A BETTER SPACE TO EDUCATE

activeceilings®

ROCKWOOL Rockfon®
ACTIVATE YOUR CEILING

Building and **renovating** in education today

New-build and refurbishment of education buildings today are subject to many challenges.

Attention is shifting away from the institutional 'school' to a greater focus on both the student and wider community needs. Many children now spend more time at school, due to changing work patterns of parents. As a consequence, the school has a more central and important role in not only education but after school activities too.

Listen to people active in schools (teachers, students, architects, contractors, etc.), and the following major challenges keep coming up:

- Noise is by far the largest problem in schools.
- Building materials need to withstand rough treatment and extreme wear and tear.
- Building materials must be safe and comply with very stringent safety requirements.
- Many rooms are multifunctional and need to adapt to different requirements such as music, lecture, individual study, group work, etc.
- Building materials must be easy to maintain and fast to install.
- Traditionally limited budgets lead to a focus on cost-effective solutions.
- Refurbishment of existing schools presents different challenges to new-build.
- Building materials and other products have an influence on the indoor climate in schools, which in turn impacts on the well-being, health and learning performance of students and teachers.
- Education buildings are characterised by high energy bills and low comfort levels.
- Different stakeholders have different requirements.

There is no "one-size fits all" solution to cope with all these different challenges. On the following pages, we delve deeper into these areas and explain how Rockfon can help you to find solutions to the main challenges and find the right balance between performance, value and cost.

Rockfon helps you find the right balance between quality, time

Rockfon's **Top-10** for a better education environment

1. Acoustic comfort
Acoustic comfort in schools is key, as high levels of noise and poor room acoustics have a strong impact on the quality of education and the learning ability of the students.

Rockfon products offer you the best acoustic comfort.

2. Product durability
Building materials used in schools need to have good longevity in high activity spaces.

Rockfon products provide excellent longevity whilst maintaining their unique performance properties. Some Rockfon ceilings also provide high impact resistance.

3. Safety of building materials
The use of safe building materials is very important. Materials must meet fire performance requirements and ensure peace of mind for building users.

Rockfon products conform to the safest fire classification (A1 non-combustible).

4. Design
Education buildings need to create their own brand and identity to attract teachers and students. Building materials need to inspire and create individual designs.

Rockfon products offer flexible design solutions using different sizes, textures, colours and edges.

5. Facility management
Schools are built for the long term, taking into account future needs. Building materials need to be easy to maintain, flexible, adaptable and robust.

Rockfon products are cost effective, easy to maintain and readily accessible for maintenance.

6. Refurbishment potential
Existing school buildings must adapt to new needs and requirements while respecting the original architecture. Budgets for refurbishment are usually low.

Rockfon products require little space and are easy to install and demount.

7. Indoor climate
Building materials used in schools should not negatively affect the health of the students or teachers and must contribute to a healthy indoor climate.

Rockfon products conform to the most stringent indoor climate certification in Europe.

8. Sustainability
Building materials used in schools should have a minimal negative impact on the environment.

Rockfon products are environmentally sound and recyclable back into its own production process.

9. Energy efficiency
Energy efficiency and thermal mass are integral factors to consider when designing today's schools. Often these solutions lead to acoustic challenges.

Rockfon offers several acoustic solutions related to thermal mass.

10. Expertise in school interiors
Decision makers in building design and refurbishment are looking for reliable partners that bring the expertise to create optimum environments and comfort for the users.

Rockfon has many years of expertise in education projects.

and cost.

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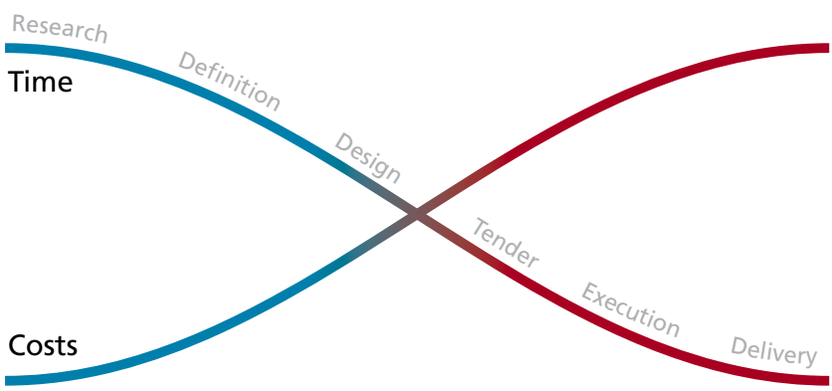
1. Acoustic comfort

***Education buildings need to provide both functional and pleasant spaces, now and in the future. Major contributors to this are* light, air, energy *and* sound.**

***All are key in providing a good and ambient environment where students and teachers can perform at their best. Rockfon products assist in all four areas, but this chapter focuses primarily on* sound *and* acoustic comfort.**

To optimise the cost and acoustic value of a building, it is important to consider acoustics during the early stages of design. The costs related to the acoustic design could also be limited to less than 0.5% of the total building cost if acoustics are taken into consideration from the very beginning, whereas acoustic renovations after project completion will be considerably higher.

Acoustics are an integral part of the initial school design



School construction uses hard materials. A Rockfon product is often

Understanding the primary acoustic problems in education

Noise problems in schools are at an all-time high due to the increasing use of hard surfaces, i.e. glass, metal, plaster which reflect sound, creating very noisy rooms. The general trend toward creating flexible open plan spaces which can accommodate a variety of teaching methods simultaneously also contributes to higher noise levels.

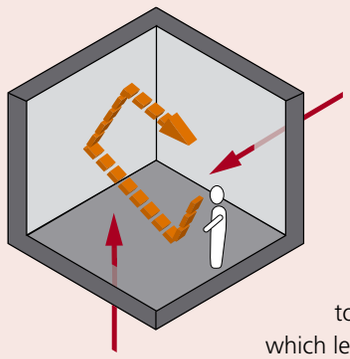
Classrooms that are reverberant (a lot of echo) and/or too noisy make it difficult for teachers to speak and children to hear and understand. Background noise from services, on-going activities in adjacent rooms, foot traffic, etc. can also create disturbances which interfere with concentration levels and performance.

Reverberation

Reverberation (amount of echo in a room) affects how well speech is understood. Any space where speech, music, working and learning are central to the purpose of the room, the acoustics are as critical as having enough air conditioning and heat, light, adequate comfortable seating, etc.

Reverberation typically occurs in rooms with hard reflective surfaces. Where high reverberation occurs in a classroom, frustration and stress levels increase, resulting in the teacher speaking more loudly and with reduced speech intelligibility. Young children particularly experience huge difficulties in understanding speech in highly reverberant rooms.

People automatically adapt to the acoustic environment of a room. The more reverberant a room is, the worse the speech intelligibility becomes.



The main factors affecting reverberation are the geometry of the room and the amount and distribution of absorbent materials. Adding Rockfon ceilings, wall absorbers, baffles and/or islands will reduce reverberation and increase speech intelligibility.

Background noise

How well a teacher can be heard and understood, how well students can concentrate and think are also negatively affected by background noise. Background noise in classrooms can be from HVAC (heating / ventilation / air conditioning) installations, foot and street traffic, adjacent rooms and corridors, shuffling of chairs, student noise, etc.

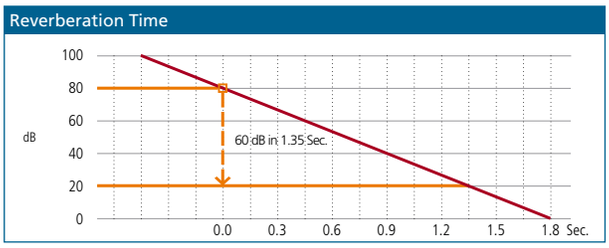
This area is gaining in importance as more group tasks are performed in today's schools. The higher the level of background noise, the more effort is required to understand others and to make yourself understood, which leads to miscommunication, frustration and stress.

Adding a Rockfon ceiling will not solve the problem at its source but will reduce the noise levels present in the room, leading to a better acoustic environment.

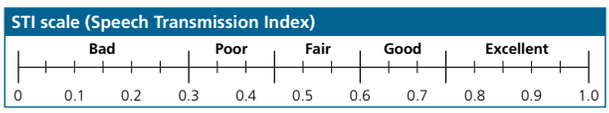
Acoustical parameters

Reverberation time, STI (Speech Transmission Index) and **Signal-to-Noise Ratio** are the three most important parameters characterising speech intelligibility in a school room.

Reverberation time: Expressed in seconds, this is the time it takes for a sound to drop by 60 dB after a source stops generating the sound. The lower the reverberation time, the less echo.



STI (Speech Transmission Index): This value describes how well speech is heard and understood (speech intelligibility) on a scale from 0 (bad) to 1 (excellent).



Signal-to-Noise ratio: Signal stands for the speech level of the speaker; Noise stands for all background noise present in the room (expressed in dB). The higher the ratio, the less disturbing the background noise is.

To create optimal speech intelligibility, Rockfon recommends a signal-to-noise ratio of at least 15 dB. For younger children or children with hearing impairments, Rockfon recommends a signal-to-noise ratio of 20-25 dB.

How does Rockfon contribute to acoustic comfort?

- In a standard classroom of 180-250m³, the installation of a Rockfon ceiling with high sound absorption will ***reduce reverberation time*** to a sufficient level to ***ensure good speech intelligibility.***

- The majority of Rockfon products have a sound absorption (α_w) greater than 0.90 which means that at least 90% of the sound energy is absorbed or dissipated. As most schools are constructed using hard surface materials for floors, wall lining, lockers, windows, etc., ***a Rockfon ceiling, wall absorber, baffle or island is often the only effective solution to create sufficient sound absorption for optimum speech intelligibility.***

Rockfon ceilings and acoustic solutions enable compliance with the requirements of Section 1, Building Bulletin 93 and Approved Document E Part E3.

Rockfon recommendations for top acoustic comfort by room type

FACULTY OFFICES	ROCKFON RECOMMENDATIONS*
Cellular office	T ≤ 0.6 sec.
Open-plan office	T ≤ 0.5 sec.
CLASSROOMS	
Primary	T ≤ 0.4 - 0.6 sec.
Secondary	T ≤ 0.4 - 0.8 sec.
Open-plan	T < 0.8 sec., STI > 0.60
All-inclusive	T ≤ 0.4 sec., STI > 0.60
Music	T < 1.0 sec.
SPORTS AND MULTI-PURPOSE HALLS	
Gymnasium	T < 1.5 sec.
Swimming pool	T < 2.0 sec.
Multi-purpose hall	T = 0.8 - 1.2 sec.
CIRCULATION AREAS	
Stairwell	Min. Class C ceiling covering > 50% stair / floor area
Corridors	Class A ceiling covering > 90% floor area
NURSERY PLAY ROOMS AND QUIET ROOMS	
Play / quiet rooms	T ≤ 0.4 sec.
Play / quiet rooms (ceiling height > 4 m, vol. > 300 m³)	T ≤ 0.4 sec., STI > 0.60

T = Reverberation Time
STI = Speech Transmission Index

** Rockfon recommendations are based on AD.E and BB93.*

Different products used in schools with their sound absorption value

Product	α_w
MONOLITHIC CEILING	
MonoAcoustic	0.90
DESIGN WHITE	
Sonar	1.00
Sonar Activity	1.00
Sonar Alto	0.20
Alaska	1.00
Sonar dB 44	0.90
DESIGN DECO	
Sonar Luna	0.95
Ligna	0.85
Selva	0.95
Polar Colour	0.95
BASIC WHITE	
Koral	0.95
Koral Tenor	0.60
SPECIAL AREA	
Hygienic (Hygienic)	0.95
Samson (Impact Resistance)	1.00
Boxer (Impact Resistance)	1.00
Scholar (Education)	0.95
WALL ABSORBERS	
Samson	0.85
Scholar	0.95
Sonar Activity	0.95
Polar Colour	0.80
INDUSTRIAL	
Industrial Black	1.00

Acoustic solutions which provide sound absorption in low frequen

- Installing a ***Rockfon dB ceiling*** (combining high sound absorption and high sound insulation) will reduce the reverberant sound level in classrooms as well as ***insulating against intrusive noise*** from service installations in the ceiling void and from ***adjacent spaces.***

- Acoustic solutions which provide ***sound absorption in low frequencies contribute to better speech intelligibility.*** They are even more relevant for children with hearing impairments, providing them with a more suitable learning environment. Rockfon has the knowledge and solutions at low frequencies.

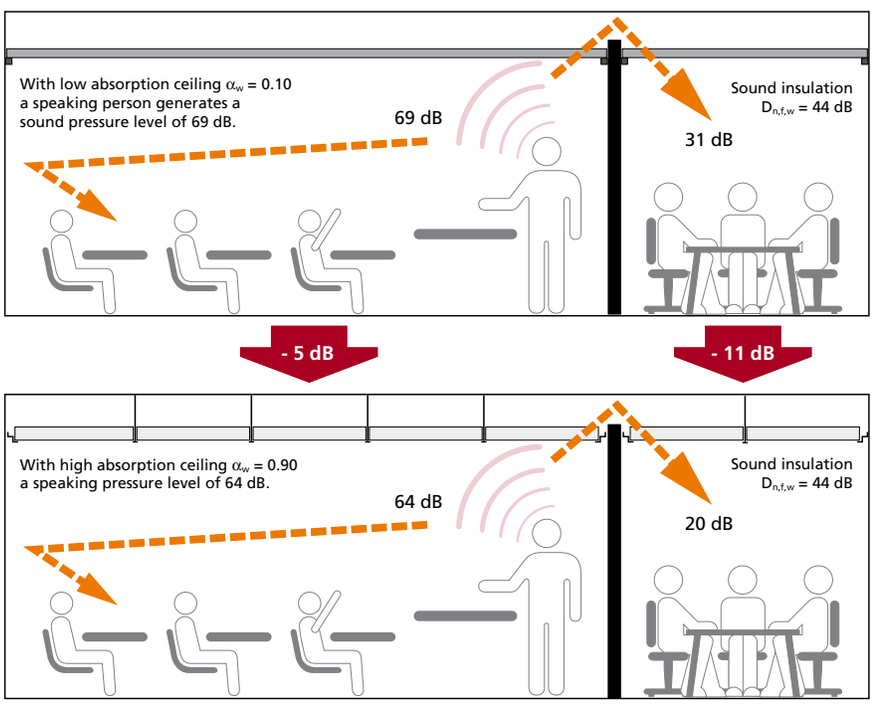
- To create ***optimal speech intelligibility,*** Rockfon recommends a signal-to-noise ratio of at least 15 dB. For younger children or children with hearing impairments, Rockfon recommends a signal-to-noise ratio of 20-25 dB.

For larger size rooms (volume > 250m^3, e.g. activity rooms, large classrooms), the use of wall absorbers is recommended to reduce standing waves and flutter echoes and ensure optimum sound absorption. Wall absorbers should be used on at least two adjacent walls in order to ensure uniform speech intelligibility around the room. For advice about appropriate wall absorber solutions, please contact Rockfon.

A Rockfon dB ceiling will decrease the ambient sound level in the classroom and insulate noise coming from installations in the ceiling void and from adjacent spaces

	SOUND INSULATION VALUES ($D_{n,f,w}$)			
Product	Without sound barrier	With sound barrier (21 dB)	With sound barrier (26 dB)	With sound barrier (30 dB)
Sonar dB 44	44	52	55	58

Where full height walls are not able to be installed, we recommend the use of Sonar dB 44 in conjunction with acoustic barriers.



With an identical $D_{n,f,w}$ value (in this case 44 dB), a high-absorbing ceiling contributes to a lower sound pressure level than a low-absorbing ceiling.

cies contribute to better speech intelligibility.

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Country-specific acoustic recommendations for schools

	Overview of guidelines and legislation for a classroom of 200 m³	REVERBERATION TIME T (s)			
		Unoccupied room		Occupied room	
		min	max	min	max
Belgium	Specification 110 (1979)	0.65	1.0	-	-
Netherlands	Dutch Building Regulation (2003)	-	-	-	-
France	Accord du 15 avril 2003	0.4	0.8	-	-
United Kingdom	Building Regulations 2003 (kindergarten/primary schools)	-	0.6	-	-
	Building Regulations 2003 (secondary schools)	-	0.8	-	-
	Building Regulations 2003 (children with hearing impairment)	-	0.4	-	-
Germany	DIN 18041 (2004)	-	-	0.45	0.7
Switzerland	SIA 181 (2006)	-	-	0.45	0.7
United States	ANSI S12.60 (2002)	-	0.6	-	-
World Health Organisation	Guidelines for community noise (1999)	-	0.6	-	-

Rockfon's high-performance products provide aesthetically-pleasing

CASE STUDY
Acoustic comfort

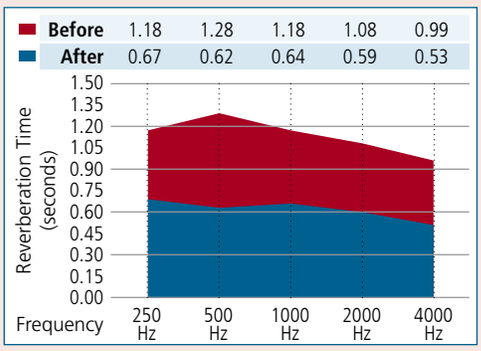
Lodge Park Technology College, United Kingdom
classroom used for individual and group work

Challenge:

In this classroom, a metal ceiling was originally installed. Students and staff alike complained that the amount of echo made it difficult to hear what was said during lessons, but worst of all was the sound of rain on the thin roof – it was so intrusive that concentration became impossible.

Solution:

After installing a highly-absorbent Rockfon ceiling, the difference is dramatic. Acoustic measurements taken before and after show that the reverberation time is half what it used to be. The staff reports that it is much easier to work, that there is no echo and that the sound of rain is no longer an issue. The students are equally delighted with the improved environment and how much more conducive it is for effective learning.



Conclusion:

Combining the high acoustic performance of Rockfon products with the Rockfon staff's high level of expertise in schools provides the ideal solution to acoustical challenges – the end result: aesthetically-pleasing acoustic comfort.

Before

After

2. Product durability

The **best value** *is often not the lowest price but rather the best combination of* **whole-life cost** *and* **quality.**

Longevity of building materials in schools is very important. Building materials need to withstand wear and tear and often rough treatment, putting strong emphasis on impact resistance of building materials. As the lay-out of schools is changing quite regularly, ceiling tiles will often need to be demounted and reinstalled.

Understanding impact resistance
In schools and sport halls, the impact resistance of building materials is an important issue. Surfaces need to offer protection in low to middle impact areas (rough treatment of students, multi-purpose halls for fitness, gym) and heavy impact areas (sport halls for ball games). The life time of a ceiling tile is thus, amongst others, strongly dependant on its impact resistance.

Impact resistance of suspended ceilings is tested in accordance with BS EN 13964 Annex D. It defines three impact resistance classes which characterises the level of impact resistance of a suspended ceiling.

Low to middle impact areas
Class 2A ceilings can be installed in sports centres where low-impact ball sports are played and in heavy-duty school areas. Class 3A ceilings can be installed in rooms where the ceiling must fulfil basic requirements on impact resistance, such as classrooms, school corridors, children's daycare centres, play areas, etc.

Heavy impact areas
In heavy duty sport halls, Class 2A ceilings will not suffice – Class 1A is necessary. Class 1A ceilings should be installed in any sports hall where heavy impact ball sports are played. The test procedure for impact resistance as described in BS EN 13964 Annex D, covers the incidental impact of balls under normal conditions in sports halls and is not subject to abuse or vandalism.

Rockfon has developed a new ceiling system that reaches the arduous 1A classification for impact resistance. This Class 1A impact resistant ceiling has, besides its impact resistance, a number of other advantages over alternative solutions:

- Fire safety of Rockfon products, rated A1 – the safest possible, meaning they are non-combustible, allowing extra time for evacuation in case of fire and reducing the spread of fire to adjoining areas
- 100% sound absorption (α_w=1.00) with Rockfon Boxer and Rockfon Samson
- Fully demountable system
- Ease of installation versus alternative systems

Impact resistance test procedure (BS EN 13964 Annex D)
A handball is fired 36 times from a ball gun at the ceiling: 12 times vertically and 12 times from two different directions at an angle of 60° with a velocity at impact of:
- Class 1A: 16.5 m/s
- Class 2A: 8 m/s
- Class 3A: 4 m/s

After the impact test, the suspended ceiling is examined. The test is positive if the strength, function and safety of the suspended ceiling is not adversely affected and its appearance has not changed to any great degree.

Rockfon offers solutions that meet of suspended ceilings

BS EN 13964:2004 Annex D	
Class	1A
Product	Boxer 1166 x 1166 x 40mm Samson 1166 x 1166 x 40mm
α_w	1.00
Fire class	A1
Installation system	RockLink Olympia^{Plus}
Hold down method	Primary hold down frame

**These products can be suitable for use in applications meeting 3A requirements.*

Building materials need to withstand normal wear and tear as well

How does Rockfon contribute to durability?

- The ***impact resistance*** of Rockfon Boxer and Samson fulfils the demand in all three classes of impact resistance.
- Samson is covered with a high-performance woven surface providing ***resistance to perforation*** while maintaining optimum acoustic properties.
- Rockfon is one of the few ceiling suppliers that declares flexural tensile strength as a part of its CE marking. This is very important as many ceiling tiles do not withstand humidity well and therefore risk sagging. ***Rockfon ceiling tiles are dimensionally stable, even at humidity levels of up to 100% RH at temperatures up to 40ºC.***
- Our products can withstand even extreme climatic conditions and still remain dimensionally stable. For this reason the life expectancy of Rockfon tiles and RockLink grid systems is high. This is why we offer a **15 year product guarantee.** For more information and conditions please contact your Rockfon sales representative.

the 3 impact resistance classes

2A	3A
Samson 40mm	Sonar Activity and Scholar 40mm*
1.00	1.00
A1	A1
RockLink 24	RockLink 24
Butterfly clip 817	Butterfly clip 817

CASE STUDY
Impact resistance

Community sports hall, Woensdrecht, the Netherlands

Challenge:

Acoustics in sports facilities are often insufficient. Sports teachers suffer from voice problems and fatigue due to poor acoustics and high reverberation in most sports halls. As well as acoustics, fire behaviour, aesthetics, impact resistance and safety play an important role in the design of a modern sports building. The sports hall for the community of Woensdrecht had a wooden plank ceiling installed that did not meet the acoustic and safety requirements of today's contemporary sports halls. The community council therefore sought the advice of Ope en Top Systeembouw, a local ceiling installer.

Solution:

After some in depth market research, Marlon Masseurs, managing director of Ope en Top Systeembouw contacted Rockfon, regarding their recently developed new ceiling for sports halls that meets the highest class of impact resistance (Class 1A, BS EN 13964 Annex D). Masseurs explains: "The community wanted a ceiling that delivered exceptional acoustical comfort, was humidity resistant, provided the highest maximum fire safety, was easy to maintain and very strong. As a ceiling installer, speed and simplicity of installation as well as demountability were important issues. The decision was therefore easily made to choose the new Rockfon Olympia^{Plus} impact ceiling system."

Conclusion:

The new 1A impact resistant ceiling for use in sports halls, developed by Rockfon meets the highest class related to impact resistance (1A, BS EN 13964 Annex D), acoustics (100% sound absorption), fire safety (fire behaviour A1) and humidity resistance. The system is easy to install and when compared to alternative systems in the market, it is also easy to demount. The large square tiles (1166 x 1166mm) and the fine surface texture help to create beautiful designs in a large areas.

Before

After

as occasional rough treatment.

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3. Safety of building materials

Not everybody can be a **ceiling expert.** *Customers need to be able to* **trust** *a ceiling supplier's declared* **performance values.**

That's the purpose of CE marking. The EN 13964 norm for suspended ceilings has been mandatory in Europe since July 1, 2007. It defines those product characteristics which can or must be declared on product labels and product documentation.

Rockfon not only declares the mandatory properties Reaction to fire and Emission of formaldehyde, but also Sound absorption, Flexural Tensile Strength, Light reflection as well as Thermal insulation, Impact resistance and Sound insulation when applicable.

As most of the above mentioned topics are highlighted in other chapters, we will focus here on fire behaviour.

Understanding fire behaviour
Every building fire is a disaster, especially when lives are lost.

Two thirds of all fire victims are as a result of breathing in smoke, poisonous gases and flaming droplets/particles. Fire safety is unquestionably an important consideration in school environments as sadly they are often a target for arson.

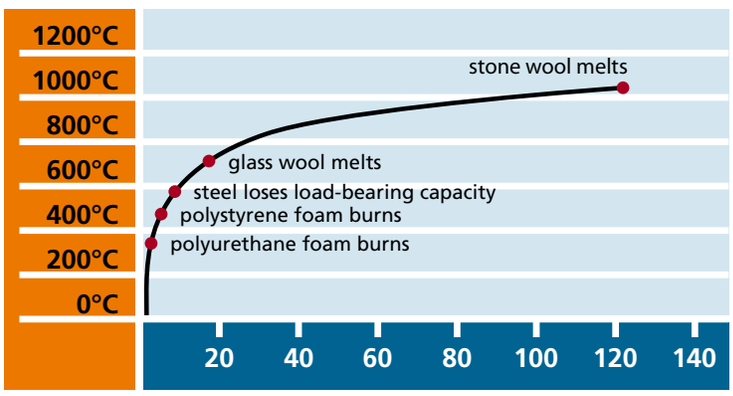
In Europe there are two parameters related to fire safety and prevention that apply to construction materials:

- **Reaction to fire** determines whether a material fuels a fire. The EU reaction to fire evaluation criteria are the material's ignitability, rate of heat release, rate of spread of flame, rate of smoke production, flaming droplets/particles and/or a combination of these safety aspects.
- **Fire resistance** indicates how well a building component – for a stated period of time – can resist and hold back a fire and prevent it from penetrating from one room to another.

How does Rockfon contribute to safety?

- Rockfon products are fire safe, rated in Euroclasses. Most products are rated A1, meaning they are ***non-combustible and the safest possible, allowing extra time for evacuation in case of fire.***
- All relevant ***Rockfon ceiling tiles have been CE marked*** since October 2005, across all our factories in Europe. In addition, Rockfon has chosen the highest level of attestation of conformity (AOC). This means that the independent certification organization has verified our initial type testing program and audits our entire supply chain twice a year.

Stone wool only melts after two hours at 1000°C



Most Rockfon products are fire-rated A1 (best in class) which means

Most Rockfon products meet the safest fire classification, A1

Product	Fire class	Fire resistance
MONOLITHIC CEILING		
MonoAcoustic	A2-s1,d0	EN13501-1
DESIGN WHITE		
Sonar	A1	EN13501-2, BS 476 Part 21, 22, 23
Sonar Activity	A1	EN13501-2, BS 476 Part 21, 22, 23
Sonar Alto	A1	EN13501-2, BS 476 Part 21, 22, 23
Alaska	A1	EN13501-2, BS 476 Part 21, 22, 23
Sonar dB 44	A2-s1,d0	EN13501-2, BS 476 Part 21, 22, 23
DESIGN DECO		
Sonar Luna	A1	EN13501-2, BS 476 Part 21, 22, 23
Ligna	A1	EN13501-2
Selva	B-s2,d0	EN13501-2
Polar Colour	A1	EN13501-2, BS 476 Part 21, 22, 23
BASIC WHITE		
Koral	A1	EN13501-2, BS 476 Part 21, 22, 23
Koral Tenor	A1	EN13501-2, BS 476 Part 21, 22, 23
SPECIAL AREA		
Hygienic (Hygienic)	A2-s1,d0	EN13501-2, BS 476 Part 21, 22, 23
Samson (Impact Resistance)	A1	EN13501-2, BS 476 Part 21, 22, 23
Boxer (Impact Resistance)	A1	EN13501-2, BS 476 Part 21, 22, 23
Scholar (Education)	A1	EN13501-2, BS 476 Part 21, 22, 23
WALL ABSORBERS		
Samson	A1	n/a
Scholar	A1	n/a
Sonar Activity	A1	n/a
Polar Colour	A1	n/a
INDUSTRIAL		
Industrial Black	A1	EN13501-2, BS 476 Part 21, 22, 23
BAFFLES		
Fibral Multiflex Baffle	A1	n/a
Opal Multiflex Baffle	A1	n/a
Hygienic Baffle	A2-s1,d0	n/a
Rockfon Contour	A1	n/a
ISLANDS		
Rockfon Eclipse	A1	n/a

4. Design

Education buildings need to be **inviting, accessible, inspiring, uplifting** *and use appropriate aesthetics to enhance the learning experience.*

Although every school should look different, the need to blend into the local community is always present. The building needs to convey a strong, individual and confident design whilst maintaining cost efficiencies.

Traditional institutional style concepts are being replaced by modern designs focusing on better circulation and thoughtful lay-out.

Group-work activities and individual learning programmes are increasing popular, leading to larger classrooms and multi-purpose spaces.

Designers need to take into consideration the ever changing role of the school as part of the local community, leading to an all-inclusive design – and Rockfon can provide inspiration for their designs.

Rockfon offers a wide range of design options while always maint

How does Rockfon contribute to a beautiful school?

- Rockfon offers a ***wide range of design options*** whilst always maintaining its high performance properties. Choose from four different visual elements to create the perfect look and performance:
  - **surfaces**
  - **colours**
  - **edges**
  - **sizes**
- HVAC (heating / ventilation / air conditioning) ***installations can be hidden*** behind a Rockfon ceiling, and still provide ***easy access to integrated lighting and mechanical ventilation systems.***
- Rockfon has an extensive product portfolio offering many different ceiling solutions – such as suspended ceilings, wall absorbers, islands and baffles – allowing for ***flexible design freedom.***
- Rockfon's white ceilings provide ***optimal light reflection*** with full light diffusion which eliminates glare and reduces eye disturbance.
- Rockfon ceilings have aesthetically pleasing, ***homogeneous surfaces*** that are free from any visible holes or perforations.
- Rockfon ceilings ***maintain their beautiful appearance even in high-humidity conditions.*** They are not subject to warping, deflection or breaking.

CASE STUDY

Design

A.P. Møller School, Germany
secondary school (7-10th grades) and gymnasium

Challenge:

The A.P. Møller School in Schleswig is a Danish secondary school (7-10th grades) including a gymnasium, which is situated in Germany, on former military land. There is room for 625 students in the 14,600m^2 school. The building is situated in an area of natural beauty. The architect firm, C.F. Møller (Arhus, Denmark) were looking for a ceiling that supported the simplicity of the school's design.

Solution:

C.F. Møller designed a lighting strip for the ceilings which contains both lighting and ventilation in the same band, contributing to the orderly feeling of the ceilings. The architect chose Rockfon Sonar for the ceiling panels, offering the best performance and widest choice in a wide variety of edges and dimensions. Rockfon Sonar has a slightly textured white surface. In many places, the ceilings are mounted as island solutions.

Conclusion:

Rockfon ceiling tiles and islands provided the architect and school principal with freedom of design in colours, edges, surfaces and dimensions. The sound absorption qualities of these ceilings are excellent and meet the extremely stringent requirements for acoustics and sound absorption in education buildings today.

5. Facility management

Cheap *can become* **expensive.** *What looks like a cost-effective solution in the short term might lead to high costs in the long run.*

Future maintenance and whole life cycle costs need to be an integral consideration in the original designs of schools. Building materials used in schools need to be easy to maintain without the risk of damage.

How does Rockfon ease your facility management?

- Rockfon products are best in class in terms of weight and therefore ***easy to demount*** which allows for repair and maintenance of service installations in the ceiling void.
- Rockfon products are durable, ***easy to clean*** and come with a 15 year guarantee.
- Rockfon offers ***hygienic ceiling tiles and baffles*** for rooms with special requirements (e.g. kitchens, locker rooms, shower and bathroom facilities, etc.) which can withstand frequent cleaning and high humidity conditions.
- Rockfon products are ***easy to replace.*** A and E edges can be replaced by personnel not necessarily experienced in full ceiling installations.

Rockfon tiles, especially A and E edges, are easy to replace – by

ceiling installers or in-house maintenance personnel.

ROCKWOOL Rockfon® ACTIVATE YOUR CEILING

6. Refurbishment potential

***Over the last few decades,* awareness *and* consideration *of good acoustic conditions in education environments has gained ground. Even so, many schools still lack* effective acoustic performance.**

In most European countries, the situation is worst in schools built between 1970 and 1990. A lot of hard surface ceilings were used, minimising the issue of cleaning, but certainly not favouring the acoustic environment.

Schools built before 1970 used similar materials in combination with very high ceilings, but the majority of these schools have been refurbished recently – most upgrading to a suspended ceiling system.

Today, new-build education projects take other factors into consideration, such as a creative and inspirational design. Hard surface materials are still part of these designs, and while they can contribute to better light comfort, indoor climate, thermal mass and low energy consumption, the acoustics will suffer as a result. This can lead to unsatisfactory acoustics if not properly integrated at the early stages of design. Rockfon offers many solutions for refurbishment situations.

Other acoustic challenges are created when small classrooms are merged into larger ones, facilitating group work and parallel activities. Such refurbishment activities often need to take place while the school is in use which also requires flexibility and efficiency in terms of delivery and installation of acoustic enhancements.

Experience has shown that new installations or refurbishments using a Rockfon ceiling can perform acoustic miracles. Considering the enormous improvement in acoustic comfort, installing a Rockfon ceiling is a cost-effective solution to both refurbishment and acoustics and can be tailored perfectly to suit any existing education buliding.

New installations or refurbishments using a Rockfon ceiling will

How does Rockfon contribute to a successful refurbishment?

- Rockfon offers a great delivery service.
- Rockfon products are easy and fast to install and use known installation techniques which reduces the risk for mistakes and delays.
- Since Rockfon products are lightweight and easy to cut, the risk of tile damage is reduced.
- Rockfon products can be cut in one stroke, inside the building, without any special machinery, without disturbing dust generation, with full precision and without breaking.
- Services can be easily hidden behind the Rockfon ceiling and a good integration of light and mechanical ventilation is facilitated.
- In older buildings, the ceiling height and high windows, do not always allow the installation of a suspended ceiling. Rockfon offers ceiling options which can be installed directly to the soffit and still provide high sound absorption.
- It may be challenging to refurbish a school where the architectural expression and style must be respected. Rockfon products have a classic, clean look that complements older architecture. Rockfon´s frameless islands are also a good solution in such cases.
- Rockfon Islands and Baffles (see chapter 9) are very often satisfactory solutions for retrospective room acoustic improvements, just as they are equally suited for use in the growing new build trend of thermal mass education buildings.

7. Indoor climate

Building materials need to **contribute** *to a healthy indoor climate by not releasing dust particles or harbouring bacteria.*

A bad indoor climate is commonly characterised by poorly ventilated classrooms, large temperature swings and an accumulation of dust. High levels of CO_2 in such environments can lead to loss of concentration, bad odours and irritation – contributing to increased student/teacher absenteeism.

More and more people suffer from allergic reactions, respiratory illness or skin problems. Humidity, combined with certain construction materials, can promote the development of micro-organisms such as mould or bacteria that cause these effects. Air quality during winter needs to be improved, and high temperatures during summer need to be under better control.

Many European governments are finally taking these issues seriously. Maximum levels of CO_2 (expressed in ppm) are being defined.

How does Rockfon contribute to a sound indoor climate?

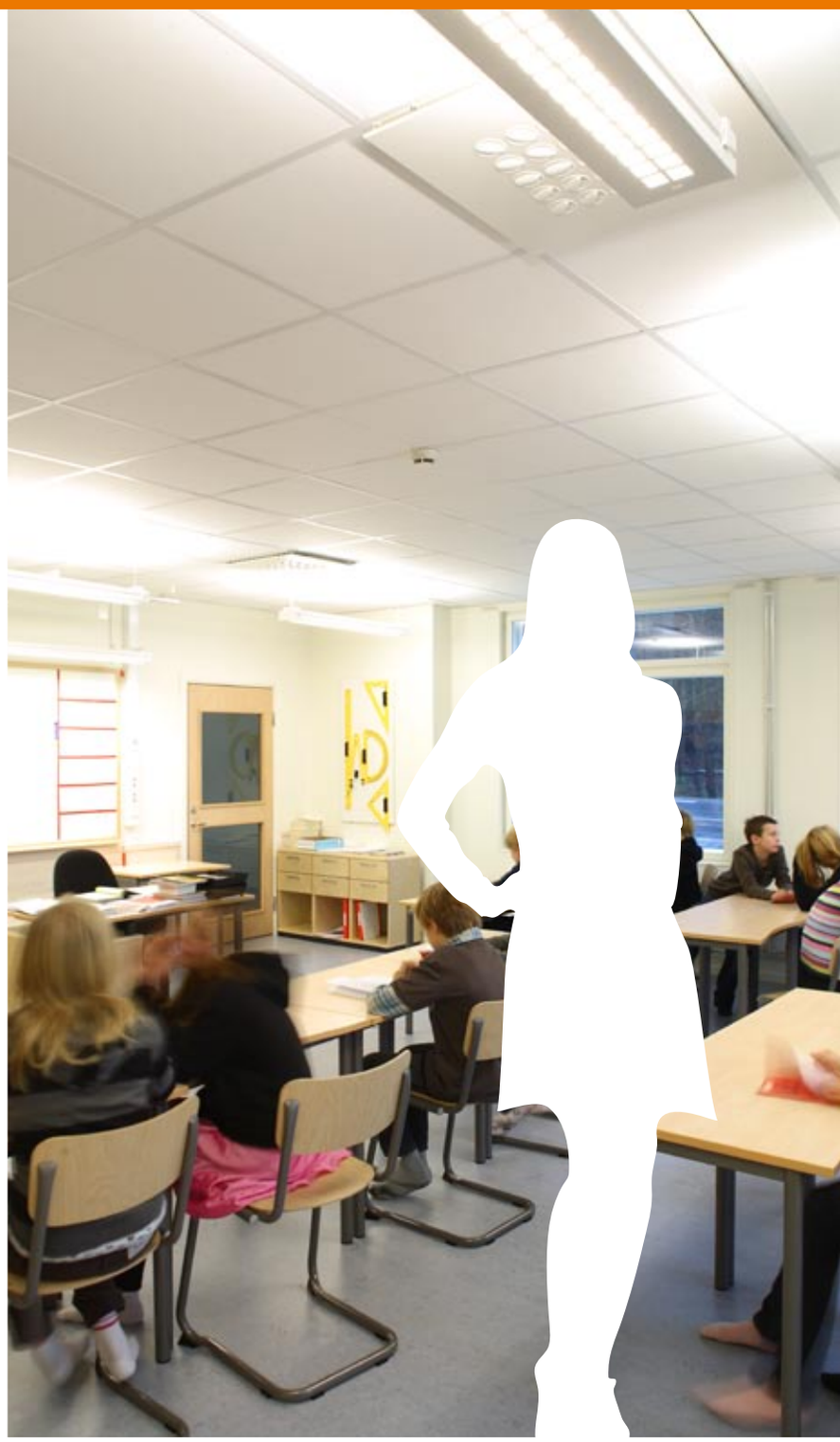
- A representative selection of Rockfon products was awarded the Indoor Climate Label (ICL) and the Finnish Classification of Indoor Climate Label (M-1) which are the ***most stringent standards in Europe.***

THE INDOOR CLIMATE LABEL

EMISSION CLASS FOR BUILDING MATERIAL M1

- Rockfon ceilings ***are non-hygroscopic*** and resist humidity levels up to 100% RH.
- Stone wool has no nutritional value and therefore it provides ***no sustenance to harmful micro-organisms.***

Stone wool has no nutritional value and therefore it provides no



sustenance to harmful micro-organisms.

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8. Sustainability

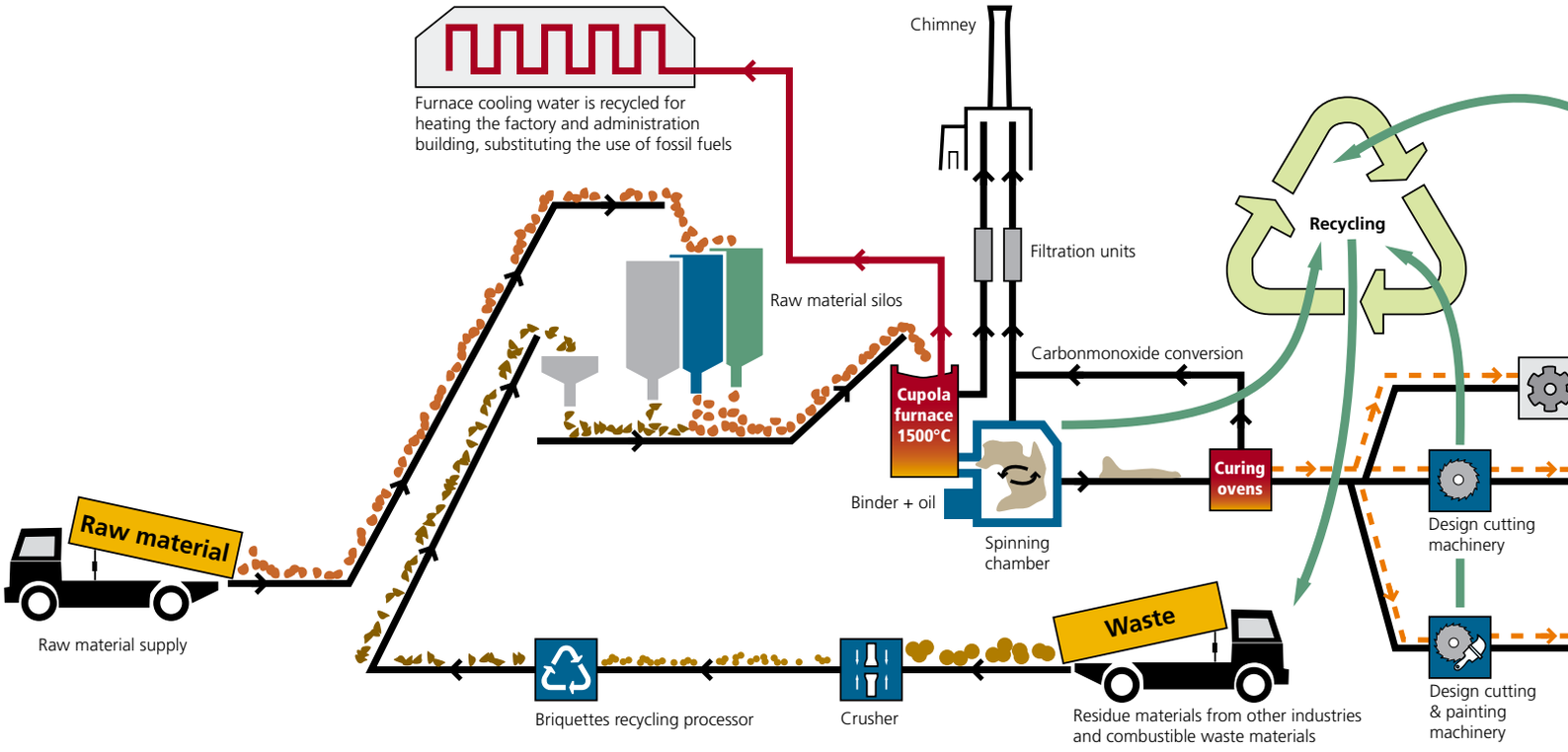
Rockfon is an* environmentally focused *company. As a subsidiary of Rockwool International,* Rockfon *has joined the International Chamber of Commerce's environmental charter. Every year, Rockwool International publishes an environmental report.

Children are our future. It is in favour of our children that industrial companies meet the most stringent requirements and strive for continuous improvement. The environmental impact of building materials and their production process need to be limited to a minimum.

Building material producers need to take responsibility and put control procedures in place to make constant improvements. Factories may not cause problems for their neighbours and environment. Building material producers need to comply with the environmental conditions imposed on them by regulatory authorities and maintain an open dialogue with stakeholders (customers, regulatory authorities, investors, employees, suppliers, etc.) in order to meet interests and requirements concerning environmental issues.

With the commitment of all the subsidiary companies, including Rockfon, and in consultation with their managing directors, the Rockwool Group has drawn up an environmental policy to meet these issues – and many more.

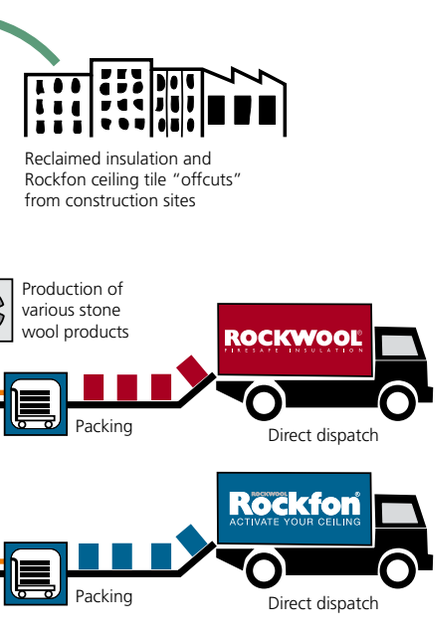
That Rockwool takes it seriously is proven by the Rockwool Award 2009 going to William McDonough, author, architect and designer, and one of the most advanced thinkers in environmental sustainability in the design of cities and buildings as well as industrial processes. He is particularly known for the cradle-to-cradle environmental concept.



Rockfon products are environmentally sound and recyclable back

How does Rockfon contribute to the environment?

- The rock used in our stone wool ***is not a scarce resource.*** Every year the earth's volcanoes and plate tectonics produce 38,000 times more rock material than is being used to make the stone wool used in Rockwool products and Rockfon acoustic ceilings.
- When producing our stone wool, ***we recycle three times more residue materials from other industries than we deposit ourselves.***
- A wide range of ***Rockfon products comply with several environmental declaration schemes,*** such as FDES (France) and Sunda Hus (Sweden).
- All Rockfon factories monitor environmental performance through ***stringent environmental management systems.***
- Rockfon products are ***environmentally sound and recyclable*** in their own production process.



CASE STUDY
Environment

Romford Hospital, United Kingdom
Major new build PFI hospital

Challenge:

As the Romford Hospital project was so large, efforts to design economically, minimise ceiling tile cutting and reduce subsequent off cuts was of paramount importance. With today's increasing environmental concerns, the challenge was to devise a method to return the off cuts from the 80,000m^2 of Rockfon MediCare range ceiling tiles due to be installed on the project.

Solution:

Working closely in conjunction with the ceiling contractor and their chosen distribution partner, a storage and collection plan was devised to return off cuts to the Rockwool manufacturing plant in Pencoed, Wales for recycling into stone wool insulation products. Particular attention was paid to ensuring that there was no cross contamination with other construction materials and only ceiling tile off cuts were collected for recycling. This would therefore retain the consistency of the subsequent stone wool produced using recyclate.

Conclusion:

Rockfon has been recycling off-cuts and end of life tiles for a number of years. Rockfon ceiling tiles are made from 100% stone wool and therefore recyclable, which helps to reduce the burden on landfill sites and reduces depletion of natural resources.

into their own production process.

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9. Energy efficiency

Architects today must combine low energy consumption *and* optimum user comfort. *This means balancing* energy, air, light *and* sound.

A contemporary school building that uses a lot of energy will face problems in the long term. Linked to energy efficiency, thermal mass buildings are a growing architectural trend.

Fluctuations in daily temperature are used as a basis for air conditioning. As cooling and heating happens via the concrete ceiling or soffit, a complete 'wall to wall' ceiling solution would make the heat exchange less efficient. Conversely, leaving the concrete ceiling completely exposed will lead to huge acoustic discomfort. Rockfon ceiling islands and baffles offer appropriate solutions to providing compliant room acoustics in these instances.

How is Rockfon linked to energy efficiency?

- For areas where it is impossible to use a traditional suspended ceiling, Rockfon offers ***thermal mass solutions.*** Rockfon Contour baffles (for vertical suspension), Rockfon Eclipse islands (for horizontal suspension) and Rockfon multi-module framed islands provide good acoustics combined with pleasing aesthetics and design.

- Thermal mass activation requires that the air flows freely within the room therefore making the use of traditional suspended ceiling impossible. ***Rockfon Eclipse islands and Rockfon Contour baffles offer perfect solutions*** to buildings using thermal mass as they do not block the air circulation while absorbing sound from both sides of the panels for ***optimal acoustic comfort.***

- The majority of Rockfon ceilings have a ***bright white surface*** which offers optimum light reflection and contributes to the creation of a comfortable environment whilst also

Rockfon Eclipse islands and Rockfon Contour baffles offer perfect

CASE STUDY
Energy efficiency

Aimée Césaire, France
kindergarten and primary school

Challenge:

Environment is a key priority for the city of Créteil near Paris. When architect agency Agence Nicolas Michelin et Associés was selected to design a building comprising a kindergarten, primary school and leisure centre, the priority was to create a sustainable building. This building was developed following the guidelines of the French H.Q.E (High Environmental Quality) program with the goal of minimising energy consumption whilst still meeting the requirements of local regulations in terms of thermal insulation and acoustics in order to create a comfortable learning environment.

Solution:

In order to minimise energy consumption, several techniques were implemented including the use of the building's thermal mass, solar panels and green roof.

Thermal mass relates to the ability of a building to store the heat it receives and re-use it when necessary. In order to optimise thermal mass, it is necessary to use materials with a high inertia – like concrete – which need to remain exposed. This situation therefore does not enable the use of suspended ceilings which are traditionally used in education buildings to bring acoustic comfort, usually by reducing reverberation time. Indeed, the various materials used in the building (concrete, glass, hard floors) are extremely reverberant, and the only option was to absorb sounds using absorbent material on the ceiling. Rockfon's Polar Alu coloured ceiling panels were selected and installed in island configurations at a distance of 20cm from the concrete soffit, covering over 50% of the surface. This construction has the benefit of enabling the air to flow freely in the room for thermal mass activation while absorbing sound on both sides of the panels. In classrooms, the distribution of the islands in the room was carefully studied by Aline Gaulupeau, acoustician at Peutz Associates, in order to not absorb too much sound above the teacher and to therefore enable the sound to travel to the back of the room.

Conclusion:

Mrs Gaulupeau carried out on site measurements after the installation of the acoustic islands and is fully satisfied with the solution that was implemented. Final results comply with the regulation and are above her expectations in most rooms, particularly in the canteen where reverberation times should be as low as possible.

From an aesthetic point of view, Architect Mr. Lorch strongly wanted to implement a solution that differed from traditional, white, 600 x 600mm ceiling tiles and is extremely pleased to have found a solution that – thanks to its colour, size (2400 x 600mm) and configuration – gives the impression of floating in mid-air and harmonises with the rest of the building.

Rooms	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	Reverberation time 500Hz-2kHz (measured)	Reverberation time 500Hz-2kHz (regulation)
Canteen	1.3	1.3	0.9	0.9	1.0	1.0	0.9	≤ 1.2 s
Classroom	1.1	0.9	0.7	0.7	0.8	0.8	0.7	0.4 s ≤ Tr ≤ 0.8 s

10. Expertise in school interiors

Rockfon has been very* active *in the* education sector *– for many years, in many countries – and has the* in-house knowledge *and* know-how *to advise you on specific problems or concerns.

Different rooms in different school areas have different requirements. The selection table below will help you choose the right Rockfon product per room type.

For assistance with special areas or situations, please contact Rockfon.

	Classroom	Assembly hall	Multi-purpose hall	Sports hall	Corridor / stairwell	Library / learning resourses	Lecture theatre	Music room	Gymnasium	Reception	Drama studio	Meeting room	Swimming pool	Nursery	Atria	Kitchen	Toilet / wet room
MONOLITHIC CEILING																	
MonoAcoustic	•									•							
DESIGN WHITE																	
Sonar	•	•	•		•	•		•	•	•	•	•	•	•	•		•
Sonar Activity	•	•	•		•		•			•			•	•			
Sonar Alto							•	•									
Alaska	•	•			•	•		•		•	•	•		•			
Sonar dB 44	•	•				•	•				•	•		•			
DESIGN DECORATION																	
Sonar Luna							•				•						
Ligna						•	•		•	•	•	•		•			
Selva							•			•	•	•					
Polar Colour							•		•	•	•		•	•	•		
BASIC WHITE																	
Koral						•	•	•			•	•	•	•			•
Koral Tenor							•	•									
SPECIAL AREA																	
Hygienic																	
Hygienic																•	•
Impact Resistance																	
Samson	•	•	•	•							•						
Boxer		•	•	•							•						
Education																	
Scholar	•	•	•		•	•	•	•	•	•	•	•	•	•	•		•
WALL ABSORBERS																	
Samson		•	•	•							•						
Scholar	•	•												•			
Sonar Activity	•	•	•			•	•	•		•	•	•	•	•	•		
Polar Colour	•	•				•					•		•	•			
INDUSTRIAL																	
Industrial Black											•						
BAFFLES																	
Fibral Multiflex Baffle	•					•								•	•		
Opal Multiflex Baffle	•					•								•			
Hygienic Baffle	•					•											
Rockfon Contour	•	•				•	•			•	•		•	•	•		
ISLANDS																	
Rockfon Eclipse	•	•				•	•			•	•	•	•	•	•		

Rockfon provides you with the best solution and has the in-house

technical knowledge to solve your specific problem.

ROCKWOOL Rockfon®
ACTIVATE YOUR CEILING

MONOLITHIC CEILING

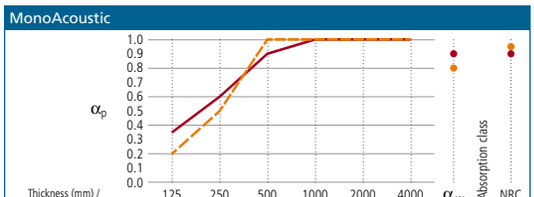
MonoAcoustic

Rockfon MonoAcoustic is a highly effective and aesthetically pleasing, seamless acoustic ceiling and wall lining system.

- MonoAcoustic can be suspended or directly installed onto soffits and walls.
- All joints are filled, sanded then render applied to the complete surface.
- Available in white as standard and special colours on request.
- MonoAcoustic is installed by authorised Rockfon MonoAcoustic installers.

Mono

MonoAcoustic



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
30 / 200	0.35	0.60	0.90	1.00	1.00	1.00	0.90	A	0.90
30 / 30	0.20	0.50	1.00	1.00	1.00	1.00	0.80	B	0.95

DESIGN WHITE

Sonar

A15, A24, B, C, D, D/AEX, E15, E24, G, M

A unique combination of the highest fire safety, Class A1, acoustic comfort and Class A sound absorption, in a wide choice of sizes and edge details.

- A comprehensive range of aesthetically pleasing tiles.
- Micro-textured surface and strong, razor-sharp looking edges for superior durability.
- Ideally suited for use in communal corridors, lobby areas and stairwells to aid compliance with the sound absorption requirements of AD.E E3, as well as classrooms and entrance halls.

Sonar Activity

A24, B, C, E24, G

Sonar Activity is designed for classrooms and open plan offices where speech intelligibility is crucial and noise and activity levels are very high.

- 40mm thickness and Class A sound absorption.
- Can be directly installed onto soffits.

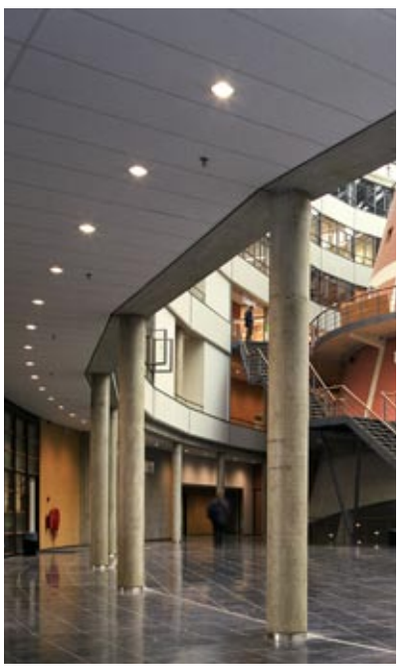
Sonar Alto

A15, A24, D, E15, E24

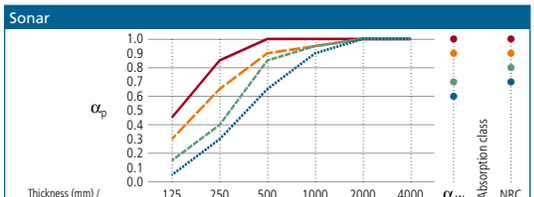
For areas where greater levels of sound reflection are required, eg. in auditoriums and conference rooms.

- Sonar Alto is Sonar with a special surface – providing higher sound absorption at lower frequencies and lower sound absorption at higher frequencies.

A15 A24 B C D D/AEX E15 E24 G M

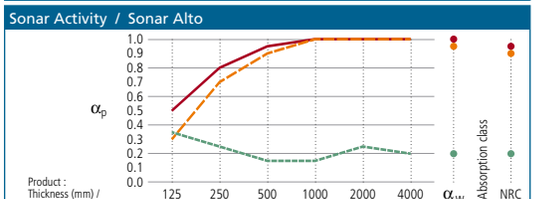


Sonar



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
20 / 200	0.45	0.85	1.00	1.00	1.00	1.00	1.00	A	1.00
20 / 100	0.30	0.65	0.90	0.95	1.00	1.00	0.90	A	0.90
20 / 50	0.15	0.40	0.85	0.95	1.00	1.00	0.70	C	0.80
20 / 20	0.05	0.30	0.65	0.90	1.00	1.00	0.60	C	0.70

Sonar Activity / Sonar Alto



Product : Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
Sonar Activity : 40 / 200	0.50	0.80	0.95	1.00	1.00	1.00	1.00	A	0.95
Sonar Activity : 40 / 40	0.30	0.70	0.90	1.00	1.00	1.00	0.95	A	0.90
Sonar Alto : 20 / 200	0.35	0.25	0.15	0.15	0.25	0.20	0.20	E	0.20

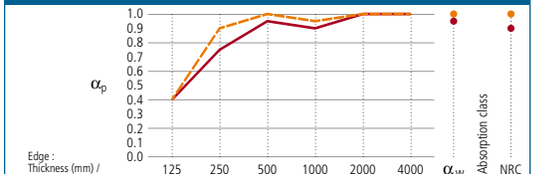
Alaska

A standard range of attractive, smooth white surface tiles which provide good functionality in a range of areas.

- Good standard of ceiling construction with good sound absorption.
- Different module sizes and edge details create semi-concealed and exposed grid ceilings.

A15 A24 D D/AEX E15 E24

Alaska



Edge : Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
A, E : 15-25 / 200	0.40	0.75	0.95	0.90	1.00	1.00	0.95	A	0.90
D, D/AEX : 20 / 200	0.40	0.90	1.00	0.95	1.00	1.00	1.00	A	1.00

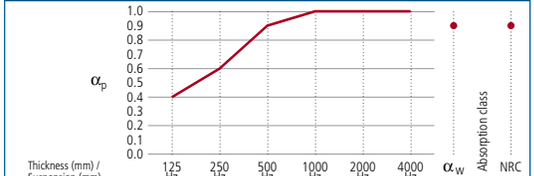
Sonar dB 44

Sonar dB 44 provides outstanding sound insulation as well as class A sound absorption for areas where confidentiality and acoustic comfort is extremely important.

- Sandwich construction of two sound absorbing layers of stone wool with a high-performance membrane in between.
- The front layer (30mm) absorbs sound from the room itself and with the high-performance membrane, it reduces the transmission of sound from room to room.
- The back layer (20mm) absorbs sound in the ceiling void coming from adjacent rooms and the floor above.
- Subtly textured surface, easy to cut, lightweight and easy to install.

A24 D D/AEX E15 E24

Sonar dB 44



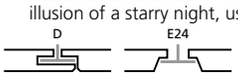
Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
50 / 250	0.40	0.60	0.90	1.00	1.00	1.00	0.90	A	0.90

DESIGN DECORATION

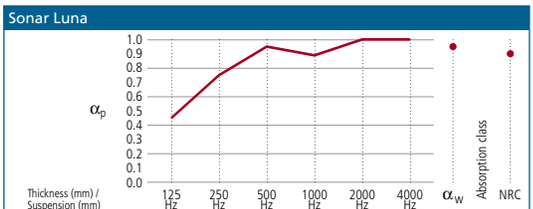
Sonar Luna

A matt black ceiling tile for areas such as cinemas, theatres etc where good acoustics in dark surroundings are required.

- Available with E edges for a semi-concealed ceiling solution or D edges for a concealed appearance, ensuring there are no distracting screen reflections on the ceiling.
- Combine with RockLux Astro System, to create the illusion of a starry night, using fibre optics.



Sonar Luna

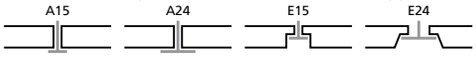


Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
20 / 200	0.45	0.75	0.95	0.90	1.00	1.00	0.95	A	0.90

Ligna

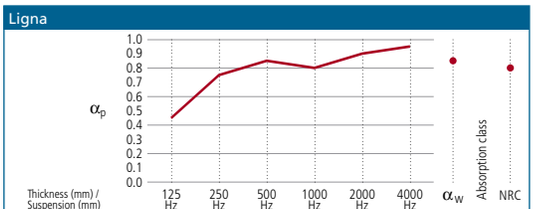
A warm wood appearance tile which provides acoustic and Class A1 fire safe properties.

- Available in three finishes to create an exclusive natural look in entrance halls, offices and lobbies.
- Smooth, non perforated surface with wood appearance.



Dark Beech | Classic Beech | Light Beech

Ligna

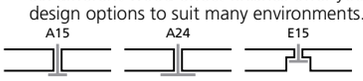


Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
20 / 200	0.45	0.75	0.85	0.80	0.90	0.95	0.85	B	0.80

Selva

A durable and impact resistant tile with a perforated, authentic wood appearance.

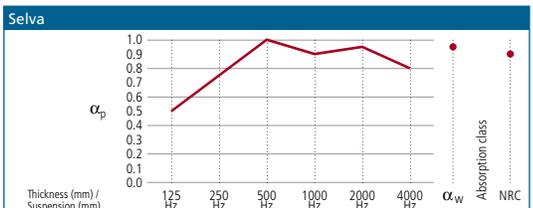
- Six different wood effect finishes offer you a variety of design options to suit many environments.



Maple | Beech | Apple Tree

Pear Tree | Ebony | Zebrano

Selva

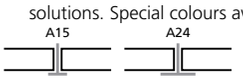


Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
20 / 200	0.50	0.75	1.00	0.90	0.95	0.80	0.95	A	0.90

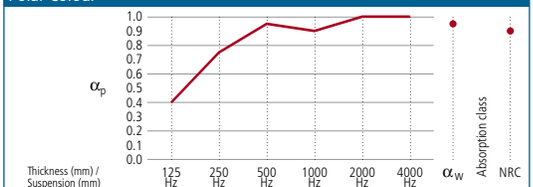
Polar Colour

A range of inspirational coloured tiles to enhance any interior design scheme.

- Make a dramatic difference to the general impression and atmosphere of a room.
- Available in ten standard colours for exposed grid solutions. Special colours available on request.



Polar Colour



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
15 / 200	0.40	0.75	0.95	0.90	1.00	1.00	0.95	A	0.90

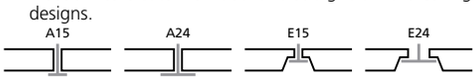
Black | Night Blue | Red | Graphite | Ocean | Dakar | Grey | Oasis | Savanna | White

BASIC WHITE

Koral

Koral combines an attractive micro-textured white surface with excellent acoustics, fire safety and humidity resistant properties.

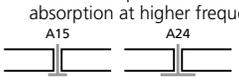
- Available in a variety of formats and suitable for many applications.
- Micro textured, painted white surface ensures high sound absorption.
- Freedom to create individual and straightforward ceiling designs.



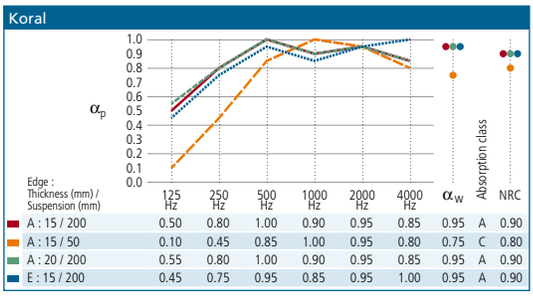
Koral Tenor

The special surface of Koral Tenor is particularly suited to areas such as concert and lecture halls for optimum acoustic performance.

- Koral with a special surface which provides higher sound absorption at lower frequencies and lower sound absorption at higher frequencies.

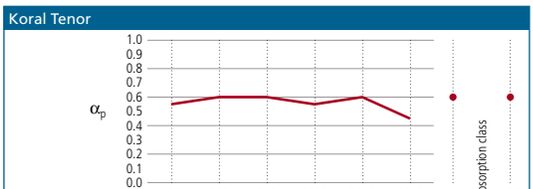


Koral



Edge : Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
A : 15 / 200	0.50	0.80	1.00	0.90	0.95	0.85	0.95	A	0.90
A : 15 / 50	0.10	0.45	0.85	1.00	0.95	0.80	0.75	C	0.80
A : 20 / 200	0.55	0.80	1.00	0.90	0.95	0.85	0.95	A	0.90
E : 15 / 200	0.45	0.75	0.95	0.85	0.95	1.00	0.95	A	0.90

Koral Tenor



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
15 / 200	0.55	0.60	0.60	0.55	0.60	0.45	0.60	C	0.60

SPECIAL AREA

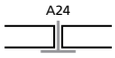
Hygienic

Hygienic

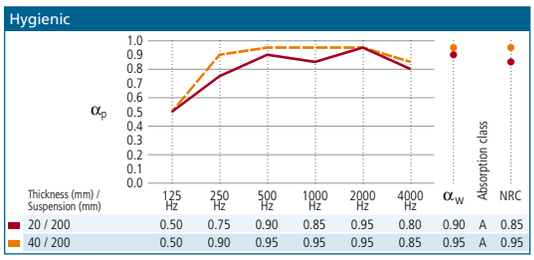
Developed to meet the exacting standards of health, electronics and food sectors, durable Hygienic can withstand regular cleaning by pressure washing.

- High performance in hygiene and cleanability.
- Coupled with longevity, durability and high sound absorption, they are suitable for highly controlled environments.
- Durable and special white painted surface, incorporating a fungicide to further enhance the resistance to growth of micro-organisms.

A24



Hygienic



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w		NRC
20 / 200	0.50	0.75	0.90	0.85	0.95	0.80	0.90	A	0.85
40 / 200	0.50	0.90	0.95	0.95	0.95	0.85	0.95	A	0.95

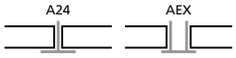
Impact Resistance

Samson

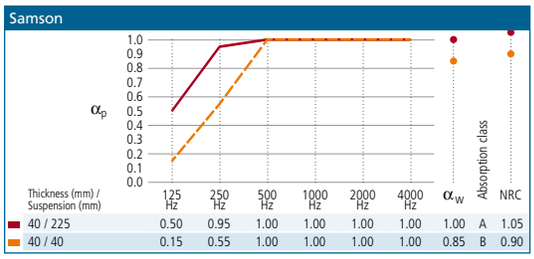
High impact resistance and excellent sound absorbency levels, makes Samson suitable for high activity areas in schools.

- Aesthetically pleasing, strong woven surface, 40mm thick.
- High sound absorption for noisy or echoey areas.
- Install in RockLink Olympia^{Plus} for maximum impact resistance, RockLink 24 for lower impact areas.

A24 AEX



Samson



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w		NRC
40 / 225	0.50	0.95	1.00	1.00	1.00	1.00	1.00	A	1.05
40 / 40	0.15	0.55	1.00	1.00	1.00	1.00	0.85	B	0.90

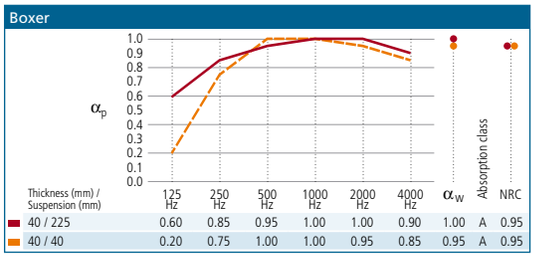
Boxer

Boxer meets the highest requirements for impact resistance (1A) so together with excellent sound absorption it is suitable for use in sports halls and schools.

- Micro-textured, white surface, 40mm thick.
- Exceptional sound absorption levels contribute to excellent acoustics in schools and sports halls.
- For sports ceilings where heavy impact ball sports are played, use with RockLink Olympia^{Plus} grid system to gain maximum impact resistance.

AEX

Boxer



Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w		NRC
40 / 225	0.60	0.85	0.95	1.00	1.00	0.90	1.00	A	0.95
40 / 40	0.20	0.75	1.00	1.00	0.95	0.85	0.95	A	0.95

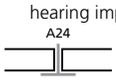
Education

Scholar

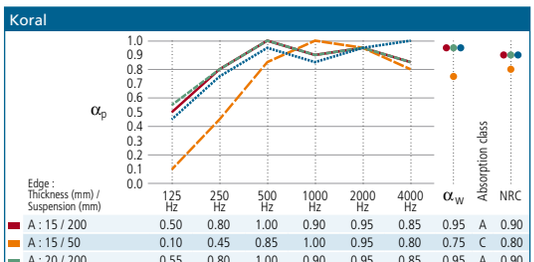
Complying with BB93 Acoustics for Schools and having impact resistant reinforced edges, Scholar is a tough, durable, fire safe and good whole life cost ceiling tile.

- Scholar can contribute to compliance with AD.E. and Building Bulletin 93, Acoustics for Schools.
- Reinforced edges remain intact even when tiles are removed and reinstalled regularly.
- Available in long planks and large square tiles, creating design freedom and speeding up installation times and saving money.
- High sound absorption ensures appropriate reverberation times and improves speech intelligibility in open plan and hearing impaired teaching spaces.

A24



Koral



Edge : Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w		NRC
A : 15 / 200	0.50	0.80	1.00	0.90	0.95	0.85	0.95	A	0.90
A : 15 / 50	0.10	0.45	0.85	1.00	0.95	0.80	0.75	C	0.80
A : 20 / 200	0.55	0.80	1.00	0.90	0.95	0.85	0.95	A	0.90
E : 15 / 200	0.45	0.75	0.95	0.85	0.95	1.00	0.95	A	0.90

WALL ABSORBERS

Samson

A24

The strong woven surface of Samson wall absorbers ensures excellent impact resistance and high sound absorption in sports activity areas.

- Ideal for use in areas where there is a high risk of occasional impact; 40mm thick.
- Should be installed in Rockfon System Samson for optimum impact resistance.

Scholar

A24

Scholar is a 40mm thick, medium impact resistant wall absorber reinforced with a concealed mesh between the aesthetically pleasing surface and stone wool core.

- For medium risk / occasional impact areas such as at high level in school classrooms, communal spaces etc.
- Direct fixed using RockLink 24 grid components.

Sonar Activity

A24, B, C

Aesthetically pleasing high performance 40mm thick acoustic absorbers, available in a range of edges providing enhanced design options.

- Added benefit of concealed edges for enhancing aesthetics and design freedom.

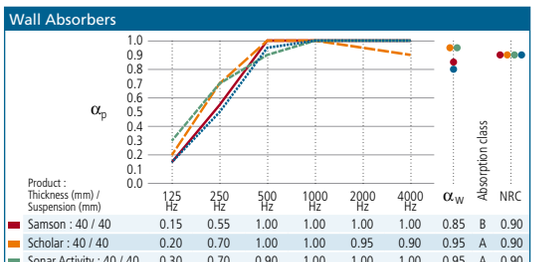
Polar Colour

A24

A range of inspirational coloured acoustic wall absorbers to enhance any interior design scheme.

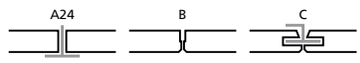
- Offering low impact resistance and high in colour makes them ideally suited for use at high level in school classrooms and lesiure areas etc.
- See Polar Colour tiles for colour range available.

Wall Absorbers



Product : Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w		NRC
Samson : 40 / 40	0.15	0.55	1.00	1.00	1.00	1.00	0.85	B	0.90
Scholar : 40 / 40	0.20	0.70	1.00	1.00	0.95	0.90	0.95	A	0.90
Sonar Activity : 40 / 40	0.30	0.70	0.90	1.00	1.00	1.00	0.95	A	0.90
Polar Colour : 40 / 40	0.15	0.50	0.95	1.00	1.00	1.00	0.80	B	0.90

A24 B C



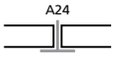
INDUSTRIAL

Industrial Black

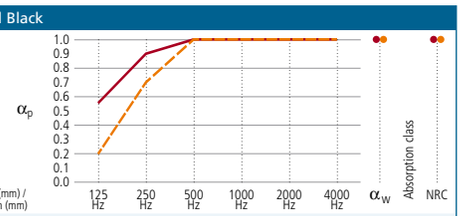
Black finish, excellent noise absorption, either used as a ceiling or behind other surfaces.

- 50mm thick, lightweight, ensuring quick and easy installation.
- Pre-finished surface, coated edges and sealed back which provides a high level of sound absorption.

A24



Industrial Black



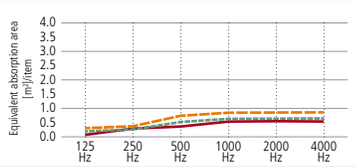
Thickness (mm) / Suspension (mm)	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz	α_w	Absorption class	NRC
50 / 200	0.55	0.90	1.00	1.00	1.00	1.00	1.00	A	1.00
50 / 50	0.20	0.70	1.00	1.00	1.00	1.00	1.00	A	1.00

BAFFLES

Fibral Multiflex Baffle
Opal Multiflex Baffle
Hygienic Baffle

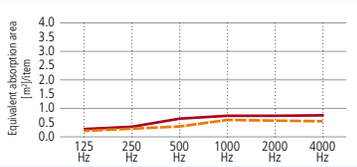
- **Fibral Multiflex Baffle** and **Opal Multiflex Baffle** are vertically installed baffles with a smooth surface enabling creative design solutions and acoustic control.
- Fibral = white, Opal = unpainted finish.
- **Hygienic Baffle** meets the exacting standards of health, electronics and food sectors. Durable Hygienic Baffle can withstand cleaning by pressure washing. They have a special white painted surface, incorporating a fungicide to further enhance the resistance to growth of micro-organisms. Clean Room Classification ISO Class 5, suitable for highly controlled environments.
- Baffles are ideally suited for use in thermal mass areas and where there is a need to maintain natural light through acoustic installations.
- Also ideal for areas where frequent and unhindered access to service installations is required.

Fibral Multiflex Baffle



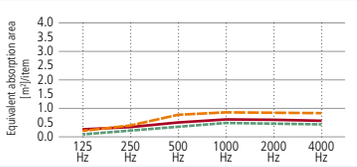
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
1200x300x50 : single item (1 baffle/m², row distance 83cm)	0.18	0.36	0.42	0.56	0.57	0.55
1200x600x50 : single item (1 baffle/m², row distance 83cm)	0.34	0.43	0.72	0.84	0.85	0.87
1200x600x50 : single item (1.5 baffle/m², row distance 55cm)	0.25	0.30	0.55	0.65	0.63	0.64

Fibral Multiflex Baffle / Opal Multiflex Baffle



	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
1200x450x50 : single item (1 baffle/m², row distance 83cm)	0.32	0.43	0.62	0.76	0.76	0.77
1200x450x50 : single item (1.5 baffle/m², row distance 55cm)	0.25	0.31	0.47	0.61	0.60	0.59

Hygienic Baffle



	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
1200x450x50 : single item (1 baffle/m², row distance 83cm)	0.33	0.35	0.51	0.64	0.61	0.56
1200x600x50 : single item (1 baffle/m², row distance 83cm)	0.29	0.41	0.74	0.83	0.85	0.84
1200x600x50 : single item (2 baffles/m², row distance 42cm)	0.19	0.25	0.43	0.50	0.50	0.48

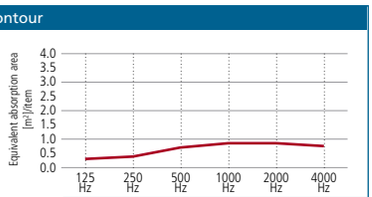
Rockfon Contour

Economic and aesthetically pleasing frameless acoustic baffles.

- Used alone, where traditional suspended ceilings can't be used or to provide additional acoustics to ceilings in areas where frequent and unhindered access to service installations is required.
- Frameless baffle with a minimalistic, painted edge underlined by an elegant bevel.
- Smooth white surface to both sides.
- Ideally suited for thermal mass areas where free flow or air is required.
- High levels of sound absorption provided.

Bc

Rockfon Contour



	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
1200x600x50 : single item (1 baffle/m², row distance 83cm)	0.32	0.36	0.66	0.78	0.78	0.73

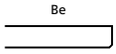
ISLANDS

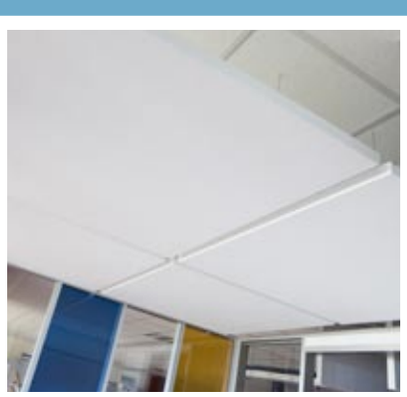
Rockfon Eclipse

Innovative and aesthetically pleasing, frameless acoustic island.

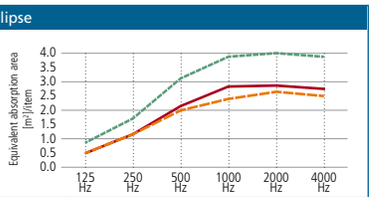
- Used alone, where traditional suspended ceilings can't be used, or to provide additional acoustics to ceilings in areas where frequent and unhindered access to service installations is required.
- Trendy and stylish, available in square or rectangular formats to suit any room shape.
- Frameless island with minimalistic sharp edge underlined by a subtle and elegant bevel.
- Ideally suited for thermal mass areas where free flow of air is required.
- High levels of sound absorption provided.
- Quick and easy to install.

Be





Rockfon Eclipse



	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
1200x1200x40 : single item* (suspension height 500mm)	0.5	1.2	2.1	2.8	2.8	2.7
1200x1200x40 : array, 300mm distance (suspension height 500mm)	0.5	1.2	2.0	2.4	2.6	2.5
1800x1200x40 : single item* (suspension height 500mm)	0.7	1.7	3.1	3.9	4.0	3.9

* distance between items superior or equal to 2 metres

Rockfon's **Top-10** for a better education environment

1. Acoustic comfort

Rockfon products offer you the best acoustic comfort.

2. Product durability

Rockfon products provide excellent longevity whilst maintaining their unique performance properties. Some Rockfon ceilings also provide high impact resistance.

3. Safety of building materials

Rockfon products conform to the safest fire classification (A1 non-combustible).

4. Design

Rockfon products offer flexible design solutions using different sizes, textures, colours and edges.

5. Facility management

Rockfon products are cost effective, easy to maintain and readily accessible for maintenance.

6. Refurbishment potential

Rockfon products require little space and are easy to install and demount.

7. Indoor climate

Rockfon products conform to the most stringent indoor climate certification in Europe.

8. Sustainability

Rockfon products are environmentally sound and recyclable back into its own production process.

9. Energy efficiency

Rockfon offers several acoustic solutions related to thermal mass.

10. Expertise in school interiors

Rockfon has many years of expertise in education projects.

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