ACOUSTICS.

OBJECT CARPET

CONTENTS

Sound & space: the challenges and indicators of modern architecture

Whether open space offices or modern conference rooms, room acoustics is one of the factors defining the quality of architecture. Acoustics is decisive for work efficiency and communication, as well as for comfort in offices, classes or workshops.

Modern architecture and living concepts using smooth, hard materials and open structures need sophisticated planning of acoustics, since glass, steel and concrete reflect the sound and wide rooms provide less possibility for sound absorption. The consequence is a long reverberation time and a loud footstep sounds resulting in background noise, which makes communication, concentration and creative thinking almost impossible. Noises exceeding 60 dB are unpleasant and can trigger stress.

Besides detailed planning, a user-oriented and economical acoustic solution also requires materials which prevent the noise or absorb it. The floor surface is one of the main causes of the formation and emission of noise - whether in the form of footstep sounds or sound reflection. Floor carpeting significantly contributes to noise reduction and to customised optimisation of room acoustics.

OBJECT CARPET flooring provides well-balanced room acoustics.
With its optimal absorption values it helps you to better hear and understand speech in offices, conference rooms, hotels, shops, restaurants and residential buildings.

To offer holistic room acoustic solutions, **OBJECT CARPET** Carpet co-operates with acoustic specialist company YDOL. In this way, it can develop individual, interior concepts additionally involving walls and ceilings into the acoustic planning, sustainably contributing to sound absorption.
For the planning, all modern techniques are available, e.g., computer simulation, model measuring and auralisation.

JThe earlier you involve us in your project planning, the more precisely we can support you in your challenges in acoustics. Do not hesitate to contact us. We will be glad to assist you at any time.

ROOM SOUND

How does the sound differ? Can room acoustics be measured?

Disturbing noise sources diminish our power of concentration. Noise stress in the office impairs our productivity and can be noxious to our health. In a research of the VDI (Association of German Engineers), labour productivity losses caused by noise are estimated to 20-30 per cent.

To systematically reduce noise, as well as to meet requirements on footfall sound insulation against sound transmission acc. to DIN 4109, we need to distinguish between room sound and footstep sound.

Regardless of its source, ROOM SOUND spreads out in the room either directly or via several sound reflection areas on walls and floors. Besides speech and noise from office equipment and other appliances, walking noise and moving chairs are also typical sources of noise. Objects and materials have an impact on deadening or boosting sound in the room through their sound absorption (absorption coefficient).

FOOTSTEP SOUND is caused by walking on the floor and by moving chairs and tables. It is transferred to adjacent rooms and to the next floors above and below.
Thus floor carpeting not only significantly influences the level of noise in the room where it develops, but also in adjacent rooms through which sound and vibrations spread.

REVERBERATION TIME is the measuring value for room acoustic quality. It expresses the time interval in which the acoustic pressure level in the room falls by 60 dB after switching off the sound source. The higher the sound absorption the shorter is the reverberation time. With carpets from **OBJECT CARPET** absorption values of up to α_w 0,40 are achieved, which is many times higher than with other carpets and granolithic floors.

„Fitted carpet is not only an effective inhibitor of footstep sound on its source, but also a room sound absorber of all kinds of noises."
Professor Philip Leistner, Dr E.Sc. Fraunhofer Institute of Building Physics IBP, Faculty of Building Physics, University of Stuttgart

NOISE SOURCE

BlackThermo®Felt Acoustic Plus
for selected
OBJECT CARPET qualities - as broadloom, rugs (RUGX) or SL tiles.
Do not hesitate to contact us.

1 I PILE MATERIAL
Highest value PA brand fibre, high-textured, dirt-resistant

2 I PILE CARRIER
Special PE fleece, heat-set, dimensionally stable

3 I FILAMENT AND TUFT EMBEDMENT
via special Latex base coat, low filler quantity, electroconductive

4 I **BLACKTHERMO®FELT ACOUSTIC PLUS**
reduces reverberation time by up to 40%; easy laying by simple fixing, preservation of existing floor coverings, hence ideally suitable for quick rehabilitation

OBJECT CARPET flooring: unbeatable noise absorber

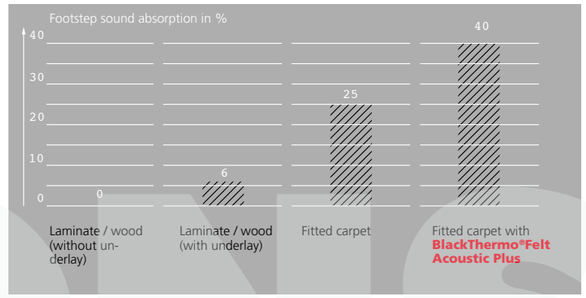
Footstep sound in rooms depends on the type of flooring. Flooring with high surface hardness and stiffness transfers footstep sounds especially strongly, whereas softly padded floors like carpets almost completely exclude such noises from the outset. Even very thin carpets can improve footstep sound absorption by about 20 dB, and carpets with high pile by about 30 dB. In contrast, in plain floors (laminates, linoleum, parquet), the improvement potential is only 5-15 dB.

Carpets of **OBJECT CARPET** impress the user even with their standard version providing the best sound and acoustic values. Carpets do not only excellently absorb footstep sound, but also reduce sound pressure level and reverberation time.

In order to additionally improve the sound-absorbing effect of carpets, **OBJECT CARPET** developed its **BlackThermo®Felt Acoustic Plus**. Its special backing coating reduces reverberation time by up to 40 %, compared with granolithic flooring, and diminishes the footstep sound by up to 40 dB. So you create a quiet atmosphere, in which you feel good, achieve your best performance, and let your creative ideas flow.

The typical structure of **OBJECT CARPET** flooring, paired with the **BlackThermo®Felt Acoustic Plus** backing, ensures that the acoustic properties remain stable for many years. High density and thermo-fixing of the backing coating provide longevity, and ensure that the carpet is ideally suitable for strongly frequented building areas.

Footstep sound compared in different types of flooring
Reduction of footstep sound by using **BlackThermo®Felt Acoustic Plus** carpets compared with laminates and granolithic floors - by up to 40 %.



Plain and granolithic building materials reflect sound more strongly than porous surfaces like carpets or fabrics, which absorb sound energy and convert it into thermal energy.

The more covered the sound-reflecting surface is, the more pleasant the room acoustics. The floor in the room is a large and continuous surface and hence it is the most suitable for this purpose.

Examples of OBJECT CARPET flooring qualities with absorption rates.

	with textile double backing		with BlackThermo®Felt Acoustic Plus	
Quality	Footstep absorption improvement coefficient ISO 140-8 ΔL_w	Evaluated noise absorptivity α_w	Footstep absorption improvement coefficient ISO 140-8 ΔL_w	Evaluated noise absorptivity α_w
Contract 1000	27	0.25	33	0.30
Fishbone 700	23	0.20	26	0.30
Glamour 2400	31	0.35	36	0.40
Glory 1500	27	0.25	33	0.35
Madra 1100	27	0.25	33	0.35
Nylloop 600	25	0.20	28	0.30
Nyltecc 700	25	0.20	28	0.30
Pescara 1000	27	0.25	29	0.35
Silky Seal 1200	-	-	28	0.30
Springles Eco 700	23	0.20	25	0.30
Web Art 600	18	0.15	26	0. 30

All above-mentioned qualities are tested and certified by the Acoustics and Thermal Power Office in Aachen and by the TFI Institute.

For more information, see www.object-carpet.com/service

Backing structure
BlackThermo®Felt Acoustic Plus achieves an acoustic improvement coefficient of up to 8 dB with the same carpet quality, e.g., Web Art. That means an improvement of up to 44 %.

Reverberation time acc. to DIN EN ISO 3382

Tested at TaylorWessing in Munich (quality Madra 1100)

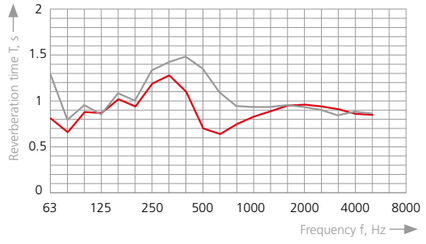
	Madra 1100 with textile double backing	Madra 1100 with BlackThermo®Felt Acoustic Plus
Frequency f, Hz	third T, s	third T, s
63	1.30	0.81
80	0.80	0.66
100	0.96	0.88
125	0.86	0.87
160	1.09	1.02
200	1.01	0.94
250	1.34	1.19
315	1.43	1.28
400	1.49	1.10
500	1.36	0.70
630	1.10	0.64
800	0.95	0.75
1.000	0.94	0.83
1.250	0.94	0.89
1.600	0.96	0.95
2.000	0.94	0.96
2.500	0.91	0.94
3.150	0.85	0.91
4.000	0.89	0.86
5.000	0.87	0.85

Single Number Value by averaging of T (from 400 Hz to 1250 Hz) acc. to DIN EN ISO 3382

T_{mid} = 1.13 s | T_{mid} = 0.82 s

Notes on room condition:
Room: empty, walls: dry construction and window façade, Floor: drywall cavity floor
Ceiling: reinforced concrete with partial suspension in the middle area

Temperature: 19.5 °C, relative air humidity: 48 %, volume of the reverberation chamber: 77 m³



Work and live: more quietly, comfortably and economically with OBJECT CARPET

MORE COMFORT FOR LESS MONEY: **BlackThermo®Felt Acoustic Plus** creates a pleasant and well-balanced atmosphere in the room. A softer tread means more walking comfort. Improved insulation properties retain pleasant warmth for your feet and save on heating energy costs. The higher and denser the pile, the better the room and footstep sound absorption and the lower the noise level both in the room and in adjacent rooms. In this way, **OBJECT CARPET** flooring positively influences the working atmosphere and improves motivation and productivity.

Moreover, **BlackThermo®Felt Acoustic Plus**, compared with other sound absorbing measures, minimises costs of building works in the room. In this case you do not need special additional underlay. The existing floor is preserved since **BlackThermo®Felt Acoustic Plus** only has to be fixed and not laid in a traditional way. For this reason, **BlackThermo®Felt Acoustic Plus** is also ideally suitable for quick rehabilitation.

Advantages of the carpets with BlackThermo®Filz Akustik Plus backing coating

Acoustic optimisation by
- Reduction of footstep sound by up to 40 dB
- Reduction of reverberation time by up to 40 % compared with granolithic floors
- Best noise absorption rates up to α_w 0.40

Less costs, less material and less time spent
- Simple to fix and no traditional gluing necessary
- Existing floor remains preserved
- No additional underlays needed
- Ideally suitable for quick rehabilitation
- Labour is largely free of dust and dirt
- Significantly lower price compared with alternative noise reduction measures

Manufacturing and quality
- High density and thermofixing
- Long lifecycle
- Made in Germany

Comfortable and healthy
- Luxurious walking comfort since a comfort underlay is already incorporated
- Suitable for allergic persons (TUEV test)
- Suitable for buildings certified by LEED and DGNB

Do you like using a certain grade from the **OBJECT CARPET** collection as acoustic carpet – broadloom, tiles or RUGX carpets? Do not hesitate to contact us.

Object Carpet and YDOL
ACOUSTICS PARTNER for tailored sound-optimising of rooms

With **OBJECT CARPET** carpets, building owners and architects provide a basis for absorption of noises like room sound and footstep sound. YDOL contributes to better and more targeted optimisation of room acoustics by a diversified product range of acoustic elements, also involving wall and ceiling surfaces. Thus, depending on the room demands, you can achieve an individually designed and acoustically efficient ambience in the range of sonically hard surfaces, as well.

Style aesthetics and room acoustics are not mutually exclusive, quite the contrary: the versatile design carpets of **OBJECT CARPET** paired with the highly efficient, sound-absorbing acoustic elements of YDOL offer considerable scope for artistic ideas. Besides elements mounted on the wall or hanging elements, the YDOL's portfolio also comprises flat wall covering and movable walls, where each element can be made in individual form, colour and size. With its own collection of lighting, furniture and curtains, YDOL additionally combines sound-absorbing properties and advanced design. This allows flexible and cost-efficient planning without restriction of artistic design possibilities.

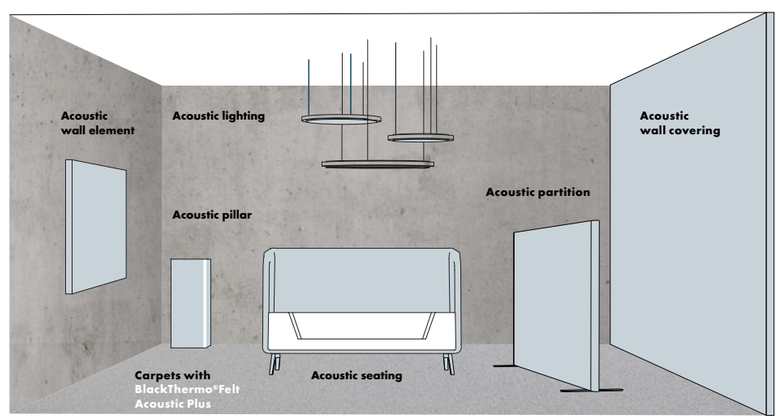
The products are manufactured in Germany and fulfil very high standards concerning used materials, process quality and lifecycle.

Thanks to collaboration between **OBJECT CARPET**and YDOL, it became possible to optimise the rooms acoustically and, at the same time, to realise creative design.

iBesides its large collection of standard elements, the YDOL factory also manufactures individual solutions tailored to your project.

An outstanding variety of colours of **OBJECT CARPET** flooring and YDOL acoustic materials match the trendy world of colours.

Innumerable design options - as unique as rooms and their users



YDOL acoustic elements can be manufactured in individual forms and sizes. Sound absorbers with surfaces of any size can be mounted on walls and ceilings and thereby selectively activate the sound-absorbing properties of these available surfaces.

Holistic acoustic planning: versatile professionalism for your project

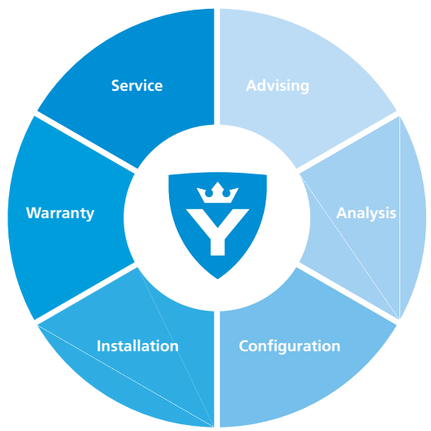
OBJECT CARPET and YDOL have expanded their services together and offer holistic advice on room acoustics. The partners' collaboration unites their professionalism and experiences. Both manufacturers have distinguished themselves through their fruitful co-operation with architects, and interior planners for many years.

The co-operative portfolio comprises a holistic comprehension of the project including advice, analysis and conception. After determining an "optimal acoustics" and taking into account the room's purpose and use, a custom-designed solution, which regards the individual demands of the user, is worked out. The emphasis is always on the design preferences of architects and planners.

With their versatile knowledge and professionalism, YDOL and **OBJECT CARPET** will assist you in the aesthetic implementation of your acoustic requirements. As acoustics planners, they also provide individual on-site consultations with experienced application engineers and specialist advisers upon the client's request.

Corner shaping with face joint

End cover slit enclosed in fabrics



OBJECT CARPET and YDOL, the partners in acoustics, bring you:

OBJECT CARPET

The most comprehensive collection of broadloom, SL tiles and rugs for acoustic optimisation in the building.

Innovative **BlackThermo®Felt Acoustic Plus**, specially designed for requirements in commercial buildings

- Reduction of footstep sound up to 40 dB
- Reduction of reverberation time by 40 %
- Noise absorption values up to α_w = 0.40
- Acoustic values stable for many years

+ YDOL

The most comprehensive collection of design acoustic elements in Germany.

Specialists in acoustics

- Professional advice and analysis
- Measuring and calculating individual acoustic values
- Professional acoustic planning
- Sound absorption rates of α_w = 1.00
- 100% absorption across the entire frequency range of the human voice

= AKUSTIKPARTNER

- **Holistic aesthetic solutions for your interior concepts**
  – For floor, walls and ceiling
- **Advice, analysis and detailed planning optimised according to DIN 18041**
  – All from a single source, using decades of experience
- **Determination of demand and calculation of acoustic target values for your project**
  – Based on DIN 18041, ISO 3382-3 and VDI 2569
- **Products with certified acoustic properties**
  – Tested by independent testing institutes
- **Individual and flexible possibility of interior design**
  – With 1,200 carpet designs and tailored acoustic components
- **Professional planning data**
  – Available for free at www.object-carpet.com and at www.akustikpartner.de

For further information on products, services and various online tools
for architects and designers, see www.object-carpet.com/akustik and www.akustikpartner.de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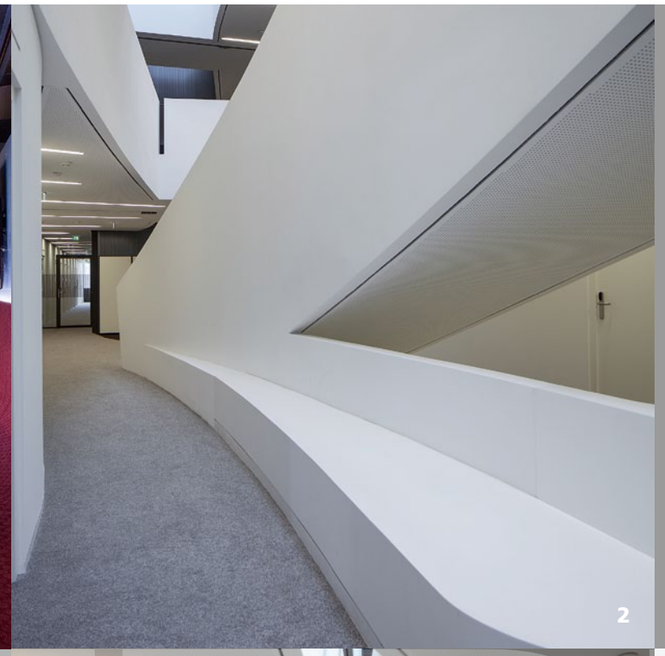
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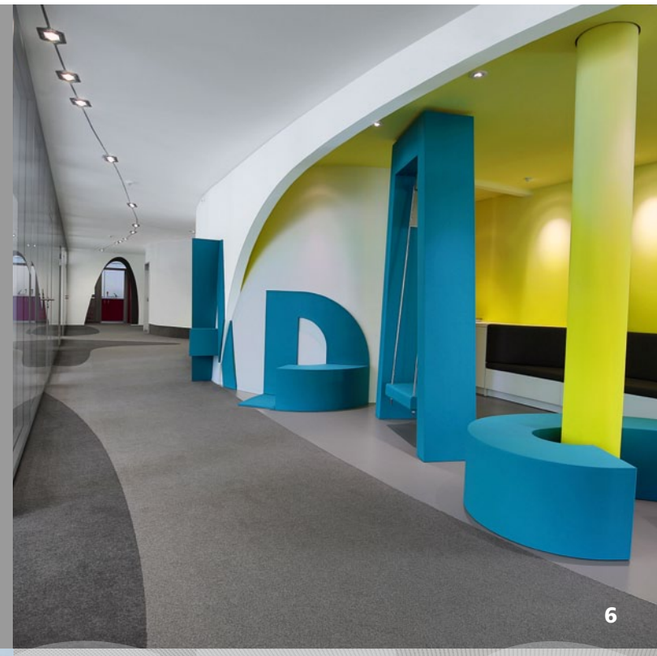
OBJECT CARPET's references:
ACTELION BUSINESS CENTRE, Allschwil
ADAC MITTELRHEIN E.V., Koblenz (fig. 6)
INNEN_ARCHITEKTEN BALS + WIRTH, Wiesbaden
INTERSTUHL, Messtetten-Tieringen (fig. 5)
BERGAGER CHEESE DAIRY, Waging am See
BSU, Hamburg
CINEPLEXX Kinobetriebe GmbH, Vienna (fig. 1)
ERNST & YOUNG, Munich
EMC2, Ismaning
FRAPORT, Frankfurt Airport
HOFBURG, Vienna
HOTEL EGERNER HOEFE, Rottach-Egern
HYPO NO, St. Poelten
LATHAM & WATKINS, Munich
LBBW, Stuttgart
LIBRARY & LEARNING CENTER, Campus WU, Vienna (fig. 2)
MICROSOFT, Unterschleissheim
PORSCHE, various locations
TOWN HALL in Dornstetten
ROHDE & SCHWARZ, Munich
STUDENTS' CENTER, Campus WU. Vienna (fig, 3)
SPARKASSE WERRA-MEISSNER, Darmstadt (fig. 4)
SYZYGY Advertising Agency, Frankfurt
TAYLOR WESSING, Munich
TELEKOM, various locations
VDK Berchtesgaden, Ursberg, Oberstdorf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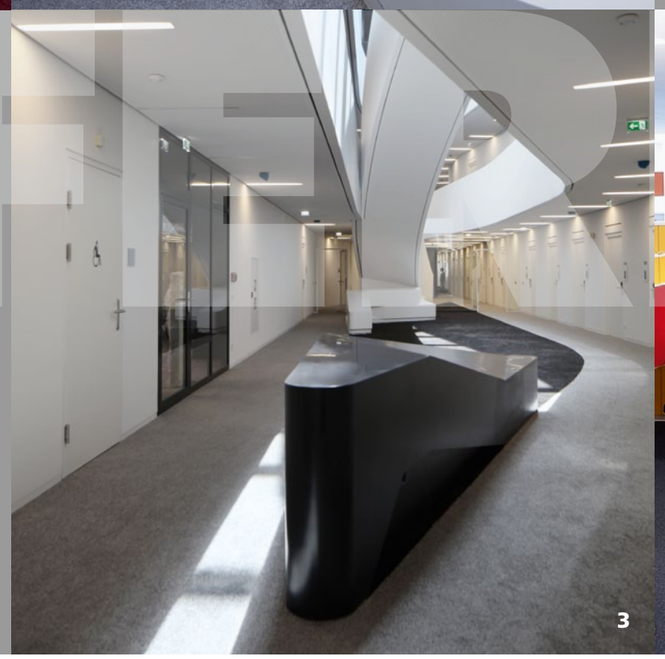
Numerous objects were already equipped with YDOL RELAX acoustic elements, e.g.:
ADAC, Munich
BARTENBACH LICHTAKADEMIE, Aldrans
BILDUNGSZENTRUM, Laemmerbuckel
CASINO BAUER GROUP, Geretsried
UNIVERSITY OF APPLIED SCIENCES in Kufstein
ILL-WERKE, Vandans
ING DIBA, Frankfurt
ISS FACILITY MANAGEMENT, Stuttgart
JUNGHEINRICH AG, Hamburg
LITERATURMUSEUM, Vienna
MINIMUM, Berlin
METAFINANZ GMBH, Munich
NAUMANN, Kirchheim
SPARKASSE, Nuremberg
SOCIÉTÉ GÉNÉRALE, Frankfurt
TELEFONICA, Munich
VOLKSBANK, Berlin
ZBC³ COMMUNICATION, Vienna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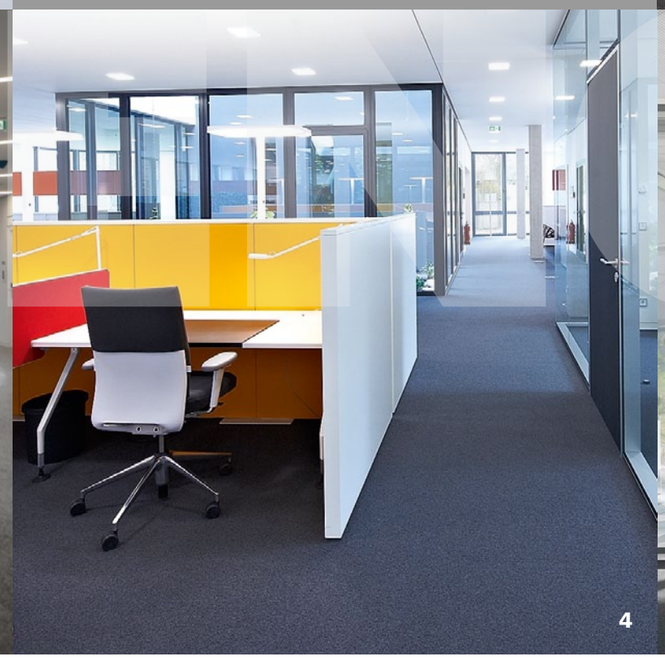
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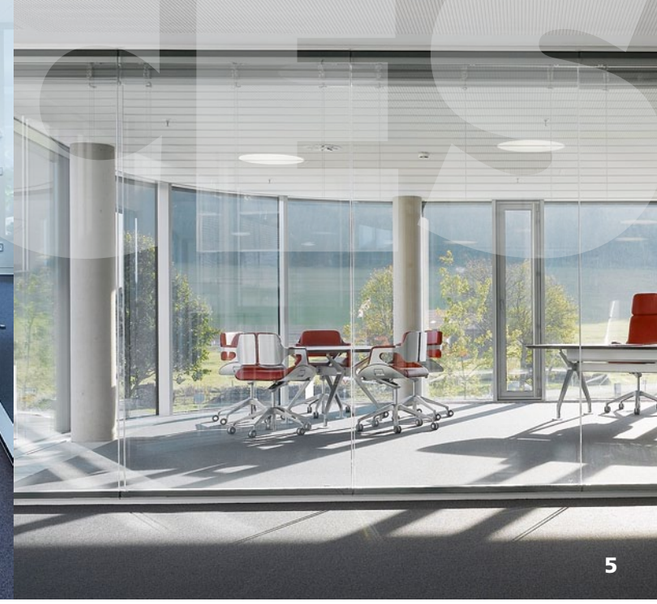
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(Fig. 2 and 3: photos by BOA Buero fuer offensive Aleatorik)

For reference objects with BlackThermo®Felt Acoustic Plus, as a flooring solution, see www.object-carpet.com

For other reference objects with YDOL RELAX acoustic elements, see www.ydol.de