BARRISOL®

Architects : Lab Architecture Studio & Bates Smart

Acoustic & Design Solutions

for public and private spaces

Restaurant - Switzerland
Architect : CCHE Architecture

CONTENTS

BARRISOL®
ACOUSTICS®

Fighting Noise Pollution

Noise pollution, as defined by the European Directive of June 25, 2002, is a serious concern to many people. According to opinion surveys, noise pollution is regularly cited as one of the many annoyances people encounter in their daily lives.
According to an October 2002 INSEE survey, 54% of French people stated that they considered noise pollution to be a serious problem.

Restaurant Ile Cortiles - France
Architect : Tony D'ONGHIA - Studio d'Onghia

Dealing with the problem of noise pollution is becoming increasingly important in spaces where noise volume is naturally high (cinemas, night clubs, restaurants, etc.), and also in private interiors (living rooms, dining rooms, home theater room, etc.) where speech intelligibility is important.
When the human body encounters excessive noise the usual results are fatigue and stress.

Methods for controlling sound levels and reducing noise pollution are evolving and improving constantly. Top designers are always working to ensure that new buildings are designed with acoustic concerns in mind. There are a wide variety ways to fight effectively against noise pollution using different designs and types of construction.

BARRISOL® offers the ability to improve acoustic comfort thanks to a line of micro-perforated sheets called BARRISOL® ACOUSTICS®.

BARRISOL®
ACOUSTICS®

Introducing BARRISOL® ACOUSTICS®

To respond to the need for construction products that offer high quality, adaptability, high performance, creativity and enhanced security, Barrisol offers a new line of products, BARRISOL® ACOUSTICS®.

BARRISOL® ACOUSTICS® offers four unique, acoustic stretch ceiling systems : Miniperf®, Microacoustic®, Acoperf® and Microperf®.

The BARRISOL® ACOUSTICS® line of sheeting has already satisfied users throughout the world by significantly improving the acoustics of enclosed spaces. In the past, the acoustic comfort of many spaces suffered from a lack of attractive options for sound absorption. Barrisol® sheets are attractive, functional, easy to install and easy to clean.

Design

Acoustic

Office - Germany
Architect: Bredt & Partner

Made to exact measurements of each location, BARRISOL® sheets can be adapted to any space and can be removed, reinstalled or changed out at any time.

BARRISOL® ACOUSTICS® line guaranties greater comfort and a better quality of life in a quieter environment thanks to its acoustic absorption. By absorbing the noise around you, BARRISOL® helps reduce the noise level in any enclosed space.

BARRISOL® is also concerned with environmental pollution and sustainability. All BARRISOL® sheeting and perimeter systems are 100% recyclable.

Installation

Ecology

BARRISOL®
ACOUSTICS®

BARRISOL® ACOUSTICS® & Design

BARRISOL® ACOUSTICS® combines design elegance with acoustic quality. Why should you have to choose between good acoustics and elegant design? Barrisol offers acoustic ceilings that are made to order, adaptable to any number of different types of spaces and are an ideal way to enhance your design.

BARRISOL® ACOUSTICS® line includes more than 230 colors and 15 different finishes such as:

- Laquers
- Satins
- Matts
- Brushed Suede
- Metallics
- Translucents
- Recycled
- Perforated

Theatre - Germany
Architect : Aydin SESIGUR

Federation Square - Australia
Architect: Lab Architecture Studio & Bates Smart

University of Fribourg - Germany
Architect : Mailander

Now there is no limit to the amount of creativity that you can bring to your interior design. Each individual space can now be customized to meet the designer's individual tastes and the needs of each space.

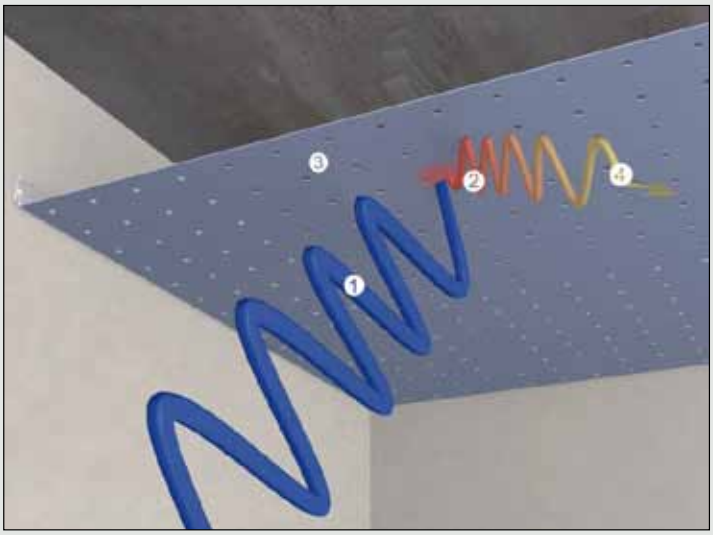
Sound absorption no longer has to come at the expense of design. Sound absorption can now compliment your design and help you provide acoustic comfort and a pleasant atmosphere in almost any space.

BARRISOL® ACOUSTICS® technology can be integrated into public spaces such as museums, airports, churches, restaurants or music venues. Any space where occupant comfort is important is an ideal application for BARRISOL®.

BARRISOL® ACOUSTICS®

The Physics of Sound Absorption

Acoustic absorption relates to the attempt to reduce the intensity of the sound waves as they reflect within a room. The wave that emanates from a sound source is partially absorbed by the BARRISOL® sheet thereby reducing reverberation. Please note that this is quite different from acoustic isolation that relates to the transmission of noise from one space to another.
The BARRISOL® sheet also lets a portion of the sound energy pass through it. As the sound waves continues to reverberate around the room, energy loss continues and the sound in the space is reduced.



❶ Initial sound
❷ Transformation of the sound into thermal energy
❸ BARRISOL® ACOUSTICS®
❹ Reduced sound

The physics of the sound absorption and the sheeting itself make BARRISOL® ACOUSTICS® sheets an ideal sound absorption device. Micro-perforations transform the acoustic energy in thermal energy. The viscous friction created when the sound wave meets the air in the micro-perforations is accentuated by the resistance of the air volume enclosed between the material and the ceiling cavity.

The technology built into BARRISOL® ACOUSTICS® sheeting allows it to obtain spectacular acoustic results.

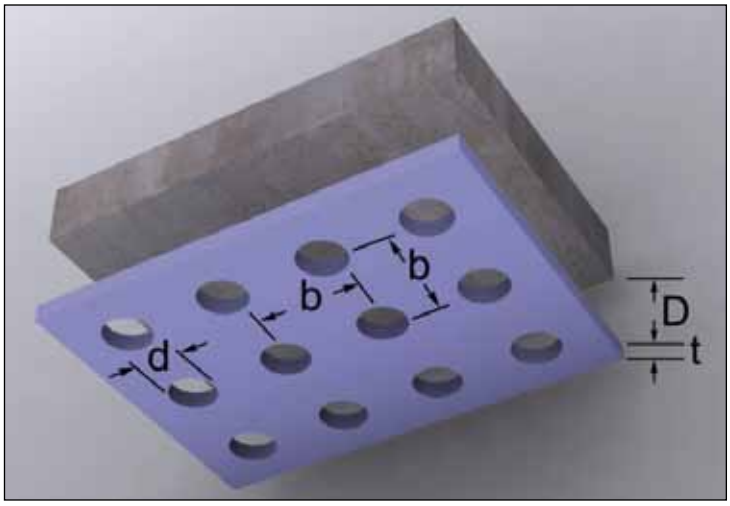
National Assembly - Adzerbaijan
Architect: Pim Design Group Istanbul

The four factors that determine acoustic absorption

The acoustic absorption coefficient α of BARRISOL® ACOUSTICS® depends on four factors:

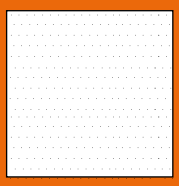
- the diameter "**d**" of the distance between the holes,
- the pattern of micro-perforation "**b**"
- the thickness of the sheet "**t**"
- the airspace behind the sheet and the ceiling above "**D**"

These four factors allow a designer to choose the best BARRISOL® ACOUSTICS® perforation style for their particular application.



BARRISOL®
ACOUSTICS®

A10 MICROPERF®



Features

Holes : **500 000/m²**
Hole diameters : **≈ 0,1 mm**
Perforation rate : **≈ 1 %**
Thickness : **≈ 0,18 mm**
Reference : **A10 + ref. colour**

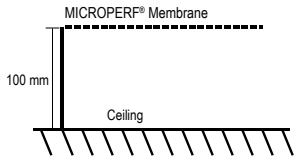
Architecte : URS Corporation

Baltimore Airport (USA) with BARRISOL® MICROPERF®

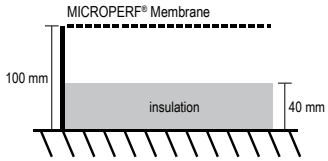
The Baltimore's airport is one of the most significant projects to utilize BARRISOL® as a means of acoustic control. Airport terminals are immense places with high ceilings and are subjected to significant acoustic disruption from the outside due to air traffic. In addition, crowd noise can often make airport terminals disorienting and confusing.

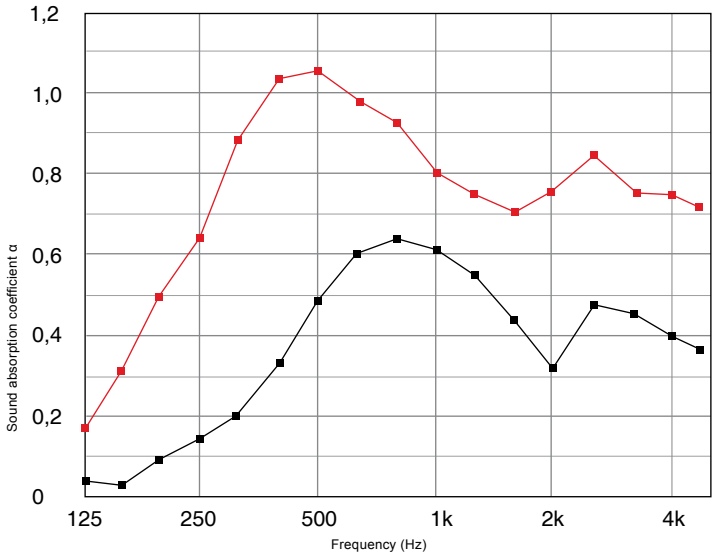
To improve the acoustic comfort of the terminal for its occupants, white matt BARRISOL® MICROPERF® was chosen as the best solution to balance aesthetics and the functional need for sound control.
The results obtained were much better than expected by airport administrators. The terminal is now more acoustically comfortable and the space benefits from the modern feel of the BARRISOL® elements.

■ **Microperf® without insulation**



■ **Microperf® with insulation**

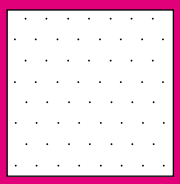




Sound absorption ratings

Sound Absorption Average according to ASTM C423-01	SAA = 0.40	SAA = 0.82
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.40	NRC = 0.80
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,40	α_w=0,85
Sound Absorber class according to DIN EN 11654	D	B

A20 ACOPERF®

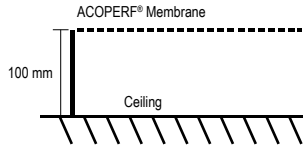


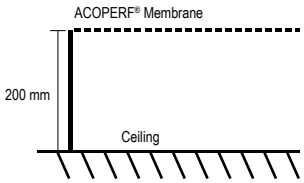
Features

Holes : **400 000/m²**
Hole diameters : **≈ 0,15 mm**
Perforation rate : **≈ 0,8 %**
Thickness : **≈ 0,18 mm**
Reference : **A20 + ref. colour**

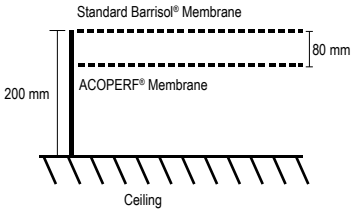
Acoperf® without insulation

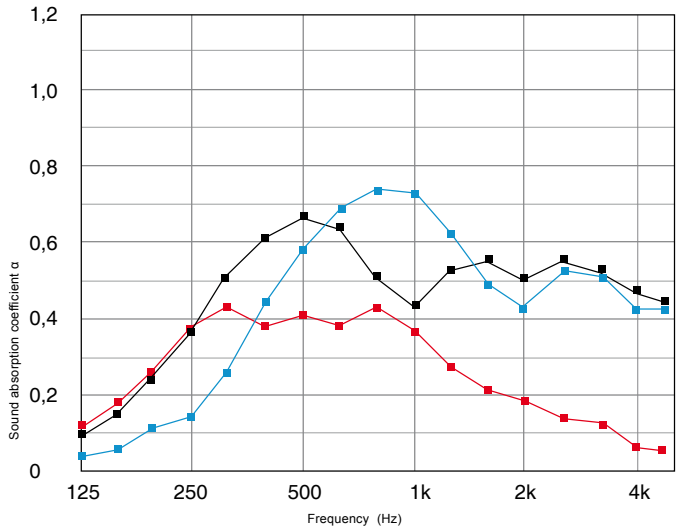
- **Acoperf® installed with 100 mm cavity**
- **Acoperf® installed with 200 mm cavity**





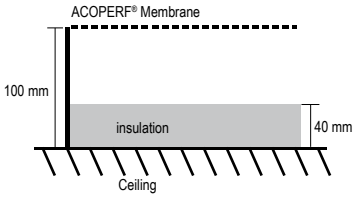
- ***Acoperf®* installed with 200mm doubled of a standard non-perforated BARRISOL® sheet**
  (with the perspective to use it as a lacquer or as a printed ceiling for example)



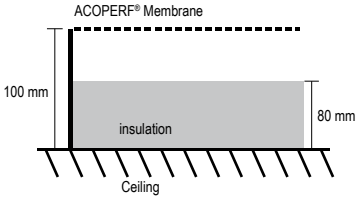


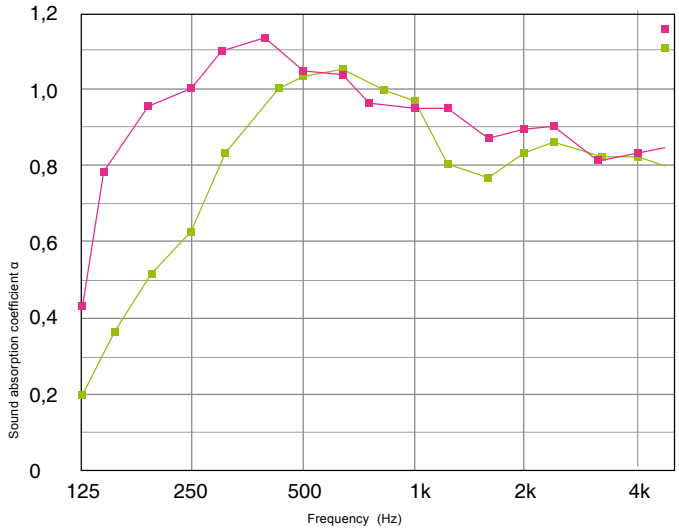
Acoperf® with insulation

- **Acoperf® installed with 100 mm cavity with 40mm insulation**



- **Acoperf® installed with 200 mm cavity with 80mm insulation**



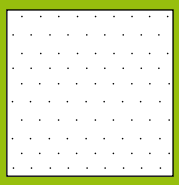


Sound absorption ratings

Sound Absorption Average according to ASTM C423-01	SAA = 0.48	SAA = 0.52	SAA = 0.32	SAA = 0.86	SAA = 0.99
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.50	NRC = 0.50	NRC = 0.35	NRC = 0.90	NRC = 1.00
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,50	α_w=0,55	α_w=0,25 (L)	$\alpha\alpha_w$=0,90	$\alpha\alpha_w$=0,95(L)
Sound Absorber class according to DIN EN 11654	D	D	E	A	A

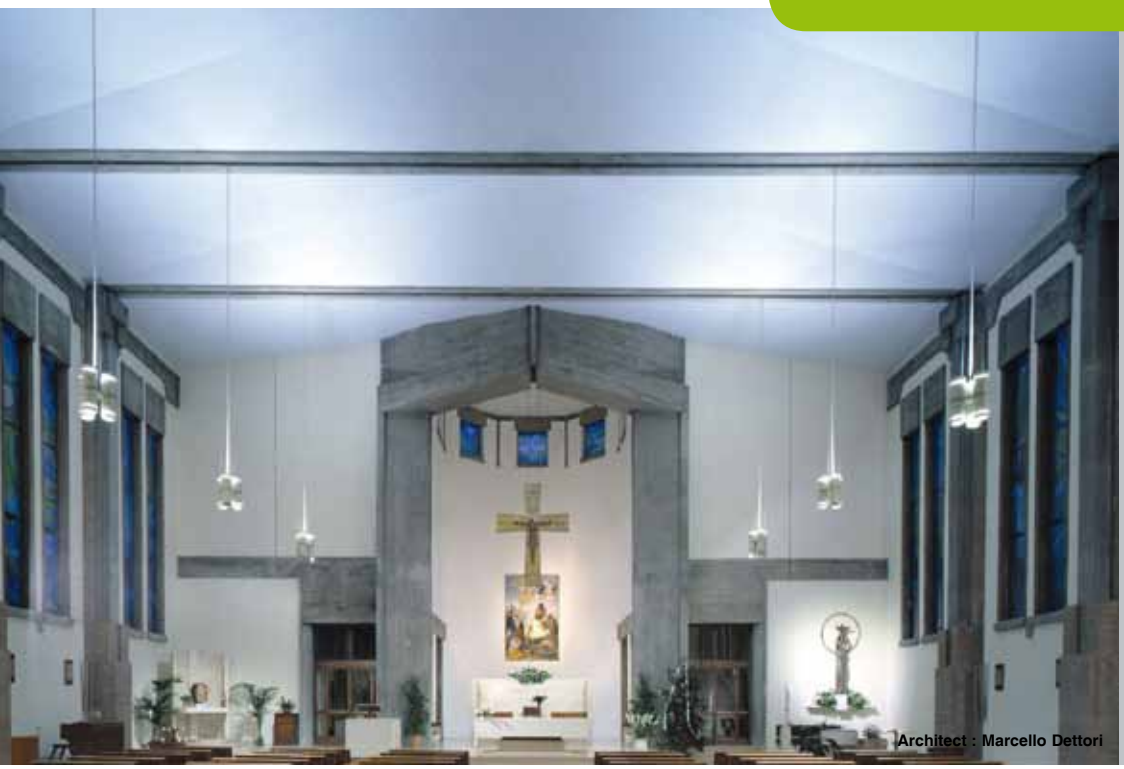
BARRISOL®
ACOUSTICS®

A30 MICROACOUSTIC®



Features

Holes : **300 000/m²**
Hole diameters : **≈ 0,2 mm**
Perforation rate : **≈ 0,6 %**
Thickness : **≈ 0,18 mm**
Reference : **A30 + ref. colour**

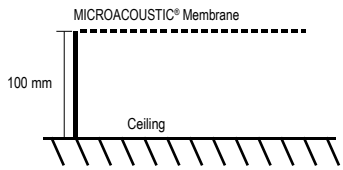


*Agnese de Modena Church (Italy) with **BARRISOL® MICROACOUSTIC®***

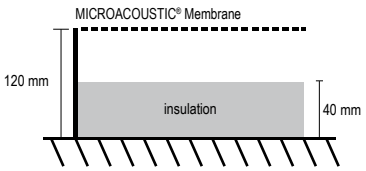
The Church of Agnese de Modena in Italy had acoustical problems. Most of the surfaces in the worship space (plaster, glass, stone & wood) were sound reflectors. Glass and wood absorbs only low frequency sound waves so the sound in the sanctuary was out of balance with an unusually high amount of high frequency resonance. The objective of this acoustic renovation was to considerably reduce reverberation time and to smooth out the frequency curve.

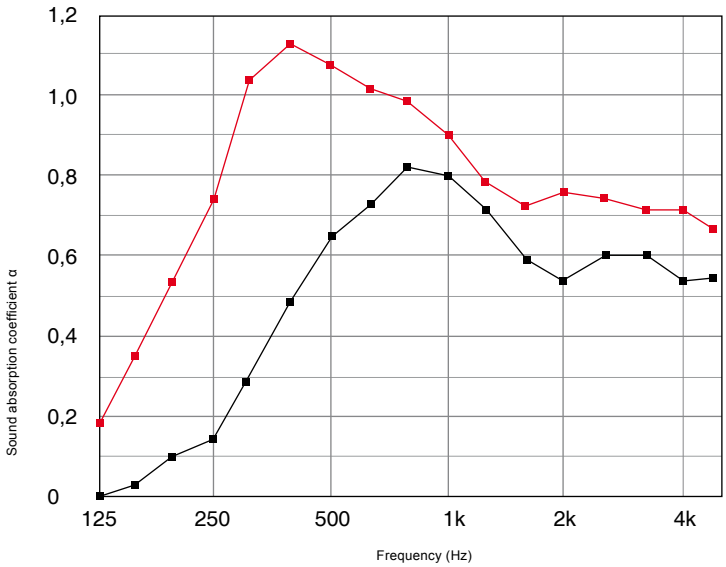
One of the tremendous advantages of BARRISOL® MICROACOUSTIC® sheeting is that the degree of absorption can be adjusted precisely for the unique form of each room. By choosing the right distance between BARRISOL® MICROACOUSTIC® and the ceiling above, the optimal amount of sound absorption can be achieved. For this particular application, the optimal size of the airspace was determined to be 200 mm.

■ **Microacoustic® without insulation**



■ **Microacoustic® with insulation**





Sound absorption ratings

Sound Absorption Average according to ASTM C423-01	SAA = 0.54	SAA = 0.86
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.50	NRC = 0.90
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,50(M)	α_w=0,80
Sound Absorber class according to DIN EN 11654	D	B

A40 MINIPERF®

Features

Holes : **30 000/m²**
Hole diameters : **≈ 0,5 mm**
Perforation rate : **≈ 5%**
Thickness : **≈ 0,30 mm**
Reference : **A40 + ref. colour**

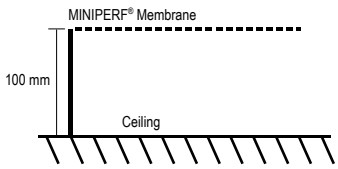
Architect : Kerez, Moger & Degelo

Vaduz Art Museum (Lichtenstein)
BARRISOL® LUMIERE®
& BARRISOL® MINIPERF®

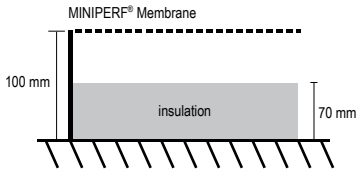
Translucent Barrisol® ceilings havegreat aesthetic value and offer optimal translucence and acoustic control. Thanks to integrated, intelligent light diffusing technology, Barrisol ceilings highlight the artwork within the Museum of Arts in Vaduz. Under a glass roof equipped with a sophisticated light technology that provides the identical amount of light both day and night, the Barrisol® lighted ceiling help create a truly unique, one-of-a-kind space.

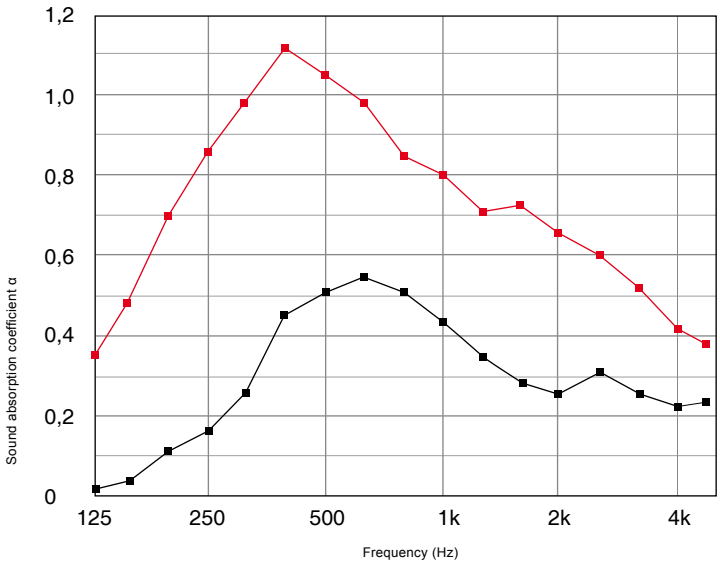
Thanks to the BARRISOL® MINIPERF® sheeting, reverberation is immediately absorbed. Because of this, even rooms with high ceilings, which are commonly found in art museums, can still provide a pleasant acoustic environment.

■ **Miniperf® without insulation**



■ **Miniperf® with insulation**





Sound absorption ratings

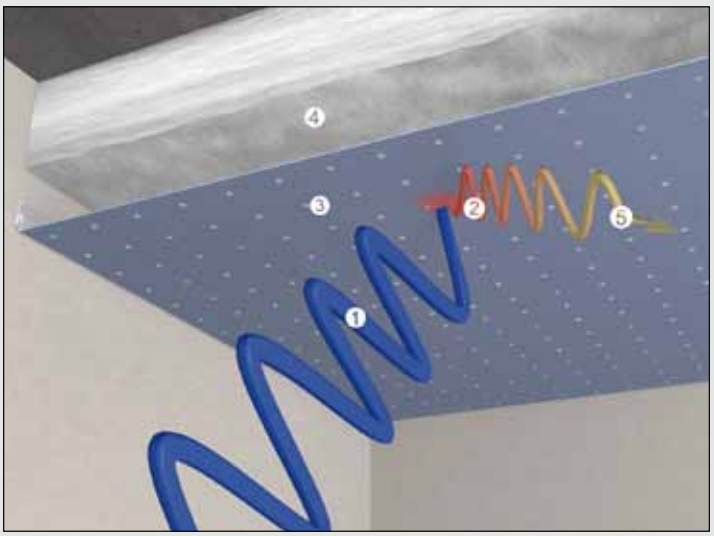
Sound Absorption Average according to ASTM C423-01	SAA = 0.35	SAA = 0.83
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.30	NRC = 0.85
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,35	α_w=0,65(Lm)
Sound Absorber class according to DIN EN 11654	D	C

Other perforated acoustic sheets

BARRISOL MEDIPERF®, MEZZOPERF® and MAXIPERF® perforated sheets have acoustic capabilities similar to the micro-perforated sheets.

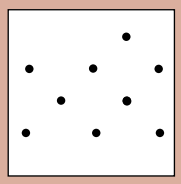
Although the perforations of these four sheets are larger than the micro-perforated sheets of the ACOUSTICS® line, they still have excellent acoustical properties. Their acoustical properties, along with their unique appearance, significantly increase the number of possible applications of these unique sheets.

When used in conjunction with a sound insulator placed behind the sheeting, BARRISOL's micro-perforated sheets provide superior acoustics and help ensure an aesthetic and functional result.



1. Initial sound
2. Transformation of the sound into thermal energy
3. BARRISOL® perforated
4. Insulator
5. Reduced sound

P10 MEDIPERF®



Features

Holes : **10 000/m²**
Hole diameters : **≈ 1 mm**
Perforation rate : **≈ 4%**
Thickness : **≈ 0,18 mm**
Reference : **P10 + ref. colour**

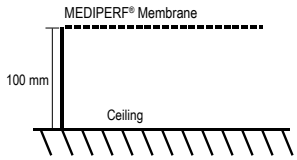
Architect : Alain Bitsch

St Peter Church - St Louis (FRANCE) with BARRISOL® MEDIPERF®

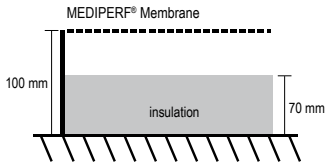
Before the installation of the BARRISOL® MEDIPERF® ceiling, St. Peter's Church of St Louis had many of the same problems as other religious buildings. Although the sound level was sufficient, because of excessive reverberation the intelligibility was low.

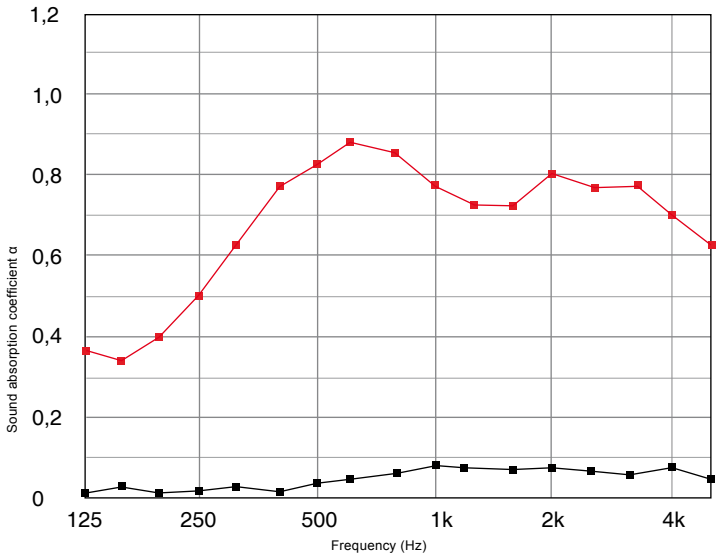
During musical performances, the instruments covered each other and decreased the enjoyment of both the musicians and the audience. Since the installation of BARRISOL® MEDIPERF® the sound is diffused in a harmonious way. Each instrument now has its own, distinct voice and the audience is better able to enjoy the music.

■ **Mediperf® without insulation**



■ **Mediperf® with insulation**



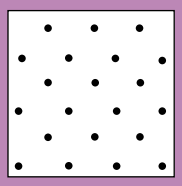


Sound absorption ratings

Sound Absorption Average according to ASTM C423-01	SAA = 0.10	SAA = 0.77
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.10	NRC = 0.80
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,10	α_w=0,80
Sound Absorber class according to DIN EN 11654	not ranked	B

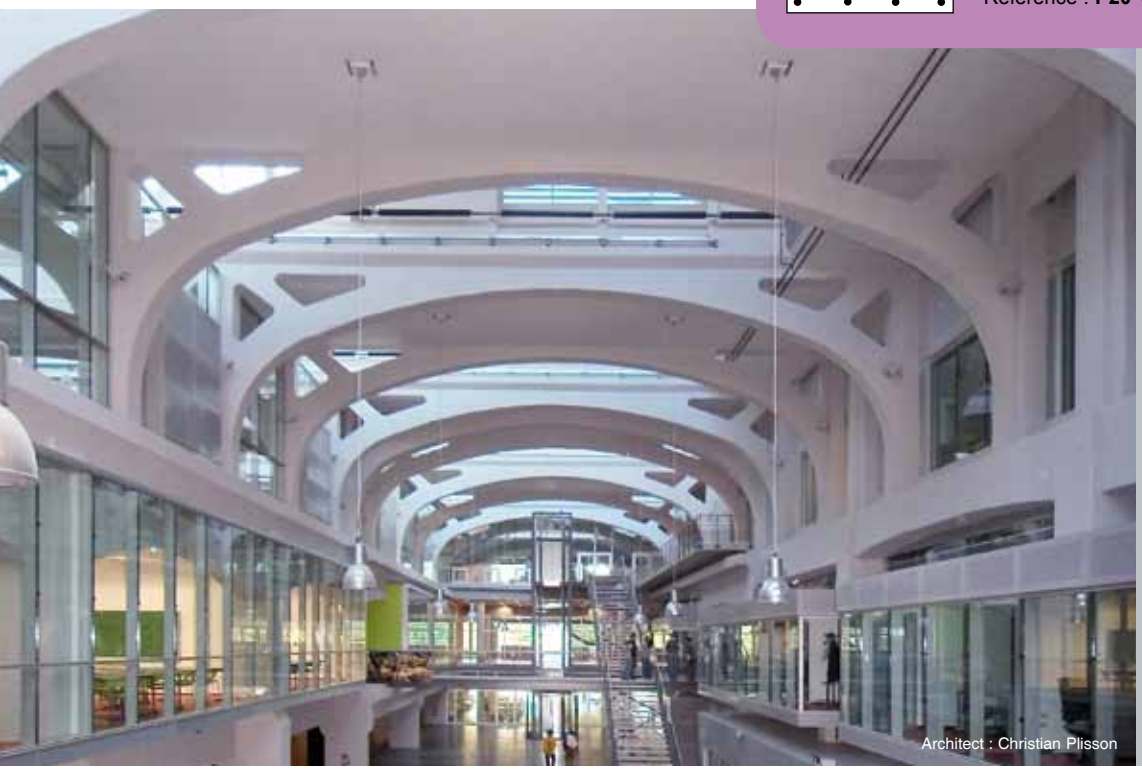
BARRISOL®
ACOUSTICS®

P20 MEZZOPERF®



Features

Holes : **50 000/m²**
Hole diameters : **≈ 1 mm**
Perforation rate : **≈ 20%**
Thickness : **≈ 0,18 mm**
Reference : **P20 + ref. colour**



Architect : Christian Plisson

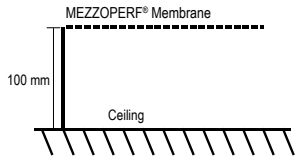
Fondry of Mulhouse (FRANCE) with BARRISOL® MEZZOPERF®

To renovate the ceilings of the Foundry of Mulhouse, architect Christian Plisson chose the BARRISOL® MEZZOPERF® sheet because of its acoustic qualities. This Barrisol stretch ceiling was perfectly integrated into the architecture of the space.

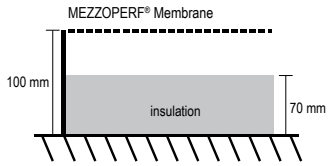
When used in conjunction with a sound insulator placed behind the sheeting, BARRISOL's micro-perforated sheets provide superior acoustics and help eliminate the acoustic resonance common for such a large space (120 meters long x 17 meters high).

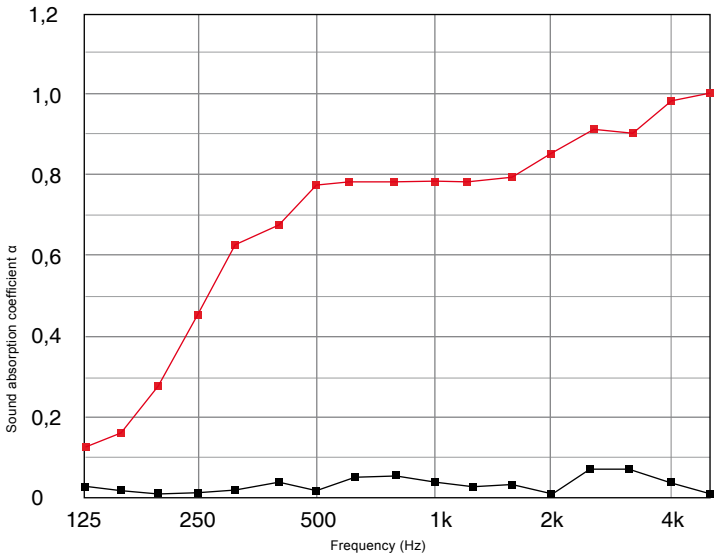
The architect was satisfied by the results obtained. BARRISOL's micro-perforated ceilings serve an important function by providing acoustic absorption but they are also well integrated aesthetically into the vaulted shapes of the space.

■ **Mezzoperf® without insulation**



■ **Mezzoperf® with insulation**





Sound absorption ratings

Sound Absorption Average according to ASTM C423-01	SAA = 0.08	SAA = 0.78
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.10	NRC = 0.80
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,10	α_w=0,85
Sound Absorber class according to DIN EN 11654	not ranked	B

P60 MAXIPERF®

Features

Holes : **40 000/m²**
Hole diameters : **≈ 4 mm**
Perforation rate : **≈ 30%**
Thickness : **≈ 0,18 mm**
Reference : **P10 + ref. colour**

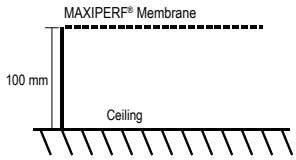
Schrun's Ice rink (AUSTRIA) with BARRISOL® MEZZOPERF®

The decorative, accent band of sheeting around the ceiling of the Schrun's ice rink is actually a great tool for acoustic optimization in addition to its aesthetic benefits.

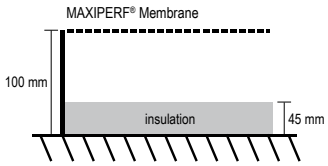
Thanks to the MAXIPERF® perforations, the BARRISOL's sheet decreases the effect of reverberation that is amplified by the hard, ice surface. This allows the space to once again provide acoustic comfort to its occupants.

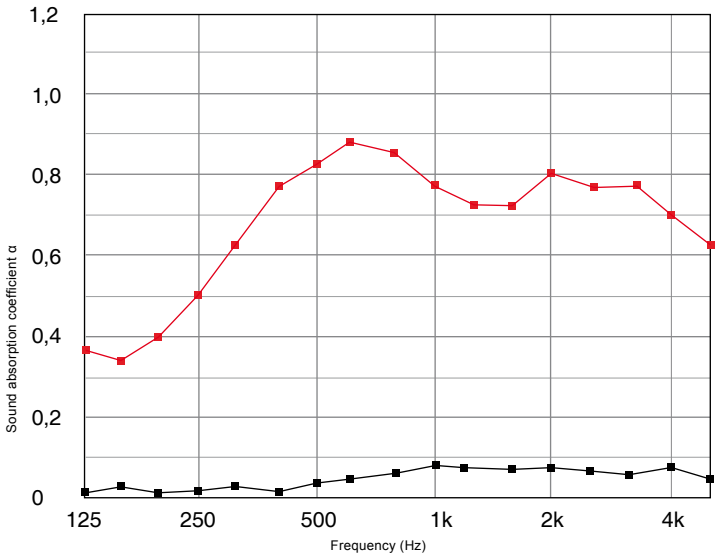
The design and functional capacities of BARRISOL allow it to provide a custom solution to any unique space.

■ **Maxiperf® without insulation**



■ **Maxiperf® with insulation**





Sound absorption ratings

Sound Absorption Average according to ASTM C423-01	SAA = 0.05	SAA = 0.85
Noise Reduction Coefficient according to ASTM C423-01	NRC = 0.04	NRC = 0.82
Weighted sound absorption Coefficient according to DIN EN 11654	α_w=0,05	α_w=0,90
Sound Absorber class according to DIN EN 11654	not ranked	A

Installation of BARRISOL ACOUSTICS®

The installation of BARRISOL ceilings is simple, clean and produces only a minimal amount of waste. BARRISOL sheets are lightweight and do not require heavy frames or support structure. BARRISOL is also very energy efficient because its lightweight means that it requires very little energy to transport.

Because of the elastic nature of the sheeting material, BARRISOL stays in place wherever it is hung no matter how often it is removed and reinstalled to gain access to the overhead plenum.

A BARRISOL's stretch ceiling is composed of a sheet that is stretched around a perimeter track system. The sheeting is attached to a perimeter harpoon that is welded to the sheet. The harpoon is then placed into the perimeter track and held permanently in place.

Examples of track systems :

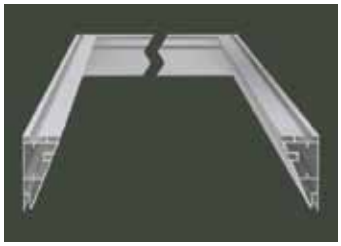
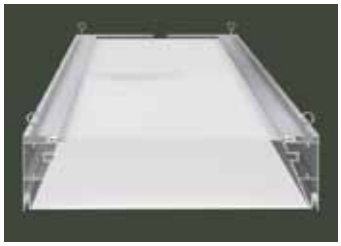
Below are two examples of commonly used track systems. There are dozens of track systems available for a variety of unique applications and conditions.

Barrisol Tradition Track (Ref. B311)

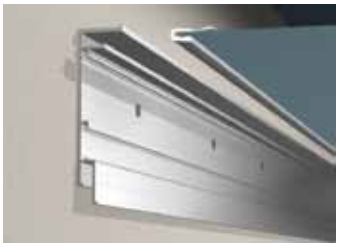
Barrisol Star Track (Ref. BS350-01)

Shopping mall - Turkey
Architect: Mustafa Toner

Barrisol Modular Frame Doubled Sheet (Ref. BS355/15)


Barrisol Star Track Doubled Sheet (Ref. BS355/10)


BARRISOL®
ACOUSTICS®

Barrisol, Ecology and Su

In 2007, Barrisol Normalu SAS celebrated its 40th year. Over the years, Barrisol, the creator of the stretch ceiling industry, has placed innovation at the center of everything it does.

The experience of a leader

The first stretch ceiling was manufactured by Normalu in 1969. The Barrisol brand was created in 1975. Today, the entire collection of Barrisol sheets composes over 20 unique systems of stretch ceilings.

Strength of innovation

For Barrisol, utilizing technology to constantly improve its products and processes has allowed it to stay far ahead of the competition.
By helping to establish new industry standards and procedures, Barrisol Normalu continues to reinforce its position as the worldwide leader in the stretch ceiling industry.

Design & interior decoration

Ceilings and walls are as important in helping to set the tone for a space as is the layout of the space itself. The potential for ceilings or walls to serve as integral design elements is too often underestimated. Barrisol offers a diverse palette of more than 130 unique colors.
Choose a texture, finish, printed image, lighting element and your Barrisol ceiling can provide you with almost any look or feel you desire.

A team approach to innovation

At Barrisol Normalu, creativity is not the work of only one person. The innovative solutions of the Barrisol Normalu SAS group are the result of a collaborative approach. This collaboration allows our R&D technicians to come up with product innovations and applications that constantly keep Barrisol Normalu at the forefront of the industry.

We are never very far away

The Barrisol network contains 1,200 partners on 5 continents, in more than 110 countries.

“ In order to make the
you first need to

This interactive network provides you with creative and technological support of a vast global enterprise combined with the attention and service of a local representative.

Barrisol Normalu SAS considers the impact on the environment in all the decisions it makes. Respect for the environment is one of Barrisol Normalu's core values. An example of Barrisol Normalu's commitment to the environment can be seen in its development of recycled and recyclable products and its corporate culture.

Recycling and environmental preservation

Barrisol sheets are 100% recyclable. After their useful life, Barrisol sheets can be recycled into others products of Barrisol Normalu such as the Thermalu radiant heating system or Barrisol's Recyclable line of sheeting. These products are ideal for any projects attempting to reflect “green design”. The perimeter rails and support elements are also 100% recyclable. This effort to protect the environment is critically important when you consider that more than 1 million square meters of stretch ceilings are installed throughout the world each year.

stainable Development

world of tomorrow more beautiful, work to preserve the world today. ”

Barrisol Normalu's manufacturing process does not require the use of water, which allows it to help conserve this vital, natural resource.
In the production of sheets, no CFC's or HCHC's are emitted and no cadmium is used in the manufacturing process.

Intrinsic qualities

Thanks to the quality and variety of the finishes, Barrisol's stretch ceilings do not need to be painted. This helps to reduce the number of chemicals and solvents used on most construction projects. Barrisol sheets that provide a high degree of reflection, such as Lacquers, can even reduce the number of lights in a space and therefore reduce electrical consumption.
Barrisol can be removed and reinstalled whenever access to the area above the ceiling is required. Removal and reinstallation of Barrisol can be done with very little disruption to the owner.

Barrisol stretch ceilings are lightweight 1000 square meters (10, 260 square feet) of Barrisol weighs around 500 kilos (1, 102 pounds) including the perimeter rail. Because it is so lightweight, Barrisol also takes far less energy to transport to the jobsite.

Lastly, because each individual Barrisol sheet is custom made for each application Barrisol generates approximately 20 times less waste than conventional ceiling materials.

Social Responsability & Sustainable Development

In order to limit the amount of waste it produces, Normalu will take back and recycle all Barrisol sheets at the end of their useful life*.
The offices of Normalu are equipped with the Thermalu radiant floor heating system to provide its employees a more comfortable working environment. Thermalu, a product of Normalu, was selected over other suppliers because its products contain over 50% recycled content. Normalu also provides car pool vehicles to its employees to help reduce traffic congestion and reduce the emissions of CO^2.
Normalu's offices are also equipped with photovoltaic and motion sensors that ensure that the lights come on only when needed during daylight hours and turn off automatically at night if no movement is detected in the office.

* See our general terms



Reception room
Architects : Thompson, Ventulett, Stainback & Associates

Certificat de conformité CE
EC - Certificate of conformity
N° 0071 - CPD - 14627

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BARRISOL®

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1997 · 1997 · 1996 · 1996 · 1995 · 1995 · 1993 · 1991 · 1991 · 1990 · 1990 · 1985 · 1984 · 1983 · 1975

Membre du conseil US pour les Bâtiments «Verts»

union des fabricants unifab
POUR LA PROTECTION INTERNATIONALE DE LA PROPRIÉTÉ INTELLECTUELLE

institut européen du plafond tendu