

# Releasing the natural power of stone



# How the natural power of stone can enrich modern living

Stone and civilisation were made for each other. ROCKWOOL® makes the most of this relationship to improve our health, wellbeing and comfort.

There is something uniquely exciting about turning an abundant natural resource into products that enrich modern life. And our search is not yet over: there's still so much to be discovered. ROCKWOOL is leveraging the **7 strengths of stone** to create products that meaningfully address the biggest challenges facing our world.

For millennia, cities have exerted a pull on humans. They are centres of learning and experimentation; cultural melting pots where people from across the world come together to live, work, and play. More people move to cities every day, and cities themselves have grown and changed in response to the needs of their ever-increasing populations.

The balance between fast-paced urban life and human health and wellbeing presents challenges ROCKWOOL aims to overcome. We've spent the last eight decades investigating how we can turn these challenges into unique opportunities. And the answer was right in front of us the whole time: stone.

We've come a long way since 1936. By applying our curiosity, passion and knowledge, and combining it with our extensive production experience, we can leverage the 7 strengths of stone to address the big challenges facing our world.

Each of our products combines the 7 strengths with one ambitious goal in mind: to minimise the human impact on our surroundings, whilst maximising the safety and wellbeing of all the people interacting with our products.

Even after 80 years, as stone wool experts, we know there's still so much to learn. Our new innovations in stone can create opportunity and help us tackle tomorrow's challenges. In a sense, this is just the beginning.



“Unlocking the secrets inside stone is more than our daily job: it is our passion. At ROCKWOOL, we have been using the natural power of such an abundant, natural resource to develop a broad product platform always with a goal in mind: make people’s lives safer, richer, more productive and more aesthetically pleasing.”

**Bernard Placade**  
Senior Vice President, Group Operations and Technology

# The

**There is something truly remarkable about the natural power of stone.**

So far, we have been able to break down this natural power into 7 strengths that are inherent in the versatile properties of stone wool. These are seven reasons why we believe the world's most abundant resource can be engineered to create uniquely useful and exciting solutions for our customers. And by applying these 7 strengths to everything we do, we passionately believe that we can address some of the biggest challenges facing our world. We're sure that there are even more strengths of stone to be discovered. And when we discover them, we'll turn those strengths into new products that improve the quality of life of everyone who comes into contact with them. That's why these 7 strengths lie at the heart of every ROCKWOOL product.

# strengths of stone



## **Fire-resilience**

Withstand temperatures above 1000°C.



## **Thermal properties**

Save energy by maintaining optimum indoor temperature and climate.



## **Acoustic capabilities**

Block, absorb or enhance sounds.



## **Durability**

Increased performance and greater stability with lower costs.



## **Aesthetics**

Match performance with aesthetics.



## **Water properties**

Manage our most precious resource.



## **Circularity**

Reusable and recyclable material.

## Introduction

At ROCKWOOL, we've been applying the 7 strengths of stone to the world's biggest challenges for decades. We keep a close eye on global megatrends to ensure that our product portfolio stays relevant to the most pressing issues facing our world. By seeing these megatrends as opportunities to improve the lives of people around the world, our products have become central to conversations on issues like climate change, health and wellbeing, urbanisation, and resource scarcity.

## Urbanisation

With the urban population growing every day, we need to find ways to house everyone in our cities in a way that keeps them safe and helps them thrive.

# 41

mega-cities with 10 million inhabitants by 2030.

The world will need twice as much food for its growing population in

# 2050

## Resource scarcity

A growing population is demanding more food and natural resources to continue to develop. The challenge is how to make it available in a sustainable way.

# Megatrends

Harnessing the 7 strengths of stone to address the world's big challenges

## Health and wellbeing

Our wellbeing goes hand-in-hand with the comfort of the environment where we work, live, learn, play or even – in the case of a hospital – recover.

Today, the average person living in a city spends

# 90%

of their time indoors.

## Climate change

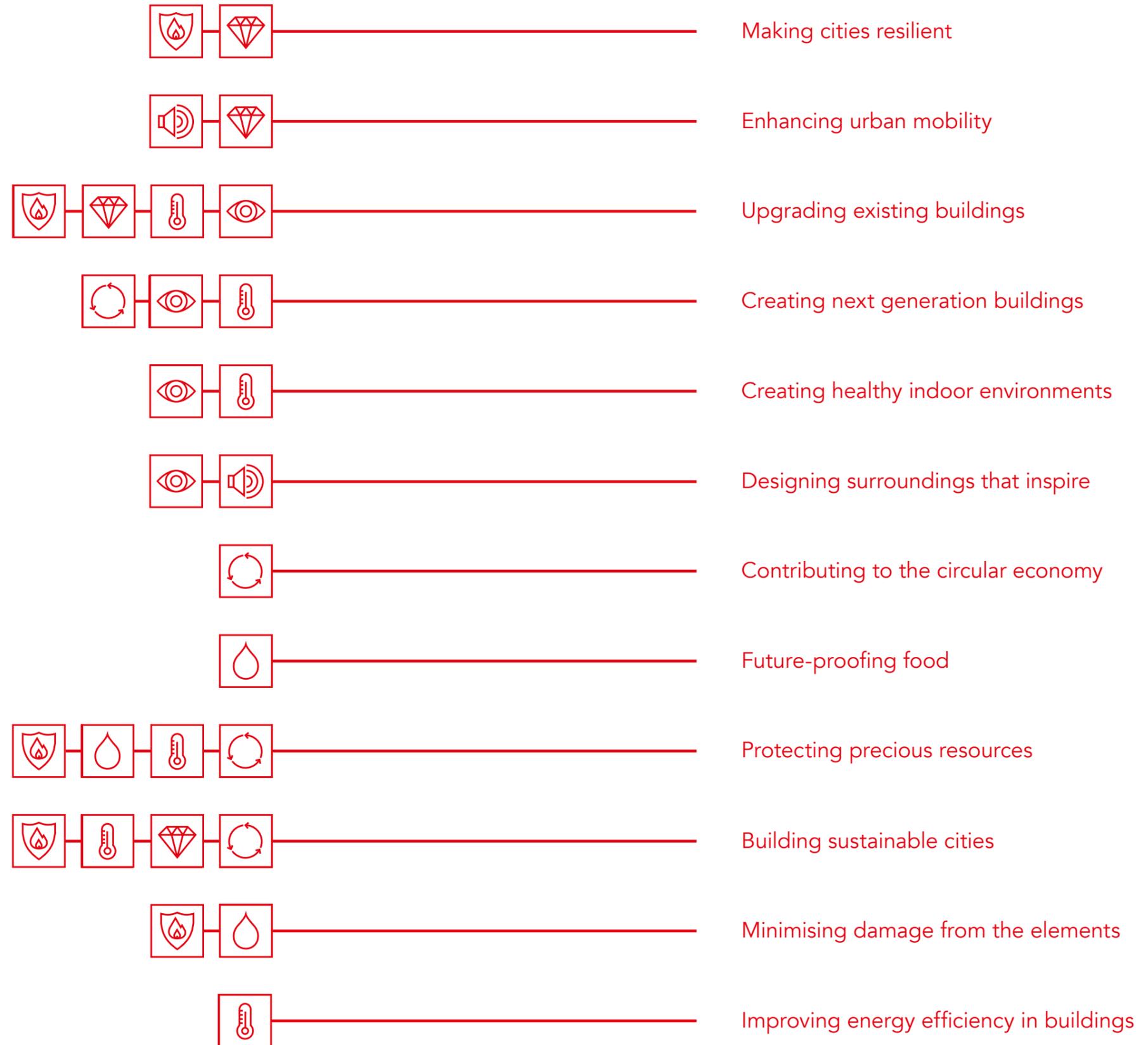
Our climate is changing, which brings new challenges as we seek to reduce our carbon footprint and live more sustainably.

# 33%

Buildings account for over one third of the energy used globally.

# Applying our purpose

The challenges of modern living have a huge impact on the growing needs of our customers and the type of ambitious projects they take on. But we are in a fortunate position to make an impact. Rigorous energy efficiency regulations, increased renovation rates for buildings, growing concerns for food security, and the need for safer and more resilient cities all favour our stone wool solutions. In fact, we have identified twelve different areas that demonstrate how we are applying our purpose of enriching modern living. Every solution is made possible by our expertise in the 7 strengths of stone.





# Welcome to homes with peace of mind built in

Urbanisation brings new challenges to the building sector.

In land-scarce urban areas, more and more people are working and making their homes in high-rise buildings. These structures can be brilliant solutions to the challenge of safely housing a growing population. But if a fire strikes in a high-rise, the consequences can be very serious.

ROCKWOOL insulation is extremely resilient to fire. It works to contain fire and prevent its spread. At the same time, it does not contribute to the emission of significant quantities of toxic smoke. From apartment blocks to skyscrapers, from industrial facilities to busy schools, the natural qualities of stone are helping us build sustainable and safe cities, full of fire-resilient buildings.

**ROCKWOOL products can make the difference between a fire in a building and a building on fire.**

ROCKWOOL insulation is heat-resistant above **1000°C**

## Did you know?

Our solutions are produced using the same process that occurs at the heart of a volcano. That means our products remain stable – even at extremely high temperatures. This makes the stone fibres suitable for a suite of high temperature applications – from car brakes to fire protective coatings.





MAKING CITIES RESILIENT

# Protecting our safety and the environment in The Big Apple

So that a Manhattan hotel could meet both fire safety standards and New York City's ambitious energy targets, we provided fire-resilient solutions for the inner and outer walls.

With the safety of guests being their number one priority, Marriott selected our fire-resilient insulation for the exterior walls of its 31-story Courtyard by Marriott hotel on Ground Zero. The walls also had the added benefit of enhancing thermal and acoustic comfort both within each room and in the communal spaces. New York City has set itself the ambitious target of halving CO<sub>2</sub> emissions by 2030. Around 75 percent of greenhouse gas emissions in the city come from buildings, 90 percent of which are from heating and cooling. So, our insulation became an even more obvious choice for its additional highly energy-efficient performance.



New York, USA. Products: ROCKWOOL insulation | CAVITYROCK for exterior wall insulation



Country built: France (STX), Country in operation: Caribbean. Products: SeaRox products

MAKING CITIES RESILIENT

# Fire safety ahoy

ROCKWOOL materials are at the core of this giant cruise ship's structure, providing fire protection, and acoustic and thermal comfort.

It's like a floating city. Harmony of the Seas, the largest cruise ship ever built, can carry 5,479 guests plus crew and staff, all of whom want to feel safe and comfortable throughout the voyage. Chosen as the insulation supplier for this huge project, we provided insulation for everything

from the core structure of the ship to cabin ceilings and walls. The fire-resilience of ROCKWOOL insulation makes the ship safer for its guests and crew, while its additional acoustic and thermal benefits mean the cruise is more comfortable and relaxing for thousands of travellers every year.



# The optimal temperature, whatever the weather outside

## Did you know?

Our products derive their thermal properties from tiny pockets of air trapped within the physical structure of the stone wool. These air pockets allow the insulation to keep hot air out in hot climates and to retain warm air in cold climates.

Maintaining a consistent indoor temperature is better for you and for the environment.

It makes living and working conditions more healthy and comfortable, helping people to thrive, especially in urban environments. Temperature maintenance can dramatically reduce heating, cooling, and ventilation costs, and reduce a building's carbon footprint.

ROCKWOOL insulation is a highly flexible material, which works in all spaces as a buffer against fluctuations in temperature. By reducing airflow and heatflow, our products maintain their shape and density, so they perform at their peak throughout the lifetime of the building. It's part of our commitment to building sustainable cities that promote human flourishing.

**ROCKWOOL products keep hot and cool air where they're needed most.**

# 66%

**of energy consumption in buildings is used for heating, cooling, and ventilation.**





Pamplona, Spain. Products: Ventirock Duo | REDair insulation

IMPROVING ENERGY-EFFICIENCY IN BUILDINGS  
BUILDING SUSTAINABLE CITIES

## Award-winning energy-efficient buildings in Spain

To help the Thermos Building become the first residential building in Spain to meet the highest possible energy rating for construction projects, we created facades that exemplified the thermal properties of stone.

The insulation we installed in the Thermos Building's facade reduces energy consumption, and increases the comfort of homes, both acoustically and thermally. Double flow ventilation enabled by stone wool's thermal properties ensures that the interior air quality stays high, with no pollen or dust. The result

is a healthy indoor environment for residents – one that even combats seasonal allergies. The innovative design was widely acclaimed, and the project won an ASPRIMA award for "Best energy-efficiency initiative in real estate projects".

CREATING NEXT-GENERATION BUILDINGS  
IMPROVING ENERGY-EFFICIENCY IN BUILDINGS

## Building the homes of the future by harnessing thermal properties

Biosphera 2.0 homes in Italy use the thermal properties in our facades and roofs to keep indoor temperatures to 21°C in the winter and 25°C in the summer, even under extreme weather conditions.



Italy. Products: REDArt® system | REDAir® | Durock Energy

Biosphera 2.0 is a high-tech, self-contained housing module that we have been actively involved in. It has been tested in all environmental conditions, and at just 25m<sup>2</sup>, is perfectly equipped with everything you could need. We provided the insulation system for the facades, which created a healthier indoor environment for inhabitants and added a particularly striking aesthetic effect. Our products were also used for the roof, proving that they can help provide the perfect indoor climate, whatever the weather.

**"I had the great opportunity to spend two days inside Biosphera. . . I saw first hand a different way of living, of course a better one, with a higher quality. And the best point is that this is quite easy to achieve!"**



Loredana Lualè, Project Specialist, ROCKWOOL Italia



# Our building insulation is a breath of fresh air

Stone wool products create healthy indoor environments for everyone.

As well as maintaining optimal temperature, stone's thermal properties mean it can protect people and properties from mould and other fungi. So architects can create buildings that not only shelter us from the weather, but also provide a safe and comfortable indoor environment that empowers us to lead healthy lives.

Buildings, like people, need to stay healthy. Stone wool is vapour-permeable, which means it allows moisture to pass through walls and out of the building. This protects buildings against rot, mould, and humidity damage.

**ROCKWOOL products let buildings breathe, which helps you breathe better.**

We spend

# 90%

of our time indoors, so buildings have a major impact on our health and wellbeing.

## Did you know?

Damp and mould can have a detrimental effect on the health of building fabric, the thermal performance of the building, and the respiratory health of occupants. Understanding breathability is crucial to creating healthy, durable, working buildings.





MOUNT ELIZABETH NOVENA HOSPITAL, SINGAPORE

# How the unique strengths of stone are creating healthier environments in hospitals

Located in the heart of Singapore's medical hub, Mount Elizabeth Novena Hospital is a state-of-the-art hospital built to create a comfortable, safe and nurturing environment for its patients and staff. By harnessing the 7 strengths of stone, we found cost-effective solutions to almost every challenge in the healthcare space, from the economic to the ergonomic, and from hygiene to safety.



Singapore. Products: ROCKWOOL Bradflex flexible ducts | ThermaRock S | HVAC internal duct lining

## BETTER HYGIENE

Building materials in healthcare facilities should have a positive impact on the control of air cleanliness – essential in preventing the spread of infections. The thermal properties of stone wool also help to reduce energy bills for cooling and prevent condensation, creating a healthy indoor climate. This makes the hospital a far more hygienic and welcoming place for patients and staff.

## MORE PRIVACY

The all single-room design, a first in Singapore, offers patients and their care-givers an unequalled level of privacy and comfort. Using ROCKWOOL solutions for inner walls and technical installations ensures the rooms absorb sound and reduces the intensity of noises and echoes. An optimal level of acoustic comfort allows patients to recover quicker and receive the privacy they deserve.

## SAFETY FIRST

In a hospital, the care of vulnerable people always comes first. That's why we specified our fire-resilient insulation. It can withstand extremely high temperatures in the event of fire, and slow down the spread of flame, providing valuable extra time to get people to safety.

## ENVIRONMENTALLY RESPONSIBLE

Mount Elizabeth Novena Hospital recently introduced a green initiative, for which they were awarded a Green Mark Platinum Award from the Singapore Building and Construction Authority. We were pleased to play our part in this success by supplying materials to complement the hospital's green efforts. Not only are our insulation solutions both sustainable and recyclable, but their thermal properties allow for better energy efficiency in buildings, resulting in lower CO<sub>2</sub> emissions.



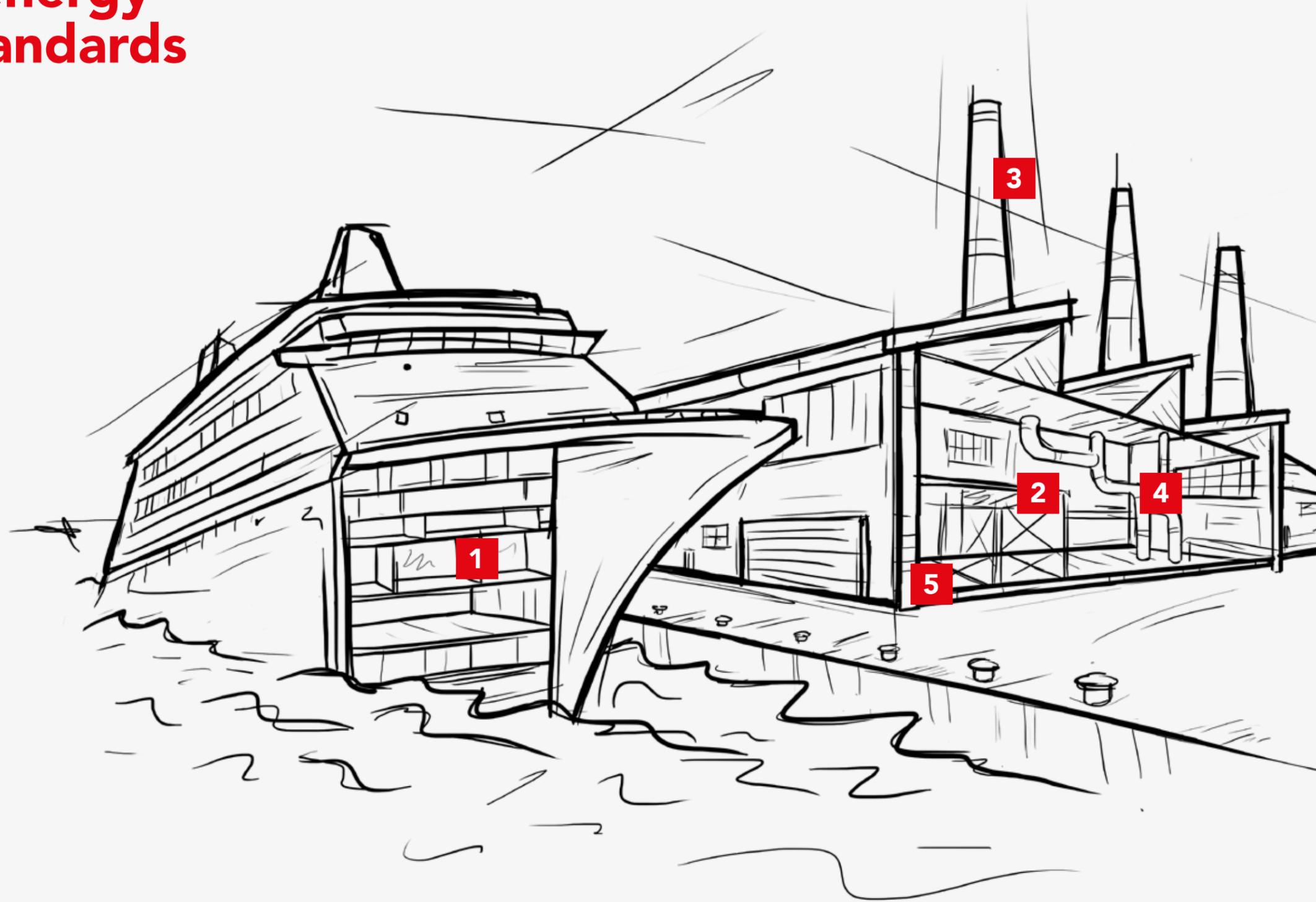
**"ROCKWOOL insulation was used to create a peaceful and quiet place that is imperative for recuperation and the healing process."**

Alex Low, Country Sales Manager, ROCKWOOL Singapore



# Innovative ways to meet future energy and safety standards

- 1. MARINE AND OFFSHORE** – Our technical insulation product lines provide a wide range of solutions and systems for thermal, sound and fire-safe insulation for the marine and offshore industry.
- 2. PROCESS INDUSTRY** – High quality insulation solutions for thermal and fire-safe industry insulation for different industrial processes.
- 3. CUSTOMISED SOLUTIONS** – Especially suitable for industrial installations such as high-pressure steam pipes, reactors, furnaces and chimneys etc.
- 4. TECHNICAL INSTALLATIONS** – Insulating heating, ventilation and air conditioning systems (HVAC) provides energy efficiency, acoustic performance and fire safety of buildings.
- 5. INDUSTRIAL WALLS** – Thermal insulation for double skin metal walls and sandwich panels.





# A city that never sleeps never keeps him awake

Urbanisation often brings infrastructure and domestic buildings closer together.

From railways to tramways, roads to airports, good infrastructure is crucial to urban life, which can be very noisy. The resulting ground-borne vibration, traffic noise – and not to mention human noise pollution – all have a serious and negative impact on our wellbeing, especially in densely populated areas.

Protection from unwanted noise can have a positive effect on our physiology, learning capacity and social behaviour. ROCKWOOL products are high-density, which makes them extremely resistant to airflow and excellent at noise reduction and sound absorption, meaning that even the noisiest infrastructure sounds quieter.

**ROCKWOOL products turn down the volume of the city.**

# 50%

**of the population are regularly exposed to traffic noise at a level harmful to health.**

## Did you know?

Stone wool structure can be engineered to isolate and control vibrations and noise from urban transport systems, reducing its detrimental impact on people and buildings. Living close to an airport, the noise you hear inside your house is reduced by 40 percent if your roof is insulated with ROCKWOOL stone wool.





Oslo, Norway. Products: RockXolid insulation

DESIGNING SURROUNDINGS THAT INSPIRE

## A roof for the Oslo Opera House you can dance on

We helped create a walkable public roof with insulation that minimises vibration for uncompromised acoustic performance in the Oslo Opera House.

One of the Oslo Opera House's most distinctive features is its large slanting roof, where the public can walk around, and where machines are able to drive to clear away snow in the harsh winter. Good acoustic insulation was therefore vital to ensure spectators' enjoyment of artistic

performance is not compromised. Inspired by our noise reduction solution for the Oslo tram, we provided the Opera House with insulation for its 'upside-down roof', providing a combined effect of thermal insulation and acoustic capabilities.

ENHANCING URBAN MOBILITY

## Creating peaceful sleepers in Stockholm

Using the acoustic capabilities of stone, our insulation helps protect homes built above the metro in Stockholm from noise and vibration.

Stone wool can isolate and control vibrations generated by mass transit systems such as metros, trams and trains. Running on a ROCKWOOL system, trains in the Stockholm metro operate beneath the city without generating any noise

or vibrations in the buildings on top of the tunnel. This means a more peaceful life for residents, and it protects buildings and other structures from fatigue caused by vibrations.



Stockholm, Sweden. Products: Rockdelta mats



# Buildings where you could hear a pin drop

Controlling the sounds we take in is key to acoustic comfort.

Our wellbeing goes hand-in-hand with the comfort of our indoor environments, and a big part of maintaining that comfort is controlling sounds.

Sometimes that means making sure that buildings like hospitals are quiet spaces in which to recover. For other buildings, like offices, it's about reducing noise bleed from outside and room-to-room, which reduces stress and increases concentration. For projects like schools, it's about controlling sound so that teachers can be heard clearly, but noise from the playground and echoes from the corridors are quietened.

**ROCKWOOL products create quiet spaces where they're needed most.**

In schools with no sound absorption, children miss

# 25%

of words spoken by their teacher.

Source: Primacoustic Educational White Paper, 2013

## Did you know?

Stone wool has an open, porous structure, which makes ROCKWOOL products highly efficient sound absorbers by nature.





CREATING HEALTHY INDOOR ENVIRONMENTS  
CREATING NEXT-GENERATION BUILDINGS

## Open for business

To ensure Statoil's new flexible open office plans would help increase productivity as well as efficiency, we provided acoustic ceiling solutions that ensured a peaceful environment.

Squeezing more people into less space may boost economic performance, but at what cost to personal productivity? These challenges were certainly top of mind as Norwegian oil and gas outfit Statoil began to expand its headquarters with a new office building, relocating over 1000 employees from the west coast of Norway.

Statoil's modular and flexible open-plan solution was designed by architect Niels Torp to ensure optimum interaction and sharing between workers. The idea was to have 22 'factories', which would provide each department with the same high-level functional space that could be adapted to their needs. Solid and glass walls could be moved

to create different solutions for each department, whether they needed more meeting room space or more workstations; it was their choice.

But having this large open space with mobile walls implied that constant acoustic comfort became heavily dependent on fixed elements like the floor and ceiling options. The exceptional sound absorption qualities of our ceiling solutions meant that no matter how the offices were configured, everybody would maintain a healthy indoor environment to work in and be productive.

We were also able to meet Statoil's requirement to have environmental information about our products, from materials to transportation.



Fornebu, Norway, Products: Rockfon® Acoustical Ceilings



London, UK. Products: ROCKWOOL HARDROCK® Multi-Fix | ROCKWOOL Acoustic Infills

UPGRADING EXISTING BUILDINGS

## Hear every cheer

To make sure no one misses a moment of the action in the London Olympic stadium, we created a roof that retains sound.

In any stadium, acoustic performance is critical to the experience of athletes and spectators. And it was central to the high-profile renovation of the UK Olympic Park Stadium. Superior acoustics provided the perfect answer, ensuring that the new roof retains sound within the stadium to create an unforgettable experience for athletes and spectators – without affecting the surrounding environment.

**"These main elements had to demonstrate top results in safety, quality and flexibility as Statoil wanted a special solution which could fulfil its long-term ambitions for growth."**

Jarle Jenssen, from Acusto, the interior installers



# Welcome to buildings that fashion the future

1,000,000 people move to urban environments every week.

This is placing a great strain on existing infrastructure, as well as energy resources and the environment. The challenge is to build sustainable cities that can support their populations now and in the future.

ROCKWOOL insulation has a unique physical structure, which keeps its shape and toughness despite changes in temperature or humidity. This dimensional stability means its performance is unchanged, decade after decade, ensuring maintenance savings throughout a building's lifetime. Due to its smart fibre structure, ROCKWOOL stone wool is also easy to fit. It adapts to all types of irregularities, leaving no gaps in the insulation layer and no sagging. This helps keep heat or fresh air in, preserving your indoor comfort.

**ROCKWOOL products build cities fit for the future.**

**Studies on ROCKWOOL products show they still perform at their peak at**

**55**  
years old.

## Did you know?

On average, it costs five times more to manage and maintain a building over its life than to build it. Buildings made of durable components require less technical supervision and refurbishment, which means savings in energy and materials used for maintenance and repair over the lifetime of the building.





SOUTH HARBOUR SCHOOL

# How the unique strengths of stone are creating next-generation schools

South Harbour School in Copenhagen, Denmark, is a new public school designed to serve the community for decades to come. Built with materials that will perform as well in future decades as they do today, it's an investment in the future. What's more it's designed to exist in in perfect harmony with its location by the waterfront – a living example of how ROCKWOOL products are helping delivering cost-effective, sustainable and healthy indoor environments that last.



Products: ROCKWOOL fire safe thermal insulation | Rockfon acoustic ceilings | Rockpanel boards



### BUILT FOR THE FUTURE

Every part of the building is custom-designed to fulfil its purpose as an educational establishment. Yet this purpose is kept in harmony with the need for the school to blend seamlessly into its waterfront surroundings. With its combination of durable ROCKWOOL materials and sensitive design, South Harbour School was built to last for generations to come.

### BETTER ENERGY EFFICIENCY

Danish government legislation means that as of 2015, all newly built buildings must be classed as low-energy. ROCKWOOL fire-safe thermal insulation has made this possible by allowing the school to easily maintain its optimum temperature in all climates, which keeps its energy consumption to a minimum – protecting precious resources.

### MORE FOCUSED LEARNING

In a busy school environment, noise control is essential to make sure that pupils can learn without disruption from corridor noise, machinery, or the sound of distant voices. Rockfon ceilings improve acoustics, so teachers can be heard clearly, but noisy activities are not allowed to disrupt other classes.

### AN ENGAGING ENVIRONMENT

The school's innovative design incorporates different ceiling heights and diverse environments. This playful design challenges and stimulates students, teachers, and visitors as they move through indoor and outdoor spaces. Architecturally, the school was made possible by custom Rockpanel® facades, which enabled the architect's vision to reveal new perspectives depending on the time of day and location from which one views the building.

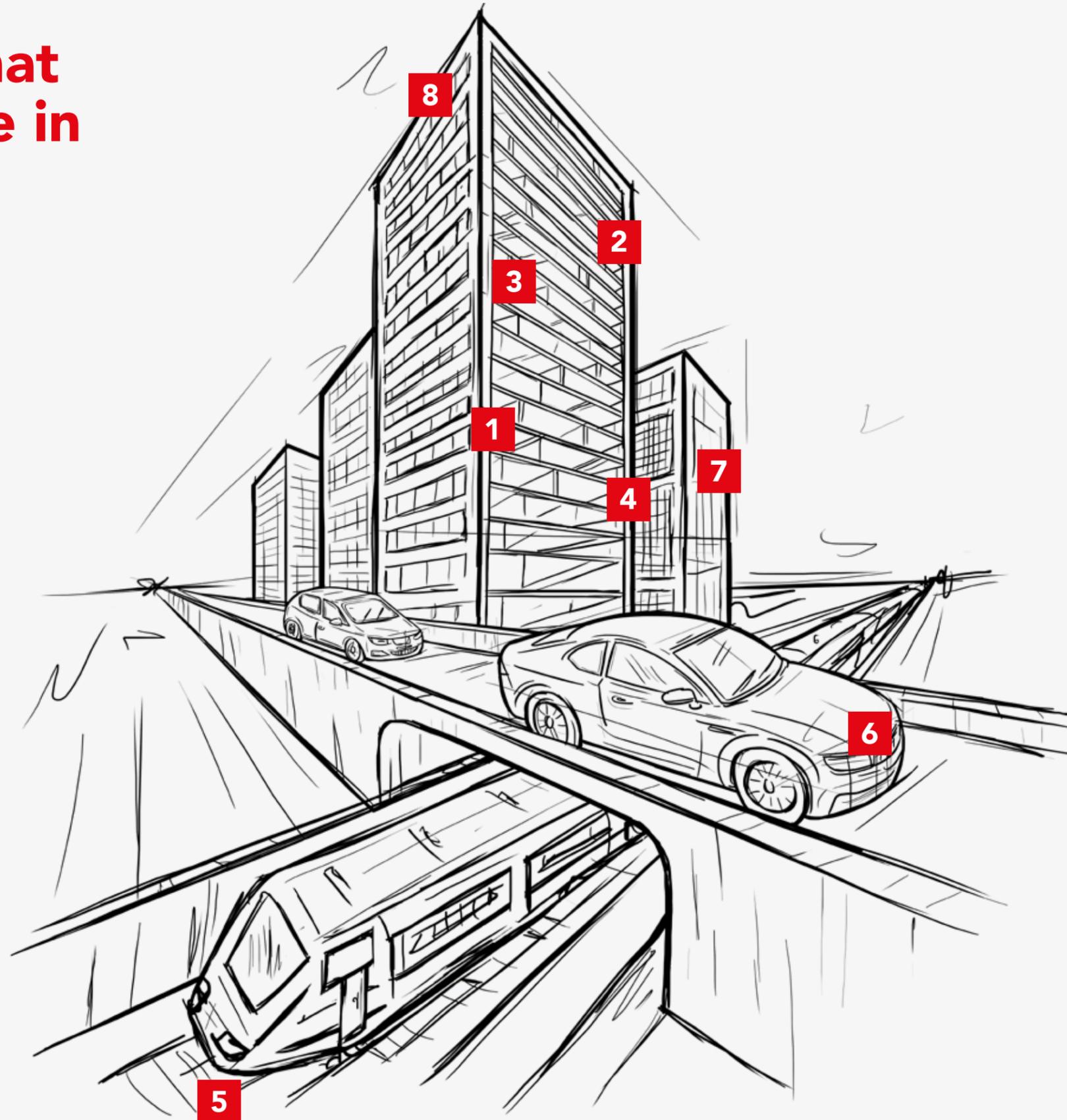
**“The product life of the Rockpanel products is 55 years, another important point when we want to build in a sustainable way.”**

Jørn Kiesslinger, Architect and DGNB auditor at JJW Architects in Copenhagen



# Building cities that are better to live in

- 1. FLOORS** – Dual density thermal and acoustic insulation solutions for all types of floors and decks.
- 2. CEILINGS** – Acoustic ceiling solutions provide a good indoor climate and a pleasant working environment.
- 3. INNER WALLS** – Products for all types of internal walls: fire walls, fire sectioning walls, and partition walls - whether the construction is masonry, timber or metal frame.
- 4. STEEL ELEMENTS** – Protection of steel structures from the effects of the high temperature that can be generated in a fire.
- 5. INSULATION FOR VIBRATION** – Stone wool boards provide ultra-efficient anti-vibration treatment for conventional railways, tramways and high-speed lines as well as protection of concrete bridges.
- 6. CUSTOMISED SOLUTIONS** – Intelligent fibre solutions for automotive composite applications such as car bumpers and brakes.
- 7. FACADE CLADDING MATERIAL AND EXTERNAL FACADE INSULATION** – Ensures a unique combination of design freedom, thermal properties, durability and fire-resilience.
- 8. FLAT ROOF** – Flat roof insulation is often used in industrial and commercial constructions to reduce heat loss, provide fire-resistance and reduce noise pollution.





# Our facades aren't just pretty faces

A building's aesthetic appeal need not compromise its performance.

When people live and work in aesthetic spaces, they feel comfortable and motivated. Environments in which people enjoy spending time can improve social cohesion and make neighbourhoods safer and healthier.

In order to create inspirational buildings, architects need flexible and aesthetically versatile materials that can make beautiful spaces a reality for people everywhere. With a combination of aesthetics and high product performance, ROCKWOOL can create these harmonious spaces that also protect and promote fire safety, acoustic and thermal performance, along with durability and circularity. We have harnessed the natural beauty and adaptability of stone to make it easy for architects to design and customise in an almost unlimited range of colours, shapes, and forms.

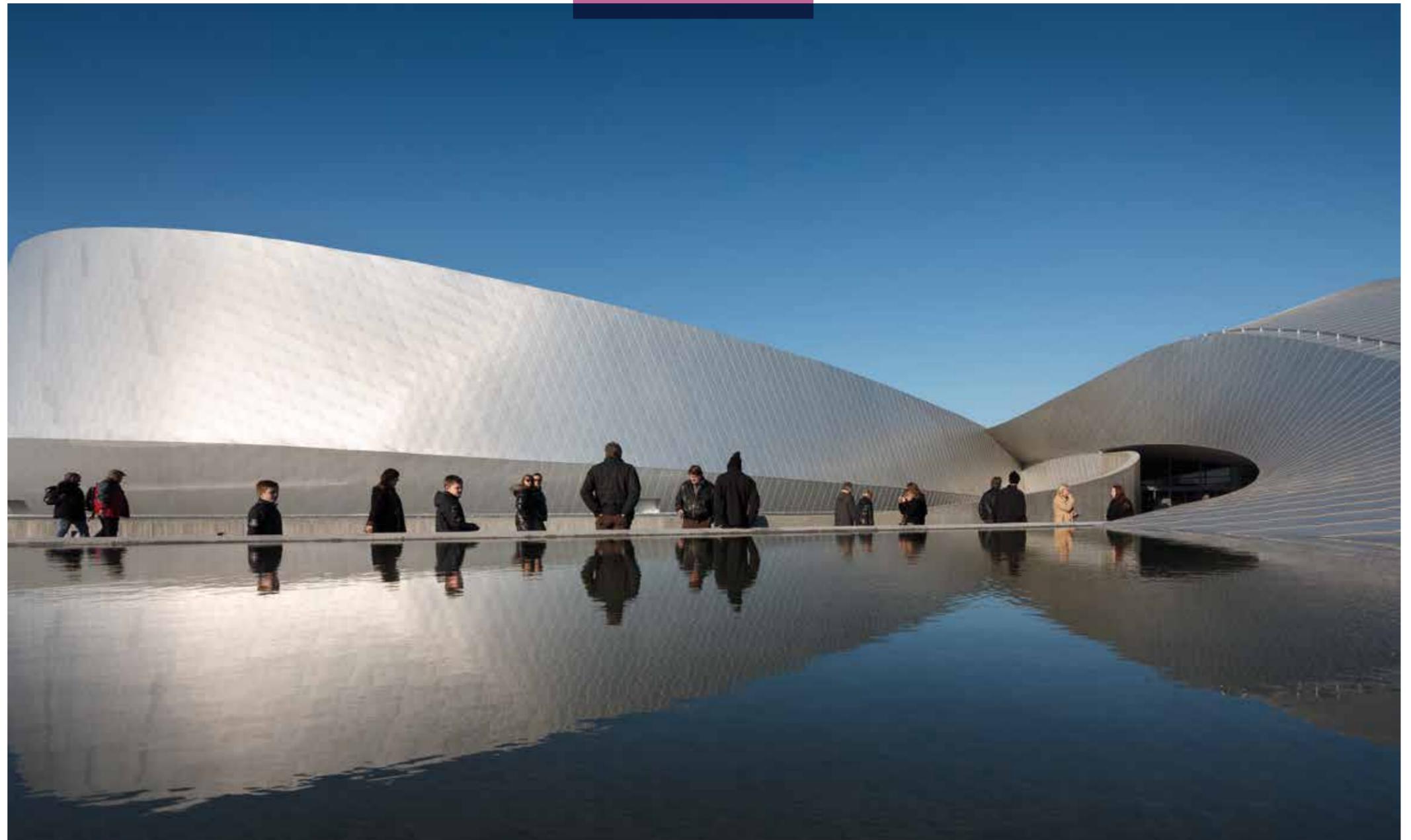
**ROCKWOOL products allow you to combine aesthetics with high performance in every building project.**

# 85%

**of people agree that 'better quality buildings and public spaces improve the quality of people's lives.'**

## Did you know?

Over 25 years, construction accounts for just 5.5 percent of the cost of a building. The cost of occupancy, which includes energy bills, makes up 86 percent. Small investments in design and materials can make a big impact on the cost of occupancy.





DESIGNING SURROUNDINGS THAT INSPIRE  
CREATING HEALTHY INDOOR ENVIRONMENTS

## Welcome to the great indoors

To help architects create an inspiring indoor university space at SDU Odense, we provided aesthetically pleasing ceilings, creating a comfortable indoor environment for students and staff.

A building's design can have a huge impact on productivity – especially important in learning environments. To make the biggest impact possible, the architects of SDU Odense demanded a wide range of products, with specific requirements for acoustic performance, surface appearance and flexibility of assembly and disassembly. Our aesthetic ceilings were chosen for their ability to offer this complete product solution. The architects requested ceilings in seven different hues to create individual

rooms with matching floors, walls and ceilings. This was made possible by stone wool's aesthetic properties: its shape, size and colour are easy to customise. Moreover, the architects believed in the products and our extensive expertise in light and indoor environments – all essential in creating a positive space for learning.

Odense, Denmark. Products: ROCKFON Mono



Eggenfelden, Germany. Products: Rockpanel boards | Rockclad boards (RAL 7016) | ROCKWOOL Fixrock

DESIGNING SURROUNDINGS THAT INSPIRE  
CREATING NEXT-GENERATION BUILDINGS

## Bringing architects' visions to life

To help local architect Professor Markus Frank achieve his vision for the new BRUNNER family business complex, we helped create an extraordinary facade that ensured the building's aesthetics reflected the future-oriented nature of the BRUNNER business.

When the BRUNNER family business expanded, they needed a brand-new facility. Architect Professor Markus Frank's approach to this modern and contemporary design was intended to reflect the ethos of BRUNNER. His objective was to create homogenous surfaces with unique character, using affordable building materials, like stacked wood – fully customisable, providing endless shapes, colours and opportunities.

And because our facades are fully customisable, he was able to bring the building into perfect

harmony with its natural surroundings. Our products contributed to cladding on the outside and continued the trend inside, giving it a warm and natural appearance. The initial yellow-green colour of the panels we provided darkens after about six weeks, resulting in a unique look that leaves a lasting impression on the visitor. Additionally, we were able to install permeable insulation, which ensured a modern thermal insulation of the facade, and a cohesive overall appearance that respected Frank's design.



**"Building materials are only truly organic if they are compatible with their surroundings and prevailing climate."**

Professor Markus Frank, Architect



# How do you feed twice the people with half the resources?

## Did you know?

If all the tomatoes grown in stone wool in Benelux greenhouses in 2016 were replaced by soil grown tomatoes from open fields in the Mediterranean area, 65 billion more litres of water would be needed for irrigation.

## Innovative horticulture is key to a secure food supply.

A growing population puts traditional food production under pressure, while challenging us to better manage our most precious resource: water. Stone wool can be engineered to absorb or repel water as needed, as well as recirculate it in a greenhouse, solving a range of problems in the fresh food supply chain, such as resource scarcity and production levels.

Precision growing also means horticulture can take place in densely populated areas, eliminating the issues of land scarcity and allowing food to be produced closer to where it's consumed.

Our Grodan product helps farmers all over the world grow fresh produce – using 75 percent less water than farmers who grow in soil.

**ROCKWOOL products help farmers tackle food and water challenges.**

By  
**2050**  
we will need to produce twice the amount of food with half of today's resources.





# Stone controls where water goes

Preventing floods and droughts is one of the greatest current and future global challenges.

Too much water or not enough? Both can have severe consequences for our rapidly developing urban environments. Stone wool can be engineered to absorb or repel water as required, helping protect people and cities against economic, social and environmental damage.

Our products can help reduce the effects of heavy downpours by draining water from roofs and other hard surfaces quickly into underground stone wool basins. From there, water can slowly infiltrate underground, replenishing groundwater levels.

When it is engineered to repel water, stone wool can defend valuable assets from the weather. This helps protect the long-term health of buildings and their occupants.

**ROCKWOOL products help solve water management issues.**

Stone wool can absorb up to

# 95%

of its weight in water without becoming weakened.

## Did you know?

ROCKWOOL can engineer stone wool to either repel or absorb water, depending on the application.





MINIMISING DAMAGE FROM THE ELEMENTS

# A world-first water management project in the Netherlands

The villagers of Schimmert were struggling with the financial and emotional burden of yearly flooding. We provided a customised water-management solution for a world-first project designed to alleviate the problem.

People living in the small village of Schimmert face serious flooding at least once a year. This is not only annoying and unhygienic, but very expensive for the village and its residents. In a world-first project, we used the water-absorbent properties of stone to create and install a water management

system underneath the playground of a local school. This involved around 550m<sup>3</sup> of stone wool, and is the first ever project of its size. It is designed to alleviate flooding, and to protect the people and property of Schimmert.



Schimmert, Netherlands. Products: Lapinus® WM elements

FUTURE-PROOFING FOOD  
PROTECTING PRECIOUS RESOURCES

# Growing more with less

Prolific and award-winning Polish tomato growers, the Kazmierczak family adopted our growing media solutions several years ago and haven't looked back since.



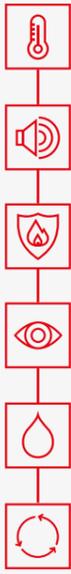
Poland. Products: Grotop Master | Plantop Delta | Grodan precision growing system | GroSens

The Kazmierczak family have noticed a real difference in their day-to-day work with ROCKWOOL growing media solutions. Irrigation is better, easier, and more controllable, and their growing season now extends into mid-November. They can now monitor their operation remotely over the internet, even checking on their plants' roots. And through our Young Grower Project, the Kazmierczaks can benefit from advice at seminars, at the point of installation and through aftercare service. Our solutions are helping growers around the world to grow more using less water, protecting our environment and feeding an ever-growing population.

**"If you compare cultivation on stone wool and in the ground, I am for stone wool, because it offers more precise control and therefore more accurate dosage of fertilisers and irrigation."**

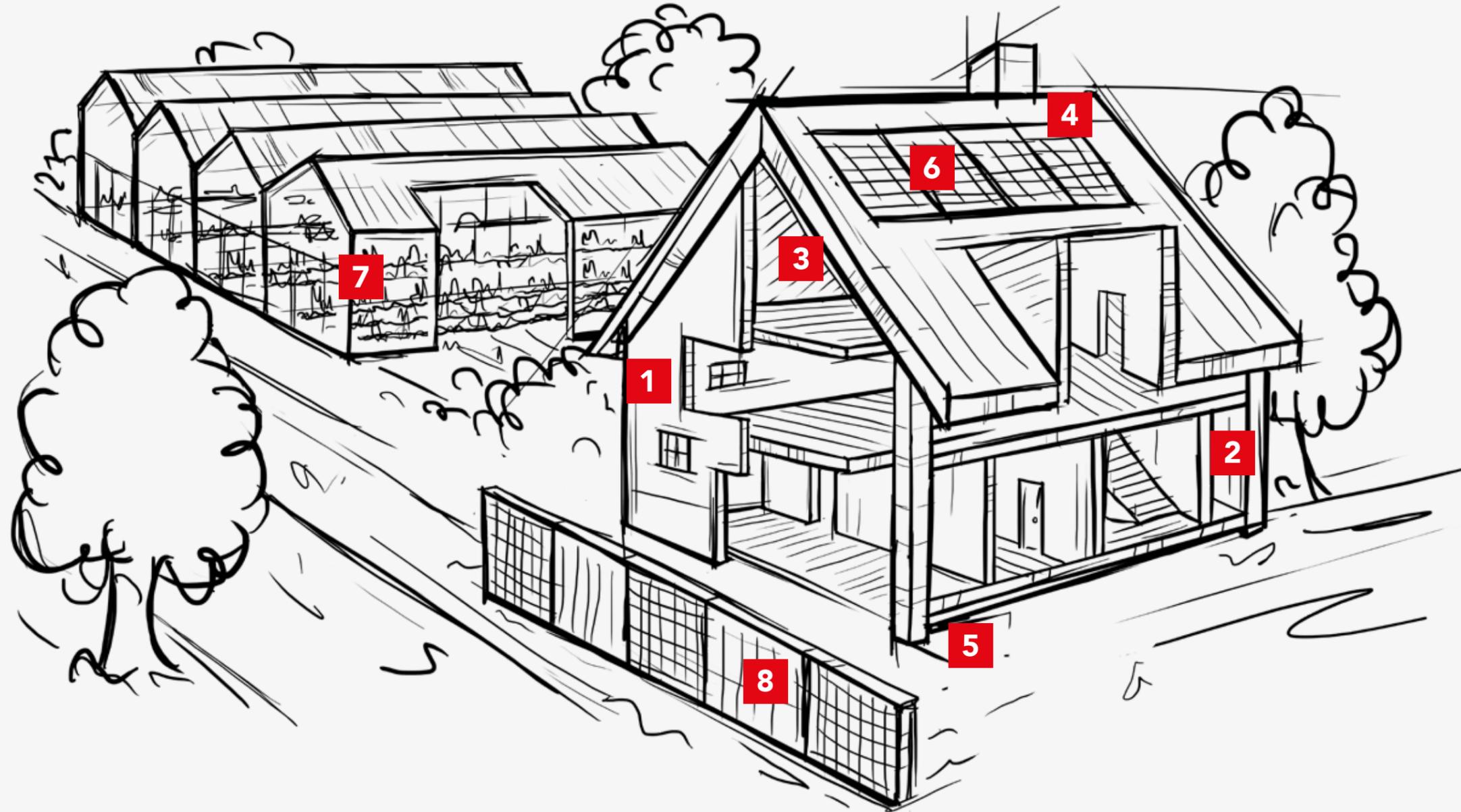


Ernst Kazmierczak, Polish tomato grower



# Creating living spaces for today and tomorrow

- 1. OUTER WALLS** – External wall insulation systems with render or cladding material improves the thermal performance as well as fire safety and acoustics of a building without taking up internal floor space.
- 2. OUTER WALLS** – Insulate from the inside when you want to keep the appearance of the house, e.g. bricks or old stone walls.
- 3. ATTIC** – Loft granulate and insulation slabs/rolls provides an easy way to insulate unused attics improving thermal properties.
- 4. PITCHED ROOF** – A large part of a building's energy loss is through the roof. Insulation keeps this loss to a minimum and improves summer comfort.
- 5. BASEMENT** – Insulation of the basement ceiling can reduce energy use and provide comfortable floor temperature.
- 6. CUSTOMISED SOLUTIONS** – Minimising heat loss and thereby increase energy efficiency, special insulation can be incorporated under solar systems.
- 7. GROWING MEDIA** – We supply innovative and sustainable stone wool growing media solutions for the professional horticultural sector, based on Precision Growing principles.
- 8. NOISE FENCE** – Creates a quiet, secluded environment wherever you want.





# Continuously creating new value from old materials

## Did you know?

We also have a take-back system for our horticultural product Grodan used in greenhouses. Today more than 90 percent of EU Grodan customers can use our recycling solutions, and we're continuously working on extending these services.

## Stone wool can be indefinitely recycled.

Rock is one of the most abundant raw materials on the planet, but we still need to make better use of our planet's resources. We have developed our technology in a way that allows us to use waste from other industries as alternative raw material.

The building sector produces a third of all waste, much of which ends up in landfill today. So we also have to prevent our building products becoming waste. We do that by making recyclable, long-lasting products and offering a recycling service. Our products can be easily removed when a building is renovated, or demolished and recycled back into new products.

In fact, stone wool can be recycled again and again into new stone wool. This is an important element of a "circular" business model – another way you can be a part of our vision for sustainable cities of the future.

**ROCKWOOL products allow everyone to be a part of the circular economy.**

Stone wool is

# 100%

recyclable.



Fully established schemes currently available in Germany, Benelux and Denmark with extension into more countries planned.



CONTRIBUTING TO THE CIRCULAR ECONOMY  
PROTECTING PRECIOUS RESOURCES

## Closing the loop in Denmark

To enable our customers to build sustainably, and avoid waste in the construction phase, ROCKWOOL has a recycling service for building sites in many countries. In Denmark, we've offered this service to our customers for more than 20 years. And since 2012, a pioneering ROCKWOOL recycling scheme also reclaims old stone wool from demolition sites.

It's a well-known fact in the building industry that cut-offs and excess material create a great deal of waste at a building site. If you do a DIY project at home, you often have the same issue. We provide big bags dedicated to ROCKWOOL cut-offs. When we deliver new supplies, we take the bags back to the factory and reuse the stone wool as raw material. It's a great source of raw material for us and a win for the environment too. It gives us longevity, and we plan to offer this service across 30 countries by 2030.

Stone wool is extremely durable – it will last for many years. But when buildings are demolished

or renovated, insulation often becomes building waste, which is frequently landfilled. In Denmark, we pioneered a national recycling scheme for end-of-use stone wool. We partnered with the recycling company RGS Nordics to collect, handle and bring back used stone wool from municipal recycling sites and large refurbishment or demolition sites to our production site – in 2016, we reclaimed just under 2000 tonnes of stone wool from building waste in Denmark. Through this pioneering partnership, we've learned valuable lessons that have helped us replicate our approach in other countries.

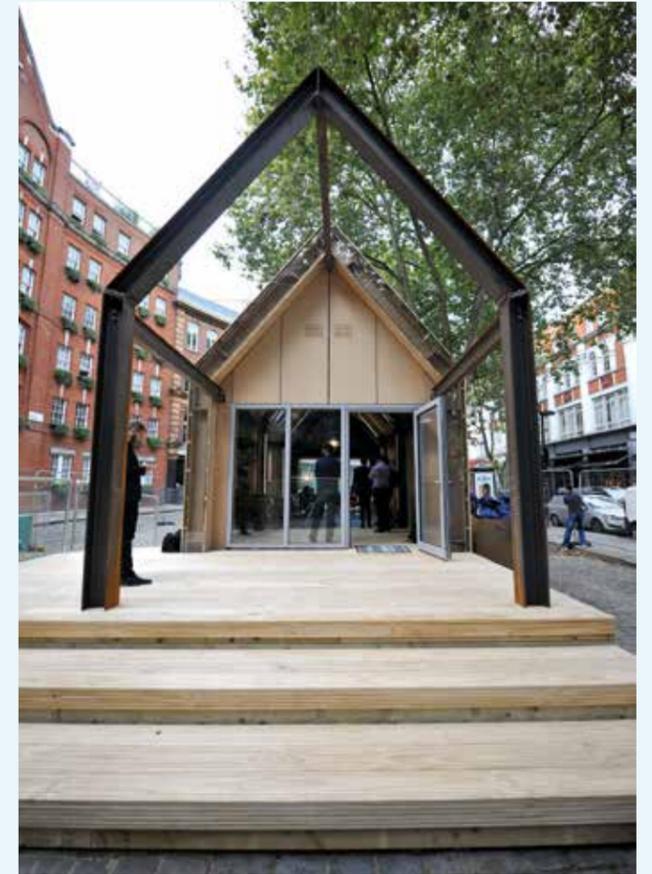


Denmark

CONTRIBUTING TO THE CIRCULAR ECONOMY  
BUILDING SUSTAINABLE CITIES

## Imagining the circular building of the future

To push circular economy thinking in the UK, we worked with partners to help design the circular building exhibition at the London Design Festival 2016. The partnership was led by Arup, alongside Frener & Reifer and BAM, with support from The Built Environment Trust, and demonstrated a prototype of the most advanced and reusable building yet.



London, UK. Products: ROCKWOOL FLEXI®



**“Very few have tried to apply circular economy principles to the built environment. . . as an industry, we should aim to eliminate waste and design for re-use.”**

Stuart Smith, Director, Arup Associates

The Circular Building Exhibition was a great opportunity for us to work with partners and apply the circularity strength of our stone wool solutions to a prototype. Designers and manufacturers input information into a cloud-based materials database, which feeds into a building information modelling (BIM) system that can be viewed via QR codes displayed inside the circular building. This way it's clear to all what the building is made of.

Today, the UK construction industry produces three times more waste than households, half of which is not recycled. The Circular Building Exhibition pushed the thinking around this idea of the circular economy. Can we design a building where, at the end of its life, all its components and materials can be reused, re-manufactured or recycled? ROCKWOOL building insulation is a perfect match for a circular building. It is made of one material only, is easily separated – it just lifts out – and can be infinitely recycled. We were delighted to be a part of a project with partners who share the belief that the circular economy can drive a shift towards more sustainable forms of value creation and economic growth.

# ROCKWOOL GROUP at a glance

Our world is developing and ROCKWOOL is helping to shape it. We're finding ever more innovative ways to tackle big global challenges and build the cities of tomorrow – better for the environment and for the people who live in them. All this is made possible because we have released the 7 strengths of stone.

ROCKWOOL has five brands, all working together to achieve our common purpose.



Fire-safe insulation for all types of buildings and installations



Innovative and sustainable growing media solutions for the horticultural industry



Engineered stone wool solutions for global industries



Acoustic ceiling and wall solutions



Exterior cladding for buildings

	ROCKWOOL Building Insulation	ROCKWOOL Technical Insulation	ROCKWOOL Core Solutions	Rockpanel	Rockfon	Grodan	Lapinus
	■	■	■	■	■		■
	■	■	■	■		■	
	■	■	■	■	■		■
	■	■	■	■	■		■
	■		■	■	■		
						■	■
	■	■	■	■	■	■	■

At the ROCKWOOL Group, we're committed to enriching the lives of everyone who experiences our solutions. Our expertise is perfectly suited to tackle many of today's biggest sustainability and development challenges, from energy consumption and noise pollution, to fire-resilience, water scarcity and flooding. Our range of products reflect the diverse needs of the world, while supporting our stakeholders in reducing their own carbon footprint.

Stone wool is a versatile material and forms the basis of all our businesses. With close to 10,500 passionate colleagues in 38 countries, we're the world leader in stone wool solutions, from building insulation to acoustic ceilings; external cladding systems to horticultural solutions; engineered fibres for industrial use to insulation for the process industry – as well as marine and offshore.

