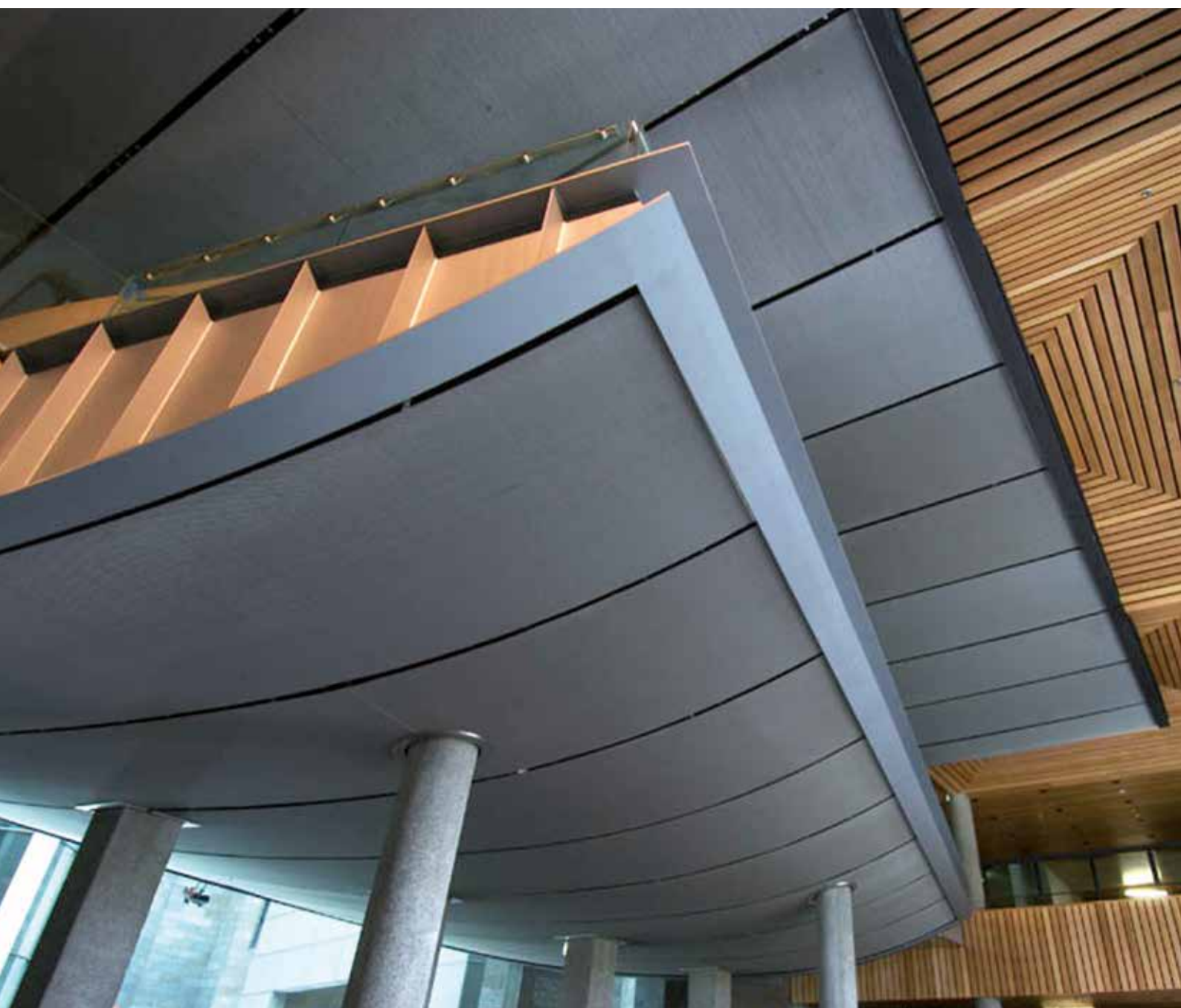


# CEILING SYSTEMS MADE OF METAL MESH

ACOUSTIC | REFLECTIVE | FUNCTIONAL CEILINGS



# NEW INTERPRETATION OF CEILING SYSTEMS

As a leading technical weaving company we have established metal mesh worldwide in the sophisticated architectural arena. We have realised design visions with future-oriented technical innovations for the past 20 years. This is also reflected in numerous ceiling design projects. Well-known references such as the Bibliothèque Nationale de France, the Tonhalle in Dusseldorf, the airports in Athens, Dusseldorf, Paris, Zurich and Singapore, as well as the European Court of Justice in Luxembourg are all prominent examples of our work. We have systematically built on our expertise in designing the most diverse free-form ceiling solutions from metal mesh and bundled our know-how in the development of dedicated ceiling systems. We now offer full-scope support for acoustically and visually optimising rooms with tailor-made functional ceilings from a single source.

## RANGE OF SERVICES

- Substructures
- Installation planning
- Full assembly/fitting
- Maintenance
- Functional mesh
- Mesh selection
- System design



*La Suisse Assurance, Lausanne, Switzerland.  
Architect: ASS Architectes LSA. Mesh: Sambesi (2)*



*Heimbs Café, Braunschweig, Germany. Architect: Despang Architekten.  
Mesh: Lamelle/Omega (3)*

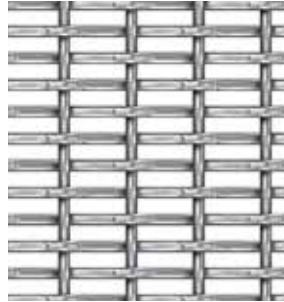
**TYPES OF MESH** (other types of metal mesh available on request)



*PC-Omega 1510*



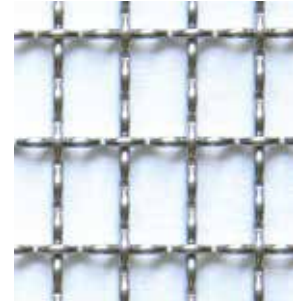
*PC-Omega 1520*



*Ellipse 52*



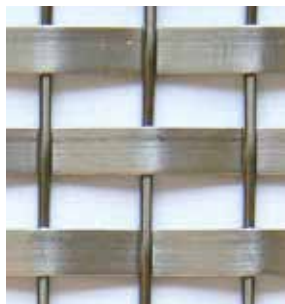
*PC-Tigris 100x15*



*Hydra 21*



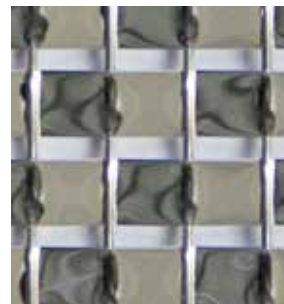
*Alu 6010*



*Atlantic*



*Atlantic Glow 7*



*Atlantic Glow 17*



*Composite mesh*

**MOUNTING SYSTEMS**

- Visible lay-in mounting with T-rails
- Concealed mounting using clamping grid profiles

**ADVANTAGES OF OUR SYSTEMS PORTFOLIO**

- Matched components from a single source
- Sophisticated complete solutions
- Certified systems
- Optimised logistics
- One contact throughout all project phases



*Fitting of lights, Mesh: Atlantic (4)*

# BEAUTIFULLY FRAMED FUNCTION

Modern ceiling design establishes a sense of creative harmony between form and function. With our systems, we therefore place as much emphasis on the effect and atmosphere of a room as on room acoustics. Ceiling systems with metal mesh are extremely flexible and can follow any architectural idea in terms of size, shape and design. They are available as element, grid or custom-shaped ceilings. The extraordinary aesthetics of the metal mesh turn ceilings into a visual experience. In its interaction with light, the high-grade surface creates targeted accents or lends the Silentmesh acoustic ceiling a kind of monolithic presence.



*Chilled ceiling, Hotel Steigenberger Drei Mohren, Augsburg, Germany.  
Architect: Alpstein. Mesh: Atlantic (5)*

## METAL MESH

- Available in either stainless steel or aluminium (other materials on request)
- Mesh-typical transparencies
- Non-combustible
- Corrosion-resistant
- Easy care
- Fully adjustable
- Recyclable

## ADVANTAGES OF METAL MESH CEILING SYSTEMS

- Freedom of design
- Ease of installation
- Elegant aesthetics
- Selectable, sprinkler-compatible structure depending on the mesh
- Maximum functionality
- Virtually unlimited service life
- Low maintenance costs



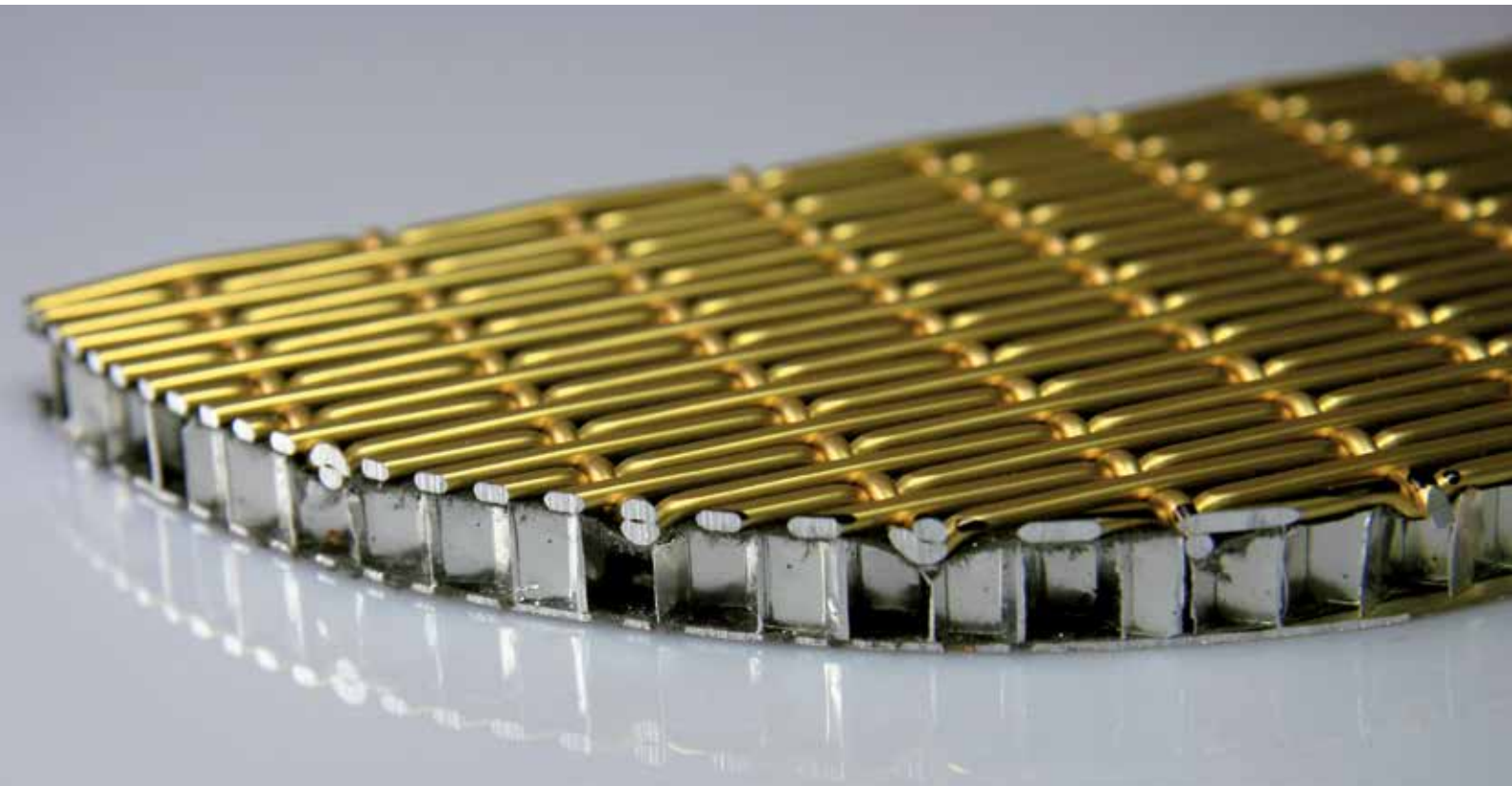
Hilton Frankfurt Airport Hotel, Frankfurt, Germany. Architect: JOI-Design.  
Mesh: Mandarin (6)

# INTELLIGENTLY REALISED EFFECT

Composite mesh (CMP mesh) made of metal mesh and aluminium honeycomb plate guarantees sag-free structures for large, grid-free ceiling solutions. The visible surface layer made of metal mesh utilises the visual advantages of the woven material. On customer request, an intermediate layer of acoustic fleece is integrated to improve room acoustics. Thanks to their design, metal mesh ceilings made of composite mesh are extraordinarily stable and resistant to bending. They allow the design of precisely shaped ceilings with a flat surface, even in large dimensions. The butt joint design underlines the homogeneous effect of the ceiling structure. Depending on the application, two-plate thicknesses are available.



„König von England“ (King of England) Ministry Building, Stuttgart, Germany. Architect: zsp architekten.  
Mesh: CMP Alu 6010 (7)



*CMP ALU 6010 mesh: ceiling elements made of Alu 6010 and aluminium honeycomb (8)*

#### **MODULE SIZE**

- Min. 50 x 50 cm
- Max. 400 x 125 cm
- Max. 12.5 mm / 25 mm thick

#### **MOUNTING SYSTEM**

- Clamped mounting

#### **ADVANTAGES OF METAL MESH COMPOSITES**

- Large format
- High level of stability
- No sagging
- Precisely shaped ceilings
- Monolithic effect
- Ease of installation



*Trouble-free connection to adjoining components (9)*

# OPTIMUM LIGHTING WITH ATLANTIC GLOW

Atlantic Glow – woven aluminium for even light distribution in modern offices. When good interior lighting performance needs to be combined with sound absorption, conventional ceiling materials quickly reach their limits. Although they may offer effective sound absorption, their light distribution leaves much to be desired (bottom picture on the left). Bartenbach GmbH, one of the world's leading lighting designers, and GKD AG therefore chose to collaborate and develop Atlantic Glow. Combining our experience of metal fabric with the lighting-related expertise of Bartenbach, we have developed lightweight, highly reflective aluminium ceiling cladding. Our metal fabric offers improved and more even daylight distribution (bottom picture on the right) and can thereby help reduce the amount of energy required for artificial lighting.



*Distribution of light with conventional ceiling materials*

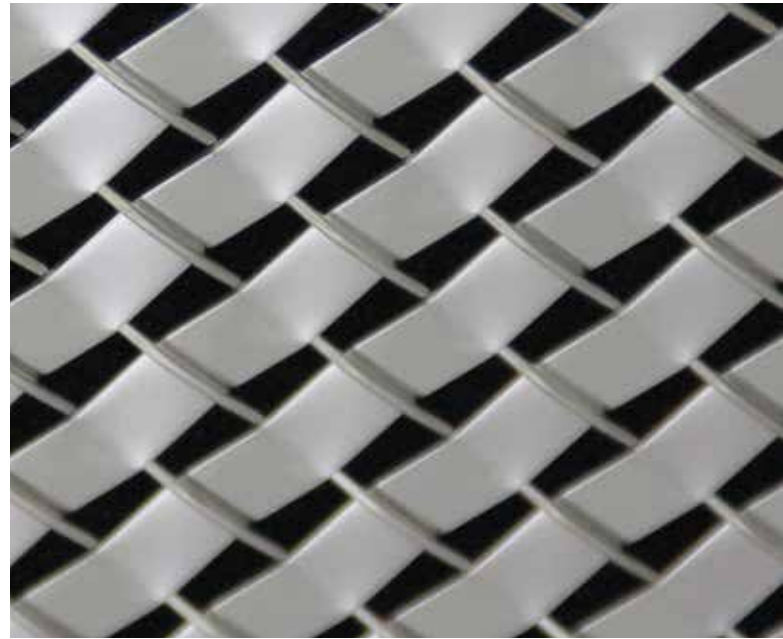


*Distribution of light with Atlantic Glow*

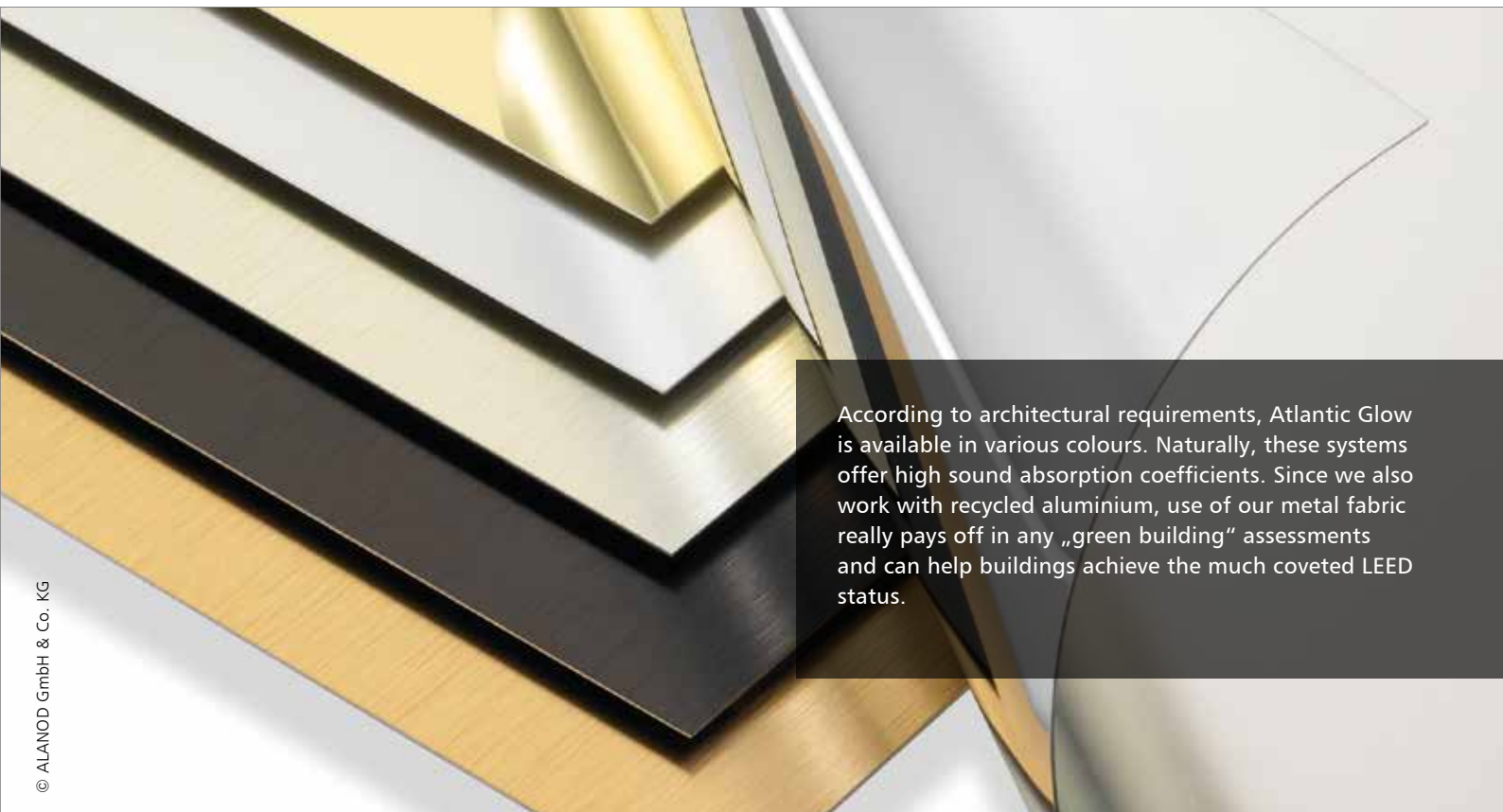




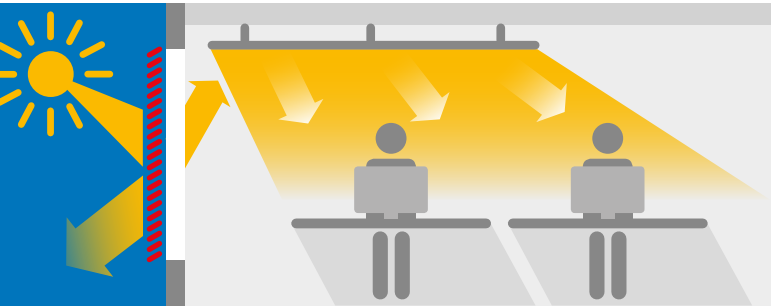
ATLANTIC GLOW, 7% open



ATLANTIC GLOW, 17% open



According to architectural requirements, Atlantic Glow is available in various colours. Naturally, these systems offer high sound absorption coefficients. Since we also work with recycled aluminium, use of our metal fabric really pays off in any „green building“ assessments and can help buildings achieve the much coveted LEED status.



Daylight deflection into the heart of rooms using Atlantic Glow with active solar protection.

### ADVANTAGES AT A GLANCE

- Suitable for daylight and artificial light
- High degree of reflection
- Targeted reflection or partially diffused reflection
  - High-quality material and design
- Available in a large choice of colours
- Three different surface finishes
- Two different weave types (7% and 17% open area)
- Lightweight
- Energy-saving thanks to enhanced light dispersion
- Manufactured from recycled aluminium
- Sound-absorbing with cover layer
- Products are made from recycled aluminium

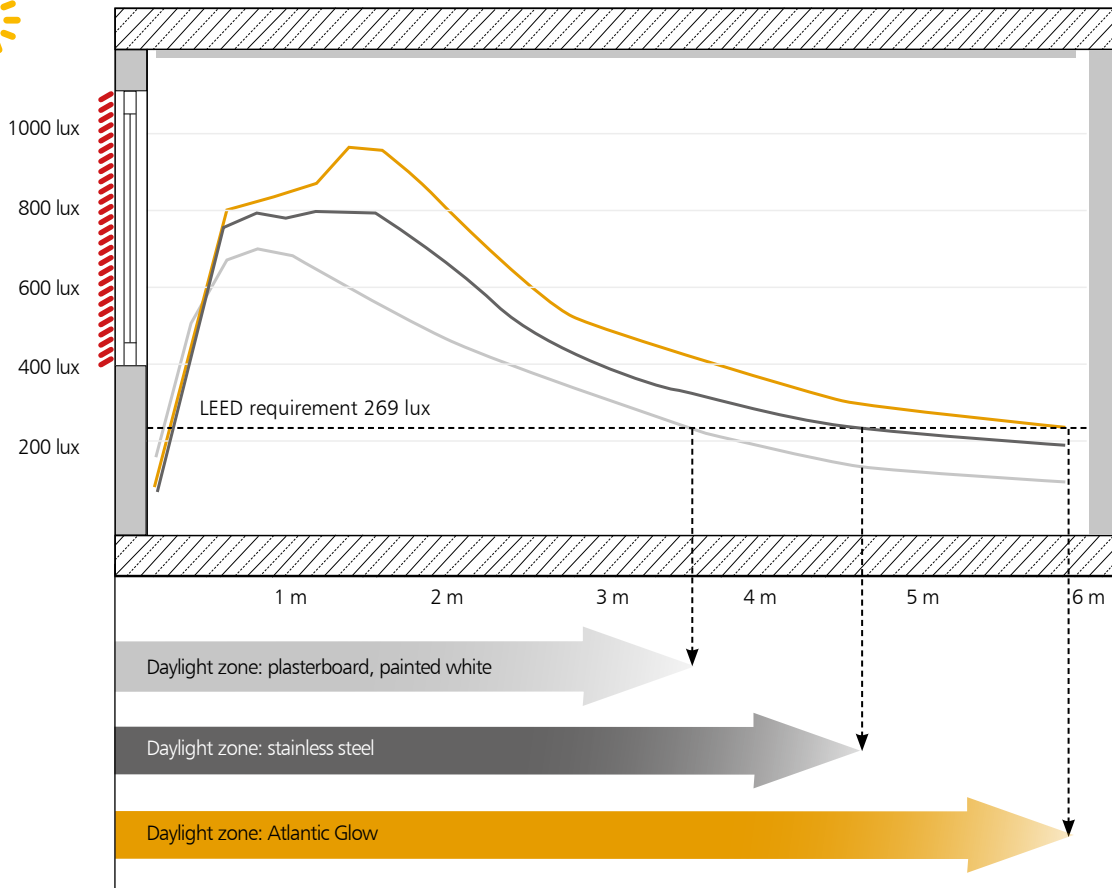
### ATLANTIC GLOW FACILITATES LEED AND DGNB CERTIFICATION

Any building that has facades sitting directly in the sun and employs activated solar protection faces challenges as to how to use daylight most effectively in its interior spaces. A large proportion of the daylight dispersed by the solar protection shutters is reflected toward the ceiling. A standard plasterboard ceiling does not offer any options for deflecting this light deeper into the room. Most of the light remains in the direct vicinity of windows, while areas further into the heart of the building remain unlit.

The high degree of reflection and the targeted reflection offered by the aluminium material in Atlantic Glow significantly improves daylight transport. This allows areas further away from windows to enjoy natural lighting, thereby reducing the need for artificial lighting. Not only does this reduce a building's energy consumption, it also provides rooms that are bright and flooded with natural daylight.

Certifications such as LEED and DGNB require evidence of effective natural lighting across the room depth. The simulation (graphic on the right) shows that Atlantic Glow with a highly reflective aluminium material fulfils the requirements more easily than conventional ceiling solutions, such as plasterboard or stainless steel fabric. It is possible to supply the requisite levels of light to room depths of up to 6 metres. Not only is more light transported across the room depth, it is also distributed more effectively. Most of the daylight does not remain within the areas of the windows, but rather supplies the core area of the workplaces near the facade.

**ATLANTIC GLOW – AN ACTIVE CONTRIBUTION TO LEED IEQ 8.1/8.2 CERTIFICATION**



- Plasterboard, painted white    25fc > 57%
- Stainless steel                    25fc > 73%
- Atlantic Glow                      25fc > 97%

**SIMULATION PARAMETERS**

Room dimensions: L= 4.8 m x W = 5 m x H = 3 m, 70/50/20  
 East facade with activated solar protection  
 (external blinds, 40° position, rho = 50%, 2 panes)  
 Date: 21 September 2014, 9:00 am  
 Location: Berlin  
 Maintenance factor 1  
 Plasterboard, rho = 70%  
 Steel, rho = 65%  
 Aluminium, rho = 95%

*In indirect lighting situations, such as buildings in which daylight is deflected from the facade to the interior, Atlantic Glow offers greater efficiency than other metals or light-diffusing white ceilings.*

# CREATIVELY OPTIMISED ACOUSTICS

The Silentmesh acoustic ceiling system, available with stainless steel or aluminium mesh, opens up virtually limitless design options. Ceiling panels made of standard products and grid ceilings or custom shaped ceilings characterise our portfolio of complete solutions for a high level of room-based acoustic comfort. Silentmesh lends rooms pleasant acoustics through a highly effective sound-absorption layer or certified acoustic fleece matting. Ceiling fittings, such as lights, downlights or sprinklers, are easy to integrate. On request, we can also incorporate tailor-made openings and trimmed sections when preparing the meshing at our facility. Silentmesh can also be removed and refitted easily for maintenance purposes.



*Acoustic fleece with hotmelt fixing.  
Mesh: Alu 6010 (13)*



*Tonhalle, Dusseldorf, Germany. Architect: HPP Hentrich-Petschnigg & Partner.  
Mesh: Omega 1540 Bronze (special mesh) (10)*



Tonhalle, Düsseldorf, Germany. Architect: HPP Hentrich-Petschnigg & Partner.  
Mesh: Omega 1540 Bronze (special mesh) (12)

**RECOMMENDED FABRIC/INSTALLATION COMBINATIONS (other types of metal fabric available on request):**

Our fabrics differ in terms of their suitability for various mounting options. The following overview recommends possible combinations (other combinations also available following consultation)

METAL FABRIC TYPE	LAY-IN MOUNTING	CLAMPED MOUNTING	COMPOSITE FABRIC (CMP)
ATLANTIC	OK	OK***	–
ATLANTIC GLOW	OK	OK***	OK
ALU 6010	OK	–	OK
ELLIPSE 52	OK	OK***	OK*
PC-OMEGA 1510	OK	–	OK*
PC-OMEGA 1520	OK	OK***	OK*
PC-TIGRIS 100x15	OK	OK***	–
HYDRA 21	–	OK***	–
MANDARIN **	–	–	OK

\* Weight must be taken into account, additional suspension elements may be necessary.  
 \*\* Mandarin is a bronze metal fabric. Colour deviations, streaks, patina, etc. are all typical of the material and caused by the manufacturing process. No such issues may be submitted as justification for complaints.  
 \*\*\* Metal mesh with surrounding upstand of 90° / 50 mm.

**SOUND ABSORPTION**

The sound-absorbing properties of the Silentmesh acoustic ceilings have been verified by an independent, certified testing laboratory in an echo chamber as per ISO 354. Here is an overview of the results achieved by the metal fabric in connection with various insulation materials:

FABRIC TYPE	INDEPENDENT <sup>1</sup>	MINERAL WOOL <sup>2</sup>	POLYESTER MATTING <sup>3</sup>
ALU 6010 CMP, 25 mm	$\alpha_w = 0.90$ / NRC = 0.85	–	
MANDARIN CMP, 25 mm	$\alpha_w = 0.90$ / NRC = 0.85	–	
ALU 6010 CMP, 12 mm	–	$\alpha_w = 0.90$ / NRC = 0.90	$\alpha_w = 0.95$ / NRC = 0.95
MANDARIN CMP 12 mm	–	$\alpha_w = 0.90$ / NRC = 0.85	$\alpha_w = 0.95$ / NRC = 0.95
PC-OMEGA 1510	–	$\alpha_w = 1.00$ / NRC = 0.95	$\alpha_w = 1.00$ / NRC = 0.95
PC-OMEGA 1520	–	$\alpha_w = 1.00$ / NRC = 0.95	$\alpha_w = 1.00$ / NRC = 0.95
ATLANTIC	–	$\alpha_w = 1.00$ / NRC = 1.00	$\alpha_w = 0.95$ / NRC = 0.95
ELLIPSE 52	–	$\alpha_w = 1.00$ / NRC = 0.95	$\alpha_w = 1.00$ / NRC = 0.95

<sup>1</sup> Applies only to CMP honeycomb elements, t = 25 mm: acoustic fleece embedded between fabric/honeycomb and back/honeycomb, element offers independent sound absorption without additional insulation materials in the ceiling cavity.  
<sup>2</sup> Mineral wool (rock wool), t = 50 mm, gross weight 50 kg/m<sup>3</sup>, in PE film t = 30 µm to prevent fibres from being released.  
<sup>3</sup> Polyester, t = 50 mm, gross weight 35 kg/m<sup>3</sup>

A close-up, low-angle photograph of a ceiling installation. The image shows a white acoustic panel being mounted onto a silver metal grid. A light fixture is visible in the upper right corner. The perspective is looking up at the ceiling, with the grid and panel creating strong diagonal lines.

### MODULE SIZES FOR LAY-IN MOUNTING T15

- 60 x 60 cm / 120 x 60 cm
- 62,5 x 62,5 cm / 125 x 62,5 cm
- imperial grid

### SOUND ABSORPTION LAYER

- Polyester 50 mm / 35 kg/m<sup>3</sup>
- Rockwool 50 mm / 50 kg/m<sup>3</sup>
- Acoustic nonwoven (CMP only)

### ACOUSTIC EFFECT

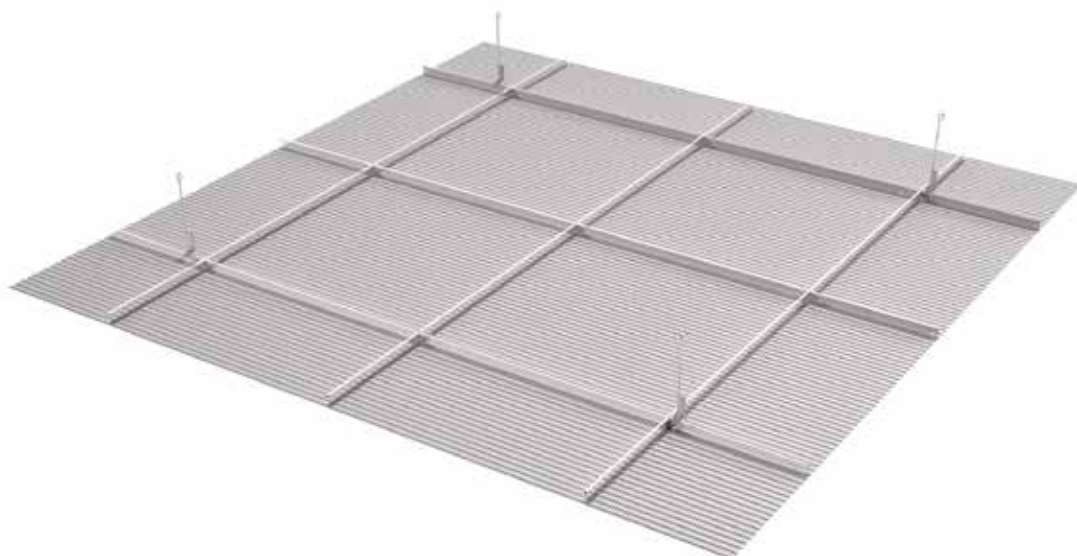
- Improved room acoustics
- Improved speech intelligibility

# HOLISTICALLY DESIGNED SYSTEMS

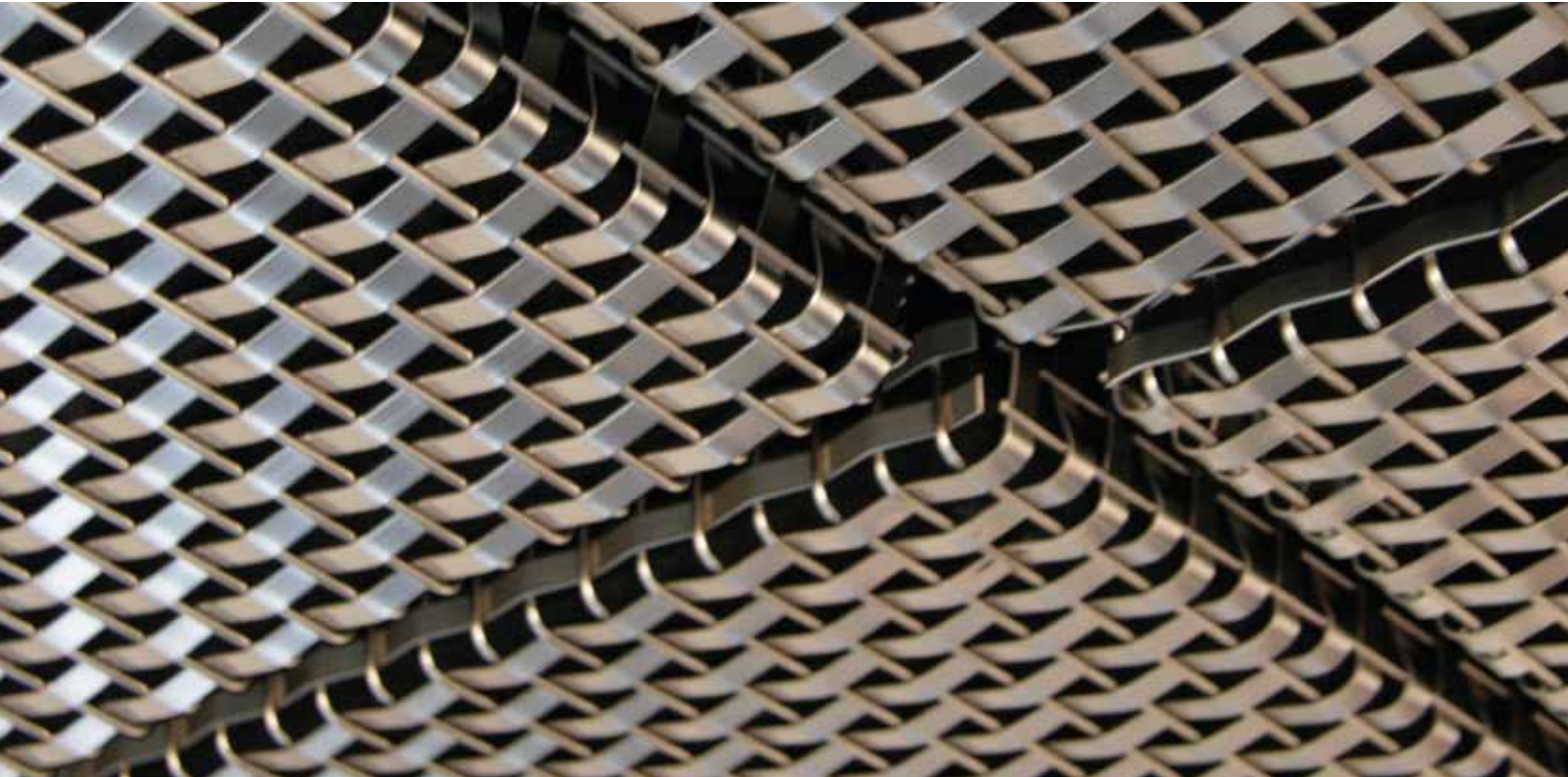
**Silentmesh is an acoustic ceiling system with metal mesh for visible lay-in mounting using a system of T-rails or concealed clamped mounting with bandraster or single clamping profiles. Wall connections are established with wall anchors (with or without shadow gap), wall friezes or are butt-jointed.**

The system is attached to the load-bearing bare ceiling using metal anchors approved by the building authorities and adjustable, galvanised nonius brackets. The substructure, consisting of the base and supporting profiles, employs galvanised CD-profiles in line with EN 13964. T15 mounting profiles for lay-in mounting are available in high-gloss chrome, natural aluminium, black, white or coloured on request. The sound absorption matt is available in both polyester and mineral wool. The surface layer consists of stainless steel or aluminium mesh.

The modules are available for all common grid sizes/rasters (EN, DIN, Imperial). Freely sculpted forms are also available on request. All components are technically and visually matched. The system is then delivered with a fully dimensioned substructure and installation plans. The openings and trimmed sections required for ceiling fittings, such as lights, downlighters or sprinklers, are prepared and implemented at our facility prior to delivery. Silentmesh can also be removed and refitted easily for maintenance purposes.







*Lateral upstands for an impressive joint pattern. Mesh: Atlantic (16)*

## **LAY-IN SYSTEM SPECIFICATIONS**

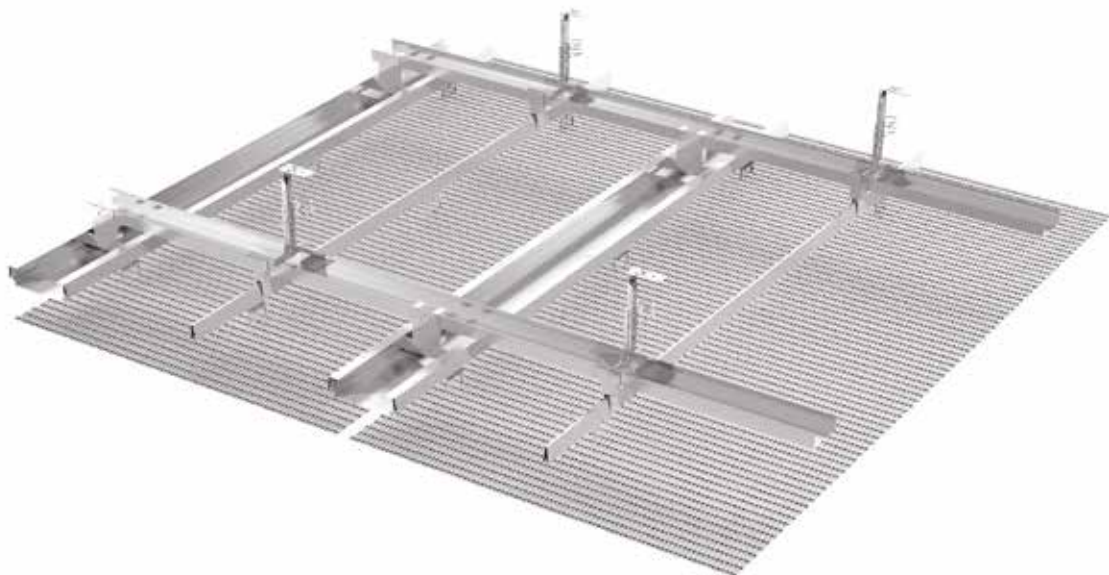
### **System description:**

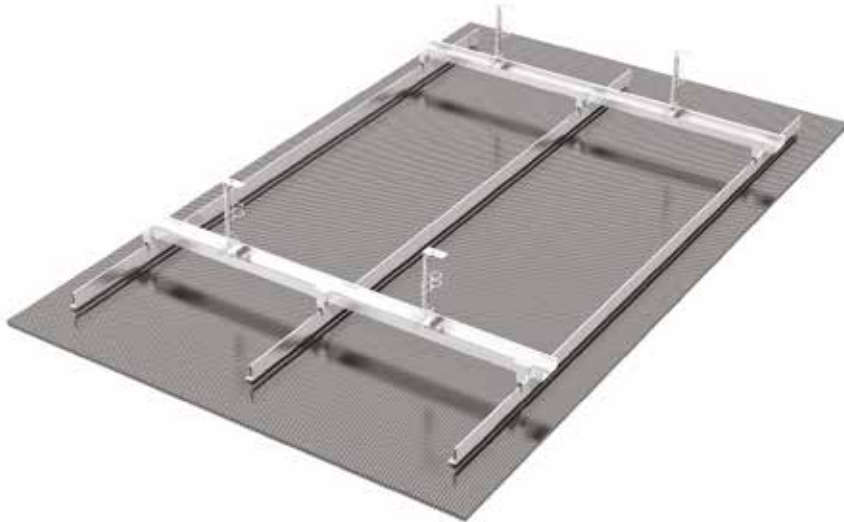
- Installation of the load-bearing substructure using metal anchors approved by the building authorities, load capacity  $\geq 5$  kN per anchor. Suspended using adjustable, galvanised nonius brackets, spacing as per static requirements.
- Substructure, base frame consisting of galvanised CD-profiles in line with EN 13964 as base and supporting profile.
- T15 or T24 mounting profiles for lay-in mounting (standard T15 mm high-gloss chrome). Alternatively, clamped and suspended installation options are also available.
- Polyester sound-absorption layer, 50 mm thick, construction material class B1. Alternatively, rockwool matting, 50 mm thick, material class A1.
- Surface layer made of metal mesh. Module sizes: 60 x 60 cm, 120 x 60 cm, 62.5 x 62.5 cm or 125 x 62.5 cm.
- Lights, downlights, sprinklers etc. can be fitted using dedicated recesses made during production.
- The ceiling systems can be demounted without any tools.

## CLAMPING SYSTEM SPECIFICATIONS

### System description:

- Installation of the load-bearing substructure using metal anchors approved by the building authorities, load capacity  $\geq 5$  kN per anchor. Suspended using adjustable, galvanised nonius brackets, spacing as per static requirements.
- Substructure, base frame/raster consisting of galvanised CD-profiles in line with EN 13964 as the support profile. Support profile grid/raster made of clamping rails (alternatively as joint backing with bandraster grid profiles).
- Surface layer made of metal mesh with surrounding upstand of  $90^\circ / 50$  mm. The surface layer is attached to the clamping profiles using GKD metal mesh suspension brackets.
- Module sizes: 60 x 60 cm, 120 x 60 cm, 62.5 x 62.5 cm or 125 x 62.5 cm, other sizes freely selectable depending on the maximum spans of the individual mesh types. The pattern repeat is to be considered.
- Polyester sound-absorption layer, 50 mm thick, construction material class B1. Alternatively, Rockwool matting, 50 mm thick, material class A1.
- Openings for downlights, sprinklers, vents, etc., to be factory-provided according to plans.
- The ceiling systems can be demounted without any tools.





*Clamped mounting Composite (CMP) (18)*

## **CMP (COMPOSITE) CLAMPING SYSTEM SPECIFICATIONS**

### **System description:**

- Installation of the load-bearing substructure using metal anchors approved by the building authorities, load capacity  $\geq 5$  kN per anchor. Suspended using adjustable, galvanised nonius brackets, spacing as per static requirements.
- Substructure, base frame/raster consisting of galvanised CD-profiles as base profile. Support profile grid/raster made of clamping rails (alternatively as joint backing with bandraster grid profiles).
- Surface layer made of metal mesh. The surface layer is attached to the clamping profiles using a mounting bracket on the back.
- Module sizes: freely selectable from min. 50 x 50 cm to max. 400 x 125 cm. The pattern repeat is to be considered.
- Openings for downlights, sprinklers, vents, etc., to be factory-provided according to plans.
- The ceiling systems can be demounted without any tools.

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**GKD - GEBR. KUFFERATH AG**

As a privately owned technical weaver, GKD-Gebr. Kufferath AG is the world market leader in metal, synthetic and spiral mesh solutions. Four independent business divisions bundle their expertise under one roof: **INDUSTRIAL MESH** (woven metal mesh and filter solutions), **PROCESS BELTS** (belts made of woven mesh and spirals), **METALFABRICS** (façades, safety and interior design made of metal fabrics) and **MEDIAMESH®** (transparent media façades). GKD continuously develops new fields of application through its manufacturing technology and process expertise. We use GKD meshes to create efficient systems, equipment and components that are perfectly integrated into our customers' processes across all industrial sectors. GKD is active on the international stage from its headquarters in Germany, five further production sites in the US, South Africa, China, India and Chile, as well as branches in France, Spain, Dubai and representatives all over the world.

**BUSINESS UNIT: METALFABRICS**

With top quality metal fabrics and design mesh, GKD combines aesthetics with function, experience with innovation. Whether custom metal fabrics or standardized system components, planners and architects have been benefiting from our creative impulses and technical innovations for more than 20 years – also in internationally outstanding architectural projects. The design options in terms of shapes, colors and surfaces ensure unique façade designs. Building shells become energy-efficient solar protection systems that can be adjusted for different times of the day. Bright LED media façades display high resolution content. Sound-absorbing ceiling systems improve room acoustics, while semi-transparent room dividers help structure interior designs. Roll-up doors offer effective burglary protection. GKD's diverse product portfolio offers the right solution for a very wide range of architectural applications.

**CLOSE TO THE MARKET AROUND THE GLOBE.**

- ① GKD GERMANY, Düren (headquarters)
- ② GKD FRANCE, La Roque d'Anthéron, Croisilles
- ③ GKD SPAIN, Barcelona
- ④ GKD USA, Cambridge, MD
- ⑤ GKD LATIN AMERICA, Santiago de Chile
- ⑥ GKD SOUTH AFRICA, Randfontein
- ⑦ GKD INDIA, Jaipur
- ⑧ GKD CHINA, Beijing, Qufu
- ⑨ GKD MIDDLE EAST, Dubai

