

The logo for BARRISOL, featuring a stylized 'B' icon in a square followed by the word 'BARRISOL' in a bold, red, sans-serif font with a registered trademark symbol.

BARRISOL®



Acoustics® & Design
for public and private spaces



Restaurant - Switzerland
Architects : CCHE Architecture

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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 cinema 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. Designers are constantly 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®.

I

Introducing
BARRISOL ACOUSTICS[®]

To respond to today's market demands for quality, adaptability, performance, creativity and security, Barrisol offers a new line of products, BARRISOL ACOUSTICS[®]. BARRISOL ACOUSTICS[®] offers four unique, acoustic stretch ceiling systems: Miniperf[®], Microacoustic[®], Acoperf[®] and Microperf[®].

BARRISOL ACOUSTICS[®]'s sheets have already satisfied users throughout the world by significantly improving the acoustics of enclosed spaces. In the past, these spaces suffered from a lack of attractive options for sound absorption. Barrisol sheets are attractive, functional, easy to install and clean.



Design



Acoustic



Office - Germany
Architect: Bredt & Partner

Made to exact measurements, the acoustic sheets can be adapted for any space and can be removed, reinstalled or changed out at any time.

BARRISOL ACOUSTICS®'s line guarantees 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

B

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[®] s line includes more than 110 colours and 8 different finishes such as:

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





Fédération 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.

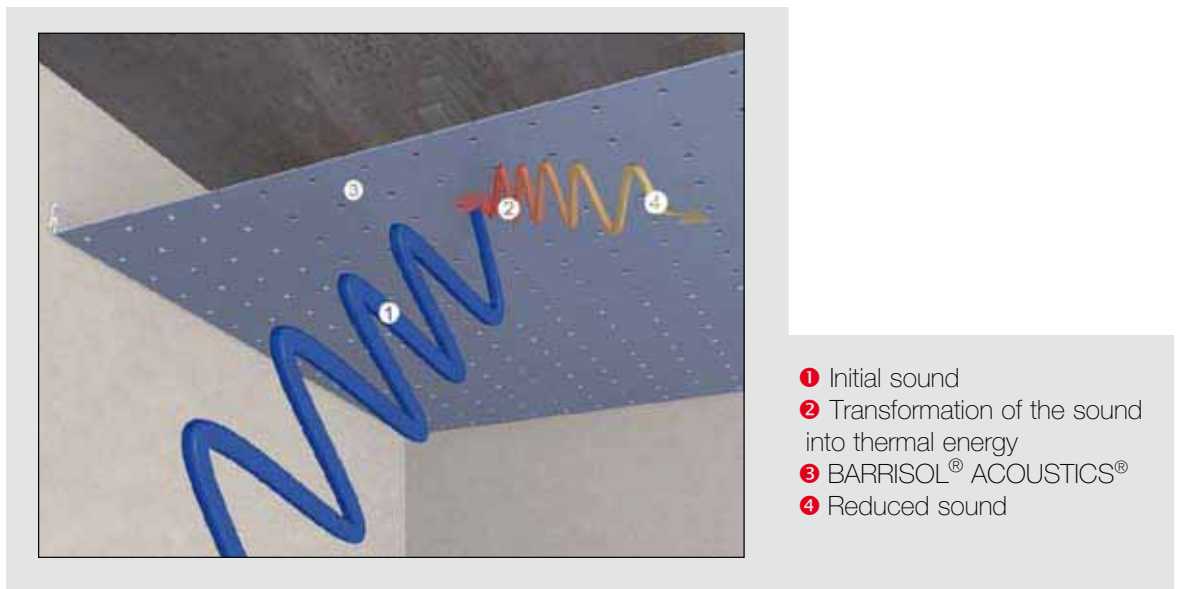
Sound absorption no longer has to come at the expense of design. Sound absorption can now compliment your design and help you provide acoustic comfort and a pleasant atmosphere in almost any space.

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.

T 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 for 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 continue to reverberate around the room, energy loss continues and the sound in the space is reduced.



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.



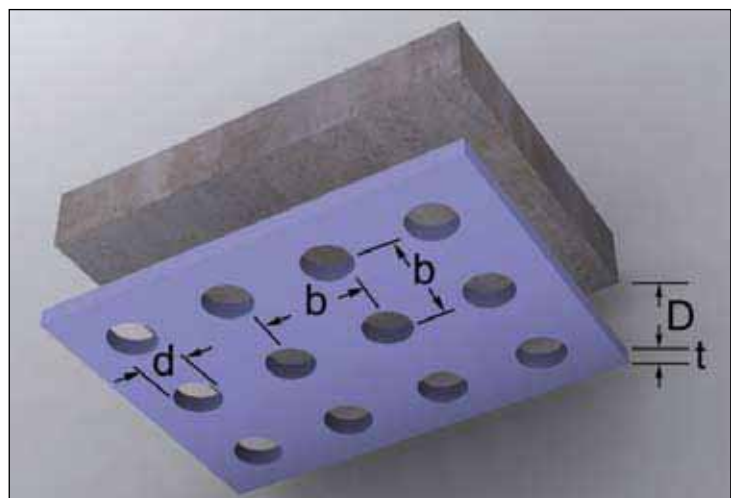
National Assembly – Adzerbaijan
 Architect: Pim Design Group Istanbul

The four factors that determine acoustic absorption

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

- the diameter “d” of the micro-perforation,
- the pattern of micro-perforation “b”
- the thickness of the sheet “t”
- the airspace behind the sheet and the ceiling above “D”

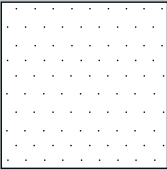
These four factors allow a designer to choose the best BARRISOL ACOUSTICS® perforation style for their particular application.



BARRISOL MICROACOUSTIC[®] without and with insulation

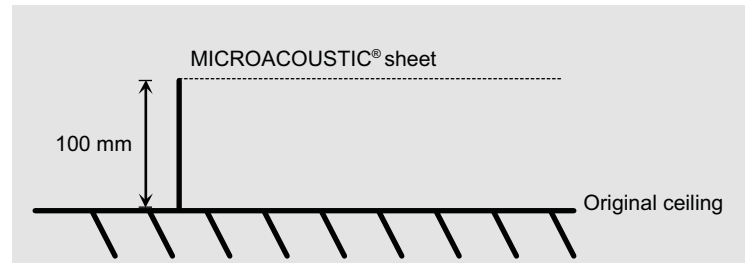
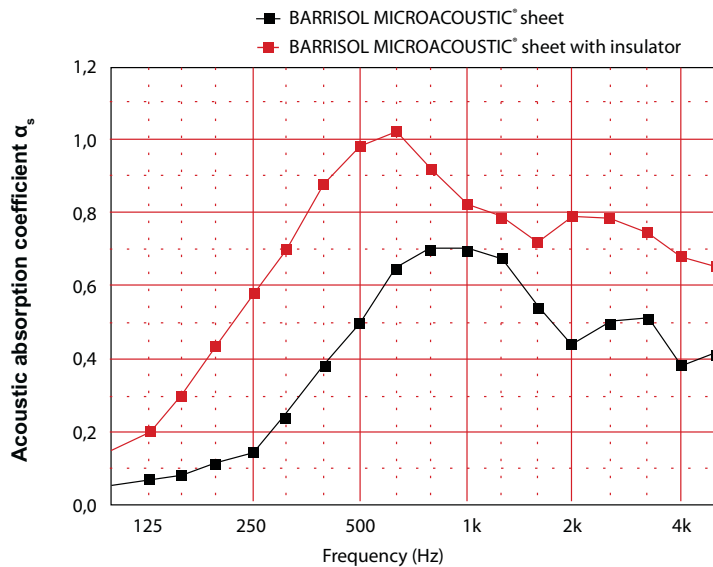
MICROACOUSTIC[®]

Perforations



Characteristics

- Number of holes: **300 000/m²**
- Hole diameter : **≈ 0,2 mm**
- Perforation rate : **≈ 0,6 %**
- Thickness : **≈ 0,18 mm**
- Reference : **A30 + colour ref.**



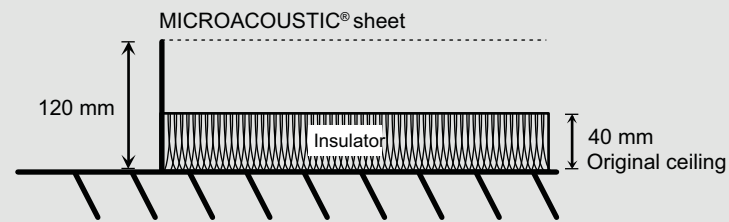
Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01 SAA=0,50

Noise reduction coefficient per ASTM C423 - 01 NRC=0,50

Acoustic absorption coefficient measured per DIN EN 11654 $\alpha_w=0,45$

Acoustic absorption class per DIN EN 11654 D



Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01 SAA = 0,78

Noise reduction coefficient per ASTM C423 - 01 NRC = 0,80

Acoustic absorption coefficient measured per DIN EN 11654 $\alpha_w=0,80$

Acoustic absorption class per DIN EN 11654 B

Example: Church of Agnese de Modena with BARRISOL MICROACOUSTIC[®] 's sheet



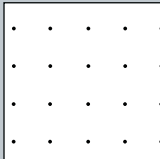
The Church of Agnese de Modena in Italy had acoustical problems. Most of the surfaces in the worship space (plaster, glass, stone & wood) were sound reflectors. Glass and wood absorbs only low frequency sound waves so the sound in the sanctuary was out of balance with an unusually high amount of high 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 less than 200 mm.

BARRISOL MINIPERF® without and with insulation

MINIPERF®

Perforations



Characteristics

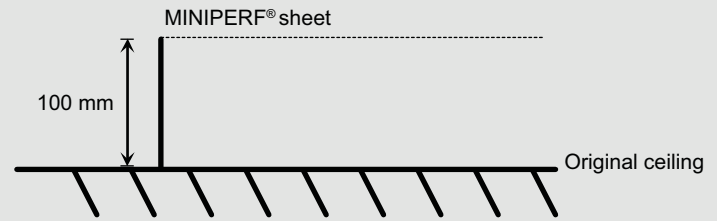
Number of holes : **30 000/m²**

Hole diameter : **≈ 0,5 mm**

Perforation rate : **≈ 5 %**

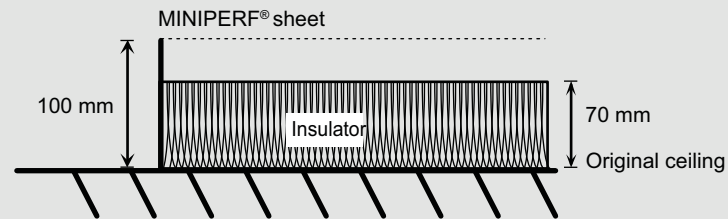
Thickness : **≈ 0,30 mm**

Reference : **A40 + colours ref.**



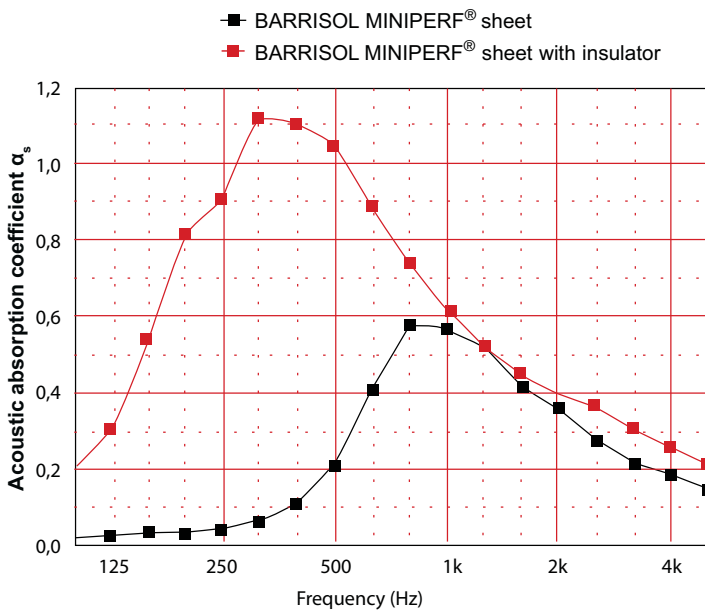
Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA=0,30
Noise reduction coefficient per ASTM C423 - 01	NRC=0,30
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,30$
Acoustic absorption class per DIN EN 11654	D



Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA=0,75
Noise reduction coefficient per ASTM C423 - 01	NRC=0,75
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,40$
Acoustic absorption class per DIN EN 11654	D



Example: Vaduz Art Museum, Lichtenstein, with Barrisol MINIPERF®'s sheet



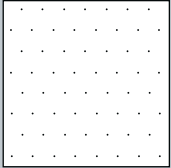
Lighted Barrisol ceilings have a great aesthetic value and offer optimal translucence and acoustic control. Thanks to integrated, intelligent light diffusing technology, Barrisol ceilings highlight the artwork within the Museum of Arts in Vaduz. Under a roof of glass equipped with a sophisticated light 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.

BARRISOL ACOPERF® at 100 mm, 200 mm and in association with a standard sheet at 200 mm with and without insulation

ACOPERF®

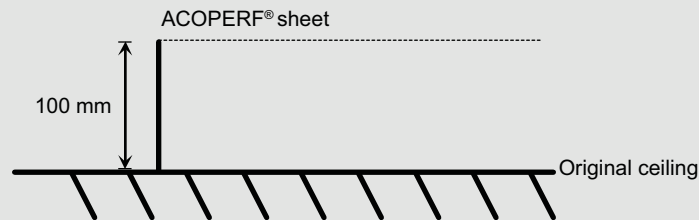
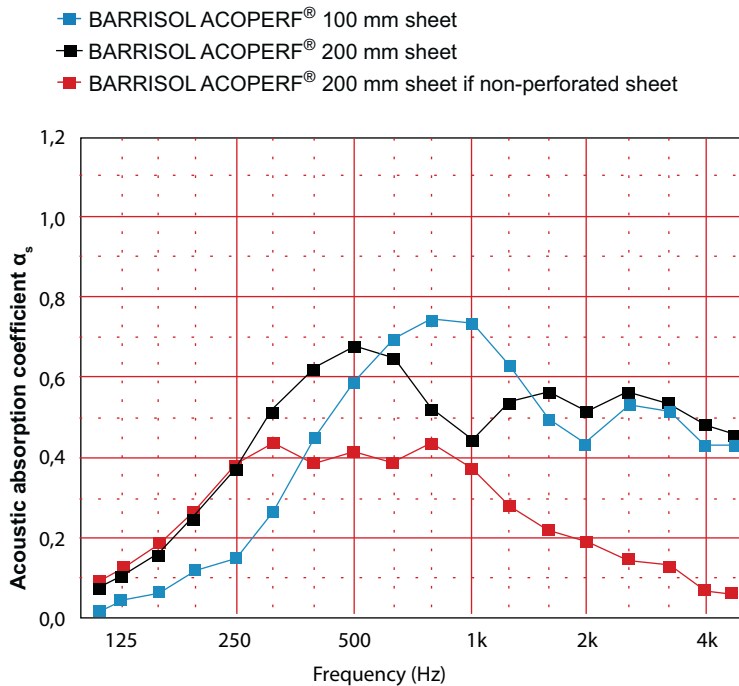
Perforations



Characteristics

- Number of holes : **400 000/m²**
- Hole diameter : **≈ 0,15 mm**
- Perforation rate : **≈ 0,8 %**
- Thickness : **≈ 0,18 mm**
- Reference : **A20 + colours ref.**

Examples of the use of the ACOPERF® 's sheet in 3 different cases : ACOPERF® installed at 100 mm of the original ceiling, then at 200 mm, and finally at 200 mm doubled with a standard non-perforated BARRISOL' s sheet (in order to use it as a lacquer or as a printed ceiling for example).



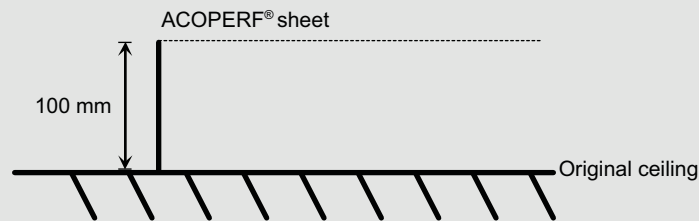
Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01 **SAA=0,48**

Noise reduction coefficient per ASTM C423 - 01 **NRC=0,50**

Acoustic absorption coefficient measured per DIN EN 11654 **$\alpha_w=0,50$**

Acoustic absorption class per DIN EN 11654 **D**



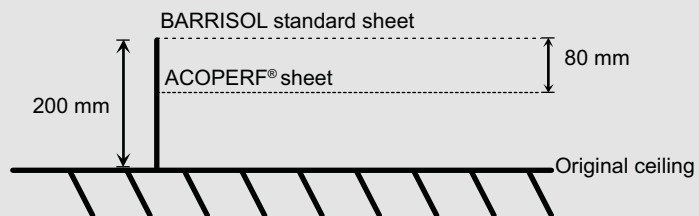
Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01 **SAA=0,51**

Noise reduction coefficient per ASTM C423 - 01 **NRC=0,50**

Acoustic absorption coefficient measured per DIN EN 11654 **$\alpha_w=0,55$**

Acoustic absorption class per DIN EN 11654 **D**



Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01 **SAA=0,32**

Noise reduction coefficient per ASTM C423 - 01 **NRC=0,35**

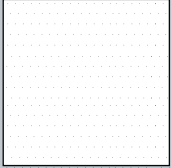
Acoustic absorption coefficient measured per DIN EN 11654 **$\alpha_w=0,25(L)$**


Acoustic absorption class per DIN EN 11654 **E**

BARRISOL MICROPERF[®] with and without insulation

▶▶▶

Perforations



 **MICROPERF[®]**

Characteristics

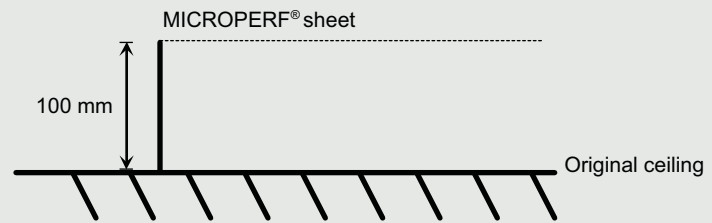
Number of holes : **500 000/m²**

Hole diameter : **≈ 0,1 mm**

Perforation rate : **≈ 1 %**

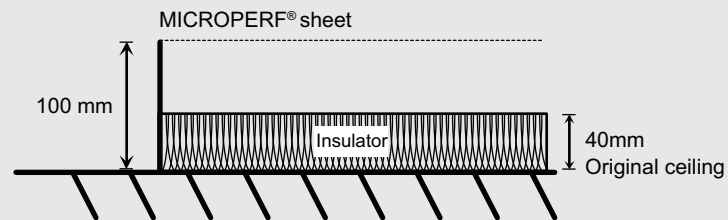
Thickness : **≈ 0,18 mm**

Reference : **A10 + colours ref.**



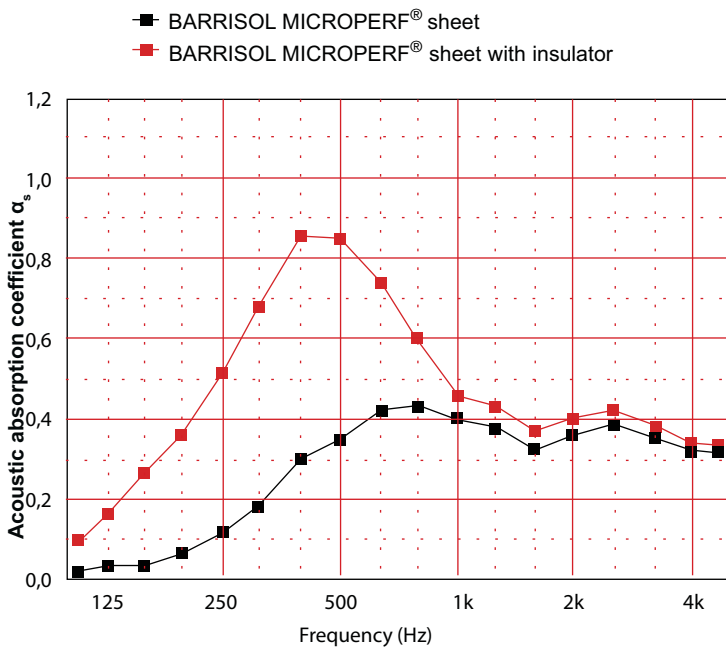
Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA=0,30
Noise reduction coefficient per ASTM C423 - 01	NRC=0,30
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,35$
Acoustic absorption class per DIN EN 11654	D



Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA = 0,55
Noise reduction coefficient per ASTM C423 - 01	NRC = 0,55
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,45$
Acoustic absorption class per DIN EN 11654	D



Example : the Baltimore's airport in USA in BARRISOL MICROPERF[®]'s sheet



The Baltimore 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 the 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 effectiveness.

The results obtained were much better than expected by airport administrators. The terminal is now more acoustically comfortable and the space benefits from modern feel of the BARRISOL elements.

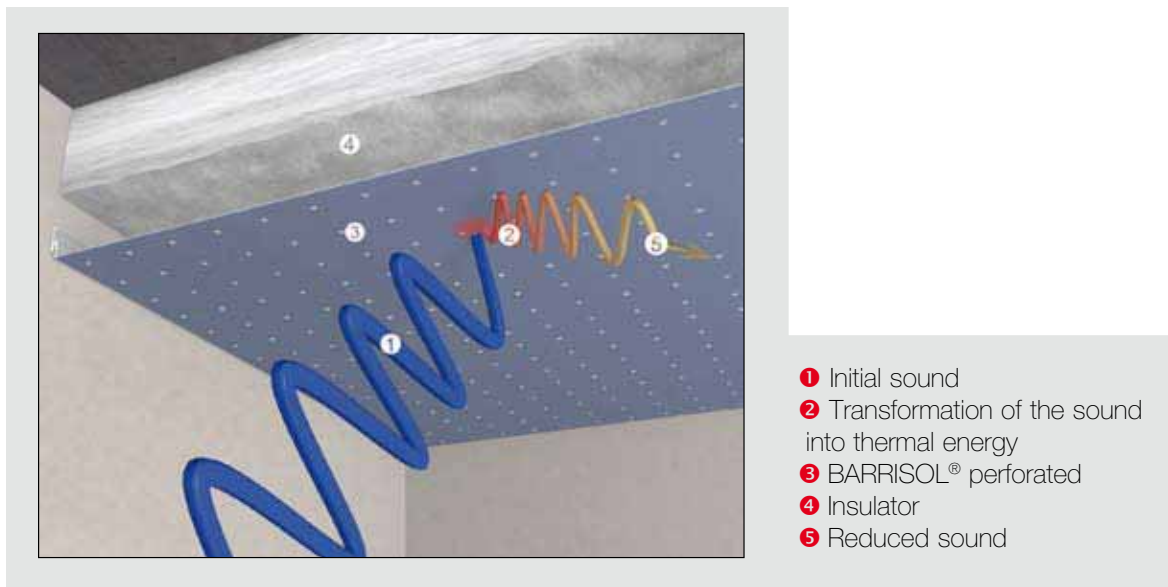
O

Other perforated acoustic sheets

BARRISOL's 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.

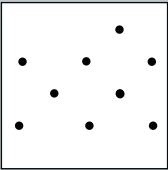
When used in conjunction with a sound insulator placed behind the sheeting, BARRISOL's micro-perforated sheets provide superior acoustics and help ensure an aesthetic and functional result.



BARRISOL MEDIPERF® with and without insulation

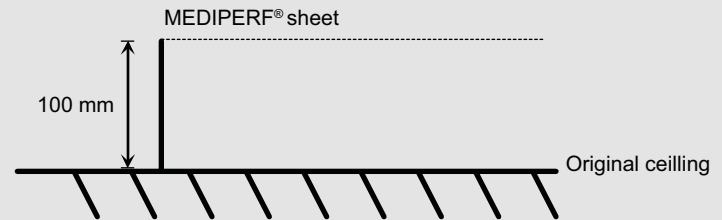
MEDIPERF®

Perforations



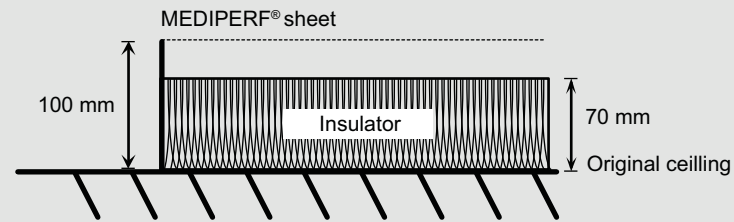
Characteristics

- Number of holes : 10 000/m²
- Hole diameter : ≈ 1 mm
- Perforation rate : ≈ 4 %
- Thickness : ≈ 0,18 mm
- Reference : P10 + colours ref.



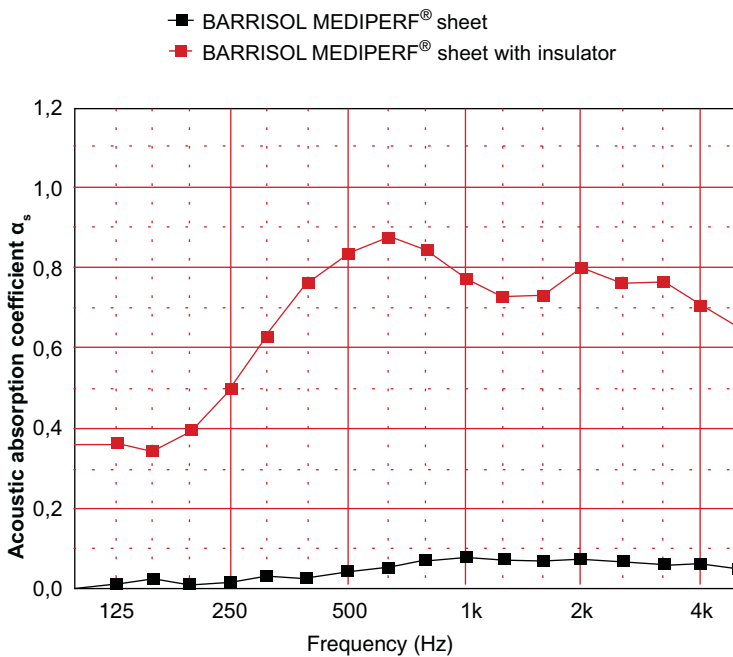
Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA=0,10
Noise reduction coefficient per ASTM C423 - 01	NRC=0,10
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,10$
Acoustic absorption class per DIN EN 11654	non classé

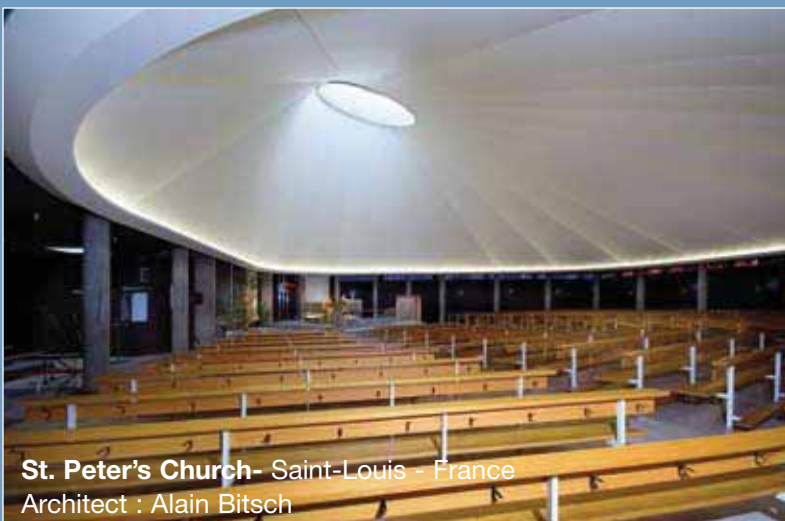


Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA = 0,77
Noise reduction coefficient per ASTM C423 - 01	NRC = 0,80
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,80$
Acoustic absorption class per DIN EN 11654	B



Example : St. Peter's Church - St Louis with BARRISOL MEDIPERF®'s sheet



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. The sound level was high but because of excessive reverberation the intelligibility was low. During musical performances, the instruments covered each other decreasing the enjoyment of both the musicians and audiences. 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.

BARRISOL MAXIPERF® seule et avec isolation

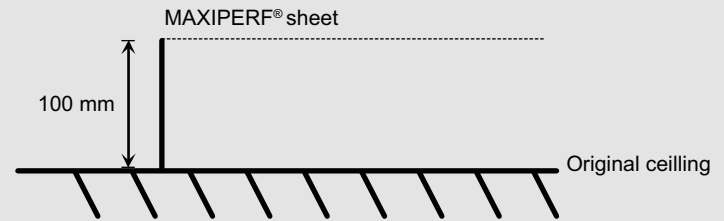
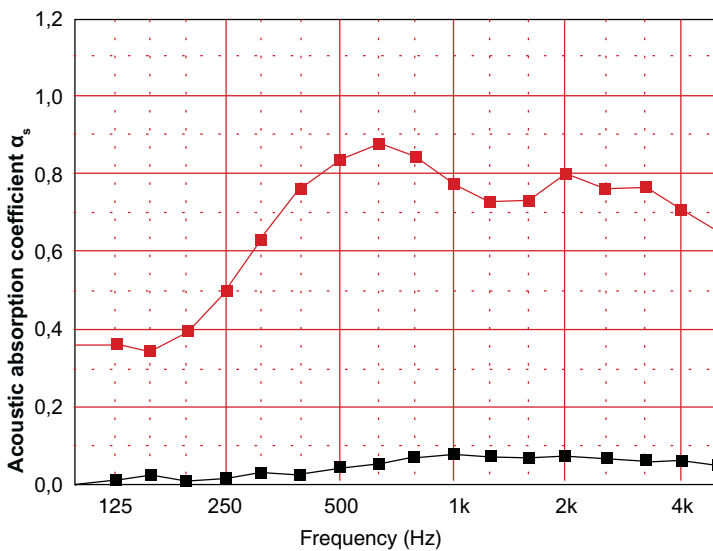
MAXIPERF®

Perforations

Characteristics

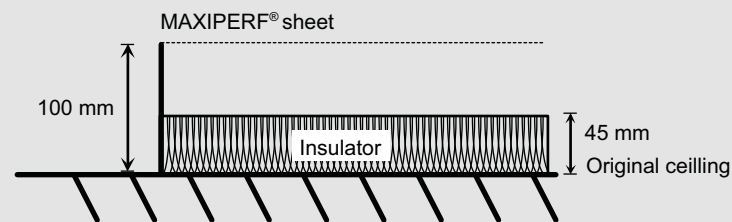
Number of holes : **40 000/m²**
 Hole diameter : **≈ 4 mm**
 Perforation rate : **≈ 30 %**
 Thickness : **≈ 0,18 mm**
 Reference : **P60 + colours ref.**

- BARRISOL MAXIPERF® sheet
- BARRISOL MAXIPERF® sheet with insulator



Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA=0,05
Noise reduction coefficient per ASTM C423 - 01	NRC=0,04
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w=0,05$
Acoustic absorption class per DIN EN 11654	non classé



Acoustic absorption indexes

Sound absorption average per ASTM C423 - 01	SAA = 0,85
Noise reduction coefficient per ASTM C423 - 01	NRC=0,82
Acoustic absorption coefficient measured per DIN EN 11654	$\alpha_w = 0,90$
Acoustic absorption class per DIN EN 11654	A

Example: Schrun's ice rink, Austria, with BARRISOL MAXIPERF's sheet



Schrun's ice rink - Austria

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's perforations, the BARRISOL 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.

I Installation of BARRISOL ACOUSTICS[®]

The installation of BARRISOL ceilings is simple and clean with a minimum of waste. BARRISOL ceilings are very lightweight and do not require heavy frames to create. BARRISOL ceilings are also very energy efficient because they are lightweight and very easy 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 from wall to wall and made to size and shape of the room. The sheeting is attached to a perimeter harpoon that is welded to the sheet. The harpoon is then placed in a perimeter track that is fastened to the wall.

Examples of tracks systems :

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

Barrisol Tradition Track (Ref. B311)



Barrisol Star Track (Ref. BS350-01)

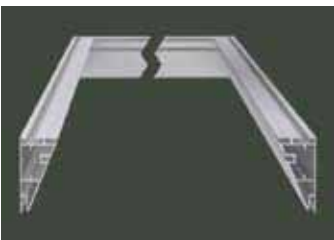




Shopping mall - Turkey
Architect: Mustafa Toner



Barrisol Modular Frame Doubled Sheet (Ref. BS35/15)



Barrisol Star Track Doubled Sheet (Ref. BS35/10)



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 division was created in 1975 to focus on this unique and exciting new product. 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 and 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 proposes a diverse palette of more than 120 unique colours. Choose a texture, finish, printed image, lighting element and your Barrisol ceiling can provide you with almost any look or feel you desire.

The working team, the strength of a group

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 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 to 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



sustainable development

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

square meters of stretch ceilings are installed throughout the world each year.

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. There is no cadmium 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.

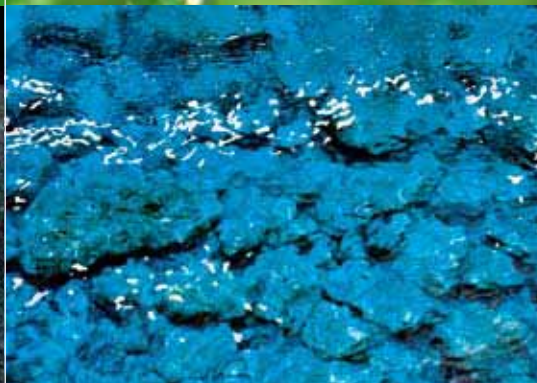
Barrisol stretch ceilings are lightweight (1000 squares meters weigh around 500 kilos including the standard perimeter rail). Because it is so lightweight, Barrisol also takes far less energy

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 Responsibility and 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 CO². 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





BARRISOL®

2008 Médaille d'Or Barrisol Acoustics Pologne	2008 Prix de Produit Barrisol Recycle France	2007 FEDR ARCH 2007 Grand Prix Barrisol Lumière Czech Republic	2004 Belgian Building Award Belgium Belgique	2003 SICCI Certificat d'Excellence Canada	2002 Excellence Award 128 Points Construction USA	2002 AP Prix de l'Innovation Barrisol Acoustics Allemagne	2002 AP Prix de l'Innovation Barrisol Lumière Allemagne	2001 FEDR ARCH 2001 Prix de Design Czech Republic	2001 Médaille d'Or Concret Expert Roumanie	2001 Médaille d'Or Prix du Meilleur Produit Barrisol Lumière Pologne	2000 Innovation et Qualité Pologne	2000 Prix Spécial de Technologie Barrisol Star Allemagne	1999 Prix d'Excellence Salon National de l'Innovation Canada	1998 Prix d'Excellence USCA USA
1997 Performance of Quality Canada	1997 Médaille d'Or Barrisol Star Chine	1996 Médaille d'Or Barrisol Star Chine	1996 Prix de l'Innovation International International Australie	1995 Médaille d'Or du Produit COCHEC 218 Czech Republic	1995 Médaille d'Or du Produit COCHEC 218 Czech Republic	1993 1 ^{er} Prix Produit et Technologie Prix de l'Innovation Czech Republic	1991 Médaille de Bronze Innovation Barrisol Pologne	1991 César d'Honneur Star Barrisol Star	1990 L'Exceptionnel Belgique	1990 Prix Spécial du Jury Technologie Barrisol France	1985 César Syndicat National des Architectes d'Intérieur	1984 Coupe de Produit d'Excellence France	1983 Léon d'Excellence Belgique France	1975 Médaille d'Argent pour l'Innovation Barrisol France



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