COPPER IN ALL ITS FORMS

As usual, this issue presents some of the best architecture from around Europe. It showcases the rich variety of surfaces that copper and its alloys can deliver for contemporary design – whether gold, brown, green or blue – all living materials continuing to develop in the local environment. But what stands out from our eleven projects is the wealth of different, sometimes innovative, approaches taken by designers today with how and where they use copper.

We start with a multi-layered, perforated copper drum: the central focus of Trondheim’s central square (pages 4-5). Daylight plays on its hand-patinated surface adding richness to this floating canopy, then at night it becomes luminescent in its own right. Transparency is also key to a new cultural centre in Corsica (pages 6-11). Here, a copper alloy mesh veil shields the building from the sun, creating changing perspectives from inside and out.

In Finland’s copper town of Pori, the material creates a monolithic solidity countering wide expanses of glazing and balconies on a landmark residential tower (pages 12-13). Despite sharing its typology, a Parisian apartment block (pages 14-17) takes a different stance, instead using copper alloy in highly structured storey-height panels, then adding texture with material perforations. Storey-height panels of copper also define Gembloux’s new town hall (pages 18-21) but here the material continues over roofs as well forming a complete external skin.

Although copper is an intrinsically thin material, with considered design it can take on a massive character. This is exemplified by a new courthouse extension (pages 22-23), both respecting and subverting the rusticated masonry of its historic neighbour. Developing the relationship between old and new is one of copper’s real strengths. This is demonstrated further by a modern intervention to a historic Polish waterworks – now the Hydropolis ‘museum of water’ (pages 24-27). Here, perforated copper sits naturally next to the animated water sculptures that define the building’s new life.

Next, we move indoors: effectively, buildings within buildings. Red Bull’s Berlin recording studio (pages 28-31) is a sculptural object within a redundant power station, formed of horizontal copper bands that redefine the intermediate space around it, as well as within. Similarly, beautifully crafted brass installations have remodelled and created an identity for a street-level, shell office in London (pages 32-33).

With a nod to one of the material’s most traditional applications, Herzog & de Meuron have roofed in copper discreet buildings within their museum remodelling in Colmar, France (pages 34-37) with detailing that is deceptively low-key yet timeless. In contrast our final project, a designer store in Sweden (pages 38-39), is unashamedly modern. Copper alloy is used over both wall and roof planes, with rigorous detailing and joint alignment emphasising the continuity of the metal skin.

We hope you enjoy this issue of Copper Architecture Forum but we still want to continually improve the magazine. Please do share your views with us in our survey on the copperconcept.org website – and thanks to those of you who already have.

Finally, a call for entries to the 2017 European Copper in Architecture Awards – a celebration of the best contemporary design with copper. To find out more, visit copperconcept.org.

The Editorial Team
Entries are invited for the 2017 European Copper in Architecture Awards – a showcase for architects designing with copper and its alloys to promote their work to an international audience. 

Final deadline for receipt of entries: 30th April 2017

All entries must incorporate facades, roofing or other architectural elements of copper or copper alloys. Any scale or type of project can be entered – from major landmark buildings to modest schemes.

Judges, drawn from a panel including some of the most influential designers in Europe, will review all the entries on their architectural qualities from graphic submissions.

For more information on entering the 2017 Awards and on previous awards entries and results, visit:
copperconcept.org/en/awards
ENTRIES INVITED

For more information on entering the 2017 Awards and on previous awards entries and results, visit:
copperconcept.org/en/awards
CONTENTS

2 COPPER IN ALL ITS FORMS – editorial comment

4 – 5 SQUARE DRUM – an intriguing floating copper canopy animates a renovated town square by day and night

6 – 11 AERIAL ARCHITECTURE – this new cultural centre is defined by a transparent veil of copper alloy mesh

12 – 13 COPPER CITY – locally manufactured green pre-patinated copper is celebrated on this residential tower

14 – 17 COPPER AT THE CROSSROADS – a copper alloy-clad apartment block plays a pivotal role on the streets of Paris

18 – 21 COPPER CONTEXT – this new town hall complex acts as a transition between historic streetscape and public park

22 – 23 MASONRY IN METAL – the rusticated facades of adjoining buildings inspire this thoroughly modern intervention

24 – 27 HYDROPOLIS – copper was the natural choice for a new annexe to a historic waterworks complex

28 – 31 MUSICAL MOVEMENT – this sculptural copper insertion creates a music studio within a disused power station

32 – 33 ELLIPTICAL INSTALLATION – brass elements shield and structure the internal spaces of an exposed office area

34 – 37 TIMELESS COPPER – copper roofs form a key part of Herzog & de Meuron’s remodelling of this museum

38 – 39 ROYAL DESIGN – a designer store exerts its presence amongst bigger and taller buildings with a copper alloy skin
This intriguing copper drum floating above an open stage invigorates the town square of Trondheim, Norway, mutating into an animated light source at night. Its designers HUS arkitekter AS explain the competition-winning scheme.

The project was part of a larger plan to renovate and upgrade Torvet, the town square as a whole. Our vision was to create a new, lively space focused on activity rather than form – a space bursting with people and life. The new stage is located in the southwest corner of the square in front of a shopping mall.
The stage itself is multifunctional without any dedicated use and is dominated by the main attraction – the cylinder-shaped stage ‘loft’. With a skin consisting of perforated and patinated copper, the colour of the stage canopy changes throughout the day. Copper patina green during daytime, it transforms in the evening with light from the inner circle reflected throughout the screen. It is almost a living element, changing expression with the rhythm of the day.

The cylinder consists of three layers: the inner reflective surface is polished stainless steel with a random pyramid pattern, the middle screen is copper with clear lacquer to keep its natural colour over the years; finally, the outer skin is made of randomly hand-patinated green copper. The two copper layers are perforated for transparency in a random pattern of hexagons of varying sizes. Between the middle and inner layers there is multi-coloured LED lighting arranged in five height zones, facing inwards. And between the outer and middle layers, on top of the structure, LED wall-washers face downwards.

_**Con una pelle costituita da rame perforato e patinato, il colore del tamburo sopra il palco cambia durante il giorno**_
A veil of golden copper alloy mesh defines this prominent new public building in Bastia, Corsica and reveals a deceptively simple yet sophisticated approach to materiality.
The Cultural Centre was seen as a key catalyst for the regeneration of neighbourhoods in the south of Bastia, largely consisting of housing schemes built in the 60s. Intended to enhance social and cultural relations, the Centre serves the whole city, opening up the neighbourhood to it. Embedded in its sloping site, the project creates a large park, now tangibly open to the city.

The project programme demanded: “an innovative and creative place, a place of contrasts, shadows and light, luminous and soft for the lecture spaces, dark and sonorous for the auditorium”. Devaux & Devaux Architectes’ solution is both literal and radical. As they explained:
“Performance areas – places of darkness, of turmoil, of agitation – are contained in a solid base. Here, the main auditorium gathers around it rehearsal and dressing rooms, along with technical and administration areas. This is a telluric architecture built of concrete blocks in earth tones, anchored to the ground.”

“Performance areas – places of darkness, of turmoil, of agitation – are contained in a solid base. Here, the main auditorium gathers around it rehearsal and dressing rooms, along with technical and administration areas. This is a telluric architecture built of concrete blocks in earth tones, anchored to the ground.”

The volume emerges as suspended above the trees, overlooking the neighbourhood with views towards the horizon, the city and the sea.

Architects: Devaux & Devaux Architectes (DDA)
Copper Installer: Bastia Charpentes Armatures
Copper Products: TECU® Gold
Photos: Joan Bracco & Cécile Septet
TRANSPARENT COPPER ALLOY MESH

Above the base, a fully glazed, recessed plane announces the reception and entrance, and extends out into a public square. This is crowned by a bold transparent box, clad in copper alloy mesh with a golden hue that will endure over time. Devaux & Devaux Architectes commented: “The media library rooms – spaces of light, of tranquility, of concentration, of meditation – are related to the sky in an aerial architecture of lightness and brightness.

“The volume emerges as suspended above the trees, overlooking the neighbourhood and with views towards the horizon, the city and the sea. It is designed as an open space, promoting space and light, as well as offering great flexibility.” The transparent copper alloy mesh facades encase open circulation routes around three sides of the building, generating external spaces for reading and enjoying the views. At night, the building becomes a glowing beacon with internal lighting shining out.
COPPER CITY

by Chris Hodson

Pori’s tallest residential building – the new Linnainmaankulma tower – is an apt symbol of the Finnish city’s long history of copper production. Indeed, the copper used for the external skin, pre-patinated in various shades of green, was manufactured at the local copper mill.

The sleek building sits on a key intersection, forming an iconic landmark at the heart of the city and its orthogonal street grid. Perched above four levels of parking and retail, the 12-storey copper tower contains 42 apartments ranging from 45m² to 125m². Of course, residents enjoy dramatic views across the city and beyond, and living spaces extend out onto generous balconies. The lower levels provide a shopping centre and other amenities, including a restaurant and café.

The choice of copper cladding goes beyond local associations, as the facades of this tall building rising above the city, just kilometres from the Gulf of Bothnia on the west coast of Finland, must deliver durability and long-life with minimal maintenance in the most challenging weather conditions.
COPPER AT THE CROSSROADS
A new development of 86 apartments and retail space, clad in golden copper alloy panels, plays a pivotal urban role in northeast Paris, described by BADIA BERGER Architects.

The project implants itself at the crossroads of diverse urban networks: the major artery Boulevard Mac Donald, the Parisian beltway, the canal Saint-Denis, and the railway axis leading to the Gare de l’Est station. By virtue of its verticality and the autonomy of its form, the new building is a prominent landmark, signalling the intersection of these various networks.
On the boulevard side, the building links up precisely with the neighbouring building, then, at the corner, the prow affirms the uniqueness of the site. The variation in building heights and architectures between the boulevard and the quay reinforces the two different situations and public spaces. The split in the volumes articulates these two different façades as well as opening up the interior of the site.

**CONTRASTING FACADES**

The contrasting façades express the double orientation of the apartments. On the boulevard façade to the north, highly exposed to ambient noise from the street, the luxury of a large window opens up each interior to unique views yet respects the necessary acoustic protection. Repetition of the façades allows an economy of scale without sacrificing precision, while the pattern avoids monotony thanks to the strength of the building volume. At the corner, the rounded glass façade works as a hinge, assuring the shift between the two façade typologies. On the courtyard side of the building, vegetation becomes the predominant material of a more intimate architecture.

**Architects:** BADIA BERGER Architects  
**Copper Installer:** Raimond SAS  
**Copper Product:** TECU® Gold  
**Photos:** Takuji Shimmura
Winners of the international Europan 10 competition, Italian architects DEMOGO studio di architettura discuss their Gembloux Town Hall project, a highly contextual design deeply rooted in its historic urban setting.
Gembloux is a medieval city in Belgium’s Walloon region, characterised by three significant historical buildings: the ancient bell tower called the Beffroi, the Église Décanale and the Maison du Bailly. The city’s reconstruction of the town hall was planned as the starting point for an urban refurbishment of the entire city.

The project underlines the importance of symbols of the city by making them direct extensions of the building: focal points from which the blocks of the new town hall are modelled.

One of the key issues lies in the establishment of a clear relationship between the park and the city. With the park a meeting place for city inhabitants, the new town hall is set up as a scenic wing from which the view opens over the medieval city core.

The project is grafted into the ancient urban centre, with its tangle of irregular and narrow streets, and designed as an operation of coherent integration with the existing urban tissue. The south front of the building is entirely open onto the Parc d’Epinal, which becomes the central garden for the people of Gembloux.
A PROCESS OF FRAGMENTATION

Definition of specific points of view, focused on the symbols of Gembloux, activates a process of fragmentation of the unitary mass of the building into three smaller parts that adjust to the urban scale of the city and house different functional programs. The resulting fragments, covered with a copper cladding, take advantage of the varying elevations of the site and generate an articulated sequence of public spaces complementary to each other. Between each of these blocks there are glazed diaphragms: empty space between solid building masses – places of transition from where the user can appreciate the surrounding townscape.

The project tries to set up a new centrality in the existing town and, at the same time, can be seen as a celebration of urban improvement. The new building engages in a dialogue with the city and, eventually, reveals the real character of its surroundings. In terms of materiality, we wanted to create a contemporary architecture able to find resonance with the brown brick and other colours of the medieval city and generate an intense, but not submissive, dialogue. Here, the balance between contextual adaptation and innovation is always key.
EVOlutionary COPPER

Copper is a living material, continuing to mutate, to absorb the light of the place in which it is immersed. We believe this evolutionary aspect of the material to be crucial, as architecture is an expression of how humanity cannot be immutable. Technically, copper is a material suitable for the harshest climates and we wanted a durable material – strong but always changing – with the potential to deliver continuity across the building surfaces.

Architects: DEMOGO studio di architettura
(in conjunction with local architects Syntaxe Architectes sprl)
Copper Installer: Design Metal
Copper Product: Nordic Standard
Photos: (unless marked otherwise) Alain Mengal

Further Information

A short, time-lapse video of the complete construction of this project can be viewed on copperconcept.org/videos

Photo: BEP
How to convincingly respect historic context while meeting modern building demands – that was the problem faced by the designers of this courthouse extension in the Austrian city of St. Pölten.

Architects Christian Kronaus + Erhard An-He Kinzelbach’s solution takes its inspiration from the distinctive rusticated masonry facade of the adjacent courthouse, set out in horizontal bands, some narrow, others wide. This rhythmic horizontality is applied in a thoroughly contemporary way across the complete surface of the new building. Carefully detailed bands of a golden copper alloy create lateral shadow gaps across the facades, reflecting those of the original masonry, while all vertical joints are concealed.

This horizontal grid also defines a playful, abstract composition of fenestration, acknowledging yet subverting the symmetry of its neighbour. A design strategy of mixing window heights – at the ceiling or floor, or between with opening casements – dissolves any expression of floor levels externally. Without inhibiting the realisation of a thoroughly modern 5-storey office building, the new addition retains the same height as its 3-storey classical neighbour without conflict. Its deep window reveals, some splayed, add to the masonry illusion, belying the copper alloy’s thin, lightweight character.

The architects commented: “The choice of the golden copper alloy facade supports architectural dialogue between the two buildings significantly. The material interprets the dominant yellow tone of the old buildings rather than just replicating it. Through the inherent richness of the material, the building gets a pleasant and warm character that varies continuously, depending on changing light conditions over time. This brings the building to life – literally.” This new building embodies much of the character of its historic neighbour without compromising on its independent and contemporary expression.

Architects: Christian Kronaus + Erhard An-He Kinzelbach
Copper Installer: Pasteiner GmbH
Copper Product: TECU®Gold
Photos: Thomas Ott
Through the inherent richness of the material, the building gets a pleasant and warm character.
HYDROPOLIS

The regeneration of a remarkable 19th century reservoir in the Polish city of Wroclaw is celebrated by a new entrance intervention with a copper skin and innovative ‘water printer’ sculpture, as its designers ART FM explain.
Built between 1890 and 1893, the clean water reservoir forms part of the ‘Na Grobli’ complex, one of only a few well-preserved historical water supply plants in Europe and a protected monument. Following its closure, an alternative use was needed to ensure preservation of the reservoir, which has now been converted into ‘Hydropolis’ – the only knowledge centre in Poland devoted entirely to water.

With a plan area of almost 73m x 64m, the interior of the reservoir consists of four chambers that, for their new exhibition function, are connected via openings made in the walls. The reservoir building has a green roof and brick facades with glazed ceramic details. Two elevations are in the historicist Neo-Gothic style, with steeples, fortified towers, turrets and gates, while the northern facade comprises an arcade of semi-circular arches. An earth bank across the southern frontage has now been replaced by a new entrance annexe.
COPPER AND WATER
MAKE AN ENTRANCE

The new annexe is roofed and clad in copper that will oxidise naturally and harmonise with the brickwork, including perforated panels – some sliding – in front of the glazed entrance. The ‘water printer’ is made up of twelve modules concealed behind the copper façade, each with controlled solenoid valves and nozzles creating effects with the water (which circulates in a closed system). The pre-programmed patterns and captions are a prelude to the theme of the exhibition, enabling visitor interaction and first contact with water.

Copper – this time pre-oxidised – also adds the finishing touch to the entrance hall, illuminating the interior and harmonising with the matt black metal and concrete surfaces. Sunlight penetrates through irregular holes in the perforated panels, fills the space and creates a unique interplay of light and reflections.

From the start, copper was the natural material choice throughout the new annexe with its durability, beauty and natural variability. It complements the unique character of the historic reservoir while, at the same time, emphasizing its contemporary architecture. Used inside, it intensifies the perception of space in the hall with its subtle glow and reflections.

Architects: ART FM [in conjunction with Studio Eka]
Copper Installer: Metaldach
Copper Products: Nordic Standard, Nordic Brown™ Light
Photos: Michał Łagoda [unless marked otherwise]

FURTHER INFORMATION

The innovative ‘water printer’ in action is featured on a video, which can be viewed at: copperconcept.org/video

Copper Architecture Forum has also explored the use of copper for regeneration of another 19th century waterworks, this time in Warsaw [CAF 32, page 22].
Los Angeles based Optimist Design discuss their sculptural copper recording studio, inserted within a 1920’s Berlin power station.

This project was Red Bull’s twelfth music studio globally. Our design concept ensured the space was Berlin-specific by keeping the power station interior’s industrial feel. The new studio provides performance and mixing spaces, with communal areas linked through multi-perspective views into the recording rooms. We approached the project as two worlds – creating a social space outside and a series of chambers inside determined by geometry, sound and technical requirements.

The design was shaped by acoustics and broken down into prismatic surfaces to ensure perfect sound for the recording and mixing space. A large triangular skylight brings natural light down into the space. Over a kilometre of copper bands serve to meld together the heterogeneous shapes demanded by the different recording rooms, while adding depth and distinction to the unified sculptural form.
COPPER FLOW

By cladding the walls with copper, links between the power station’s industrial era copper infrastructure and Red Bull’s association with power and energy are highlighted. A visual rhythm has been created by forming the shape of the copper strips into an undulating sequence to represent the natural flow of sound and music. A giant staircase flows centrally through the space, allowing musicians to literally climb up to a newly created mezzanine lounge, nestled on top of the recording room sculpture.

The formal design language as well as the choice of material finishes and colours create a balance of juxtaposition and union, while establishing a fresh dialogue and balance between old and new. Red Bull’s revitalisation of the power station is a perfect metaphor for the resurgence of Berlin as a capital of ideas. The city’s unused former industrial spaces, rendered obsolete by shifts in technology, provide a post-industrial canvas for the creative exploration of music, art and culture.
ELLiptical installation

Striking brass installations have transformed this glazed, street-level office shell in London, described by architects Bureau de Change.

The brief was to establish a strong identity, bringing cohesion to a headquarters with a variety of uses, and creating a bold brand for a diverse business. The design divides the site into two distinct spaces: the sharp and reflective events space, and warm monochrome office space, workshop and meeting rooms.

A central elliptical ‘chamber’, with walls formed by a cluster of twisted 1mm thick brass ribbons, is the focal point of the space. It cleaves an intimate inner space into the expansive glass box. The ribboned walls extend and glide across the ceiling, creating a permeable surface that folds sharply and lands at the base of the outermost glazing. The bespoke brass panels cast dramatic shadows onto the polished floor, creating a rhythm of reflection, shadow and light, which is animated for visitors as they circulate through the space.
PRACTICAL PURPOSE

The overhead brass strips also have a practical purpose, swelling and tapering to circulate air, disperse light and mask off the existing service heavy ceiling above. Fabricated by Mike Smith Studio, brass ribbons were folded before being edged and pressed to retain the consistency and depth of the profile. The process was akin to pattern cutting, but eschews the need for ’stitching’ by working to a 1mm tolerance. The structure is self-supporting, cantilevering from the ceiling and anchored to the floor using bespoke metal plates, cast into the concrete.

Discreet fixings, suspending the twisted panels from the ceiling, and bespoke made components, used to fasten their vertical and horizontal planes, ensure an absolute crispness of profile is retained. For the main office space, we were also asked to design a table for small, intimate meetings of up to five people. Constructed from 50mm thick walnut veneer and brass, the slab-like table top appears to rest on fine 3mm thick brass legs - as though it is has been placed like a jeweller sets a stone into a surround.

Architects: Bureau de change
Copper Installers: Mike Smith Studio and Stec Constructions
Copper Product: brass
Photos: Bureau de change architects
Remodelling and expansion of the Musée Unterlinden in Colmar, France – including two copper-roofed interventions and an underground gallery – deliver urban, architectural and museological solutions, as architects Herzog & de Meuron explain.

With our project, two building complexes facing each other across the Unterlinden square are now united by an underground gallery. To one side is the medieval convent consisting of a church, cloister, fountain and garden, and, on the other, the new ‘Ackerhof’ museum building mirrors the church’s volume which, together with the former municipal baths, constitutes a second, enclosed court.
1 ENTRANCE/EXIT
2 CLOISTER
3 CHAPEL
4 UNDERGROUND GALLERY
5 MILL HOUSE
6 ACKERHOF
7 BATH HOUSE
8 COURTYARD
9 TOURIST OFFICE

© Musée Unterlinden, Colmar
Between the two complexes, the Unterlinden Square has recovered its historical significance, recalling the times when stables and farm buildings faced the convent – an ensemble known as 'Ackerhof'. The Sinn canal, which flows under Colmar’s old town, is reopened and becomes the central element of this new public space. Close to the water, a small building marks the museum’s presence on the square: its positioning, mass and shape are those of a mill that once stood there. Two windows provide dramatic views down into the underground gallery.

Mill house windows overlook and illuminate the underground gallery

The new Ackerhof and mill buildings use traditional materials. Irregular, hand-broken bricks enter into a dialogue with the convent facades of stone and plaster – redone many times over the centuries – and a few lancet windows are inserted. The steeply pitched roofs of both buildings are in crisply detailed copper giving a timeless quality.

Architects: Herzog & de Meuron
Copper Installer: Schoenenberger SA
Copper Product: TECU® Classic
Photos: Ruedi Walti (unless marked otherwise)
Drawing: Musée Unterlinden
Despite a straightforward plan form of three linked rectangles, this large designer store and café in Jönköping, Sweden, exerts its presence through architectural form and crisp detailing. Architect Johan Özmen of ARKITEKTHUSET tells us more.

Within its shopping centre location the ‘Royal Design’ project is insular but surrounded by many larger and taller buildings. Our design concept aims to create contrast and respond powerfully to these surroundings.

EXCLUSIVE ARCHITECTURAL MATERIAL

All the facades and sloping roofs are clad in golden copper alloy cassettes with hidden fixings. This addresses the client’s requirement for the complex shapes to be covered in an exclusive, reflective and metallic architectural material. But sustainability, recycling, environmental impact and long-life properties were also important to the final decision.

Particular care was taken with detailing the external skin so that the complex corners and different angles always connect elegantly. There are also special solutions to technical issues, such as drainage with rainwater conveyed in hidden gutters, covered and fully integrated with the roof, and then to downpipes hidden within the facades.
Because of the central location of the building, the key consideration was that all sides of the scheme matter: walking around the building will reveal different architectural experiences, ranging from minimalistic façades to complex architectural forms. The parking lot frontage is open with extensive glazing in black frames following the sharp angles. The side elevations are calmer but still exciting with irregular windows continuing the black edged theme.

All the facades and sloping roofs are clad in golden copper alloy cassettes with hidden fixings

Architect: ARKITEKTHUSET
Copper Installer: Hägnens Plåtslageri AB
Copper Product: Nordic Royal™
Photos: Johan Tägström