

**CreativeWEAVE**  
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# **Illu**mesh® & **Media**mesh®

## Transparent **media façades**



**ag4** | media facade GmbH



WORLD WIDE WEAVE





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Magical effects. Mesh type: **illu**mesh®

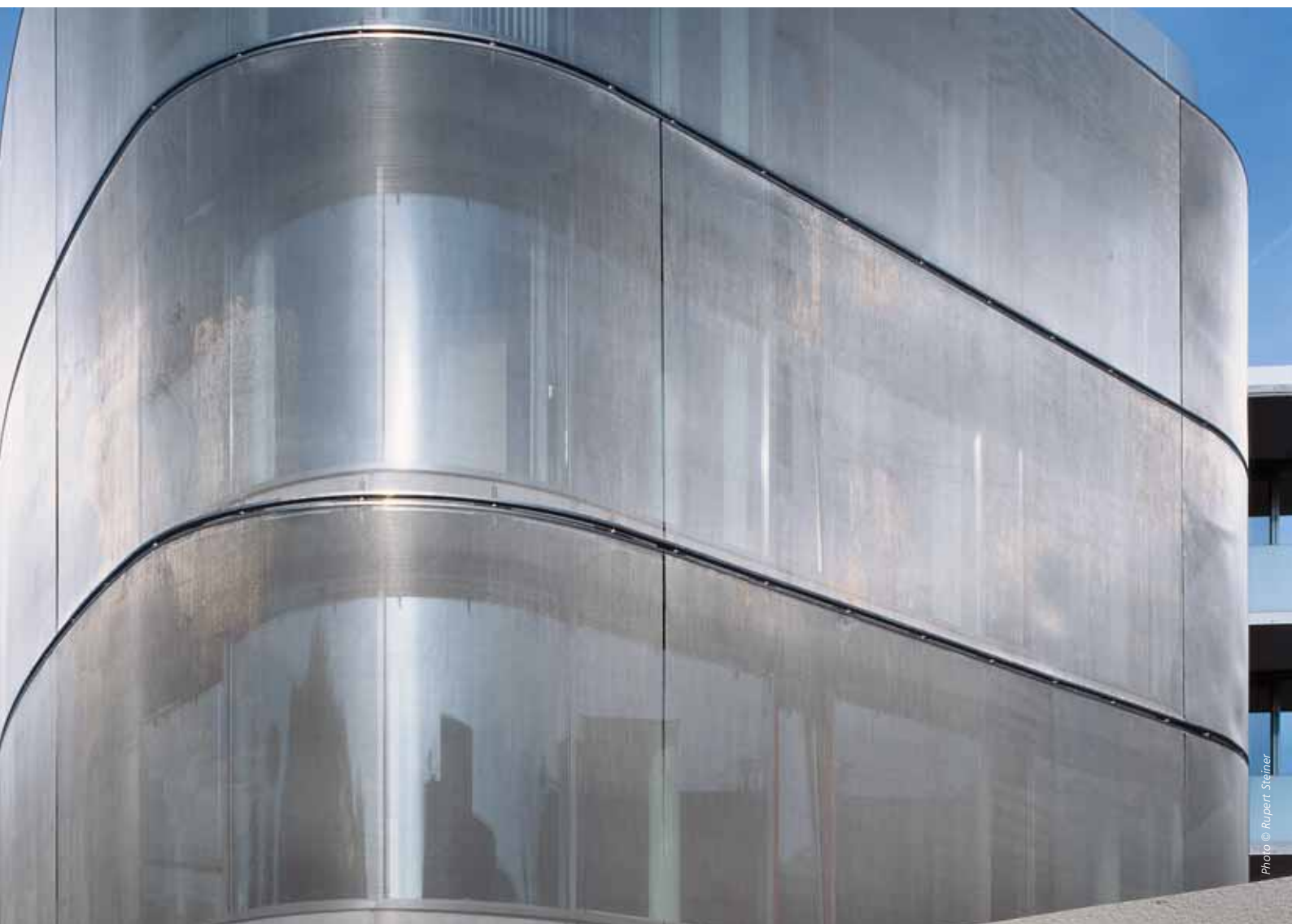
## **Clever combination of core competence:** Transparent media façades.

As the face architecture turns towards the outside world, every façade in addition to its traditional structural function also has the task of communicating. It is the interface between inside and outside, representing the users of the building and co-shaping the context in which it stands. Since the 1920s, this communicational function of façades has been fundamentally changed through the use of artificial lighting. When night falls, highly frequented squares and boulevards come alive with luminous adverts that create an atmospheric backdrop for the revellers on the streets. The development of the light emitting diode (LED) gave advancing illumination technology a decisive and innovative impulse, changing static or merely blinking adverts on the walls of buildings into multimedia displays. In the meantime a range of illumination technologies – from integrated luminants through displays to projection and back projection – have invaded public spaces. The disadvantage of all of these systems has been their closed structure and the fact that they could only be used at night. The solution to these deficits finally came as a breakthrough in the form of a novel, patented technology by GKD – Gebr. Kufferath AG and the company ag4 media facade GmbH. In a technological and creative joint venture, the two companies developed a daylight-capable, transparent medialisation system consisting of stainless steel wire mesh with integrated LED profiles.

Woven metallic architectural and design fabrics made by the world's leading technical weaver GKD come in a wide range of forms and play prominent roles in visionary architectural structures all over the world. As a trailblazer for the use in architecture of what was originally a purely industrial material, at the end of the 90s GKD was already heavily involved in the medialisation of mesh façades. In projects like the Expomedia Light Cube in Saarbrücken, the Estadio Santiago Bernabéu, Arctura in Östersund or the Spielbudenplatz in Hamburg's St. Pauli district, GKD mesh was enhanced with accentuated lighting using projection or back projection. What makes stainless steel wire mesh so attractive for architectural applications is not only its aesthetic and functional potential but also the fact that it can be woven in widths of up to 8 m and in practically unlimited lengths. The textile-like structure is an attractive outer shell, climate membrane and safety balustrading all at the same time: opaque or transparent, reflective, lastingly resistant to weathering and corrosion, robust, fireproof and easy to maintain.

At the beginning of the 90s, the architects and media specialists ag4 media facade GmbH founded the new discipline of "mediatecture". The idea was to take the urban context fully into consideration and to create communicative media façades that are truly integrated into the architecture. As an alternative to the conventional electronic solutions of that time, ag4 developed the principle of the transparent media façade: transparent carrier systems with integrated rows of LEDs and a strategic communicative programming concept. Groundbreaking implementations of the idea are the T-Mobile façade in Bonn and the foyer of the Merck Serono company headquarters in Geneva.

*Alpenland Wohnbaugenossenschaft,  
St. Pölten/Austria  
Mesh type: PC-Omega 1530*





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**Media**mesh® – LEDs integrated into stainless steel mesh

## Intelligent effects:

Wire mesh with integrated LED profiles.

In a unique alliance of core competences, GKD and ag4 developed the process for the integration of customised LED modules into textile-like stainless steel wire mesh. Especially designed for long-term implementation in architecture, variants of the systems suitable for daylight and night-time offer unlimited scope for visual effects. The range of weavable dimensions makes it possible to medialisise extremely big facades with degrees of transparency ranging from 40 to 90 percent. The basis for the system is the GKD cable mesh type "Tigris", made of stainless steel, and its woven-in round profiles, open along the front, into which light emitting diodes – LEDs or SMDs – are installed with a waterproof seal. The specific image resolution of the product will depend on the particular display quality requirements of the individual project and on the cost structure. Whether the resolution is high enough for graphics or for videos is a matter of how close the pixels are to each other. The horizontal profiles containing the pixels are interconnected in groups of up to 8 with insulated cables that are inserted into the edges of the mesh, where they are hardly visible. After installation, these profile groups are connected to control units integrated into the building's structure and networked with a central server inside the building. This is how they are supplied with power and display data.

**Illum**mesh®: Using special fixtures, LED profiles are attached to the front of the woven metal mesh



Two essentially different systems are available. With **Media**mesh® the rows of LEDs are integrated into the mesh. After the weaving process, carrier sleeves woven into the warp at defined intervals accommodate the LED profiles, which shine directly out at the viewer. **Illu**mesh®, on the other hand, has special fixtures woven vertically into the mesh panel to hold the LED profiles in front of the mesh. Here, the LED light is projected backwards onto the mesh and is only visible to the viewer indirectly as a reflection.

The LEDs can display up to 16 million different colours. Computer-controlled display programming, executable via the Internet, creates the project-specific relationship between the architecture, the user's message and the urban context. The contents can be any desired combination of advertising, corporate or city information, artistic displays or even live transmissions of events.

Long service life, low power consumption and minimal maintenance requirements thanks to reliable technology are the outstanding qualities of both systems. The reactive adaptability of display brightness to daylight and weather conditions underlines the energy efficiency of the concept. And regardless of the type and performance of the display, the carrier material keeps all of its aesthetic and functional properties. **Media**mesh® and **Illu**mesh® won the internationally recognized red dot design award 2008 for outstanding design and quality.



DESIGNPREIS  
2009



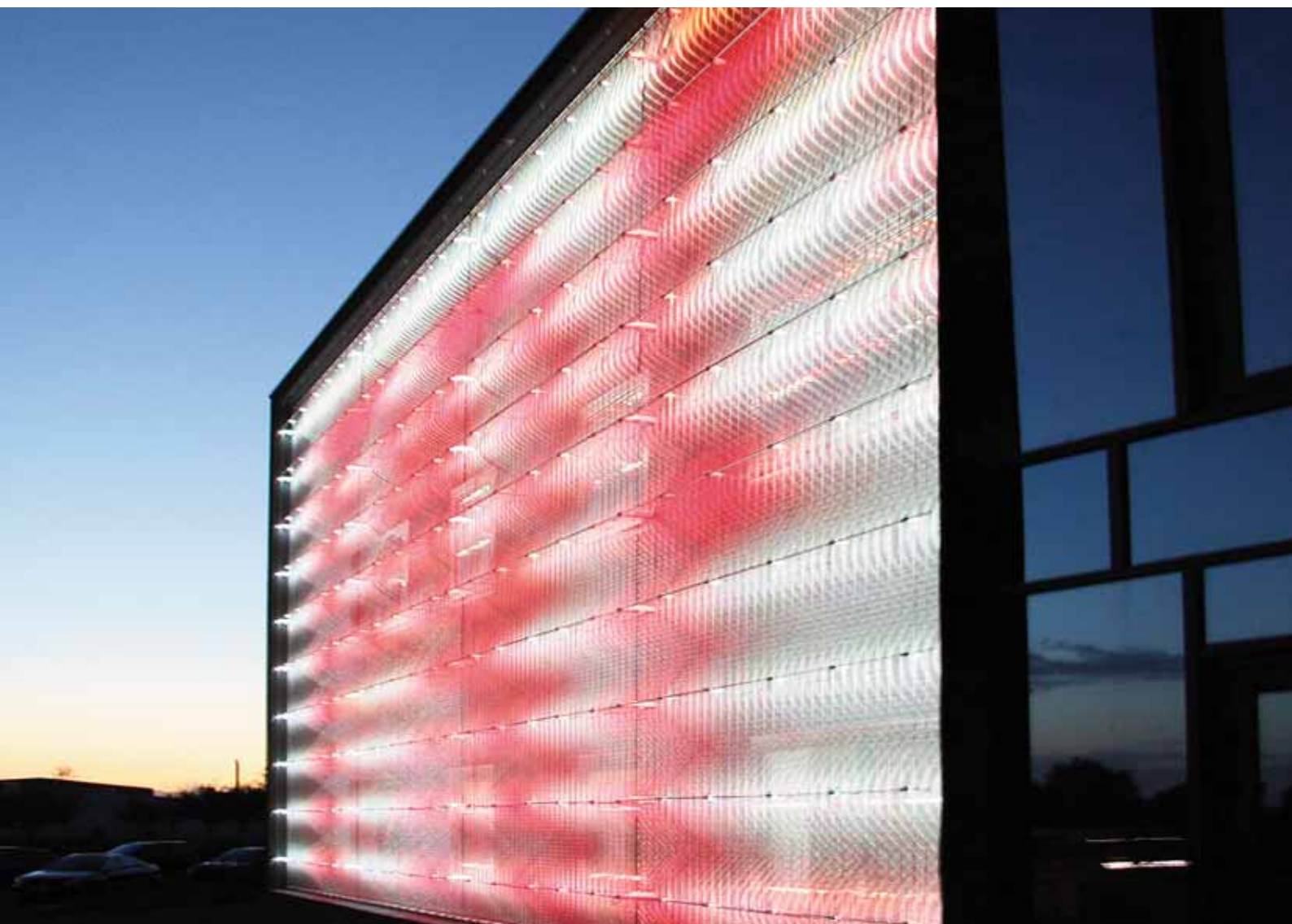
product  
design  
award

2009



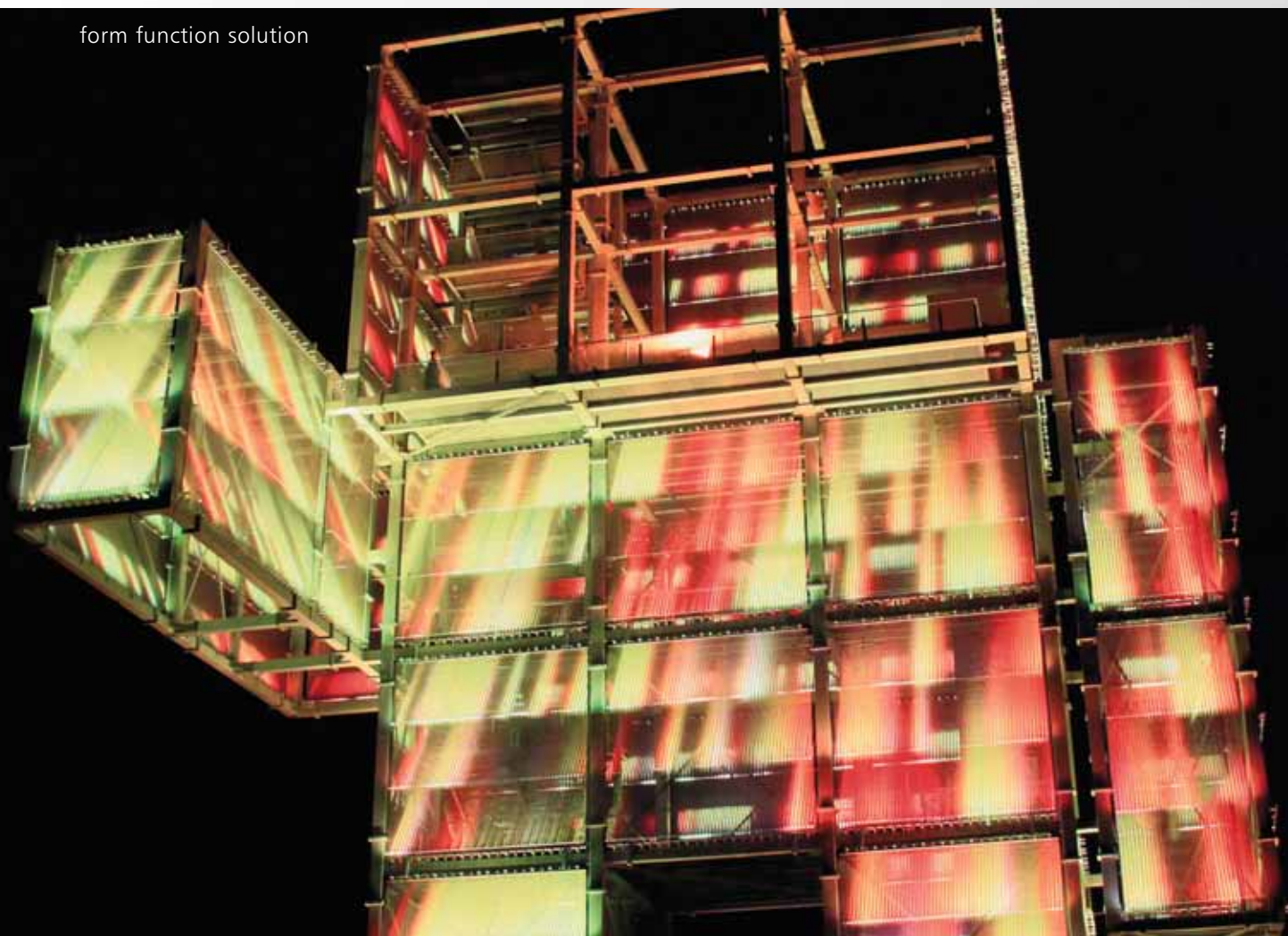
reddot design award  
winner 2008

**Illu**mesh® – LED light is reflected from the mesh





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**Illu**mesh® – fascinating colour effects for large surfaces

Foto © GKD / ag4

## **Illu**mesh®: **Media façade system with** integrated illumination.

**Illu**mesh® is suitable for permanent night-time illumination and medialisisation of large façade surfaces. Special fixtures woven into the stainless steel mesh accommodate the LED profiles so that they are positioned in front of the mesh. The openings in the profiles are directed backwards towards the façade and project expansive light and colour compositions onto the shimmering material. The interplay of colourful light reflection and the metallic reflectivity of the stainless steel wires makes the lighting look as if it is floating in front of the façade. The effect, reminiscent of holograms, gives the illumination a particularly magical quality.

The size of the illuminated area can be rendered larger or smaller depending on the angle at which the mesh is illuminated. The vertical and horizontal intervals of the LED profiles determine the resolution of the display. These two parameters offer fascinating scope for the illumination of large surfaces, even with relatively low investment, ranging from alternating colour fields through to complex animations or text and graphic elements.

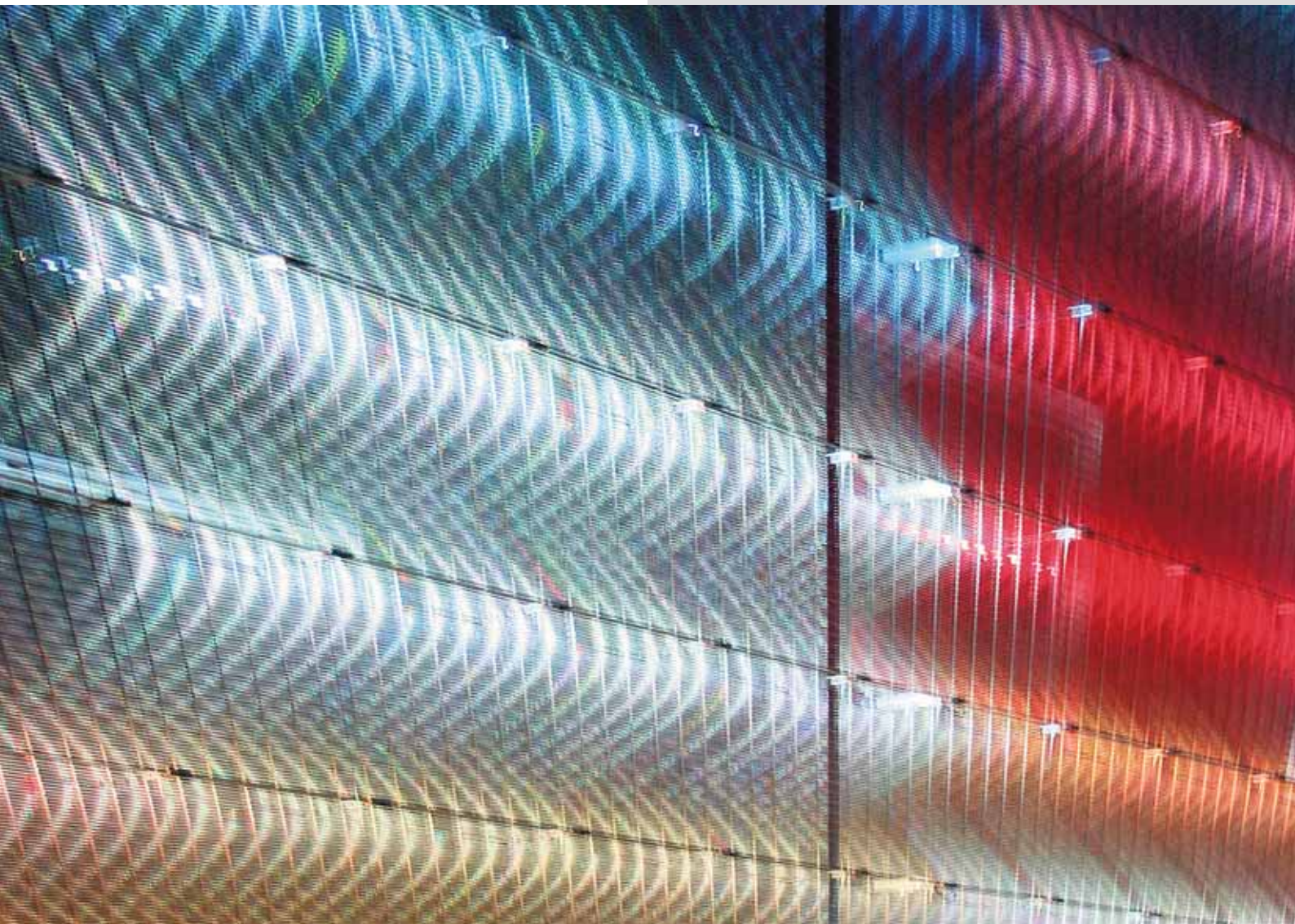


The advantage of **illu**mesh<sup>®</sup> over conventional systems is its graphic image resolution and low-maintenance operation. The system itself is robust, resistant to weathering and temperature, functions as sun protection or climate membrane and has an attractive transparency, all properties which make it suitable for a multifunctional range of application.


#### Technical data:

- Mesh width up to max. 8 m (power connection on both sides)  
mesh length up to max. 25 m
- Mesh depth 20 cm
- Transparency 67 %
- IP-Level 65
- Ambient temperature from -20 °C to +70 °C
- LEDs: 70,000 operating hours
- LED profiles:  
vertical pixel pitch from 40 cm to 4 m  
horizontal pixel pitch from 10 to 50 cm
- Weight, depending on resolution: 7 – 8 kg/m<sup>2</sup>
- 3 or 5 LEDs per pixel
- Warranty: 1-year guarantee on all components

**illu**mesh<sup>®</sup>: effects reminiscent of holograms







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**Media**mesh® – the density of the LEDs determines the resolution of the images

## **Media**mesh®: **Transparent platform** for complex content.

**Media**mesh® can be used to medialisise large façades by day or by night without concealing the architecture behind it. High-luminosity LED profiles with a project-specific pixel pitch are integrated into custom-woven stainless steel wire mesh. Each individual pixel can be separately addressed. In contrast to conventional LED boards or temporarily deployed imaging systems with individual pixels, **Media**mesh® is the only system in the world that combines brilliant display quality, even in daylight, with the option of permanent architectural integration of a transparent façade. A key feature is the extremely low structural depth of less than 25 mm, making the system eminently suitable for external medialisations. The textile-like structure of the mesh creates a spectacular media “skin”, and even when switched off acts as a decorative shimmering metallic cladding that reflects its surroundings in fascinating nuances. With a weightlessness that does not detract in any way from the transparency of the woven veil, the integrated technology transforms the metallic mesh into an intelligent platform for complex content.

**Media**mesh® covers the whole range of display options, revealing its own unique magic when it comes to high-resolution images, videos or live transmissions. The display format is not restricted to conventional standards like 4:3 or 16:9, and the possibility of free definition of format allows the display design to harmonise flexibly with the proportions of the architecture behind



the façade. **Media**mesh® is always custom configured according to the specific application and required display quality. The density of the LEDs and the intervals between the profiles determine the fineness of the resolution: the smaller the intervals, the more detailed the image displayed.

Unlike conventional systems used so far for the medialisation of architecture, **Media**mesh® combines daylight-capability with a structural transparency that only woven metal mesh can offer. The façade obscures neither the view of the building behind it nor the view outwards from inside the building. In contrast to conventional LED boards, **Media**mesh® requires no extra cooling in hot climates, which means considerable savings on operating costs. A further bonus is the proven functionality of stainless steel wire mesh as high-quality sun protection or as a highly effective climate membrane. But the particular fascination of this system is the sheer size of the display area, which transforms the stark elegance of the mesh into an emotional experience.

**Media**mesh® – a spectacular portal for urban communications

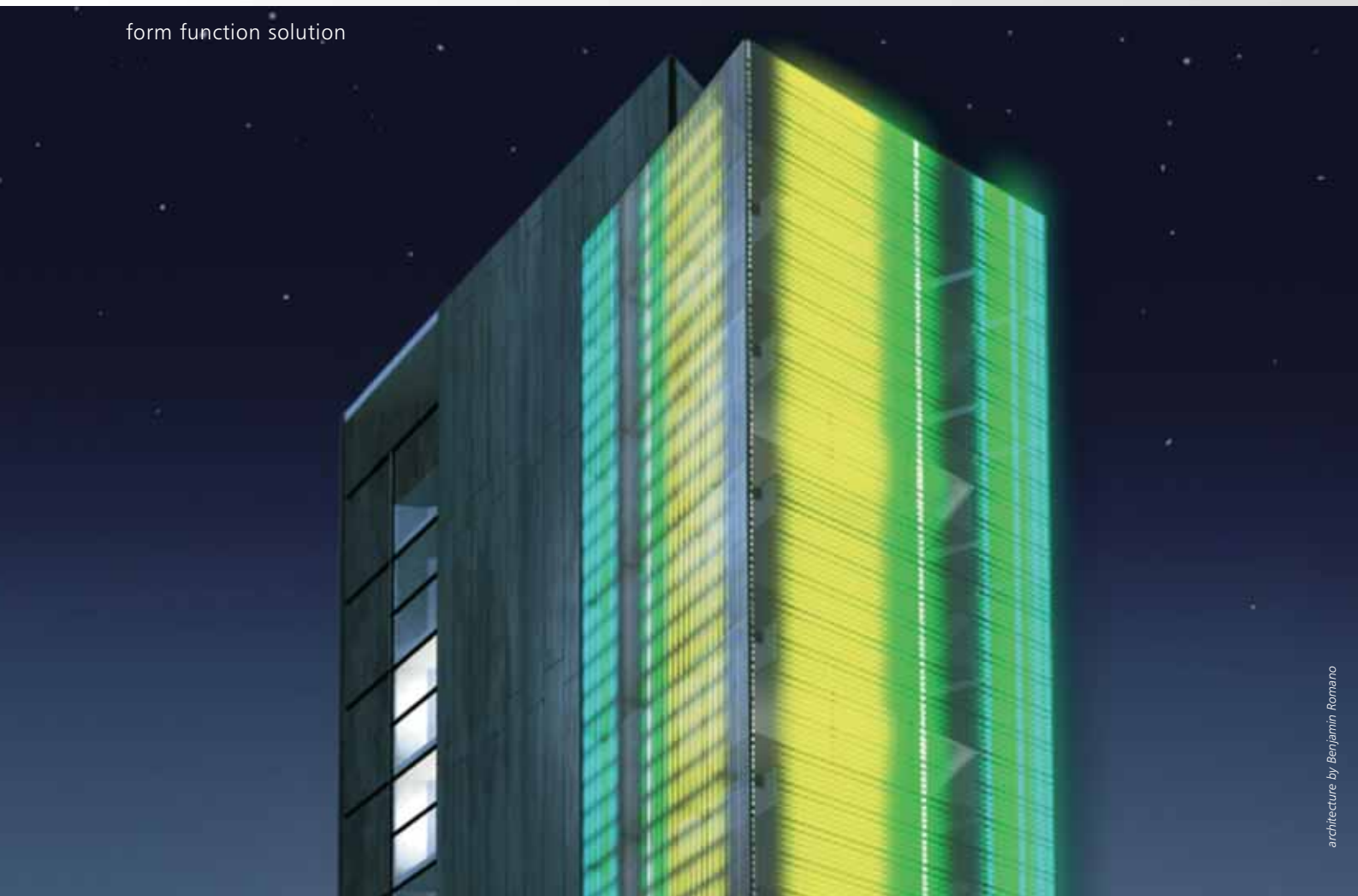
#### Technical data:

- Mesh width up to max. 4 m, mesh length up to max. 20 m
- Mesh depth 2.5 cm
- Transparency 54 to 65 % depending on resolution
- IP-Level 65
- Ambient temperature from –20 °C to +70 °C
- LEDs: 70,000 operating hours
- LED profiles:
  - free choice of vertical pixel pitch from min. 3 cm intervals
  - horizontal pixel pitch from 4.25 cm
- Vectored LEDs: angle of radiation vertical 60 degrees, horizontal 140 degrees
- Weight depending on resolution: 6.2 – 10 kg/m²
- 3 or 5 LEDs per pixel
- Warranty: 1-year guarantee on all components





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architecture by Benjamin Romano

*Creative interplay of **Illu**mesh® and **Media**mesh®*

## **Illu**mesh® + **Media**mesh®: **Inspiring** interplay.

Combining **Media**mesh® and **Illu**mesh® exploits the potentials of both systems to the maximum – also in terms of the cost aspects. Especially when devising the display concept of particularly large media façades, or even media façades that completely clad whole buildings, it is a good idea to plan in zones with different image resolutions. In those zones where a low resolution will be sufficient for the display of text, symbols or colour fields, **Illu**mesh® is the best system to choose. Inserts made of **Media**mesh® can be integrated for the display of complex graphics or video feeds. The interplay of the two mesh systems allows dramatically staged effects to be created round the clock and thus substantially expands the expressive potential of the media façade.

During the day, the optical versatility of the wire mesh complements the two-dimensionality of the display on the **Media**mesh®: the translucence and reflective depth of the stainless steel mesh becomes a media performance in its own right. At night, **Illu**mesh® adds a third dimension to the effect through its projections. The optical overlaying of materials and media, the way



architecture by Benjamin Romano



they unfold and are superimposed, creates a façade-space structure which is at the same time real and virtual. This effect is mainly generated by the high optical permeability of the mesh and the similar aesthetics of the building's structure. This allows the medialised metallic veil to integrate smoothly into the specific architecture, which thus never loses any of its own identity, regardless of the size of the display area.

Skillful media design synchronises the zones with different resolutions into an artistically integrated display. Video images melt into dynamically changing colour fields that seem to absorb one concrete image only to bring forth new images. With a programming concept tailored to the specific project, the synthesis of the two systems pervades the anonymity of public space by filling the façade with carefully chosen, appropriate images, transforming it into an enduring feature of emotional reference.

In contrast to conventional systems, a combination of the two mesh systems provides a platform for dramatically accentuated transmission of 24-hour content. The transparency of the medialised façade accomplishes much more than LED boards could ever do to elevate the architecture itself to the function of communicative backdrop. The proven aesthetics and functionality of the stainless steel wire mesh as the carrier material add force to the argument for choosing this particular form of media façade.

*Optical overlay of the two systems expands the media potentials*





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Photo © XL solutions GmbH

**Media**mesh® Indoor as a bi-functional partition screen

## **Media**mesh® Indoor: **Representative backdrop** and attractive partition screening.

**Media**mesh® Indoor is an extension of the functionality of this technologically superior system. As a partition screen that is attractive from both sides, this system variant is used indoors at events, trade fairs, in public transit spaces or commercial areas. The fact that in such contexts the viewing distance is usually shorter is reflected in the correspondingly modified configuration of the profiles integrated into the stainless steel wire mesh: instead of LEDs, considerably smaller SMDs (Surface Mounted Devices) are used. Because of their smaller dimensions, the pixels can be placed much closer to each other. This permits an extremely high image resolution which is usually more than adequate for the short viewing distances typical of indoor situations. In this way, images and videos can be displayed with the same brilliance and detail as is the case with the outdoor variants of **Media**mesh®. SMDs are not suitable for use in outdoor applications because of their limited luminosity.

The indoor variant opens up a range of new application areas for the system. At trade fairs, **Media**mesh® Indoor functions both as a representative feature for the exhibitor and as a dynamic-informative backdrop. With its display capability for lights, text, graphics, animations or videos, this innovative technology is perfect for product launches or image presentations. The medialised mesh can be used as a large-scale guidance and information system, or as a platform



for brand messages in shopfitting or event sectors. The fact that the cabling is integrated into the edges of the mesh and therefore invisible means that there is nothing to detract from the function of the reverse side of **Mediamesh® Indoor** as a stainless steel wire mesh partition screen. The textile-like structure of the mesh – supple, shimmering and highly reflective – gives the planner unlimited scope for interpretation. Through accentuated lighting, the surface can be rendered opaque or translucent as required, allowing the desired degree of transparency to be precisely defined. Assembly is easy and quick, even for large surfaces, underlining once more the functionality and efficiency of this highly versatile system.

#### Technical data:

- Mesh width up to max. 4 m, mesh length up to max. 20 m
- Mesh depth 2.5 cm
- Transparency 40 to 65 %
- IP-Level 42
- Ambient temperature from –20 °C to +70 °C
- SMDs: 80,000 operating hours
- SMD profiles:
  - vertical pixel pitch from 3 cm
  - horizontal pixel pitch from 2 cm
- Weight depending on resolution: 6.2 – 7.5 kg/m<sup>2</sup>
- SMDs: angle of radiation vertical 120 degrees, horizontal 120 degrees
- 1 SMD-all-in-one-RGB per pixel
- Warranty: 1-year guarantee on all components

**Mediamesh® Indoor** – almost opaque or translucent –  
spectacular effects with accentuated lighting and display programming





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**PC-Media**mesh: modified rod mesh with integrated LED profiles

## **PC-Media**mesh: **Maximum transparency** for daylight medialisation.

In the case of **PC-Media**mesh, the priority is on greatest possible transparency for effective, round-the-clock medialisation. Robustness and the independent aesthetics of the façade skin are of secondary relevance in this system. Instead of the cable mesh type "Tigris", a modified rod mesh is used as the carrier medium. Pre-crimped warp wires replace the flexible cables; LED profiles replace the usual weft wires. The crimping of the warp wires produces carrier recesses into which the LED profiles are inserted with their openings towards the viewer. The system is mounted in a frame to stabilise it, and can therefore not be rolled up or tension mounted.

**PC-Media**mesh – optionally with LEDs or with SMDs – is suitable for both indoor and outdoor applications.

This daylight-capable media façade looks light and – compared to **Media**mesh® – is in fact much lighter, having a weight, depending on the resolution, which is more comparable with **Illu**mesh®. The frame construction, available in any format desired, does not require calculation of tensioning loads. The mesh is delivered as flat panels and, for outdoor applications, is mounted into the frame on site. For indoors, the mesh can be mounted in the frame at the factory, although this means that the specific size of the access doors at the destination must be taken into consideration.

**PC-Media**mesh: unbeatable in transparency



Compared to conventional systems for the medialisation of architecture, **PC-Media** mesh offers the advantages of a weatherproof combination of maximum transparency and daylight-capability of the media display function.

#### Technical data:

- Mesh width up to max. 4 m, mesh length up to max. 4 m
- Depth of structure 2.5 cm
- Transparency up to 90 %
- IP-Level 42 (SMD), 65 (LED)
- Ambient temperature from  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- SMD: 80,000 operating hours  
LED: 70,000 operating hours
- LED profiles:
  - vertical pixel pitch from 3 cm
  - horizontal pixel pitch from 2 cm (SMD), from 4.25 cm (LED)
- Weight depending on resolution: 7 – 8 kg/m<sup>2</sup>
- 3 or 5 LEDs per pixel resp. 1 SMD-all-in-one-RGB per pixel
- Warranty: 1-year guarantee on all components
- Special transport options



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Photo © ag4 media façade GmbH

Transparent media façade by the use of horizontal, medialised louvres

## Louvre-based transparent media façade:

Design and functionality in a frame.

The first realisation of transparent systems for media façades was a louvre-based solution which has remained unchanged to this day.

This daylight-capable transparent system consists of horizontal metal louvres, into which the LEDs are integrated, and a stabilising frame construction. This is firmly anchored in front of the façade. The majority of the required electronics and the cable duct are accommodated in the vertical profiles of the frame. The complete system can also be installed rotated through 90°, e.g. on curved facades, so that the LED louvres run vertically and the profiles with the integrated cables run horizontally.

Louvre-based transparent media façades are suitable for displays of lights, images, text or videos. Due to the structural depth 200 mm, the system can also function as sun protection. As with **PC-Media**mesh, because the frame construction is firmly anchored there is no need to calculate tensioning loads. The system is also comparable to **PC-Media**mesh in terms of its transparency: 90 percent optical permeability.

Daylight-capable media platform



Photo © ag4 media façade GmbH



Photo © ag4 media façade GmbH

The first louvre-based transparent media façade: T-Mobile headquarters in Bonn/Germany

Compared to the conventional systems so far available, the system of medialised louvres offers the advantage of daylight capability combined very high transparency.

#### Technical data:

- Dimensions of louvres:  
width up to max. 4 m, length up to max. 13 m
- Depth of structure 20 cm
- Transparency up to 90 %
- IP-Level 65
- Ambient temperature from  $-20^{\circ}\text{C}$  to  $+70^{\circ}\text{C}$
- LEDs: 70,000 operating hours
- LED profiles:  
vertical pixel pitch from 2 cm  
horizontal pixel pitch from 2 to 12.75 cm
- Weight depending on substructure
- 3 or 5 LEDs per pixel
- Warranty: 1-year guarantee on all components



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**Media**mesh®: American Airlines Arena in Miami

## Construction and programming:

Identity in creative harmony  
with technology and surroundings.

Each media façade is unique: the communicative goals, the look and authenticity are defined and implemented according to the individual specifications of each particular project. The crucial factor for acceptance and effectiveness of the medialisation is the dynamic interplay of architecture, surroundings and display programming. From the very start, qualified specialists from GKD and ag4 are there to support you with their technical expertise and their creative competence.

The planning starts with the specification of the communicational goals and content. Depending on the location of the object, viewing distance and budget, the mesh system, image resolution and type of display programming are then defined.

With engineering, blue prints, statical and wind load calculations and selection of the appropriate attachment technique, GKD and ag4's team of experts work out the fundamental planning of the media façade. The mesh is produced to specifications on ultra-modern looms, then cut to shape and equipped with LED profiles.

**Media**mesh®: distortion-free optics  
even on round façades





# 1:1      1:2      1:4

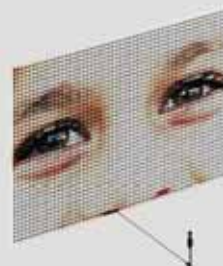


*Relationship of pixel density and resolution*

ag4 develops the display programming concept for the integrative implementation of the intended communications – information, advertising, video events or even art in public spaces – and of adequate contextualisation of these messages. The fact that they are creatively implemented and continually supervised ensures that the performance is a perfect balance of cost and benefit.

The programming software (IMPP – Interactive Media Pool Platform) required is available in two variants. The standard version consists of a complex transmission plan with a fixed sequence. In the extended version, constantly new compositions and sequences of images are software-generated from a pool of varied contents. Data transmission takes place via a digital DVI signal in the formats avi, quicktime or jpg. The media platform and development of the initial display programming are included in the product price.

What you get is a turnkey solution, i.e. fully installed, server connected, and, if desired, display capable.



Highest resolution =>  
minimal viewing distance

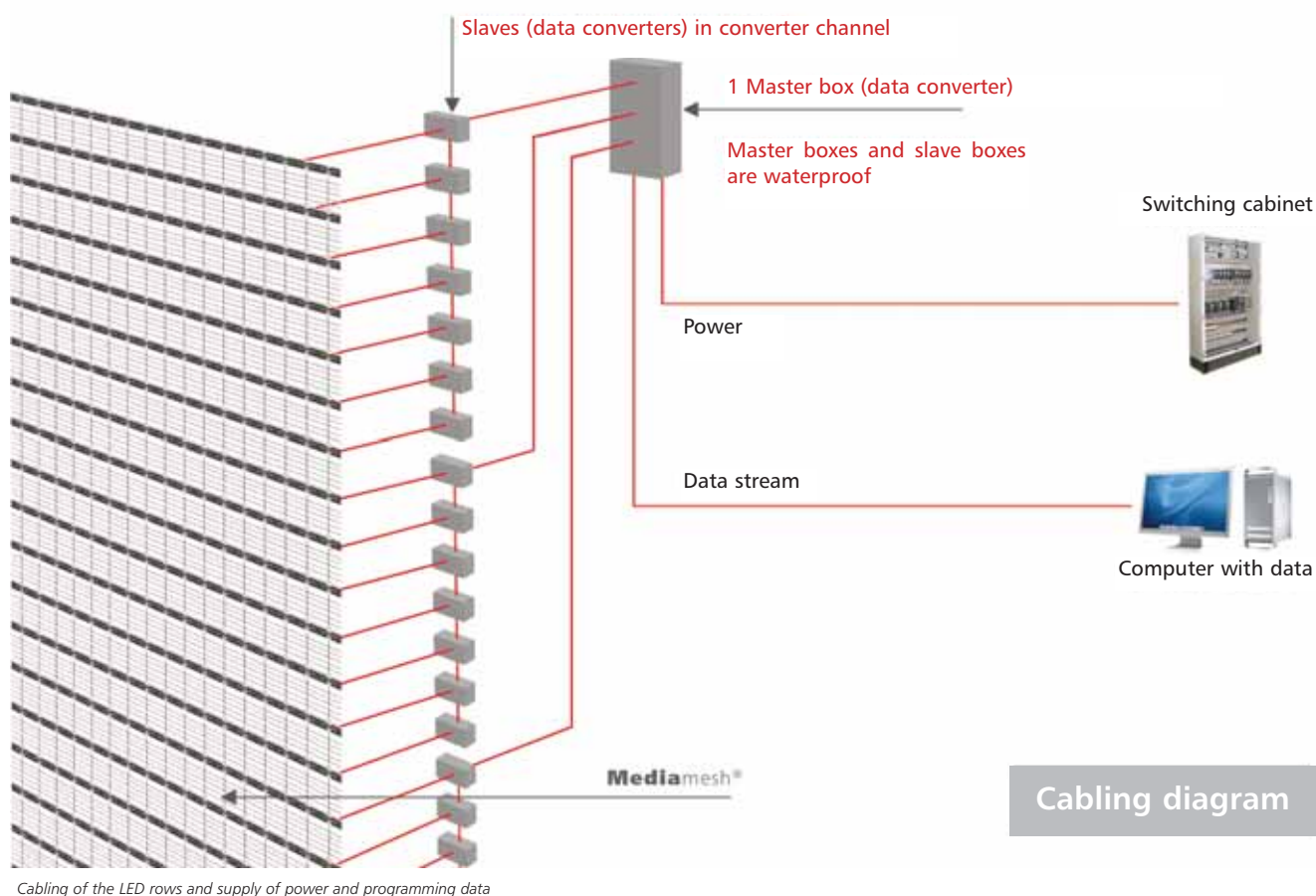


Medium resolution =>  
medium viewing distance



Lowest resolution =>  
maximal viewing distance

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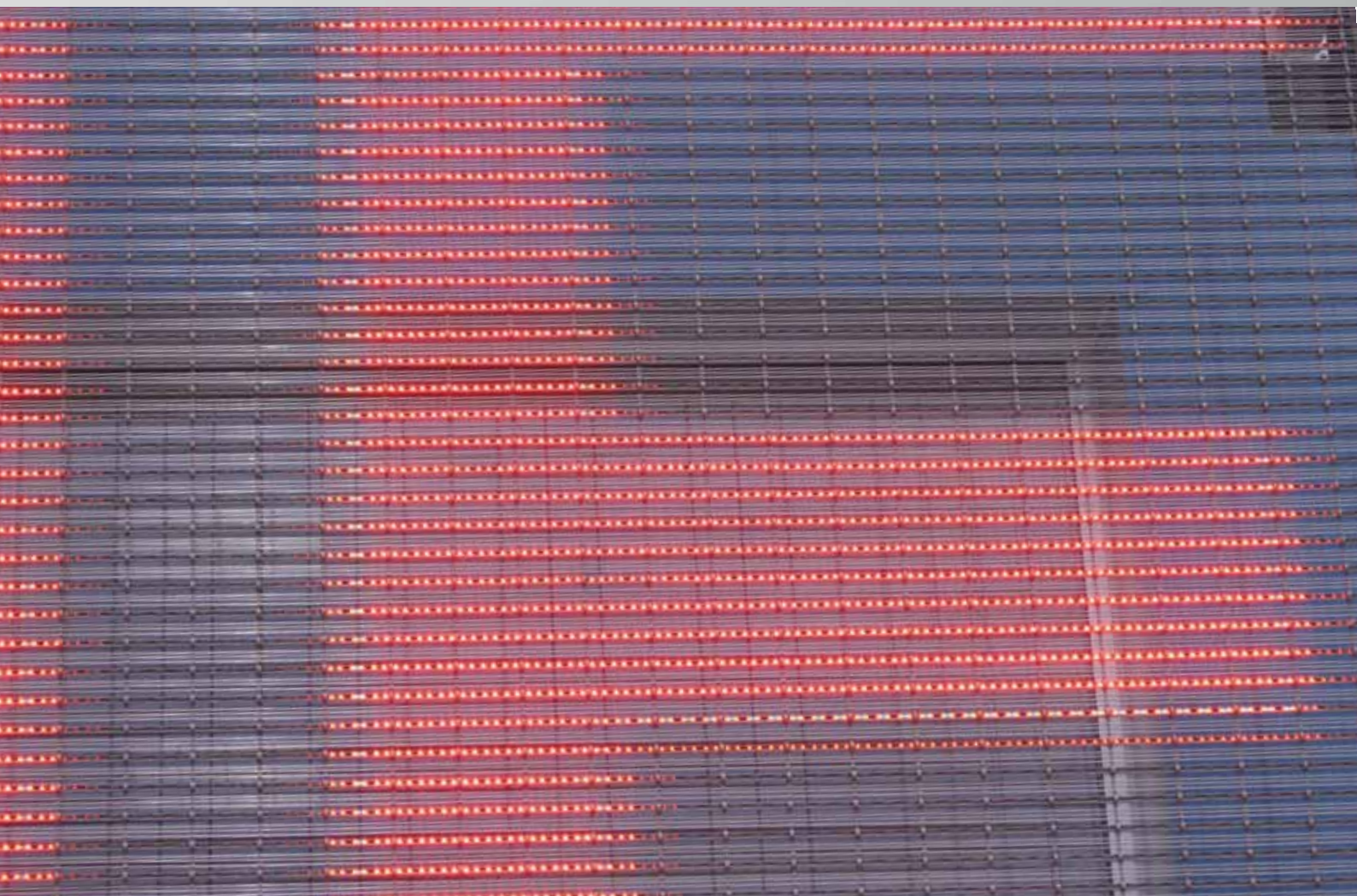
## Parameters for successful performance:

Fascinating multifunctionality,  
perfectly implemented.

There are four basic parameters which determine the technical design and subsequent implementation: viewing distance, size of the media façade, brightness and resolution. Viewing distance is a crucial consideration in calculating the required resolution. The smaller the distance from the viewer to the media façade, the denser the pixels have to be in order to produce a crisp and recognisable image. Free-standing objects can make do with a considerably lower resolution for their media façades than buildings in densely populated, built-up urban settings, where the viewing distance may be less.

The capacity of stainless steel wire mesh to clad any building and any geometry in an apparently seamless envelope gives its medialisation a fascinating multifunctionality. No limits on the size of the display area, free choice of resolution and the option of combining zones of different resolution all allow optimal tuning to the budget, the message and the significance of the building in question. Whether daylight or nighttime capability, whether facing the sun or the other side





**Illu**mesh® and **Media**mesh®: medialised transparency

*Practically invisible cabling is integrated into the **Media**mesh® (above) and **Illu**mesh® (below) systems*

of a street: the required display brightness – depending on the location and orientation of the building and on the purpose of the medialisation – is achieved through the specific type and resolution of the mesh system. Its additional advantages as fully functional sun protection, safety balustrading or climate membrane supply the planner with convincing arguments for investors and facility management.

Groups of eight LED profiles are interconnected linearly via intelligent cabling that is inserted into the edges of the mesh and is therefore almost invisible. Once installed, power and display data are supplied via control units consisting of network and electronic components that are integrated, for example, in ceilings and connected to a central server inside the building.





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Office building with **illu**mesh® façade in France

## Partnership as a principle:

Experts for help and advice.

For GKD and ag4, service means partnership from the outset. The foundation for this is the close cooperation between leading experts for high-quality woven solutions in architecture and recognised specialists for mediatecture. This concentration of expertise gives you the assurance of superior solutions from the best in their fields.

We work together with you to define the architectural, media and pricing requirements of your media façade. Using a questionnaire, we determine your exact needs as the basis for a first cost estimate. In addition, at your request we create detailed drawings and computer animations to illustrate the impression and effect of the options. Our preplanning includes a feasibility study based on a concrete concept of the specific building design and media-technical preconditions for your media façade. And of course this also includes consideration of the aspect of long-term maintenance.

Once an order has been placed, our architects, engineers and media specialists work out the precise plan of execution. We then precisely implement the project-specific parameters in production, dimensioning and configuration, including testing of each individual LED. Completely finished

**Media**mesh®: the first transparent media façade on Times Square





and equipped with LED profiles and cabling, your media façade of **Mediamesh®** or **Illumesh®** is then rolled for transportation and delivered to the site. The mesh is then suspended and tensioned using our proven attachment technique with round rods and eye bolts. **PC-Mediamesh** is delivered pre-mounted in frames.

After installation of the technology for the initial display programming, this is then put into operation. Project documentation and training round off the installation of your media façade. On request, we will be happy to continue to be at your service beyond this point: with our full service package for maintenance, repair and overhaul as well as remote access via Internet for speedy rectification of problems with the display programming. We are also your reliable partner for short-term reprogramming of display contents and sequence.

**Mediamesh®** : innovative advertising and communications platform





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