Shimmering harmony of architecture, acoustics and aesthetics

Stainless steel wire mesh in concert hall design

In this age of global events, fierce competition rages between "low culture and high culture". Countless providers of theatre, concert, media, sport and entertainment events compete with each other for the favours of the culturally-interested public. As a result, the demands on the structural design of theatres and concert halls are becoming considerably more complex. While the delicate relationship of space, music, audience and musicians demands perfect balance, the sheer range of performance types from symphonies and ballet to shows and multimedia performances call for extreme versatility in terms of image display capabilities, acoustics and equipment. Complex challenges which architects meet with a vocabulary of meticulously planned forms and materials.

Première in Lucerne

The metal weaver GKD – Gebr. Kufferath AG, based in Düren, Germany, has been crucially involved in such developments in concert hall design since the early 90s. It was in 1992 that Jean Nouvel discovered the company's stainless steel wire mesh for the new building of the Culture and Congress Centre in Lucerne (KKL). Three mesh panels of GKD's stainless steel wire mesh type "Lago", almost 20 meters long and eight meters wide, were used as cladding for the central staircase on both external sides and as a safety balustrade in the stairwell. The semi-transparent metallic fabric acts as an enigmatic visual filter, playing with the perception of the public as it passes by. In contrast to those early days, the challenges involved in two recent concert hall projects are of a far greater complexity. In the

refurbishment of the Europasaal in Aachen's Eurogress and also in the renovation of the Concert Hall in Düsseldorf, it was the acoustic features of the stainless steel wire mesh which were the decisive factor in its selection as the appropriate material.

Aachen: scope for atmospheric light shows

Maastricht and Liège are just a half an hour away by car, Brussels, Cologne and Düsseldorf little more than an hour. Its proximity to Belgium and the Netherlands has made Aachen an important node in the European network. It was for this reason that Ernst Schiffer, in the mid-70s, built the international congress centre Eurogress in the middle of the newly created spa gardens on Monheimsallee, adjacent to the International Casino and Aachen's biggest hotel, Hotel Quellenhof, and close to the Carolus Thermae spa. The plan was to create a new kind of civic centre, a "meeting place of art and commerce". And that is exactly what happened. Today, more than 360 events take place at the Eurogress each year: from the conferral of the local carneval award "against deadly seriousness" and a range of art exhibitions, to concerts featuring international pop and rock giants, performances of the Aachen Symphony Orchestra, and renowned specialist congresses. In order to be able to keep up with the demands of a constantly changing events industry, agreement was reached on wide-ranging refurbishment measures to be completed by 2007. This involves a fundamental renovation of the fire safety features and the design of the whole Eurogress, but also an improvement of the acoustics in its concert hall, the Europasaal. So it came as no surprise that the commissioned agency for architecture and interior design, Klein/Haller in Mönchengladbach, decided on GKD's stainless steel wire mesh for the interior cladding of the Europasaal and its foyer. It was certainly the extraordinary aesthetics of the material which provided the initial impulse

for this decision. Its subtle elegance in the way it interacts with light and allows a versatile range of colour effects gives the mesh a stylistic openness which makes it perfectly adaptable to any kind of context. The 1,500 sqm of wall cladding completely conceals the technical equipment installed behind it and thus helps to create an appropriate atmosphere in the concert hall. 600 panels of mesh type Baltic were installed with a horizontal curve in the upper area over the balcony. Parallel to this, a further 230 densely woven and finely structured panels were installed down in the auditorium as full-length cladding along the walls. Here, the mesh type used, Lamelle, was developed especially for this application and produced to specification with three times the usual number of warp cables and 37% open area. The aim was to combine the required robustness with fineness and density. Through refraction, reflection and coloring of the artificial light, the shimmering wall cladding with its velvet-like surface optics communicates a variety of atmospheres.

Optically consistent and acoustically neutral

But it was also primarily the functional properties of GKD's stainless steel wire mesh that made it the material of choice for the project in Aachen. While inadequate acoustics and ventilation in the Europasaal had previously been the reason for frequent complaints, such problems are now a thing of the past. Through its textile-like structure, the material combines air permeability and acoustic neutrality with an optical consistency of appearance. And the classic advantages of stainless steel wire mesh, like its long service life, fire-resistance, easy maintenance and recyclability round of its list of merits. Structurally, the advantage of the wire mesh lies in its greater durability in relation to its low weight. In the upper part of the concert hall the panels are curved in varying radii, and horizontally curved frames specially developed for this project were used to shape the wire

mesh. Here, the flexibility of the material due to stainless steel cables woven lengthwise into the mesh proved to be of special advantage. For the application in the lower part of the concert hall, the panels were glued to MDF boards specially produced to meet the acoustic requirements. Both attachment techniques were new and extend the range of previously applied standard solutions.

Düsseldorf: musical planetarium

In 1925, the architect Wilhelm Kreis designed today's concert hall building in Düsseldorf as a series of buildings for events with a planetarium and surrounding museums. The complex in Düsseldorf's Ehrenhof district was dominated by the domed structure under which a huge concert hall was built about 25 years ago. During a major refurbishment of the concert Hall in 2005, improvement of the acoustics was also on the agenda. The planners decided on a special mesh production made of stainless steel and bronze for the cladding of wall and ceiling sound deflectors. 2,500 sqm of GKD mesh type Omega 1540 clad these sound deflectors. Now they no longer reflect the sound directly into the rows of the audience – as the former wood panelling of the dome used to do – but instead guide it up into the dome. The result is a surround sound without interference and with improved reverb that guarantees the audience unadulterated musical pleasure. Importantly not only the audience will benefit from these new acoustics. The musicians on stage will also be able to hear each other better from now on – an important precondition for harmonious, high-quality ensemble playing. And the special wire mesh with its novel optical qualities also sets new aesthetic standards, considering that the idea was to maintain the former color scheme and spatial impression with as little change as possible. The transparency of the wire mesh picks up on the original idea. Tiny lights installed in the interspace between the inner dome

and the outer reinforced concrete dome shimmer mysteriously through the textile-like structure of the mesh and transform the concert hall into a musical planetarium. Depending on the angle of view, the effect shifts between glittering opaqueness and transparency and gives the impression of an unadorned beauty that constantly creates new and surprising perspectives.

Beijing: monolith which glistens like gold

The most recent and certainly most renowned cultural project in the world is the Grand Chinese National Theatre in Beijing. For this prestigious object, GKD has developed an innovative blended mesh in two different gold tones that emulates the typical structure of bamboo. This anodized aluminium mesh will be used to clad the complete façade of the Beijing Opera. As a glittering monolith beneath the gigantic titanium glass dome, it will enchant visitors once it is finished. For the creation of the representative façade, GKD is currently producing 5,400 sqm of the special mesh Canisse. When the Opera is completed, the shimmering outer skin of the building will allow the outside observer to discern the vague outlines of the people walking inside, while at the same time acting as safety balustrading and giving those inside a sense of security.

8.739 characters incl. spaces

GKD – WORLD WIDE WEAVE

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 mesh and spirals), Architectural meshes (façades, safety

and interior design made of metal fabrics) and Mediamesh® (Transparent media façades). With its headquarter in Germany and five other facilities in the US, South Africa, China, India and Chile – as well as its branches in France, Spain, Dubai and worldwide representatives, GKD is close to markets anywhere in the world.

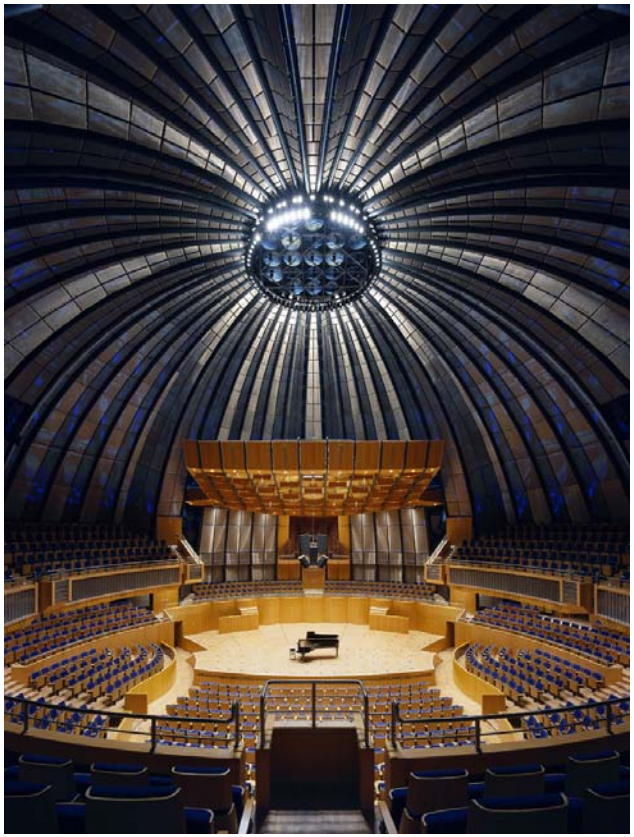
For more information:
GKD – GEBR. KUFFERATH AG
Metallweberstraße 46
D-52353 Düren
Tel.: +49 (0) 2421 / 803-0
Fax: +49 (0) 2421 / 803-211
E-Mail: metalfabrics@gkd.de
www.gkd.de

Please send a reprint to:
impetus.PR
Ursula Herrling-Tusch
Charlottenburger Allee 27-29
D-52068 Aachen
Tel.: +49 (0) 241 / 189 25-10
Fax: +49 (0) 241 / 189 25-29
E-Mail: herrling-tusch@impetus-pr.de

Shimmering harmony of architecture, acoustics and aesthetics – Stainless steel wire mesh in concert hall design

Picture 1: Shimmering in bronze tones, stainless steel wire mesh gives a unique character to the optics and acoustics of the refurbished concert hall in Düsseldorf.

Picture 3: Stainless steel wire mesh wall cladding in the Eurogress in Aachen ensures brilliant acoustics and the possibility of fascinating light shows.



Picture 2: Panels of blended stainless steel and bronze wire mesh specially woven to fulfil acoustic criteria guarantee pure delight for both the eyes and the ears.

We will be happy to send you the desired images in printable resolution by e-mail.

impetus.PR
Agentur für Corporate Communications GmbH

Ursula Herrling-Tusch
Charlottenburger Allee 27-29
D-52068 Aachen
Tel: +49 [0] 241 / 1 89 25-10
Fax: +49 [0] 241 / 1 89 25-29
E-Mail: herrling-tusch@impetus-pr.de