



Acoustic and Aesthetic Suspended Ceiling Solutions Using Stone Wool





01

Rockfon

Part of ROCKWOOL Group

ROCKWOOL Group - our mission

Release the natural power of stone to enrich modern living



85 ROCKWOOL Group's
years in the stone wool
manufacturing industry



12,000 specialists



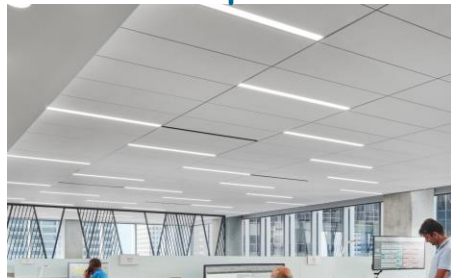
40 countries

Five brands with one common purpose

Helping construct more sustainable buildings and communities



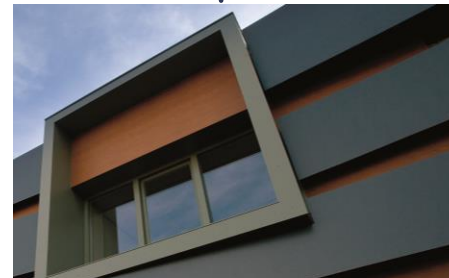
Fire safe insulation for all types of buildings and installations



Acoustic ceiling solutions



Precision growing for the horticultural industry



Exterior cladding for building facades

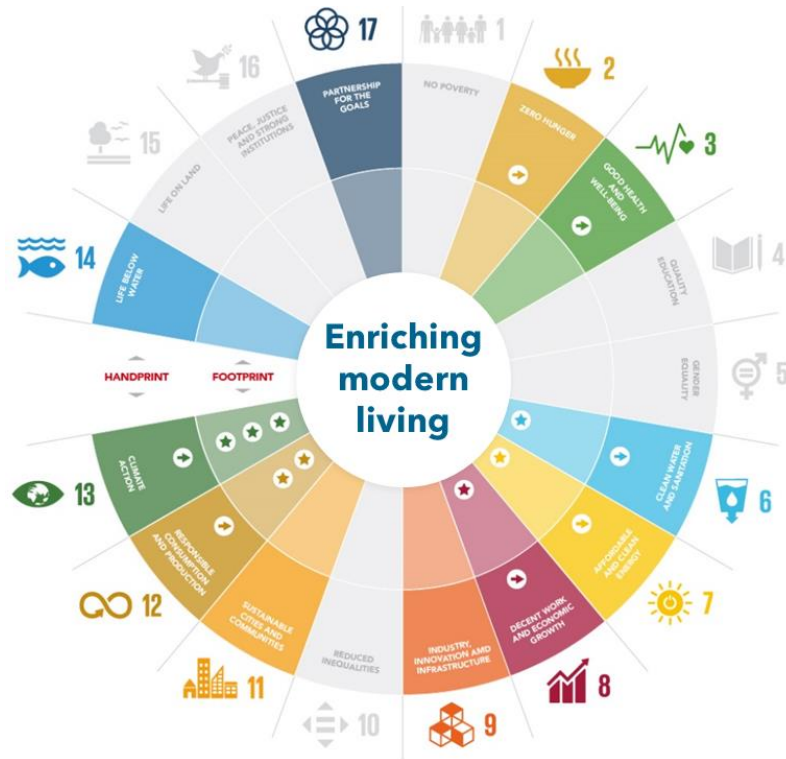


Engineered stone wool for composite applications, noise and vibration control



Available in Europe Only

Sustainability is a core asset of our business



→ Handprint | Seven externally developed product handprint metrics to measure positive value creation of our products

★ Footprint | Eight Group-level sustainability goals including two science-based targets



ROCKWOOL Group actively contribute towards achieving 11 out of the 17 goals established by the United Nations

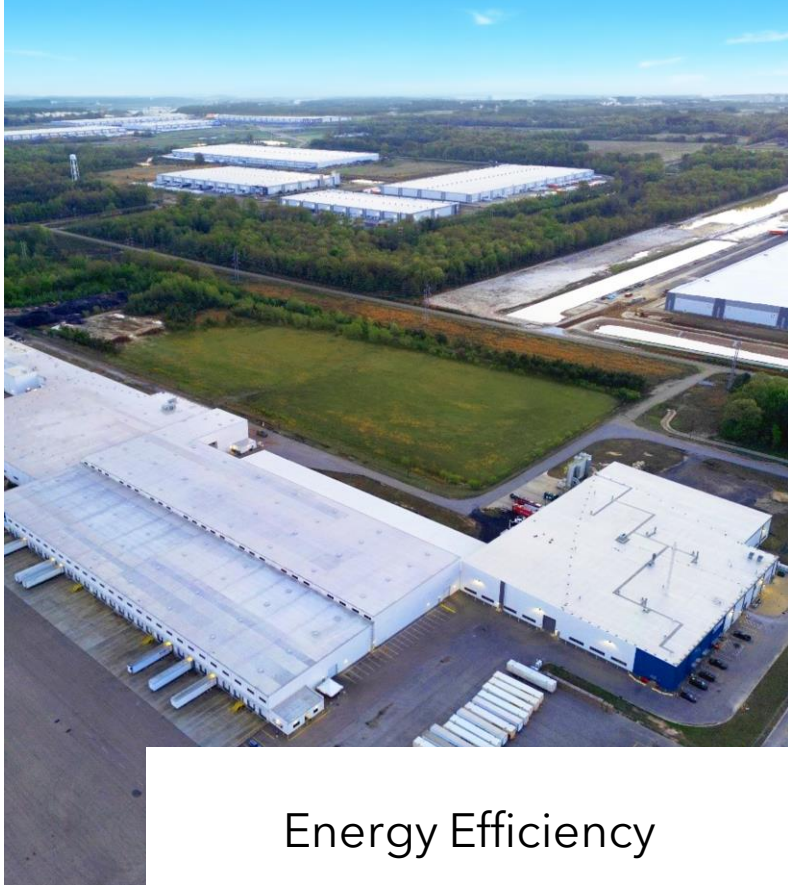


The prestigious **Corporate Knights Global 100** sustainability index ranks ROCKWOOL #1 globally among Building Products companies

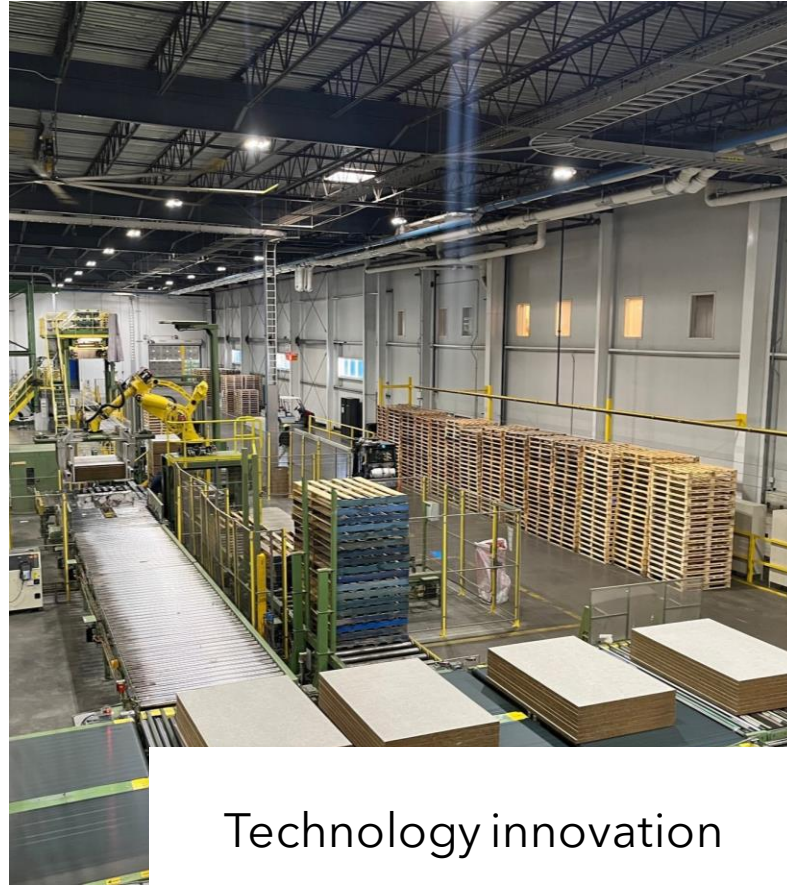


The three pillars of our decarbonization targets

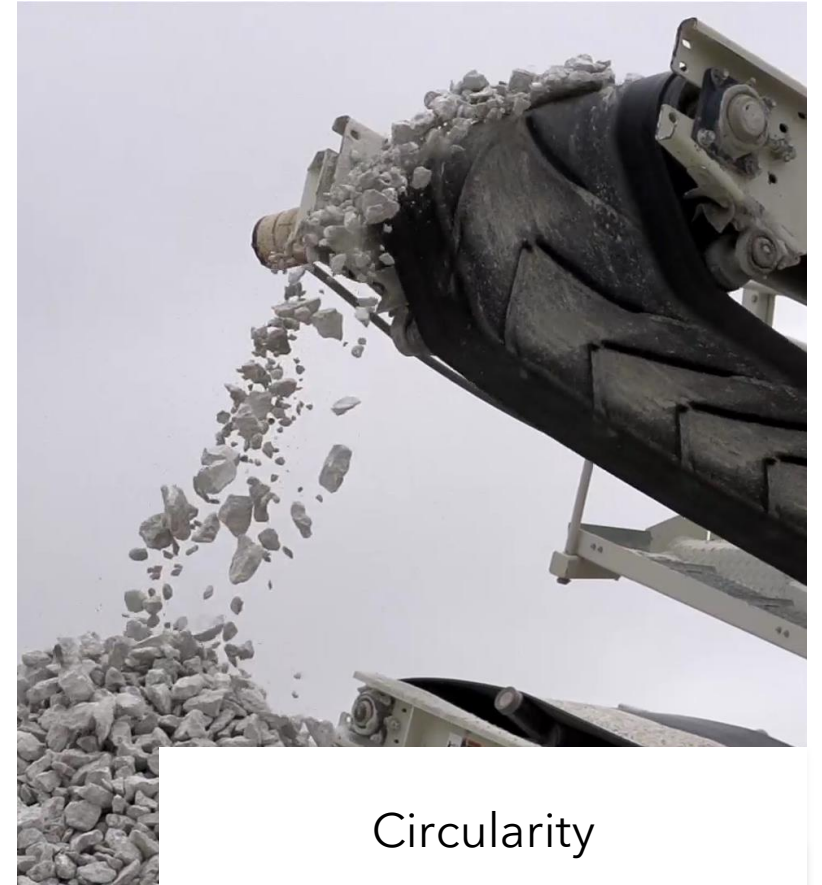
Approved by SBTi: ROCKWOOL to cut 1/3 of our lifecycle GHG emissions by **2034**



Energy Efficiency



Technology innovation



Circularity

Rockfon - North America

Offices

Chicago, Illinois

Production Facilities

Chicago, Illinois (Grid & Metal Ceilings)

Marshall County, Mississippi
(Stone Wool)

Warehouse Facilities:

Maryland, Baltimore

California, Los Angeles

Marshall County, Mississippi



1893

Chicago Metallic Sash was formed.

1937

ROCKWOOL Stone Wool plant in Hedehusene, Denmark began production.

1962

Rockfon acoustical Stone Wool ceiling company is started as a part of ROCKWOOL Group.

1988

First factory in North America was acquired in Ontario Canada to produce Stone Wool.

2013

Rockfon North America and Rockfon EA (Europe-Asia) were created by splitting the newly acquired Chicago Metallic Corporation.

2017

Rockfon line was open at ROCKWOOL factory in Marshall County, Mississippi.

2023

Rockfon celebrates 10th Anniversary in North America and launches Rockfon Mono Acoustic ceiling solution

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(Stone Wool)

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Agenda



01

Use of
suspended
acoustic ceilings



02

Stone Wool
acoustic ceiling
tiles



03

Performance
attributes of
Stone Wool
ceiling tiles



04

Creating
inspirational
spaces with
Stone Wool tiles



05

Summary

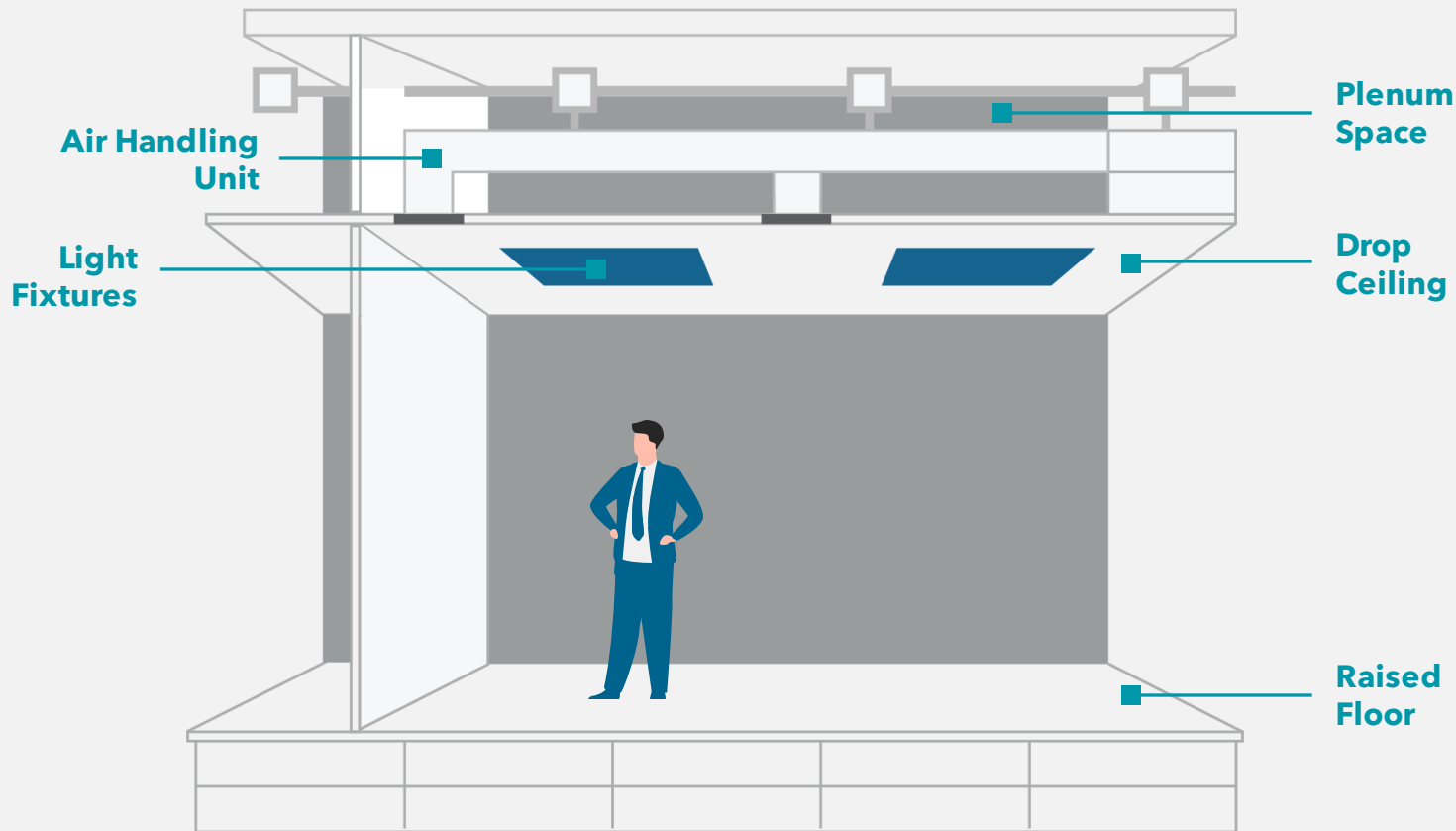




01

Use of **Suspended Acoustic Ceilings**

Use of suspended acoustic ceilings



Acoustics



Aesthetics



**Supporting
Indoor Air Quality**

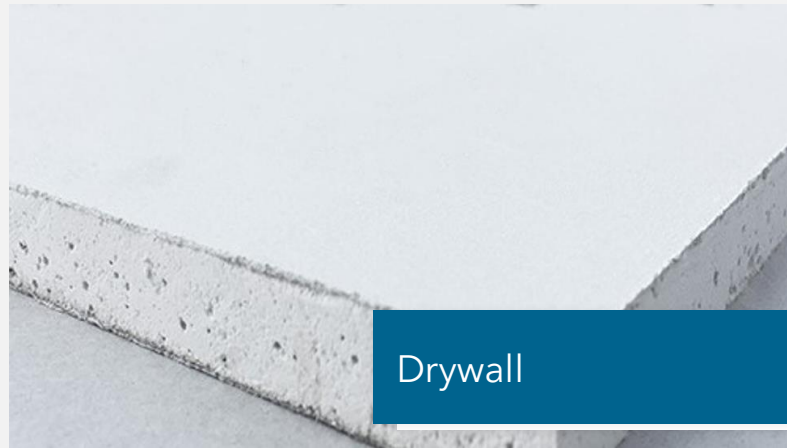


**Occupants' health
and wellbeing**

Materials used for suspended ceilings



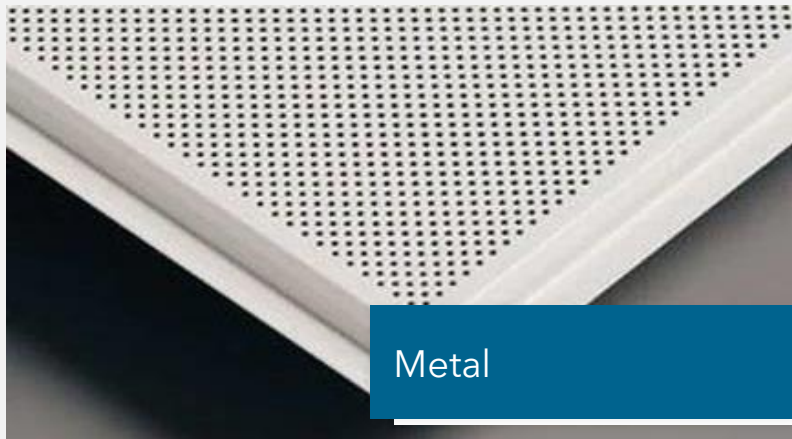
Wood



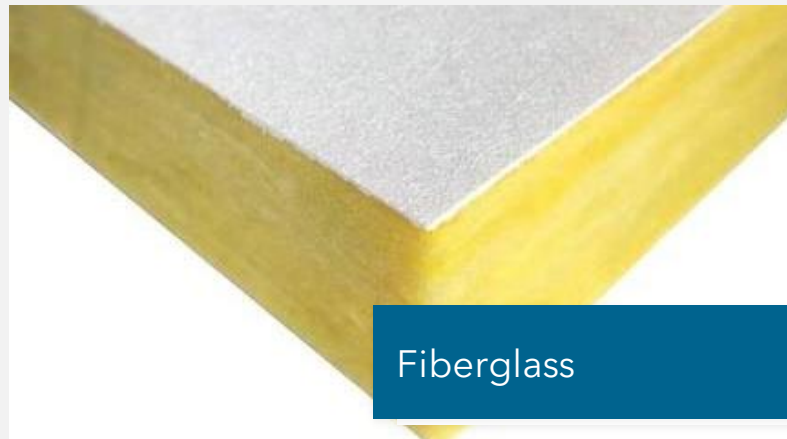
Drywall



Wet-felted Mineral Fiber



Metal



Fiberglass



Stone Wool



02

Stone Wool
Acoustic
Ceiling Tiles

Stone Wool Origins

Basalt rock occurs naturally as a product of volcanic activity

Stone is melted to lava at **2700°F** and spun into fibers

Non-directional fiber orientation provides valuable characteristics

Volcanic rock is an abundant material replenishing itself **38,000** times faster than depletion



Basalt



**Primary
Component of
Stone Wool**

General Composition of Stone Wool ceiling tiles



Water based paint

Mineral fleece

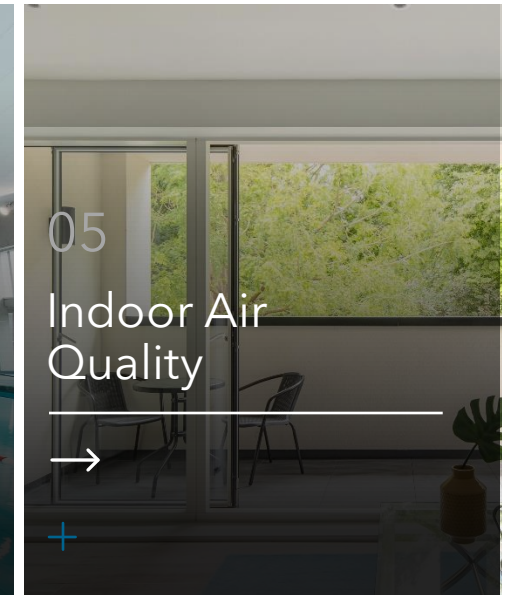
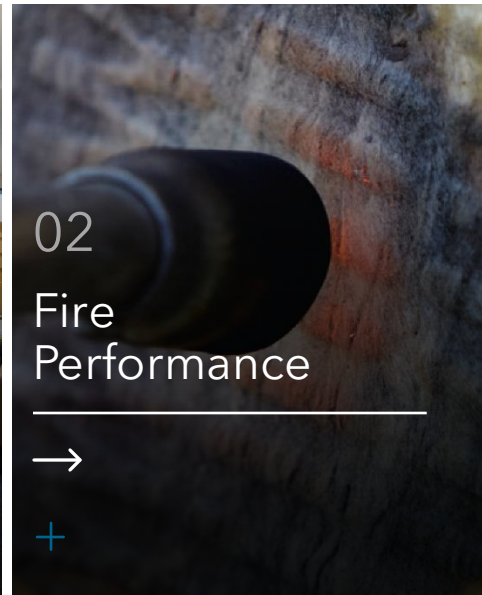
Stone Wool



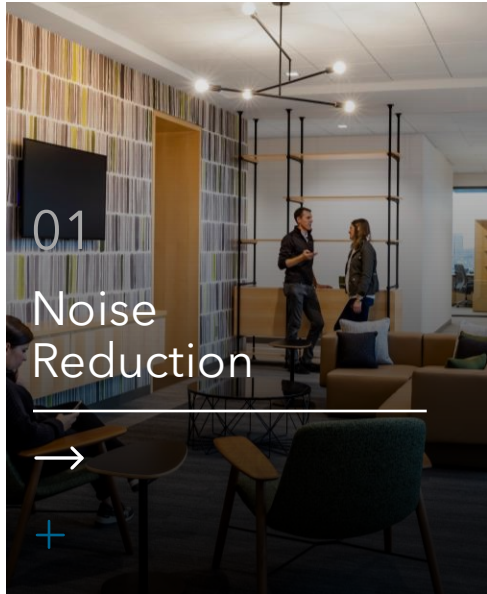
03

Performance attributes of
**Stone Wool
Ceiling Tiles**

Performance attributes of Stone Wool Ceiling Tiles



Performance attributes of Stone Wool Ceiling Tiles

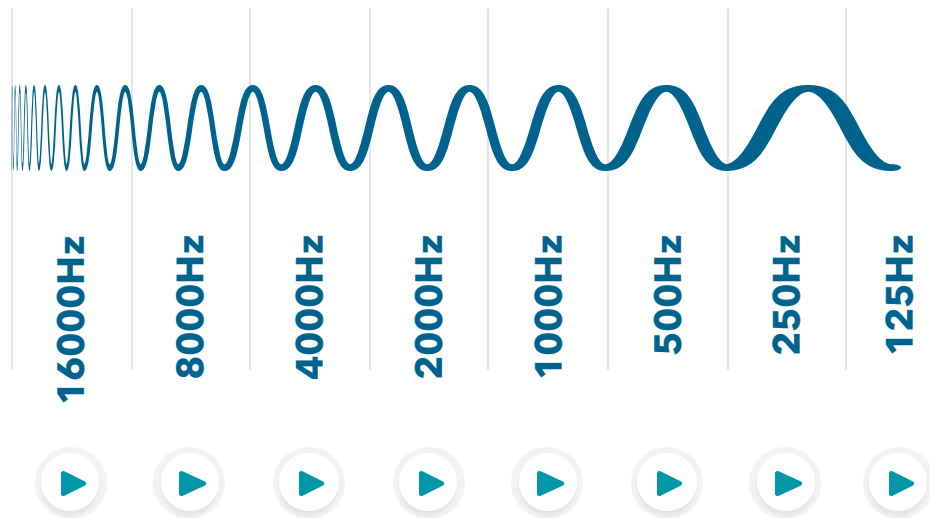


Sound Frequency and Level



Frequency

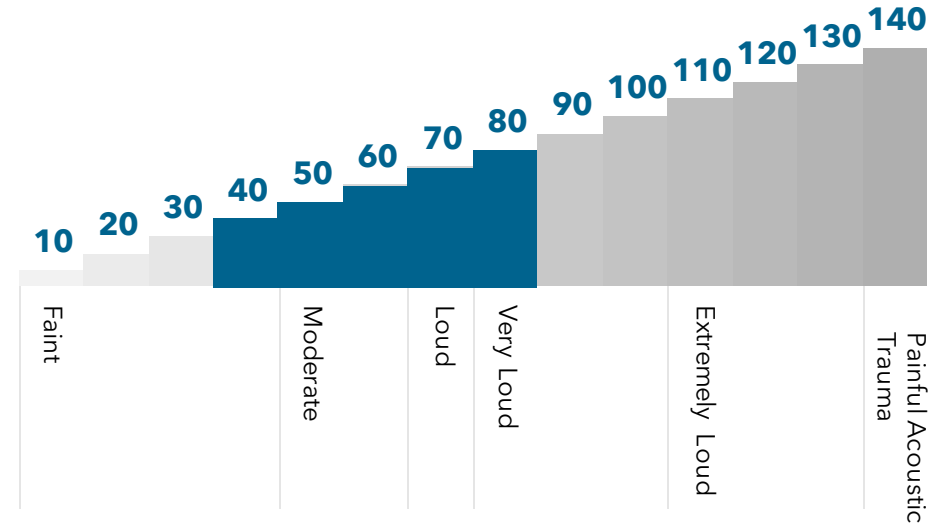
Number of complete cycles of vibration per second (**Hertz, the unit of sound frequency**) perceive frequency as pitch



Use the **play buttons above** to explore different levels of Hz, studies show that **16000 Hz** can only be heard by people under the age of 26!

Level

Sound loudness measured in dB = decibels
Sound pressure perceived as loudness



40 dB - 80 dB mostly experience in our daily lives

4 Roles of Acoustic Ceilings

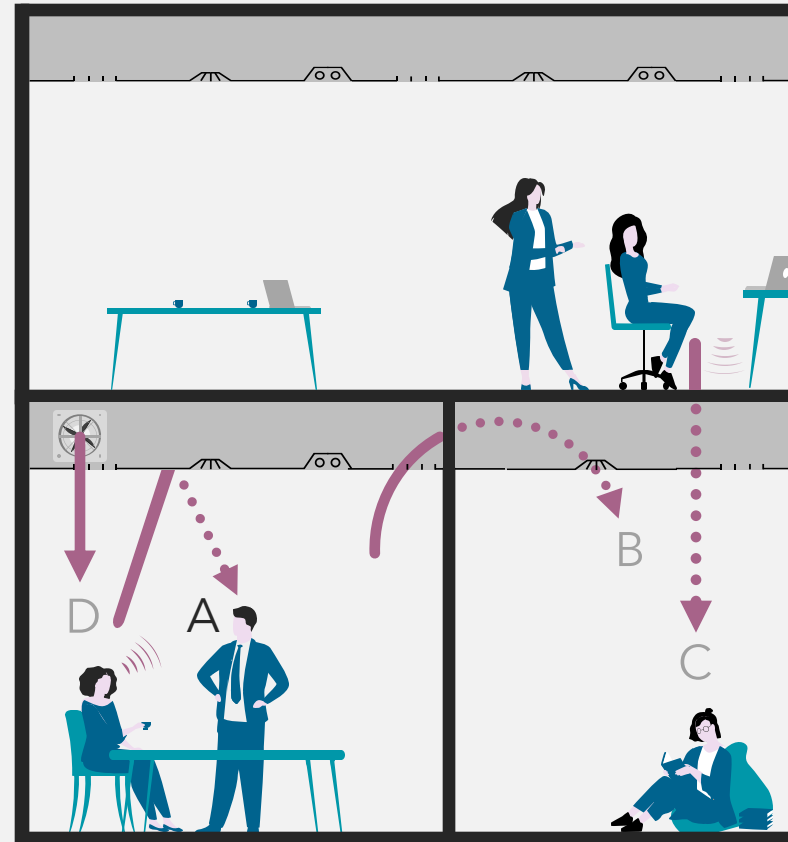


A Absorb noise inside rooms

B Decrease noise from next room

C Decrease noise from room above

D Decrease noise from equipment in plenum

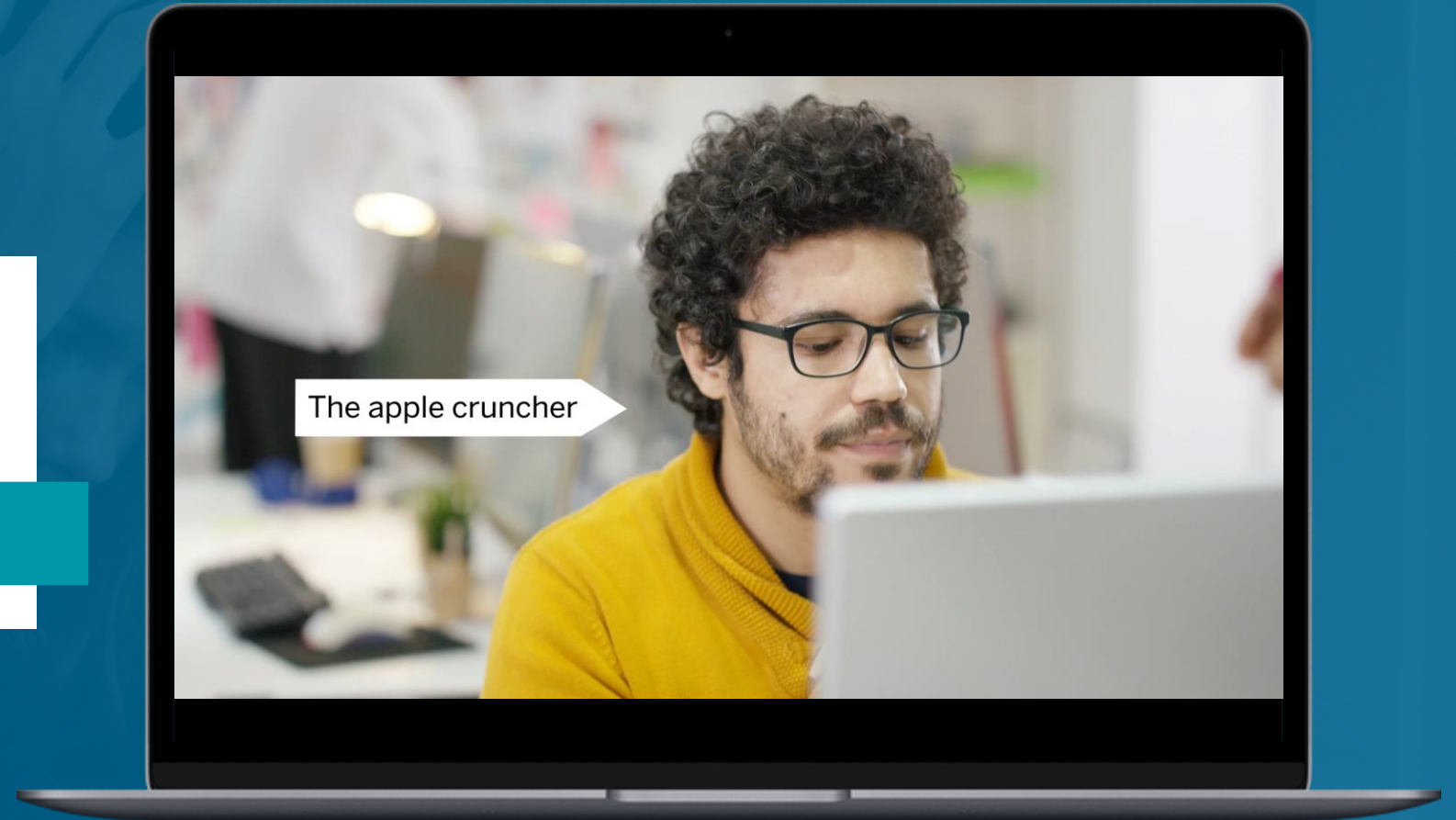


The roles of ceilings versus walls

Optimized acoustics



Bad office acoustics can lead to a **66% decrease** in **staff performance** because of distracting noise*



* <https://www.techradar.com/news/audio/how-your-noisy-open-plan-office-is-making-you-66-less-productive-1148580>

Ceiling sound absorption



Design Considerations

Many building design standards, guidelines, and certification systems such as WELL and Green Globes require minimum ceiling NRC (Noise Reduction Coefficient) of 0.90

NRC (Noise Reduction Coefficient)

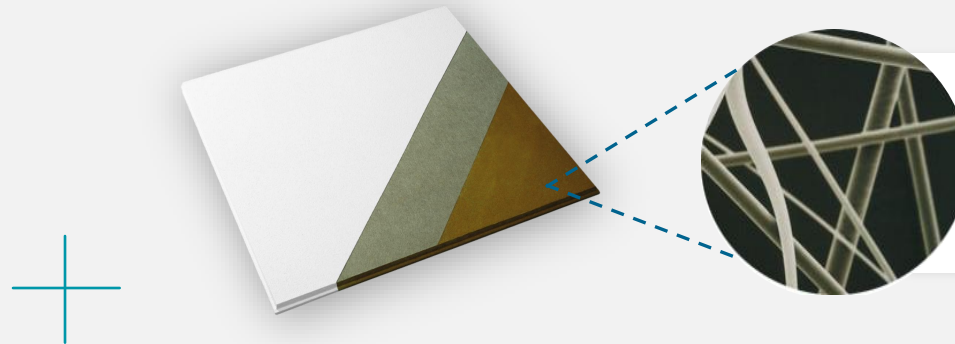
Ranges from 0 to 1:
higher the better

Absorption

helps with all 4 roles
of acoustic ceilings

Wellbeing

creates quiet, private,
and comfortable spaces



Stone Wool is a porous absorber with non-directional fiber structure

Stone Wool ceilings top sound absorption (NRC)



Performance

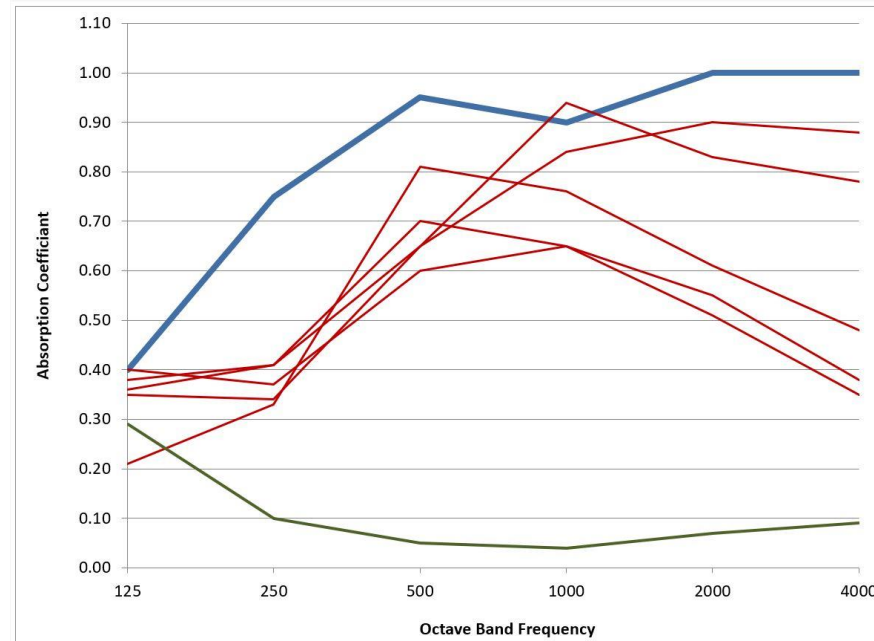
ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method.

* **Higher NRC:** 0.90 Best, 0.80 Better, 0.70 Good

Test Method

No ceilings **outperform** stone wool for **sound absorption**

Most Stone Wool ceiling panels NRC range is from **0.75** to **0.95**, with some at **NRC 1.0+**



- Examples of Stone Wool Ceiling
- Examples of Mineral Fiber Ceiling Panels
- Examples of Drywall Panels

Listen to the absorption difference



Shorter Reverberation.
Improved Intelligibility.

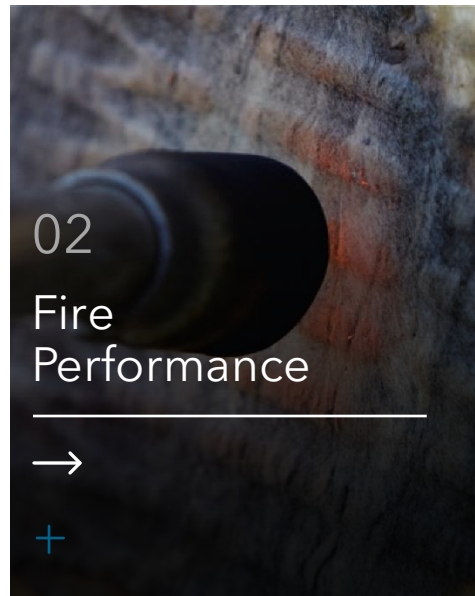
(Listen using in-ear headphones)

Higher NRC

Shorter
Reverberation Time

Students **Understand
more words**

Performance attributes of Stone Wool Ceiling Tiles



3 elements of fire



Fire Triangle

Removing any of the **3 elements** in the triangle will stop a fire.

A fire needs 3 elements in order to ignite:

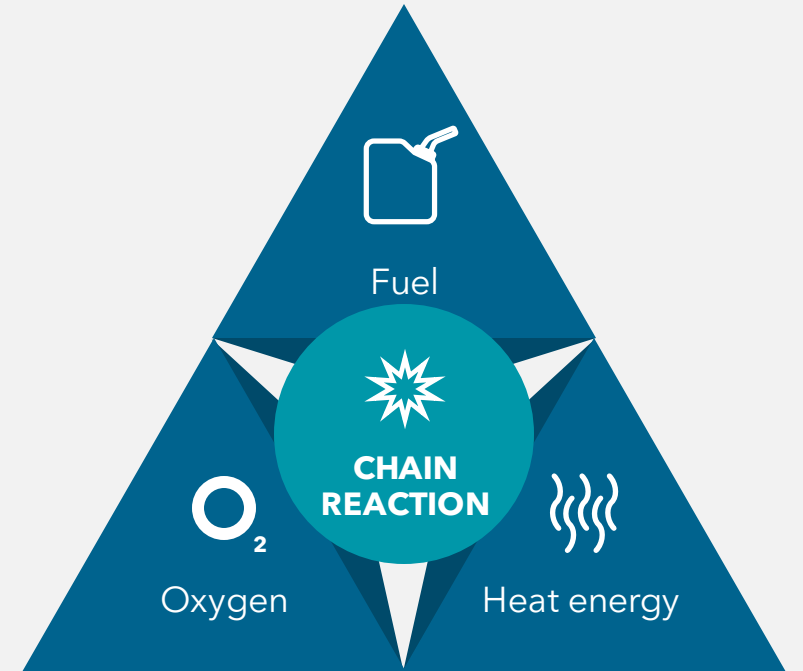
Fuel

+

Oxygen

+

Heat energy



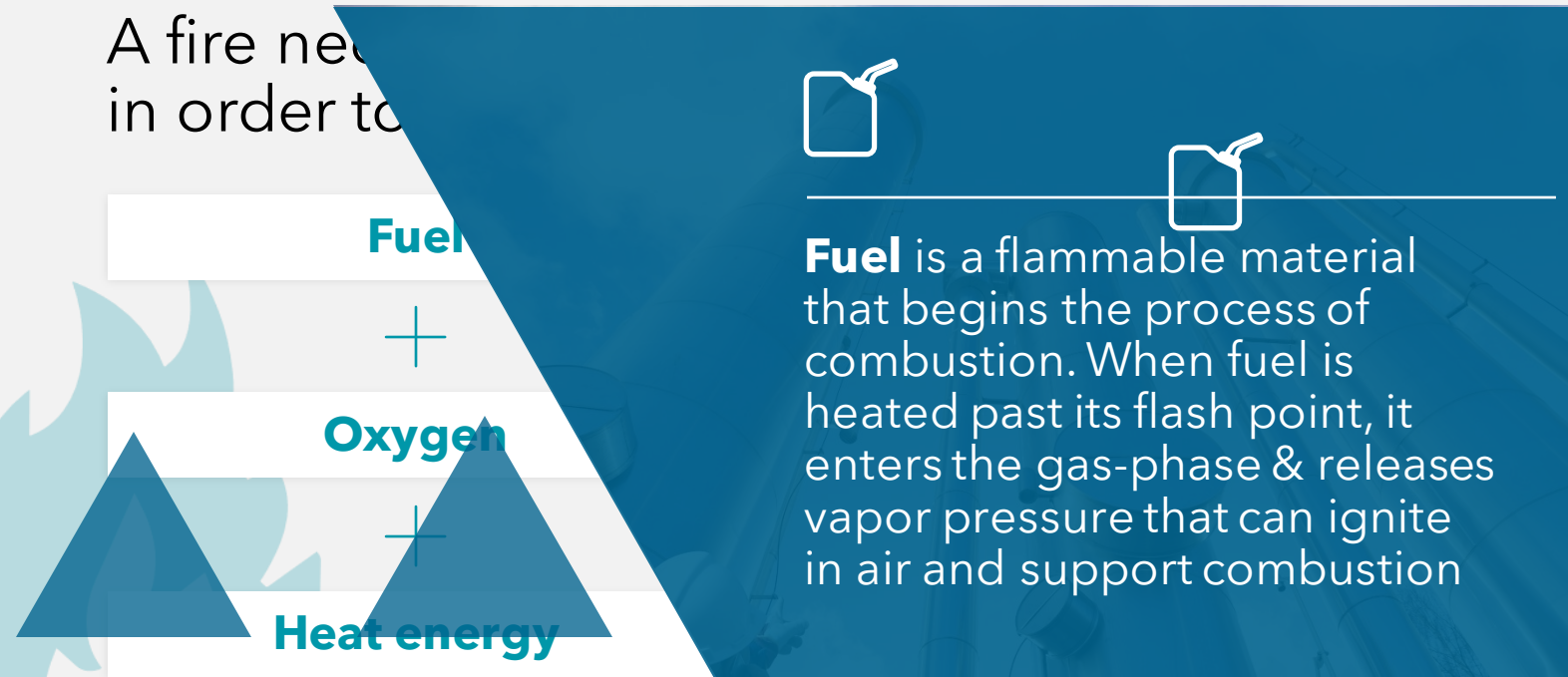
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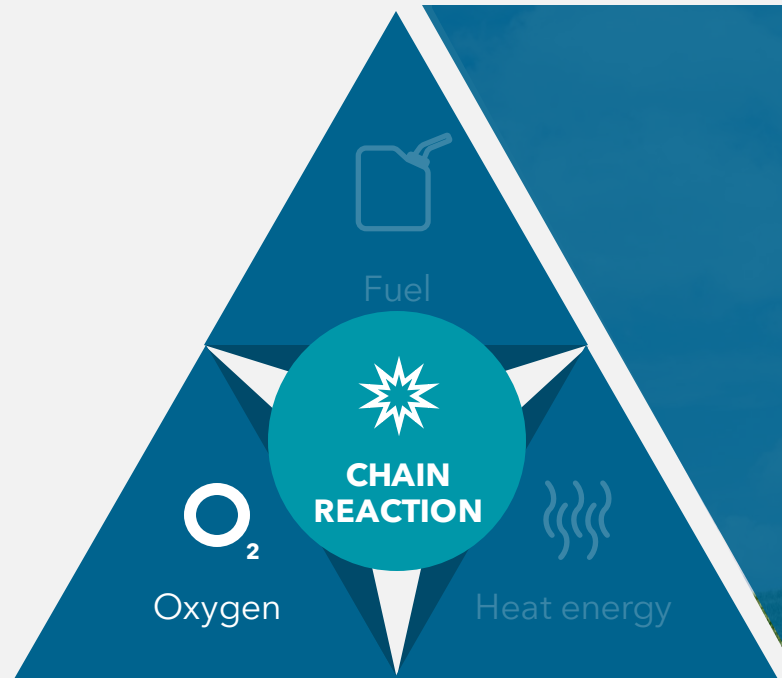
Fuel

+

Oxygen

+

Heat energy



Oxygen supports burning due to oxidation. This is when gases released by fuel heat up, break apart, & recombine with oxygen.

This is what causes burning to begin

3 elements of fire



A fire needs 3 elements in order to ignite:

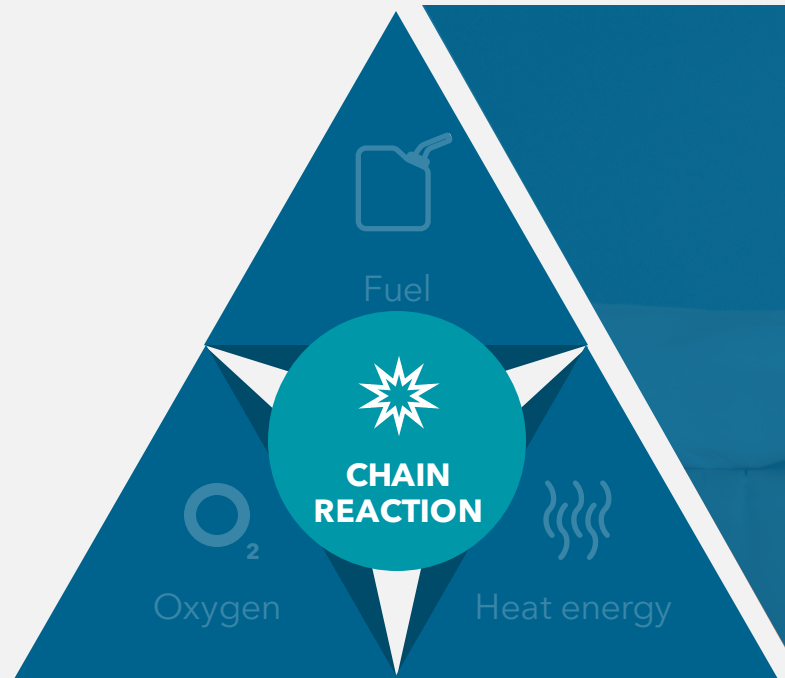
Fuel

+

Oxygen

+

Heat energy



Uninhibited chain reactions are when heat is constantly being produced as a result of ongoing reactions. This is what makes the fire self-sustaining

3 elements of fire



A fire needs 3 elements in order to ignite:

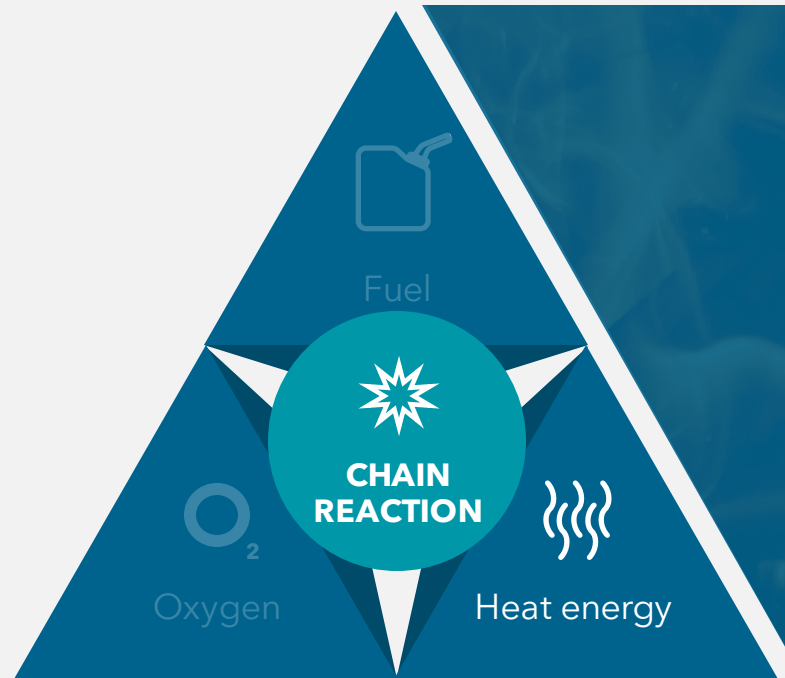
Fuel



Oxygen



Heat energy



Heat energy is produced during combustion because the reaction is exothermic. Since these reactions are ongoing, combustion releases more than enough heat to make the fire self-perpetuating.

3 elements of fire



A fire needs 3 elements in order to ignite:

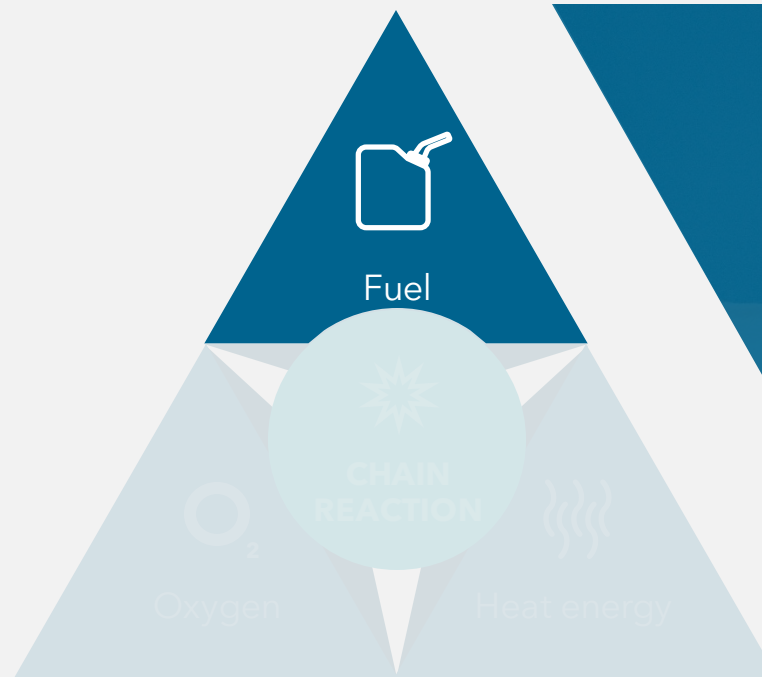
Fuel



Oxygen



Heat energy



Materials with a low reaction to fire (like Stone Wool) can achieve best in Class A range fire performance without significantly contributing to fire.

Stone Wool withstands temperatures of 2700°F - endures longer providing minimal contribution to flame and smoke spread.

Design Considerations

Selecting the right building materials delays fire spread, giving vital extra minutes to save lives and limit building damage.

Fire resistant materials can help create a safer indoor environment.

Performance & Test Method

ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials

Class A

Flame Spread Index
0 - 25

Smoke Developed Index
0 - 50

Acoustical materials typically have a Class A rating.

Class B

Flame Spread Index
26 - 75

Smoke Developed Index
0 - 450

Class C

Flame Spread Index
76 - 200

Smoke Developed Index
0 - 450

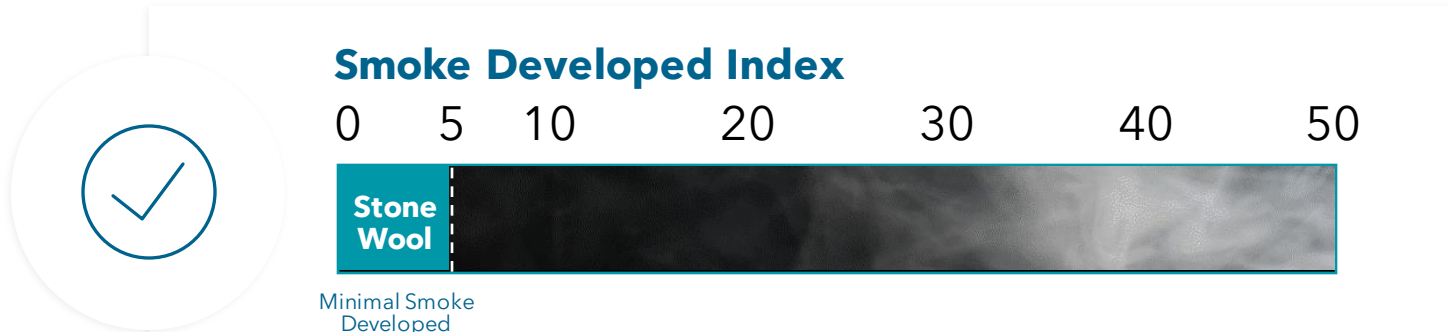
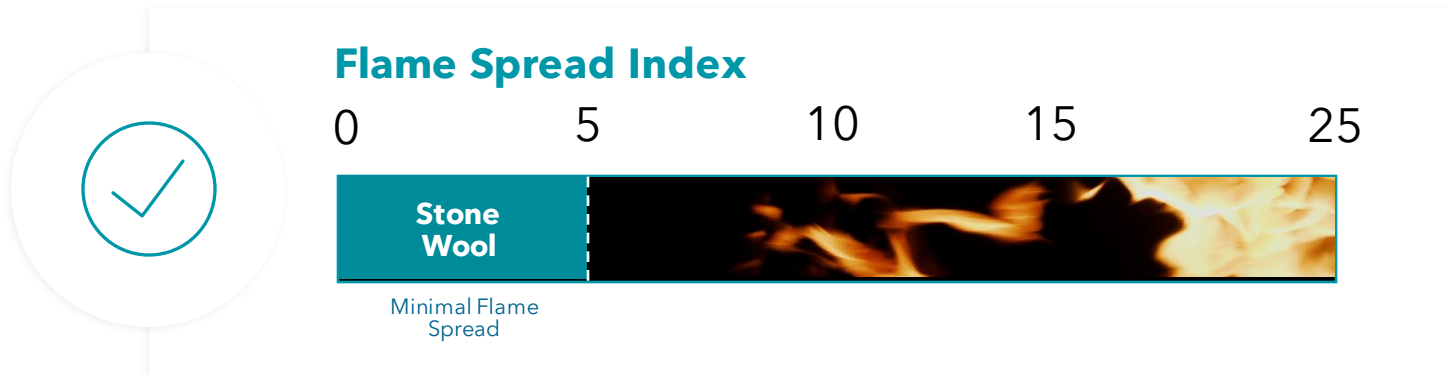
Stone Wool Ceiling Tiles Fire Performance



Fire resilience

When specifying acoustic products, prioritize those that fall within **Class A range**, with **flame** and **smoke results as close to 0** as possible, **minimizing fire and smoke impact**.

Class A:



Results apply to all standard Stone Wool white surface tiles and panels



Performance attributes of Stone Wool Ceiling Tiles



Humidity resistance



Humidity can weaken the structure of materials and cause them to sag, drooping beneath their ceiling suspension system.

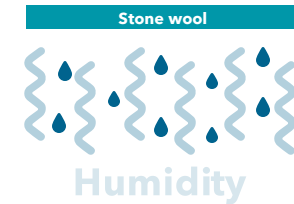
Ceiling should **not** rot, corrode or promote the growth of mold or bacteria.

Performance & Test Method

ASTM C367 - Standard Test Methods for Strength Properties of Prefabricated Architectural Acoustical Tile or Lay-In Ceiling Panels



Some materials can **lose** shape over time



Stone Wool retains its robust shape over time

Stone Wool ceiling tiles are inherently hydrophobic. Stone Wool remains dimensionally stable and sag-resistant even up to 100% relative humidity (RH) and in temperatures ranging from 32 to 104°F(0-40°C)

Humidity resistance



Design Considerations

Humidity can have a significant impact on indoor environments, affecting both the comfort of occupants and the overall condition of the building.

Humidity can cause:



Materials Deterioration (rot, corrosion degradation)



Mold and Mildew Growth



Affect Indoor Air quality



Lack of Aesthetic Appeal



Safety Concern (structural failures)

Humidity Resistant materials like Stone Wool provide:



Durability



Mold and Mildew resistance



Safe Indoor Air quality

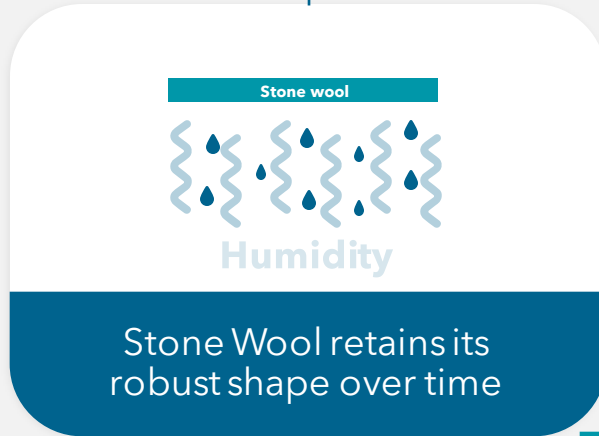


Aesthetic Appeal



Safety

Humidity resistance



Hydrophobic

Stone Wool tiles are inherently resistant to moisture and can be installed in environments with up to 100% relative humidity:

Sag resistance protects installations from unexpected climate and environmental issues

- No sagging | No drooping | No warping

Tiles are tested according to ASTM C367 for sag resistance

Performance not affected by temperature changes and humidity



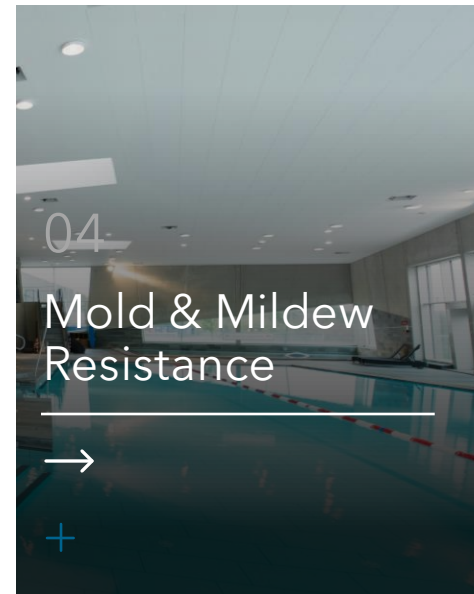
No Acclimatization Required

Stone Wool tiles can be installed at temperatures between 32° and 104° degrees, and tested in up to 100% humidity:

Tiles can be delivered to the job site before the building is fully enclosed

Installation can be done during the very early stages of the building

Performance attributes of Stone Wool Ceiling Tiles



Mold and mildew resistance



Design Considerations

According to **UL Environment**, indoor air is **two to five times more polluted than outdoor air**. Yet we spend over **90 %** of our lives indoors.*



Eye, nose and throat irritation



Coughing and phlegm build-up



Wheezing and shortness of breath



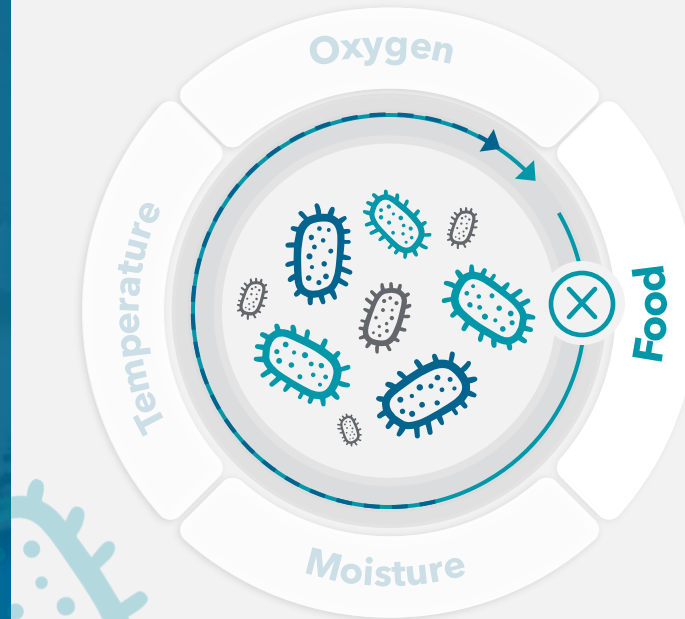
Allergic reactions

Mold and mildew resistance



Stone Wool ceiling tiles surface and core effectively provide no sustenance to mold or harmful bacteria.

Fungicides / antimicrobials **not added** to achieve mold-resistance.



Stone Wool

Stone Wool

Stone Wool **does not serve as a food source, thus disrupting the complete mold cycle**

Mold and mildew resistance



Water repellent stone wool has **no nutritional value**.

Provides **no sustenance** to harmful micro-organisms.

Products designed for Medical use have been classified **ISO Class 5**, or better, in accordance with **ISO 14644-1**.

Performance & Test Method

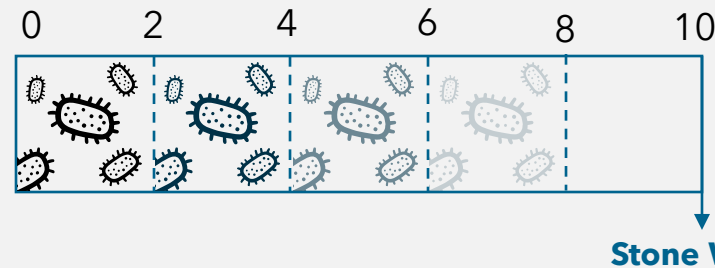
ASTM D3273 – standard test method for resistance to growth of mold on the surface of interior coatings

ASTM C1338 – Standard test method for determining fungi growth resistance of insulation materials and facings

Scale of 0 to 10

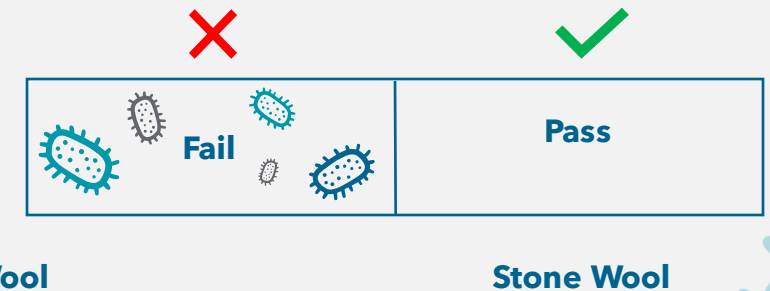
10 being highest performing

Stone Wool = 10
(No mold growth)

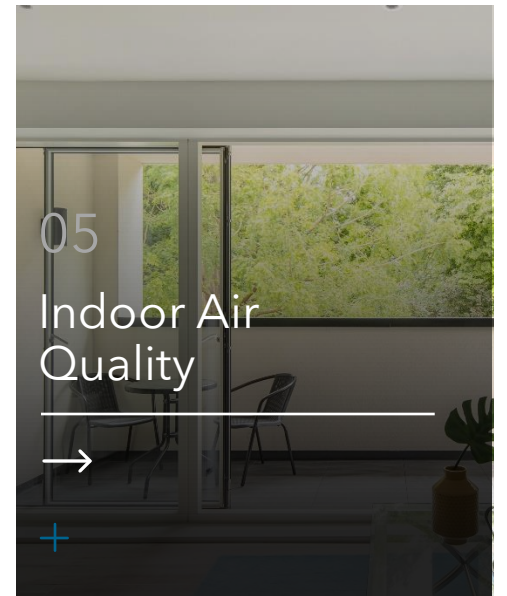


Pass or fail

Stone Wool tiles - pass



Performance attributes of Stone Wool Ceiling Tiles



Design Considerations

VOC's (Volatile Organic Compounds) are present in building materials.

Choosing 3rd party verified **low VOC** products **can improve indoor air quality**



Indoor air quality fact

*50 or more VOCs are often found to exist at average concentrations of 200ppb (existing buildings) and even 1000ppb (new buildings), which are more than those in outside air.

Elements that need to be considered in bio-informed design are ventilation, lighting, temperature, noise levels and the most prevalent, interior air pollutants, including Volatile Organic Compounds (VOCs) and microorganisms.

Indoor Air Quality



Products that meet **test criteria** can be **GREENGUARD Gold Certified**, indicating they meet stringent standards for **low VOC emissions** and are **safe** for use in indoor environments.

GREENGUARD Gold certification aligns with the **low VOC standards** set by the **California Department of Public Health (CDPH)**.

Performance & Test Method

UL 2818 - test method that measures Volatile Organic Compound (VOC) emissions from indoor sources using dynamic environmental chambers. **Measures release of VOCs.**

UL GREENGUARD Gold
Pass

UL GREENGUARD
Pass

No UL GREENGUARD
Fail



Stone Wool tiles and panels are **3PV UL GREENGUARD Gold** certified regardless of edge type or size.

Stone Wool tiles demonstrate exceptional performance in the following areas



ASTM C423



**ASTM E84
CAN/ULC S102**



ASTM C367



**ASTM D3273
ASTM C1338**



UL 2818



04

Creating inspirational
spaces with Stone Wool
Ceiling Systems

Design Attributes

Surfaces | Edges | Sizes



Waste Management Corporate Headquarter , TX, USA - LEED Platinum

Surfaces - Stone Wool Acoustical Ceiling Systems



Strong | Monolithic | Modern | Sleek



Grundfos, Brookshire, TX USA - **LEED Platinum**



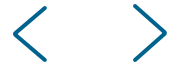
Architects Hawaii Ltd., HI, USA



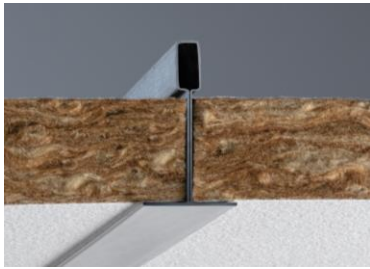
The University of Texas at Dallas - Sciences Building, Dallas, TX - **LEED Gold**

Stone Wool Acoustical Panels Edge Types

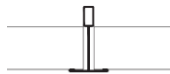
From Traditional to a Modern Seamless Feel



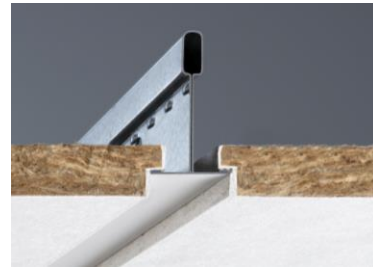
SQ



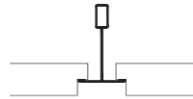
Square Lay-In
15/16", 9/16", 1 3/8"



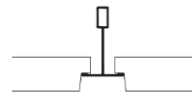
SL, SLT, SLN



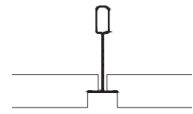
Reveal Edge
15/16", 9/16"



SL - Square Tegular

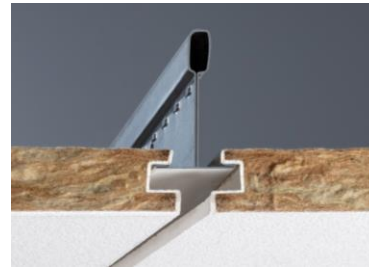


SLT - Angled Tegular

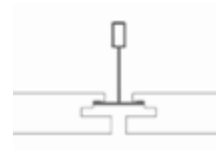


SLN - Square Tegular Narrow

SCD



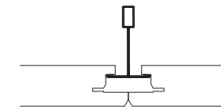
Semi-Concealed Edge
15/16"



CDX



Concealed Edge
15/16"



DMT



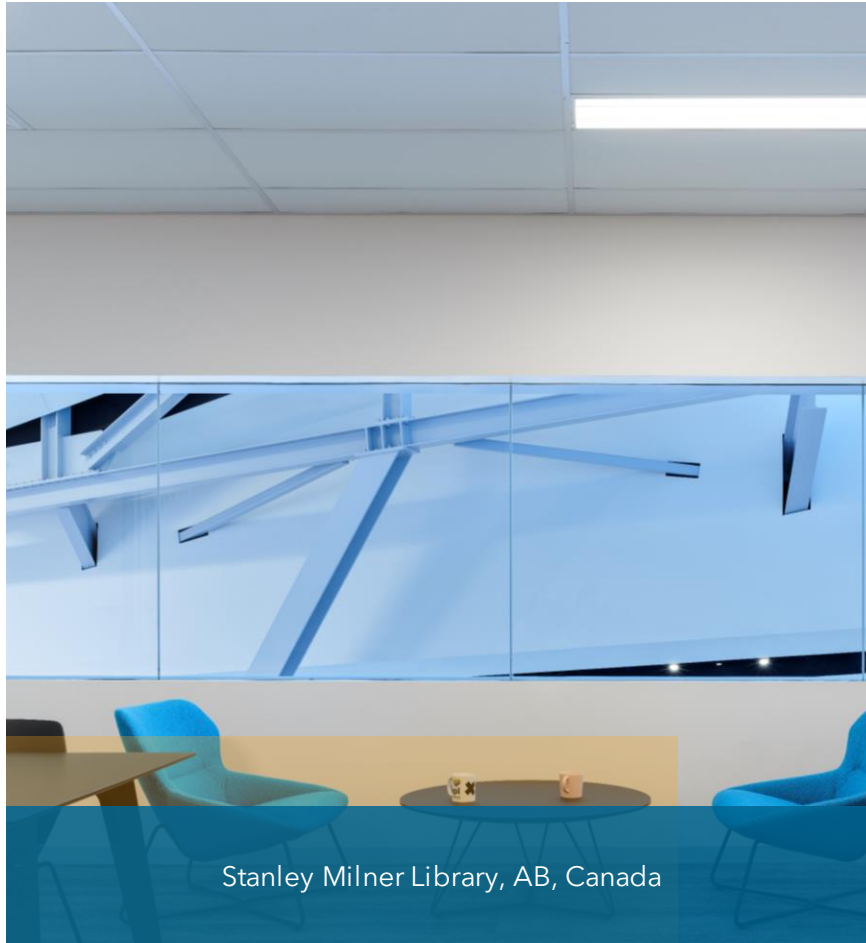
Direct Mount



Moving from traditional to modern sleek look



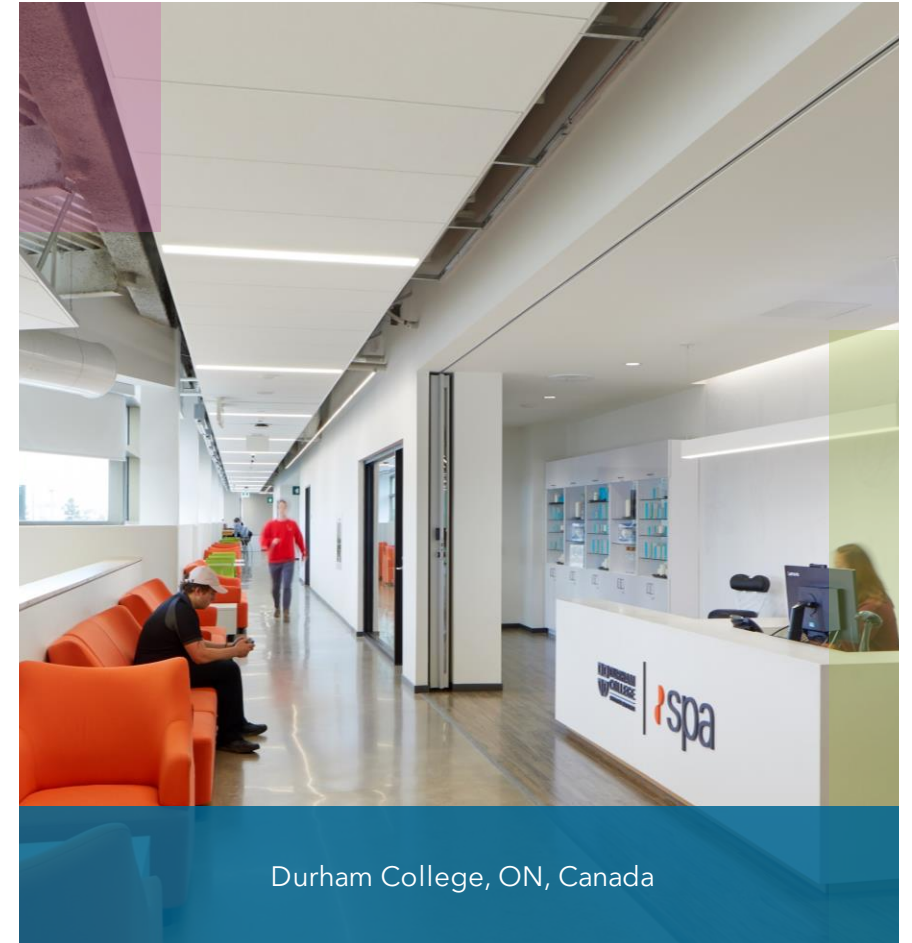
Square Lay-in Edge



Reveal Edge



Concealed Edge



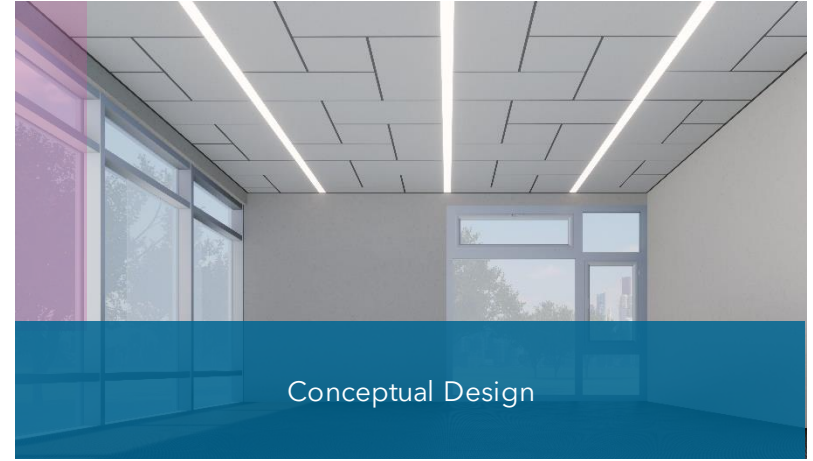
Sizes - Stone Wool Acoustical Ceiling Systems



Grundfos, TX, USA



Collin College Wylie Campus, TX, USA



Conceptual Design



Aercoustics, ON, Canada



05

Summary of **Rockfon** portfolio

Rockfon - Acoustic Stone Wool Ceilings

Stone Wool ceiling panels, NRC 0.60 - 1.05



Toronto Metropolitan University, Daphne Cockwell Health Sciences Complex (DCHSC), Toronto, ON - **LEED Gold**

Colors

Stone Wool Acoustical Ceiling Systems



The Spy Museum, DC, USA

Shapes and forms - Stone Wool



Dimensional stability - passes all rigorous testing processes for compliance



Solar Spectrum, MO, USA



Marsh & McLennan Agency, MN, USA



Woonzorgcentrum De Schuylenburgh
Azora, The Netherlands

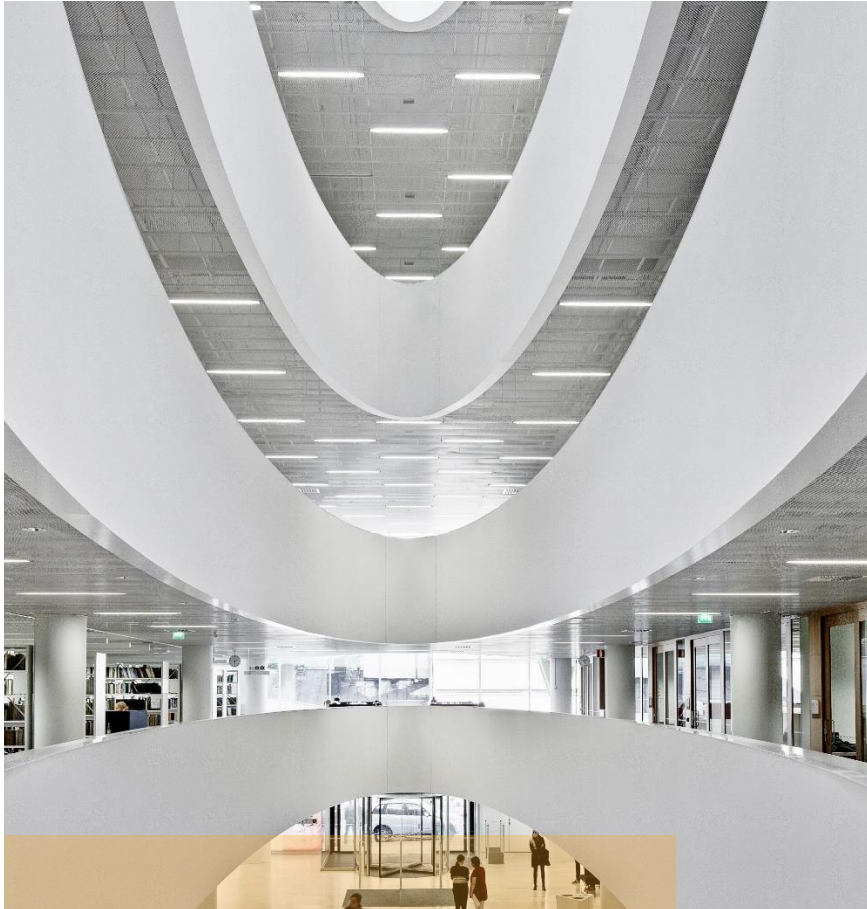


Canada Science and Technology Museum, ON,
Canada

Shape - 2D - squares, rectangles, etc.

Form - baffles, islands, clouds

Rockfon - Mono Acoustic Ceilings



Kaisa House, Helsinki, Finland



Nieuwe Rechtbank, The Netherlands

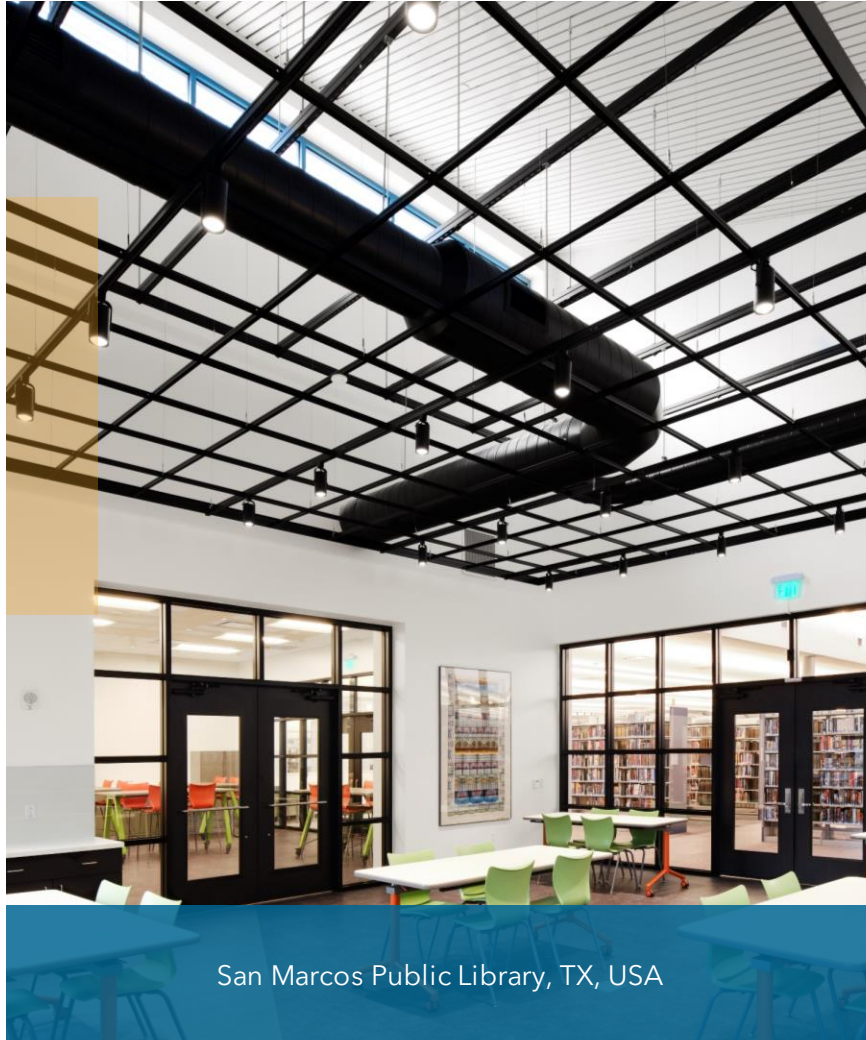


Stockholm Station, Sweden

Rockfon Chicago Metallic - Suspension Systems



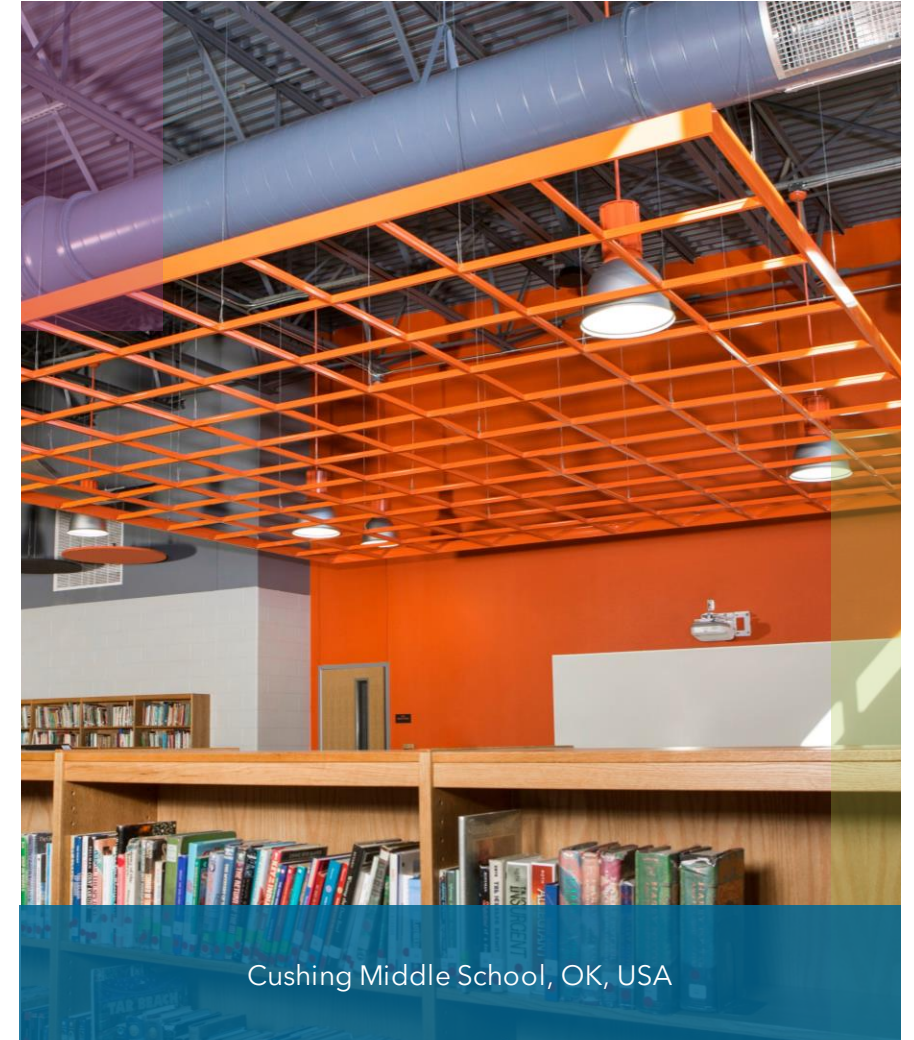
15/16", 9/16", cleanroom, bolt slot, drywall, specialty systems



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Cushing Middle School, OK, USA

Rockfon - Acoustic Metal Ceilings

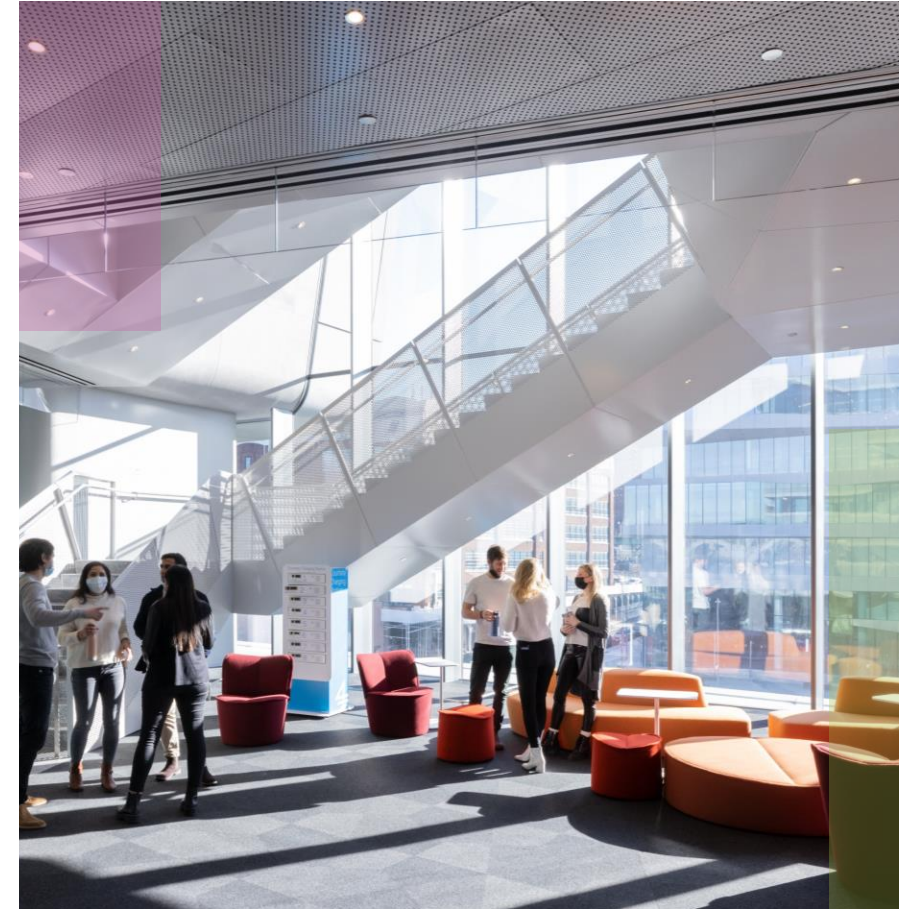
Linear, panels, planks, perimeter trim, curved, open cell



St. Petersburg High School, FL, USA



Morgan State University, MD, USA



Columbia Business School, NY, USA - **LEED Gold**

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