

2018-19

**BULDINGS THAT
RESHAPE THE FUTURE**



Introduction



How we can build a better tomorrow

Reports from the UN Intergovernmental Panel on Climate Change (IPCC) make it clear: Climate change is a serious and growing challenge to the environment as we know it, and the building sector has a central role to play in limiting its scope and impact.

From our schools and hospitals to our offices, stores and homes, buildings provide critical infrastructure. They are also the source of roughly 30 percent of global energy use and emissions.

It's a number that will only grow with the population if we don't improve how we build. According to the IPCC, the building sector has no excuse: it is where the world can get the most carbon emission savings for each dollar spent, 40% more than the next most cost-effective sector.

The best part? Most of the savings can be achieved if we do two things: require new buildings to meet the highest energy efficiency requirements like those set by the Nearly Zero-Energy Building standard and renovate existing buildings to meet the same standards.

From the built environment to horticulture and water management, the ROCKWOOL Group works relentlessly to address some of the most serious challenges facing life on Earth.

By 2025, an estimated 1.8 billion people will live in areas plagued by water scarcity (UNDP, 2006). We have horticultural solutions to help growers produce more and better food using much less water.

And where too much water is the problem, caused by more frequent and severe rainfall, we have water management systems that use sustainable stone wool. Our solutions are specially engineered to be both strong and highly absorbent, enabling excess water to be released slowly without harming valuable infrastructure.

In urban spaces, we are making life more comfortable, reducing the effects of noise pollution on residents through the acoustic capabilities of stone wool; while also protecting families and neighbourhoods from the risk of fire.

All of these efforts have one thing in common: ROCKWOOL Group's commitment to improve people's lives with our products and lower our impact on the environment.

The 7 strengths of stone wool relentlessly to shape our tomorrow – reducing emissions, optimising acoustics, improving aesthetics, preventing flooding and growing more food with less water, all through the use of 100% natural, long-lasting and fully recyclable stone wool.

In these 36 case studies, you'll see the breadth of possibilities and applications of the ROCKWOOL Group's products and knowledge. We hope you find them inspiring and will join us in creating a better future for everyone.

ROCKWOOL Group at a glance

The ROCKWOOL Group was the first to start the production of stone wool in Denmark, in 1937. Since then our products have contributed to countless landmark projects around the world.

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.



We are the leading supplier of fire resilient stone wool insulation providing solutions for all major application areas, including technical and OEM.



We provide customers with a complete ceiling system offer, combining panels with suspension grid systems and accessories.



We manufacture board material mostly used in ventilated constructions, for façade cladding, roof detailing, soffits and fascias.



We develop innovative products used in a wide range of applications, including friction and water management, tracks, coatings, gaskets and fences.



We are a global leader in the supply of innovative stone wool substrate solutions for the professional horticultural based on Precision Growing principles.

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. And over the years we've become experts at applying these strengths to help people around the world create landmark projects and enrich modern living.

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.



Robustness

Increased performance and greater stability with lower costs.



Aesthetics

Match performance with aesthetics.



Water properties

Manage our most precious resource.



Circularity

Reusable and recyclable materials.

Why New Build?

By 2050, the floor area in buildings worldwide is expected to double to over 415 billion square metres, with associated energy demand likely to increase by up to 50 percent (World Green Building Council). Anything new must be built with energy efficiency in mind. With ROCKWOOL solutions, you can construct buildings with superior energy efficiency, fire protection, acoustics and comfort.

New standards such as Passive House and Nearly Zero-Energy Buildings provide good guidance on how to ensure your building envelope meets the requirements for low energy consumption and therefore the lowest possible CO₂ emissions for the future.

Building to the highest standards will ensure buildings will last the next 100-200 years with continued performance. This also means 'designing for reassembly' and building with fully recyclable, sustainable building materials.

By designing and building sustainable buildings, you'll help to reduce energy costs – for yourself and the planet.



"The exterior insulation will lead to a lifetime of energy savings and better durability for the structure – since we don't have to risk any negative impacts inside the house caused by condensation – and we're providing the added benefit of fire-resistance."

Matt Risinger,
Owner at Risinger & Co

Craftsmanship and science keep the house dry

Controlling exterior moisture in a new home build

*Risinger & Co, Texas, USA
2015*

Risinger & Co is a custom home building company in Austin, Texas with a passion for building science, fine craftsmanship and ensuring that best practices are prevalent throughout. The company's latest home build is a perfect case in point.

The house has been built well beyond the building code requirements, since Risinger & Co's owner, Matt Risinger, believes there are still a lot of locations in the USA using dated code jurisdictions. This has particular impact when it comes to energy efficiency.

Since the new build was largely wood based, there was a need to control moisture on the outside, which is why Matt was keen to use ROCKWOOL Comfortboard, a vapour open exterior insulating solution that uses the natural thermal, acoustic and fire-resistant properties of stone wool. Comfortboard ensures that any fluctuations in temperature – such as a cold snap or changes in humidity – do not affect the structure's moisture control,

stability or performance. And because of stone wool's excellent water properties, it is unaffected by water, moisture and will never rot or grow mould.

The completed home now has insulation performance that is well beyond current building codes thanks to stone wool. Using the Home Energy Rating System index (the USA's standard for measuring a home's efficiency), this house achieves a score of 48; roughly 50% more efficient than a standard code built home. This means a lifetime of energy savings for the occupants of the new home.

Self motivated builders like Risinger & Co are always seeking to raise their own standards, and in this case, Matt achieved a spectacular finish as well as protecting against heightened humidity levels in Southern USA. It's an approach that clearly makes good business sense for owner Matt.



New heights in energy saving

Highest possible energy savings for the world's tallest passive house building

*Bolueta Tower, Bilbao, Spain
2018*

The 28-storey Bolueta Tower is the tallest 'passivhaus' building in the world at 88 metres, containing apartments and homes for social housing. It received the prestigious Passivhaus Certified award in 2018 and is the first Vivienda de Protección Oficial (VPO) building in Spain for people on low incomes or with particular social needs.

During its design phase, the concept evolved to create a building to the Passive House standard, which meant excellence in terms of energy efficiency was required.

The architect, German Velázquez, chose Ventirock Duo to optimise the insulation of the building and create a structure with no thermal bridges. This minimised energy consumption and ensured that residents would enjoy lower energy

bills for decades to come. In fact, with an A1 energy rating the reduction in heating demand will be around 80%.

The use of stone wool insulation in Ventirock Duo has many additional advantages. Residents will benefit from excellent winter and summer living comfort since the walls 'breathe' and contribute to high quality indoor air, with no dust or pollen. The insulation also reduces noise thanks to its acoustic performance, and is weather-resistant and robust.

This project is a fine example of combining energy efficiency and sustainability for the good of society, and it will be a testament to its designers for years to come. For now, it sets the standard as the tallest and most highly certified passivhaus building in the world.

"We chose Ventirock Duo because it's a dual density, rigid slab designed for ventilated façades. At the same time it provided the highest possible insulation performance for our passivhaus design. It was easy to install and most importantly it delivers high energy efficiency that will benefit residents, and continue to reduce their energy bills."

**German Velázquez,
Architect at Varquitectos**



Vanja Boyer

ROCKWOOL: The power of stone wool & the passion of our people

"ROCKWOOL allows me the opportunity to be in contact with people from different countries and to collaborate with colleagues across the globe. I'm thankful to work with such a wonderful team of people who are passionate about offering solutions that will help contribute to ROCKWOOL's future growth. I am happy to be a part of an organisation, who after all these years, is a world leader in stone wool solutions – continuously focusing on sustainability and helping our customers address many of the big issues of modern living."

*Vanja Boyer
IT People Manager and BRM
ROCKWOOL North America*

Throughout our history, ROCKWOOL employees have been doing something that looks like magic. Regardless of job title, tenure or location, they make sure that ROCKWOOL excels in transforming

an abundant, renewable natural resource into materials that bring comfort, safety and sustainability to millions of people worldwide. In every department in 39 countries, and with differing skills, backgrounds and experience, the dedication of ROCKWOOL's personnel – 11,000 strong – has shaped how the company thinks and acts.

Vanja Boyer has been happily part of the ROCKWOOL family for a long time as she reflects on how the company has grown and delivers results from around the world. She started her career with ROCKWOOL in January 2009 as part of Global IT – Digital. Vanja has been involved with the company's technological innovations, enhanced digital services, new projects and organisational changes. Most recently, her division participated in an update to create a stronger interface for delivering digital project ideas, projects and services to OPCOs and Group functions.

"I am happy to be a part of an organisation, who after all these years, is a world leader in stone wool solutions – continuously focusing on sustainability and helping our customers address many of the big issues of modern living."



Safety first for students

“More than 50 percent of fire fatalities and injuries are due to toxic smoke. Stone wool will not feed or spread a fire and therefore will not contribute any significant toxic smoke.”

Source: Report: Energy and Buildings (2011),
Assessment of the fire toxicity of building insulation materials,
Anna A Stec and T Richard Hull

Fire safety was at the heart of this development, with a pioneering use of mineral wool

*The Quad, Norwich, UK
2018*

Demand for student housing in Norwich led to The Quad development in a prominent city centre location. The regeneration has transformed an old Mecca bingo hall into the highest habitable building in Norwich with a height of 13 floors.

Not only were the logistics of this project a talking point, but the contractors Alumno Developments were especially keen to make sure that the building met strict fire safety standards. The project came at a time when there were many changes in the industry relating to fire safety and Alumno wanted to implement and future-proof a completely new design.

Due to the importance of fire safety, the contractor, HG Construction, pushed for A1 non-combustible products. RAINSCREEN DUO SLAB was chosen for its natural, non-combustible stone wool composition, which differentiates ROCKWOOL stone wool from its competitors.

This became HG Construction's first project to use stone wool insulation with a masonry façade, and the company was delighted to be able to incorporate the added value of stone wool. It is extremely resilient to fire and withstands temperatures above 1000°C.

Safety was always key to The Quad, which consists of 244 student rooms. Students now have a building which is both aesthetically pleasing, and safe to live in.



Changing sustainable thinking

"I was pleasantly surprised that I could specify a product which enhances the 'cyclic' aspect of the school, and at the same time achieve a BRE Green Guide A+ rating. Materials must be carefully chosen in ultra-low energy buildings, so it is important that we are able to rely on the ROCKWOOL Group to provide the necessary testing and performance certification and on-site support."

Patrick Vonck,
Architect at Árter

A new ultra-low energy school building will literally reflect the seasons

*Les Trèfles school, Anderlecht, Belgium
2016*

Les Trèfles (The Clovers) is a brand new primary school in Anderlecht, Belgium, featuring award-winning design by architectural firm Árter of Brussels. The new school features an inventive layout of four partially overlapping circles.

Thermal performance was a priority, so the school was designed to be highly sustainable with low energy use¹, using construction materials with low lifecycle environmental impacts. This enabled energy to be saved by maintaining optimum indoor temperature and climate.

For the architect, the choice of Rockpanel Chameleon and Rockpanel Natural for the façade cladding was easy, since they are produced from compressed natural basalt which offers not only great thermal performance and high energy efficiency, but also robustness and long-term sustainability. Rockpanel Chameleon also worked perfectly with the architect's design concept of seasonal

change. The colour of the boards varies slightly depending on natural or spot lighting, the board's angle and the viewing point.

The constructors praised the easy fitting of Rockpanel boards and their invisible fixing which creates a clean and aesthetic look. The boards were also engraved to provide signage around the school building.

The thermal performance of the school has not only improved but also now has a highly original design with an important BRE Green Guide A+ rating for sustainability, and a very high fire safety classification—crucial for a large school of 750 pupils.

Les Trèfles seamlessly blends educational innovation, sustainability and attractive architecture, and the design has made both its pupils and stakeholders proud. This impressive long lifetime, low maintenance structure will be enjoyed for generations to come.

¹(Only 12kWh/m² per year versus 15 kWh/m² Passive, 50 kWh/m² Low, 100 kWh/m² New, 150 kWh/m² Modern, 200 kWh/m² Old and 300 kWh/m² Leaky)



Keeping steam at 300°C

“Due to the pipe’s layered structure, heat radiation through seams between the pipe sections is kept to a minimum. And the main advantage of pipe sections is that there is no need for a support structure to keep the outer jacket at a distance and take on the loads of the insulation. The use of such support structures (spacers) also leads to extra heat loss and the risk of damage to the pipeline's protective coating.”

Elbert Reijtenbagh,
Technical Insulation Sales Consultant at ROCKWOOL RTI

Insulating a bio steam pipe to create sustainable energy

*Groningen Seaports, Farmsum, The Netherlands
2018*

Groningen Seaports, a port owner in the Netherlands, wants to create a local network of steam pipelines to help connect businesses. The goal is to capture heat, which is generated as a by-product in nearby production plants. As a first step, a bio steam pipe in an industrial park in Farmsum has been designed to transport steam to nearby end-user Nouryon (formerly an AkzoNobel chemical specialities plant).

The steam flows through an above-the-ground pipeline with a length of 2.7 kilometres, so keeping the heat inside the pipe with minimal heat loss is essential to deliver on energy efficiency and sustainability.

For the latest extension to the pipeline, Groningen Seaports chose Prorox, a ROCKWOOL insulation system, which consists of a double layer of stone wool pipe sections, with 250mm thick insulation.

ROCKWOOL stone wool works as a highly efficient insulation material to continually limit heat loss and guarantee the efficient operation of the process. By using stone wool, steam which enters the pipeline at a temperature of around 300°C arrives at the purchaser Nouryon with a temperature loss of only a few degrees. Stone wool is sound absorbent, so noise arising from the speed of the steam is inaudible. Since the pipe sections are insulated with stone wool, they also have great water repellent properties that mitigate the risk of deterioration.

This project is a testament to using sustainable solutions to transform waste heat into a sustainable and safe supply of energy. And it's all made possible due to the excellent thermal, acoustic and robust properties of natural stone wool.



Ann Publicover

ROCKWOOL: The power of stone wool & the passion of our people

"ROCKWOOL would not be here today without the dedication of its employees and a firm commitment to growth and quality products that customers receive every day."

*Ann Publicover
Quality Control Lead Hand
ROCKWOOL North America*

While the worldwide expansion of the ROCKWOOL Group continues, the company has flourished for 80 years for two essential reasons: we are committed to unlocking the strengths of stone to enrich modern living, and we recognize that the passion of our people makes this goal possible.

Ann Publicover began her "wonderful journey" with ROCKWOOL in 1990. She says

"I can still clearly remember my first day on the line...and oh what a day it was! Since that day, I have never looked back, and ROCKWOOL North America became not only my employer, but also like a family in the extended sense."

Ann acknowledges "It's hard to believe that once a small factory starting up in the mid 80's has turned into a profitable company that employs over 200 people and is known North America-wide!"

When the company turned 80, I found some old pictures. Most employees are still a part of ROCKWOOL North America today. Some from the pictures have left this earth, but their standards and work ethics still live on today."

"Many friends have been made over the years and I can attribute those friendships to a long and interesting journey with ROCKWOOL"



Energy efficiency that respects aesthetics

"We chose ROCKWOOL stone wool because it protects from fire, it is non-combustible and endures above 1000°C. Moreover, in the case of fire it does not fan the flames and does not emit toxic gases."

Enzo Cattarina,
Designer at Re_load

Replacing a marble façade to improve energy efficiency

*Fondazione Iniziative Zooprofilattiche e Zootecniche, Brescia, Italy
2018*

A ten-storey building complex for residential and administrative use in central Brescia was in a serious state of deterioration. Built in the 1950s, the building's façade of marble tiles was damaged by the passing of time and the effect of successive freeze-thaw cycles. An energy audit of this historical architectural building showed that the façade had very poor insulation, with repeated and huge thermal bridges, resulting in low energy efficiency.

The building's owners, Fondazione Iniziative Zooprofilattiche e Zootecniche, expanded the works to improve the building's insulation and energy performance as well as future proofing the safety of its façade.

Designers Re_load in Brescia were tasked with preserving the original aesthetic look of the property, which required a multidisciplinary team including the technical support from the ROCKWOOL Group.

The use of ROCKWOOL stone wool for exterior insulation contributed enormously to

improving the building's energy class. In terms of energy savings, the owners estimate a reduction of 59% in consumption, with an annual saving of around €26,000. Stone wool also provides exceptional safety and fire-resistance since it withstands temperatures above 1000°C. The ROCKWOOL Group even supplied cladding with a close match to the original marble.

Those living and working in the building have immediately benefited from lower energy bills and now live in a safer and more comfortable indoor climate, since natural stone wool 'breathes'. It also provides excellent sound insulation for the building, which is located in a noisy, high-traffic area.

The building has gained a certificate of sustainability (Italy's GBC protocol); the first in the region. It is an impressive example of sustainable redevelopment and is now used as a case study for students interested in knowing more about innovative ways to conserve energy, in this case, by 345,000 kWh per year.



THERMAL PROPERTIES

Tomorrow's school built today

Wood and stone wool reduce school's energy consumption

New Build

*F. Socciarelli School, Ancona, Italy
2016*

F. Socciarelli required an extension to its school which combined efficiency with attractive looks and built-in safety. Despite rapid construction using laminated wood and a 'post and beam' frame system, the new multi-storey school guarantees efficient thermal performance for the building's envelope.

To achieve this, the contractors, Subissati Srl, specified Rockpanel: a façade solution from ROCKWOOL which reduces heat loss, decreases energy consumption and delivers significant advantages in terms of 'breathability' of the façade and optimal living comfort both in winter and summer.

Rockpanel also offered the right combination of aesthetics and sustainability for the school's requirements. It is made from stone wool which is long-lasting, durable and fully recyclable, and Rockpanel colours and woods (which are a replica of wood), perfectly complemented the school's design.

Subissati Srl found that Rockpanel was fast and easy to install, which helped the school to reduce construction time and meet a tight completion deadline.

F. Socciarelli School now benefits from A4 energy performance which makes the school nearly zero-energy efficient – a standard given to buildings with very low energy consumption. This is backed by excellent safety, since stone wool withstands temperatures above 1000°C and prevents the spread of fire. Both the thermal performance and acoustics of the school have been improved – which in combination help to create a better indoor environment and enable students to concentrate better.

F. Socciarelli School is a great example of 'building tomorrow today'. The harmony of natural wood and ROCKWOOL products give the children a safe and sustainable school with an attractive design that will perform well into the future.

"We have invested not only for the future but for the present of our children too. To give them a safe place to study, play and live is a matter of pride for us. The school has an excellent level of thermal and acoustic comfort. We also have to recognise that we completed the project in less than 100 days."

Francesco Subissati,
Legal Representative at Subissati Srl



Discrete fire protection

Fire protection was paramount for a large apartment building – but could it blend in?

*Sluseholmen Karré K, Copenhagen, Denmark
2017 – 2019*

Sluseholmen Karré K is an iconic apartment project with a unique location in the South Harbour of Copenhagen. The project comprises 168 apartments with associated balconies, gardens and roof terraces.

Due to the number of residents and the need for a high level of safety in every home, architect Gröning Arkitekter required technical insulation with high fire protection for the building's ventilation ducts. Of secondary importance was the ability for the technical insulation to blend in with the aesthetics of the building.

ROCKWOOL Conlit Fire Boards were chosen for fire protection since they are made of non-flammable stone wool. This provides excellent

fire protection so that families can feel safe inside the high building. The additional advantage of thermal and acoustic insulation means that residents benefit from a building that is energy efficient and quiet.

Gröning Arkitekter were impressed that the ROCKWOOL Group offered Conlit Black Alu tape, a groundbreaking black (rather than silver) technical insulation tape which finished the installation perfectly, camouflaging joints between the black insulation boards and creating a smooth, homogenous look.

With Conlit products throughout the ventilation ducts in Karré K, the challenges of both fire safety and design aesthetics were met, contributing to an efficient construction process, long-term safety and energy-saving benefits for the residents.

“The black colour of the new Conlit solution is an aesthetic advantage for the construction, as the fire insulation is camouflaged and does not attract the eye as much as traditional aluminum-coloured tape. Fire insulation is an important part of the safety and security of a building, and now the insulation can protect future residents in a discrete way.”

**Allan Kasper,
Owner at contractors PM Teknisk Isolering**



Smart savings for a paint shop

Insulation reduces operating costs for a car manufacturer

Škoda Auto™, Mladá Boleslav, Czech Republic 2018

Škoda Auto, based in Mladá Boleslav in the Czech Republic, is one of the world's longest-standing automobile manufacturers. The tradition of the company dates back to 1895, when Václav Laurin and Václav Klement laid the foundation for over 100 years of Czech expertise in automotive engineering.

Škoda Auto is now investing in excess of €214 million in a new paint shop in Mladá Boleslav, which will see its car painting capacity increase from 600 to 2,700 bodyworks per day.

A key requirement for the new paint shop was an insulated building that would reduce energy consumption, since large paint shops can be the largest energy user in a vehicle manufacturing plant. Škoda Auto also wanted to use materials that were non-combustible to mitigate the risk of fire hazards associated with paints and solvents.

Rockfall stone wool insulation was chosen due to its good thermal insulation properties, its ability to reduce energy bills, and the fact that it 'breathes' to create a comfortable interior environment which is acoustically efficient. Rockfall was also specified for the flat roof due to its durability and A1 non-combustible performance – it resists temperatures above 1000°C and prevents the spread of fire.

The new paint shop will start operations in 2019, and provide a safe, quiet and comfortable working environment for hundreds of workers. Škoda Auto will see energy savings for many decades to come and have the certainty of an energy efficient, fire-safe and acoustically-sound building, which has achieved **BREEAM certification** for sustainability and performance.

"Recent studies have shown that if we compare the thermal property (lambda value) of our products after more than 55 years of service we can see the value is still the same. ROCKWOOL products have no aging effect and deliver a constant performance without suffering any degradation."

Source: Report: Durability Project Mineral Wool, FIW Munchen, 2016



THERMAL PROPERTIES

First nearly zero-energy clinic in the Czech Republic

An innovative clinic built to nearly zero-energy levels

New Build

*Pavilion II Clinic, University Hospital Olomouc, Czech Republic
2017 – 2018*

A new five-storey building, Pavilion II, is being created alongside the University Hospital in Olomouc. With a 100-bed capacity, the clinic will feature an intensive care unit, a department of geriatrics and specially designed rooms for disabled patients.

A unique feature of the project is that it will be the first clinic in the Czech Republic to be designed with innovative features for nearly zero-energy consumption.

To achieve such low energy requirements, the architect specified ROCKWOOL solutions throughout, for floors, partition walls and pipe insulation. The natural thermal performance of stone wool is perfect to meet nearly zero-energy levels since it has a very low U-value for thermal insulation yet remains 'breathable'.

This will lower energy bills for the clinic while ensuring greater indoor comfort and air quality for patients and staff. The clinic will reduce its need for heat in winter, as well as maintaining a comfortable interior temperature in summer.

Fire-resistance has been ensured throughout since ROCKWOOL solutions are entirely non-combustible and withstand temperatures above 1000°C. Stone wool insulation also resists the growth of mould, rot or harmful bacteria, which is an important consideration since many patients will have gastroenterological or hepatological disorders.

Today, the energy performance of Pavilion II is ten times lower than that of the hospital premises to which it is connected by a corridor. And the long-lasting robustness of stone wool will ensure that the clinic can give care and protection to its patients for many decades to come.

"On a global scale, there is potential for energy savings of 50-90 percent in existing and new buildings. ROCKWOOL solutions are, among others, an important part of the solution to release this potential."

Source: Report: World Urbanization Prospects, United Nations, 2014



Decades of fire prevention built in

Fire protection for a building that's different from every angle

New Build

*Baltyk Tower, Poznań, Poland
2017*

Baltyk Tower is a dramatic new 16-storey building in Poland, featuring an unconventional cascading structure which resembles a giant staircase. The 25,000m² tower includes a mix of retail spaces, offices and a panorama restaurant.

Due to the unusual design and height of the building, the key focus for Dutch architects MVRDV was fire safety. The client required a building that was completely safe for office workers, shoppers and visitors.

For this reason, stone wool insulation from ROCKWOOL was specified for its thermal performance and non-combustible fire properties. It withstands temperatures above 1000°C and prevents the spread of fire without contributing to the emission of toxic smoke. ROCKWOOL insulation was used throughout the building for the fire protection of heating and ventilation pipework, as well as steel ductwork.

Robustness was another focus, since the client demanded a building that would stand for many decades. Being highly robust, stone wool insulation lasts for decades and will not change its shape or form. For Baltyk Tower, this gives the surety of unchanged fire protection and energy-saving performance to reduce costs for the building's lifetime.

An additional advantage of stone wool insulation is its sound absorbing quality, which will reduce noise in this busy mixed-use building in the city centre.

Baltyk Tower has now become a new landmark in Poznań. As well as being an impressive building, it is first and foremost a place of work and a centre of commerce. Thanks to the use of non-combustible stone wool, everyone connected with the building can enjoy its facilities in greater safety, now and in the future.

"We wanted to create a shape which would be beautiful and at the same time different from each side. We've spent a lot of time to get the right appearance of the building. In addition, we had to deal with a very specific construction site. Our client and partners supported us throughout the entire project implementation period. We are all proud that so ambitious a building has been so well received."

**Natahlie de Vries,
Architect at MVRDV**





Jen Deelstra

ROCKWOOL: The power of stone wool & the passion of our people

"As a former Marine Engineer, I was hired by ROCKWOOL Netherlands in January 1995 as a manager in the technical department of Rockfon.

I clearly recall the instance of my first modification of machinery in the Rockfon department. I got into a collision with purchase telling me: 'You are far too expensive with your ideas and design. We think three years ahead. How long do you think this project must last?' I answered purchase that I was thinking 100,000 running hours ahead.

Eventually we settled the discussion in between – by creating quality machinery that lasts for 50,000 running hours – 'for a few pennies more' as I stated. And this promise on both sides made me stay with ROCKWOOL."

Jen Deelstra
CIT
ROCKWOOL CWE

The ROCKWOOL Group has endured for eight decades for two essential reasons: we are committed to unlocking the strengths of stone to enrich modern living, and we recognise that the passion of our people makes this goal possible. Over the years we've become experts at applying the power of stone to help people around the world create landmark projects and enrich modern living.

Jen Deelstra has spent 23 years with ROCKWOOL and is now an Engineer in the Continuous Improvement Team. He admits that "ROCKWOOL and I are still

happy with each other." He also recalls another critical event in his history with the company involving a challenging ROCKWOOL production unit.

"Ten months after my arrival at ROCKWOOL I was asked to move from Rockfon production to the Line 7/Rockfibres combination (this was a line in need of technical improvement and increased profitability). During my first working day at Line 7, a frustrated mechanic came to me and spoke the following words: 'I have had thirteen bosses in twelve years on this line. How long do you think you are going to stay here?'

I answered: 'About ten months I guess, so let's not waste any time and get started!'

I stayed a bit longer than 10 months... It took me over 18 years before handing over a totally renewed production-unit consisting of Line 7, with now Rockfibres lines 1+2. In those years, I had gained the reputation of 'The Expensive One'.

Interestingly, the mechanic who confronted me became my dearest colleague, and worked with me through all those years. A lot of machinery installed in the early years has already passed 100,000 running hours. And see how profitable the Fibres Unit is today! Now consisting of Line 7, Rockfibres 1+2, and Rockpanel, this is a unique combination of production lines and products within ROCKWOOL."



Driving safety and savings at Jaguar Land Rover™

Cutting edge plant gets an A1 fire safe roof

Jaguar Land Rover, Nitra, Slovakia 2018

Jaguar Land Rover is building a new manufacturing plant in Slovakia to launch a range of all-new aluminium cars. When completed, the £1 billion plant will have an annual capacity of 150,000 vehicles.

The plant construction already includes a range of environmental measures, such as water saving devices and heat recovery systems, to ensure sustainable and efficient operations. Jaguar Land Rover was therefore driven to find equally sustainable, energy efficient, and fire-safe insulation materials for its giant roof space.

The design team at contractors TAKENAKA EUROPE GmbH were impressed by the A1 non-combustible performance of Rockfall stone wool insulation, which resists temperatures above 1000°C and so prevents the spread of fire.

Rockfall also has excellent mechanical properties: its intertwined fibres of stone wool create strong, durable panels which will not expand or contract – an important factor for such a large structure.

The insulation is compatible with all types of pitched roof systems and increases the thermal and acoustic performance of any building, reducing energy bills and creating a comfortable environment which is cool in summer and warm in winter.

When fully operational, 2,800 workers in this cutting-edge plant will work in a safe, quiet and relaxed environment which has achieved **BREEAM certification** in recognition of its environmentally friendly and energy efficient design.

“Stone wool’s built-in fire protection is not dependent on flame retardants. Stone wool withstands temperatures above 1,000 degrees Celsius, is durable and will not change its fire performance during its working life.”



Taming the sounds of the city

“Marina One is just one example of how Safe’n’silent allows us to be more focused on specific customer-requirements with segmented product offerings and customised collaterals for our different stakeholders. We are also able to serve them better by providing system data and build-up solutions that make it easy for architects to specify the different acoustic design elements for various building types.”

Kwok See Chun,
Business Unit Director, Singapore and Marketing &
Business Development Director at ROCKWOOL Asia

Acoustic comfort was essential for mixed-use buildings in a busy city centre

Marina One, Singapore
2018

Marina One comprises four high-rise buildings, which are **LEED Green Mark Platinum** (a local building rating scheme in Singapore). Its two office towers are occupied by blue-chip tenants like Facebook and PwC, while its two residential towers provide 1,042 city apartments and penthouses for around 3,000 residents.

For architect Christoph Ingenhoven, the key challenge in this prestigious development project was providing acoustic comfort for the occupants of its offices, residences and retail outlets – all of which are in the busy city centre district of Singapore, with lots of surrounding traffic noise.

This project employed the acoustic capabilities of ROCKWOOL Safe’n’Silent using an estimated 165,000m² of the drywall partition system. To aid the design process, ROCKWOOL Asia provided the architect with

a complete toolset to meet the required Noise Criteria (NC) and achieve the desired ambient noise level in specific rooms of Marina One.

Since Safe’n’silent is made of natural stone wool it has excellent acoustic insulation performance, as well as being non-combustible, thermally efficient, sustainable and long-lasting. This means that workers and residents in the high-rise buildings will benefit from a reduction in noise pollution, high levels of fire safety and better indoor comfort in their daily lives.

Noise and disturbances are common in a mixed environment of residences and offices. In Marina One it has been significantly minimised, and these buildings will stand for many years as examples of how quality living and working can be safely and silently combined.



Keeping city noise down

Creating quieter living and working spaces in a bustling metropolis

DUO Residences, Ophir-Rochor, Singapore 2017

DUO Residences is a large premium twin-tower development in the Ophir-Rochor area of Singapore. One 49-storey tower consists of 660 luxury residential units, while the other 39-storey tower is home to a 5-star hotel and multiple levels of premium office and retail space.

The architect's key requirement for this lively mixed-use development was reduction of noise pollution and improved acoustics, particularly for homeowners in luxury units ranging from studios to penthouses.

Thermalrock insulation from ROCKWOOL Asia was chosen for the partitions and ceilings, since stone wool has excellent sound-absorbing qualities. In addition, the acoustic performance of stone wool does not change over time. This meant ROCKWOOL Asia was able to provide the architects with acoustic calculations for the various partition systems in the building, to demonstrate noise reduction.

Since DUO was designed and built with elegant and stylish touches throughout, the architect also sought to add value to the properties by using materials that increased safety, thermal performance, comfort and long-term sustainability.

Stone wool insulation is resistant to fire and temperatures above 1000°C which creates a safer high-rise environment for residents, workers and visitors. It also 'breathes', contributing to better air quality and a more comfortable indoor climate, which improves the quality of life of residents.

In a busy city neighbourhood that is packed with retail and entertainment options, DUO Residences now stands out as a quiet and prestigious place to live and work. It has also been awarded Singapore's **Green Mark Gold Plus certification** (a local building rating scheme in Singapore) which recognises environmentally-friendly buildings.

"As an iconic landmark and a Green Mark Gold Plus-rated building, we are proud to bring to DUO a strong set of insulation solutions that further enriches the lives of its residents."

Alex Low,
Country Sales Manager at ROCKWOOL Singapore



Better acoustics improve the cinematic experience at this new complex

*Golden Screen Cinemas, Paradigm Mall, Johor Bahru, Malaysia
2017*

Acoustics are of utmost importance for a great cinematic experience, so when a new 16-screen cinema was built in the 1.3 million square feet Paradigm Mall, the architect required excellent acoustic performance from the cinema partitions, plus good thermal insulation for the roof.

ROCKWOOL Safe'n'Silent boards were chosen because they are made from natural stone wool which has a dense, non-directional fibre structure which traps sound waves and dampens vibration. Used for partitioning at Golden Screen Cinemas, the boards keep sound inside each movie theatre and prevent exterior mall noise from filtering in. This improves the clarity of movie soundtracks and provides a more immersive experience for movie-goers.

As well as improving the acoustic performance, Thermalrock insulation was

also used for the roofing to help this large cinema complex to save energy costs due to stone wool's thermal performance. Since the insulation boards also 'breathe' they contribute to better air quality and improved indoor comfort, which makes the cinema more attractive to customers.

Additional advantages for Golden Screen Cinemas are that ROCKWOOL products are easy to install, highly resistant to fire and therefore safe for customers, as well as durable so they will perform consistently for the cinema's lifetime.

Golden Screen Cinemas has created an attractive new entertainment venue with excellent acoustic performance – without the complexity of adding additional layers of acoustic material. Now 2,000 people at a time can enjoy the latest cinematic technology and sound experiences in total comfort.

A cinematic sound experience

"Our success in securing one of Malaysia's largest mall projects is a testament of the strong ROCKWOOL brand and close support extended to the clients and architects throughout the whole tendering process."

**Agnez Cheong,
National Sales Manager at ROCKWOOL Malaysia**



Big energy savings for a bold conference center

High performing insulation meets strict requirements

New Build

*Ningxia International Conference Center, Yinchuan, China
2015*

Ningxia International Conference Center is more than 70,000m² in size, and one of the largest convention centers in North China. Both the project owner and architects had high standards and expectations for the construction of this stunning public building, as well as strict requirements for its building materials.

ROCKWOOL FacadeRock was chosen to enhance insulation performance and lower the energy consumption of this landmark building. Since FacadeRock is made from stone wool it provides excellent long-term thermal and acoustic performance, which perfectly meet the requirements of densely occupied buildings. Stone wool also 'breathes' to create a comfortable and healthier indoor climate for visitors and workers.

Ningxia International Conference Center will not only save energy using ROCKWOOL insulation, but also protect people inside the

building. Stone wool is an A1 non-combustible material that resists temperatures above 1000°C and does not contribute to the spread of fire and toxic smoke.

Ningxia Autonomous Region Government, the owners of the building, were also impressed by the ability of the ROCKWOOL Group to efficiently supply in the local market and provide technical support throughout the project.

Ningxia now has an iconic structure, which is a blend of Chinese and Arabic cultural influences. Using high quality, durable and energy efficient materials from the ROCKWOOL Group, this premier meeting, exposition and performance center will remain a safe attraction for visitors – and an energy efficient building for its owners – for many decades to come.

“More than one million people a week move to an urban environment. ROCKWOOL solutions help to prevent a considerable increase in energy consumption from buildings in the future.”

Source: Report: World Urbanization Prospects, United Nations, 2014



ROBUSTNESS

Insulating the world's longest sea bridge

New Build

“ROCKWOOL stone wool is highly resilient, durable and dimensionally stable, maintaining its thickness and shape over time. Moreover due to its fibre and flexible structure, stone wool has a great fitting ability avoiding unplanned air gaps, cracks or other installation errors in the final construction. This can help in easy and correct installation of building elements, which is essential to warranty-stable performance over time.”

Source: Report: Durability Project Mineral Wool, FIW Munchen, 2016

Saving energy in three major port buildings

Hong Kong–Zhuhai–Macau Bridge 2018

At 55 kilometres in length, the Hong Kong–Zhuhai–Macau Bridge is the world's longest sea bridge, costing over 30 billion Hong Kong dollars. Opened in 2018, it now connects the Hong Kong and Macau special administrative regions with the mainland Chinese city of Zhuhai.

The project required port travel buildings in Hong Kong, Zhuhai and Macau to accommodate entry and exit procedures for passengers, the inspection of vehicles and port offices. The scale was immense, with the building at Macau alone covering an area of 169,498m².

Thermal performance was a key requirement to ensure significant energy savings for the bridge project and to create a comfortable environment for tens of thousands of travellers using the facilities.

ThermalRock was chosen for all inspection buildings due to its excellent thermal properties and long-lasting performance. Since it is made of stone wool, it does not change shape or form, and will give predictable low energy costs for decades to

come. Its resilience ensures that it will perform at its best for more than 60 years – even in China's hot, humid environment where frequent storms, rainfall and temperature changes could affect other insulation materials.

The ROCKWOOL Group also provided safe and reliable fire prevention solutions for partition walls, smoke exhaust ducts and fire-proof blocking. Stone wool withstands temperatures above 1000°C which prevents fire from spreading, a crucial capability to safeguard passengers who use the bridge every day.

The Hong Kong–Zhuhai–Macau Bridge features some of the highest construction requirements and standards in the history of Chinese transportation. The ROCKWOOL Group's thermal and fire-resilient materials passed strict engineering inspection and acceptance tests, which sets a precedent for the use of stone wool products in cross-sea bridges. Today, our solutions comprehensively guarantee the energy performance, comfort and safety of this first-class engineering project, for thousands of travellers.



The HQ of energy and fire performance

High energy savings and safety for a suburban tech campus

*Tencent Seafront Towers, Shenzhen, China
2015*

Tencent is one of the largest Internet companies in the world, providing a variety of online and digital services including the WeChat app. The company's new landmark headquarters in Shenzhen consists of two towers of 50 floors and 41 floors respectively, connected by three bridges.

The 'vertical campus' includes advanced sustainability features to maximise passive energy efficiency. For architects NBBJ, employee well-being was a key requirement of the design and they chose ROCKWOOL insulation to further improve energy efficiency and ensure fire safety for this huge project.

Thermalrock was used for general insulation since it offers thermal performance to low U-values and allows Tencent's building to breathe. This creates a healthy indoor climate for workers, with good air quality all year round, which is an important consideration for the hot and humid climate of southern China.

As well as ensuring positive thermal performance, fire resilience was important too. Rocksafe was therefore used as fire protection for the curtain wall since it is made of stone wool that withstands temperatures above 1000°C. It provides fire compartmentation on each floor of the Tencent building and so prevents the risk of fire spreading. Since Tencent Seafront Towers' curtain wall incorporates a modular shading system that varies according to the degree of sun exposure, ROCKWOOL's technical service team provided a highly customised fire insulation solution for the building.

Now, energy consumption and carbon emissions are 40% less than those from a typical office tower and Tencent Seafront Towers has gained **LEED NC Gold certification**. The use of stone wool, which is 100% recyclable, also complements the sustainability features of this amazing building.

"Continuing population growth and urbanisation are projected to add 2.5 billion people to the world's urban population by 2050. ROCKWOOL solutions will help to prevent a severe increase in energy consumption from buildings in 2050."

Source: Report: World Urbanization Prospects, United Nations, 2014

2018-19

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 over 11,000 passionate colleagues in 39 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.



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