35 countries and 38 manufacturing sites. Being part of the family-owned Knauf group Knauf Insulation Technical Solutions provides solutions for customers' requirements in industry, marine applications, heating, ventilation and air conditioning. A profound market understanding and insulation know-how enables us to provide a broad range of products to meet your specific needs.

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