• Award-winning, luxurious “Stella Maris”
• The Art in Copper – Marie Louise Kold
• Helsinki Music House – present status
• Copper Decoration and Architecture
Welcome to a new and excitingly fresh autumn edition of Koppar Forum.
One of the many properties of copper is the natural patina it develops over time. Depending on the location, wind and weather, it’s possible to see how quickly the shiny surface of new copper takes on new dimensions of depth and beauty. And just as you thought it couldn’t change any more, yet more shades start to appear.
In this edition, we will take a look at how artists perceive the magic of copper: “What I see in copper is a world of possibilities and a fantastic contrast, to the extent where I feel totally in love with it,” says Marie Louise Kold who experiments with different ways of achieving a patina on her fantastic pieces of art in copper.
We can also see trends within architecture, which is making increasing use of copper on a range of surfaces and finishes, according to architect Chris Hodson, who takes us on a guided tour to some exciting copper projects where the contribution of copper sets the tone for the final look of the building. We will also be presenting “The Green Guide”, just launched in the UK as a guide for architects in the use of environmentally-friendly building materials. From the perspective of copper, it is of course delightful to find that copper as a roofing and facade material gets top marks in the guide.
Next year, 2009, it will be once again time to hand out the “Copper Award” for the best copper project in Europe. Nominations have to be in by May 2009. Koppar Forum will of course be following developments and in future editions will be presenting the projects nominated.
Enjoy your read and remember: We welcome contributions and comments. Contact the editor if you want to send us any material.

Lennart Engström, Editor
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Skellefteå Kraft’s new head office is a building with classical architectural value. It has been built with quality materials and proven techniques, designed and planned with long-term use in mind. The aim was to create a building which is interesting, functional and economical now and in fifty years time.

The building was planned from a comprehensive perspective, in which the client is both the occupant and owner. This led to solutions and systems optimised for the total cost of a life cycle where functionality, maintenance and running costs were built in.

Skellefteå Kraft is a wholly-owned local authority company, and the fourth largest energy provider in Sweden. Since the 1960s, its head office has been centrally located in Skellefteå. Thanks to steady growth, more personnel were needed and in 2006, GA were commissioned under a parallel project to design an extension to the old office, with a similar exterior and room for new operation centres for production and distribution of electricity.

The head office will be the tallest building in Skellefteå. A six-storey high internal atrium is located in the centre of the building, to create a social dynamic and a sense of activity in the office environment. Around the atrium are cellular offices, with large meeting rooms in the corners. The western part of the building rises to twelve storeys, with a boardroom and executive suites at the top.

The design of the building is based on classical architectural lines that have withstood the test of time. It is adjacent to Skellefteå Kraft’s existing building from the 1960s, which has influenced storey heights and modular measurements. The basic measurement of 1300 is divided into 400 and 900 and provides the base for levels, section and facade. These measurements are also reflected in the interior design and ceilings.

The building has a heavy, heat-retaining frame of sitecast concrete with internal pillars and outer walls. The exterior facade is built to provide a structure without the use of organic materials. Three layers of steel beams with insulation behind fibre cement sheets support a facade cladding of cassettes in 1.25 mm copper panels with concealed fastenings. The aluminium windows are inset to half the wall’s thickness, which along with the copper cassettes and indoor birch panelling give an overall wall thickness of 680 mm and a solid impression that the building is clad in copper ingots.

Indoors, the concrete is exposed and complemented by the birch panels and steel sections. Outdoors, the building is partially clad in sheet metal. The deep niches and sealed outer wall contribute to good energy retention by reducing heat radiation. Despite the solid outer walls, the building gives a light impression thanks to its many windows.

In 1924, the biggest copper deposit in Europe was found in Boden, just outside Skellefteå. The link to copper has always been strong in Skellefteå and the client’s administrative experience going back 100 years contributed to the choice of facade cladding. 9000 cassettes cover the facade, including tin, grilles and foundation fittings executed as cassettes. As an architect, the sheet metal industry is particularly interesting to work with, as it can produce made-to-measure products with industrial finishes, unlike other parts of the building industry. A sort of ‘haute couture’ with rational production.

The repetitive module system using a limited selection of quality materials and the recurring principal solutions for details create the right conditions for very high quality execution.
Client: Skellefteå Kraft AB

Representative: Karl-Johan Öhgren

Architect: General Architecture

Project Team:
- Josef Eder architect SAR/MSA
- Olof Grip architect MSA
- John Billberg architect SAR/MSA
- Fabian Blücher architect SAR/MSA
- Erik Persson architect MSA
- Sanna Söderhäll architect MSA
- Erik Gardell architect MSA
- Jan Lidström architect SAR/MSA
- Bengt Drakenmark architect SAR/MSA

Structural Engineer: WSP Skellefteå

Responsible: Rolf Öberg

General contractor: NCC Construction AB

Skellefteå

Project start: 2006

Occupancy: 2009
When Marie Louise Kold was captivated by the characteristics of copper in 1997, she quickly realized that this was going to be her medium as an artist. “It wasn’t the most obvious choice and I didn’t make it easy for myself by choosing a material which has so many independently developing qualities – but in copper I saw a world of opportunities and amazing synergies and basically felt I’d fallen in love,” says Marie Louise.

It was while learning copper printing during her years at Lund’s Art School that Marie Louise noticed that the metal plates were far more fascinating than the prints that were produced from them. This was particularly so when the copper lost its original, shiny surface. “The depth and dynamism that surfaced in the metal after etching, with time and from touching it, couldn’t be transferred to paper. So I stopped printing, allowed the metal to become the work of art, and started experimenting with different ways of affecting the patina,” she explains. After art school an education in metallurgy and bronze casting followed. This was intended for her to get to know the cuprous metals and their possibilities better.

As a consequence, the technique that sprung from copper printing has never stopped developing in the Danish artist’s hands.

Marie Louise Kold works with copper, brass and bronze. She uses 0.05 mm copper foil which is shaped into the three-dimensional parts of her works and etches 0.4–2 mm metal with ferric chloride or nitric acid for the other parts. Subsequent patination is carried out with ammonium chloride, ammonia, copper sulphate, copper nitrate and iron sulphate, among others.

Rain water and sulphur are also used extensively, not least for the large portraits which consist of thousands of little squares of copper or bronze, each of which is patinated individually before being placed side by side in what is similar to a giant puzzle. Some of the squares are left outside for days, others for months. The degree of sulphur in the rain, as well as pollution, cause different nuances. The patina of the metal sometimes becomes a way of showing and measuring time, and the process continues long after the work leaves the artist’s hands. Thus, the work of art is in constant, but slow, change.
Selection of works made of etched and patinated copper, copper foil and brass.
“The works are treated with wax when they are done, which slows down the subsequent ageing significantly, but doesn’t make it stop altogether. I think the metal should be allowed to continue to show traces of what it has gone through, whether it is the weather or people wanting to touch it. It was precisely the copper’s ability to change that made me fall for it to begin with, so it would feel completely wrong to put a stop to that process.”

As Marie Louise Kold’s very own technique developed, so did local and international demand for her art. Solo exhibitions in Paris and Scandinavia have led to her art being sold to towns, companies and people in many countries. She has also carried out several big commissions, among them one for the previous American ambassadors to Denmark, Stuart and Wilma Bernstein, who commissioned the artist’s largest portrait to date, consisting of more than 3000 bronze squares.

Marie Louise Kold often uses texts in her works, primarily as purely graphic elements or fragments of communication, which do not necessarily have to be read and understood. The works contain powerful combinations of two- and three-dimensionality and a wide spectrum of colors, patterns, structures and texts.

Since 2001 Marie Louise Kold has worked full time at her Malmö studio. At the moment she is preparing her next major solo exhibition, to be held in April 2009 at Galleri New Form in Trelleborg, Sweden. As a new element, the exhibition will include a number of oil paintings also on patinated metal.

“In copper I have found endless possibilities which in themselves are a constant source of inspiration. I am driven by testing the limits – my own as well as those of the material – and am fulfilled by being able to express my feelings in a material which at first sight might appear cold and impersonal, but which I find has warmth, its own will and personality, and which is definitely my medium.”

Structure Number 1 (detail) – etched and patinated copper

Liv – etched and patinated copper/copper foil
VILLA LUVATA MEETS COASTAL CHALLENGES

Annual fairs are held in Finland to exhibit the latest housing trends, featuring both permanent and holiday homes. The popularity of these fairs has increased year by year. This year the holiday housing fair was held on the idyllic Reposaari Island on the west coast of Finland, about a mile away from the busy Mäntyluoto Harbour. The harbour area is separated from the open sea by a breakwater, inside which also the fair area is located. Villa Luvata was opened to the public in mid-June along with 25 other holiday homes.

“Building in Demanding Conditions” was the Theme of the Fair

It is always a challenge to build by the sea, as the climate is much harsher than inland. The shore is often windy, and rain and salt water are hard on building materials. Therefore special attention was paid to the durability of the houses built for the fair. Some of the villas were erected on concrete pontoons floating in the sea. Two floating villas were open to the visitors to the fair. By the year 2010 there should be a total of 16 floating villas. They were obviously the main attraction at the fair, as not many have been built in Finland yet.

The Villa Luvata plot borders on the sea by an old concrete jetty. In stormy weather waves may splash on the building. This was an important aspect to consider in the design of the house. Weather conditions were certainly taken into account in the design of Villa Luvata, and it must be one of the most durable houses in the fair area with its abundant use of copper. As is well known, copper is among the most resistant building materials lasting for generations. Installation of copper is easy today – thanks to ready-made cassettes and panels. As the theme of the fair focused on building in demanding conditions, copper was an ideally suitable building material.

The Architect’s Thoughts of Villa Luvata

Architect Martin Wolff designed Villa Luvata and the abundant use of copper both in the interior and exterior. He based the design on the location – what can be seen, heard and sensed around. A holiday home must feel different from the ordinary surroundings. The climate on Reposaari is harsh, so the yards must be sheltered. Villa Luvata has a large terrace built of spruce wood to connect the main house and the separate sauna building. Severe weather conditions require durability from the materials. Therefore there is copper on the exterior, on the roof and the walls. In order to create a functional fair area, it was important to ensure that all the buildings and their residents formed an integral part of the existing Island of Reposaari with its mostly old wooden houses.

The interior of Villa Luvata is divided into two parts. The living room, the dining room and the hall are all combined together and in direct connection with the sheltered outdoor terraces and peaceful bedrooms linked to the landscape through the windows. Copper is also used in the decor, not exceedingly, but in most surprising places and colours. The copper wall strips add zest to the austere wooden walls, says Wolff.

Copper from Ceiling to Cabinets

Villa Luvata was commissioned by Luvata Pori Oy, which supplied all the copper used in construction. According to Sales Manager Elina Kuusisto the abundant use of copper in the Luvata house was taken for granted, as it provided a great opportunity to demonstrate the use of copper in a wide variety of ways. Since the use of architectural copper has developed and diversified considerably, fairs like this provide a wonderful opportunity to exhibit and market copper. It was clear from the very beginning that the roof on Villa Luvata would be made of ordinary shiny copper, which would, however, turn dark brown in a couple of months.

Pre-fabricated ribbons were used on the Luvata roof. The ribbons were attached to each other by hitting the ready-made seam joints together. The method is simple and quick, and there was no need for traditional manual or machine jointing. The copper roof with its rainwater system provides the house with a beautiful and durable cover, under which the residents can enjoy the splendid scenery and blowing winds carefree. The vicinity of the sea may also speed up the accumulation of patina on copper, but that remains to be seen. The roof is equipped with a large almost hidden solar panel. The heat en-
ergy generated by the solar panel heats the household water and provides floor heating.

The walls are built of wood and copper panels made of the Nordic Green Living material. The base material is copper oxidized dark with trickles of green patina sprayed on the surface. This makes the dark green panels vivid and animated. The colour tones beautifully with the light brown wallboards. Inside the house the corner strips are of copper, a piquant detail to add colour to the light boards. The visitors found the versatility of copper as well as its availability in many different tones of colour surprising, as they had been under the impression there was no choice except bright copper.

The Sun and Wind as Sources of Energy

The price and availability of energy continues to worry people. New, environmentally-friendly and inexpensive alternatives are being developed constantly. The sun and wind are natural sources of energy, fairly commonly utilized elsewhere in Europe. In Finland solar energy can be used only part of the year, but there is certainly always plenty of wind by the sea.

Villa Luvata harnesses both of these energy sources. The copper roof houses 12 square meters of solar panels. The seams crossing the roof are in alignment with the seams on the actual copper roof. As bright copper quickly turns dark brown, the solar panels are virtually invisible on the finished roof. The annual output of the solar energy collector has been calculated to be approximately 4 Mwh per every ten collection square meters, which accounts for about 20 per cent of the house’s energy requirement.

Copper is the most important element in the collector as its heat conductivity is extremely high. The collector is of a modular structure, which enabled the installation of a large solid section on the roof. The large water boiler also supplies heat to the floor heating system made of copper piping. The remaining 80 per cent is generated by the four wind turbines on the opposite shore. This villa can truly be referred to as an eco-friendly model house.
Surprising Kitchen Cabinets

When copper is used in interior decoration, it is traditionally seen on fireplaces and ornaments as well as in public facilities. The conspicuous use of copper in Villa Luvata is also evident in the kitchen where the doors of the top cabinets are covered with hazel-brown copper sheets. The surface has been treated with dirt-resistant nano-technology, which gives the doors a nice shine. Visitors were interested in the kitchen cabinets, as copper doors had not been seen in kitchens before. The wall behind the cabinets is also of copper, which the steel-coloured refrigerator door matches surprisingly well. The effect is not cold at all, but the different shades of brown generate peacefulness and warmth.

The house also has two fireplaces, one indoors, the other outdoors. The indoor fireplace divides the combined kitchen and living room into separate areas. Both soapstone fireplaces also feature a touch of copper. The doors in the indoor fireplace are bordered with the Nordic Blue copper, and the outdoor fireplace has copper on the door and the fireguard. Used in small quantities copper decorates and enlivens the evenly grey rock surface. As a whole Villa Luvata is an outstanding work of architecture highly admired by the visitors and widely publicized in interior design magazines.
Tombak adds warmth to architecture

Tombak is a special alloy of copper and zinc, in which the zinc element is usually approx. 10-20%. It is easy to work and its brown colour provides a warm effect, which can be seen on the new buildings at Vendsyssel hospital, Denmark.

"The aim was to create a harmonious building complex, which complemented the existing buildings of the hospital," explain aart arkitekterne on their website about the project. They also state that they wanted to get away from the traditional clinical look usually associated with hospitals.

One way of doing so was to extensively use Tombak, which gives off a completely different signal to that of steel, glass and coldness thanks to its warm golden sheen. Neither does Tombak go light green over time, as traditional unadulterated copper does. Thanks to its zinc content, Tombak does not become coated with verdigris, and is very easy to shape for use as facade cladding, as can be seen on the Tietgenkollegiet building in Ørestad, Copenhagen.

"A total of 30 tonnes of Tombak was used for the Hjørring project," says Henrik Lau from Povl Sørensen A/S in Rødovre, cutting and forming specialists. "We formed the material into cassettes of up to almost 3 metres in length, packed them carefully in wooden crates and sent them to North Jutland for installation. The material is very easy to work, but can also be a little delicate. Finger marks and scratches show easily, so we are extremely careful here in the factory".

Continuous deliveries to Hjørring
Povl Sørensen A/S staff also prepared the Tombak sheets for Tietgenkollegiet, which has since received praise from all over the world for its unique architecture and unconventional materials. This means the staff at the Rødovre works are well used to handling large quantities of Tombak.

"Unfortunately, the practice of cladding the panels with film has been discontinued, as there was a risk of it burning on to the surface of the Tombak. This means we now have to be extra careful when working with Tombak both with regards to forming it and despatching it to the building site. We delivered this order in a continuous stream, as the contractor couldn’t work any faster than the building process allowed," explains Lau.

Kresten Lavsen of Grønbech Construction A/S was able to confirm this fact. Grønbech was the contractor on the project right from 2004, but due to various problems along the way, the buildings have only just been finished.

External and internal installation
"Getting continuous deliveries from Povl Sørensen A/S suited us fine, as the project moved forward at its own speed," explained Kresten Lavsen. "We usually only had two men working on installation of the Tombak cassettes, and they are in the process of finishing off now. They put the 1.5 mm thick cassettes up using concealed fasteners, so that the screws were not visible. It will be a handsome and well-executed project."

It was also Grønbech Construction A/S which won the tender for cladding the façade of the Tietgenkollegiet building, which means the partnership between Grønbech and Povl Sørensen has become well established. "We’ve gained a lot of experience from the use of Tombak for facades, and it’s easy to see why architects and clients like the material. It’s attractive and is practically maintenance free," concludes Lavsen.
St. John’s Church in Tartu, Estonia

St. John’s Church in Tartu was built in stages, starting at the end of the 14th century up until the 18th century when it had obtained its present form. The church is of brick construction. The primary style represented by the church is Gothic. It has been destroyed several times during its history. The top part of the Tower as well as the vaults of the choir were ruined during the Great Northern War in the 18th century.

The interior of the church was altered in the 19th century on the basis of the designs of architect G.F.W. Geist. The façades were renovated toward the end of the 19th century and at the beginning of the 20th century under supervision of Riga architect W. Bockslaff.

The church burned in 1944 during the Second World War, and the north wall of the nave collapsed in 1952.


The new copper roof of the church was realised with funding received from Tartu people. The renovated church was introduced to the townspeople in 1999.

As. Ehitusfirma Rand and Tuulberg started as the main contractor of the church construction project in 2002.

The central objective of the project was to restore the church in its original form, using as many original building methods as possible.

Architects ARG, architect Udo Tüürmaa has in collaboration with art historian Kaur Alttoa been responsible for the construction project of the medieval church.

In 1993–1996, the project focused on the reinforcement of the church’s foundations. The reinforcement structures of the foundations of the tower part have been realised with steel piles. The base slab of the tower part was poured in stages simultaneously with the piling work. This has created a so-called piled floating slab foundation. Kari Avellan, Licentiate in Technology, Engineering Firm Kareg Oy, has been responsible for this part of the project.

The church is an important element in the medieval city of Tartu. It represents an early stratum in the city, on one hand repeating and on the other hand reflecting and preceding the human scale of the townscape as it is today.

St. John’s Church in Tartu is also internationally acknowledged for it exceptional terracotta sculptures.
The view of Lübecki Street

Section and plan of the church

The foundations of the tower
COPPER – THE ESSENTIAL MATERIAL OF THE INSPIRATIONAL WOODEN BOAT CENTRE
Kotka Town on the Baltic coast is the home of the sleek new wooden boat centre. Copper was considered as the façade material from the outset. The owner of the centre found the copper sheeting proposed by the architects so fascinating that there was no need to consider other alternatives. The architects drew their inspiration from the sleek lines and the hull structure of sailing boats.

Sleek sailing boats were the source of inspiration for the design

Architect Jesperi Vara of the Lahdelma & Mahlamäki Oy Architectural Office states that it would be wrong to say the building is simply an overturned boat. It is much more. The contour is patterned on the sleek lines of sailing boats and the structures of the hull, but bearing any constructional limitations in mind. The large glass surfaces give transparency to the activities, and together with the copper surface they reflect the vicinity of the sea and the port. The renovation and building of wooden boats require great skill and superb craftsmanship as well as carefully selected high-quality materials. This idea is best reflected in the selection of a natural and valued surface material for the façade – a material that displays the mastery of the highly skilled craftsmen and later on the patina of age.

The shape of the building also inspired the architects to select copper. The practical demands made on the building were based on the instructions given by Wooden Boat Builder Allan Savolainen. Architect Vara captures the true nature of copper in his description of it as a natural and honest material with a timeless quality in any environment. Copper maintains its individual properties in different applications.

Smooth cooperation and highly skilled craftsmanship

The successful outcome of the project was guaranteed by smooth cooperation among all the project parties throughout the construction stage. Architect Vara admits that the highly skilled sheet metal workmanship and commitment shown by the Kangasniemen Pelitityö Sheet Metal Works were vital to the project’s success. Project Head Pekka Pynnönen of Kangasniemen Pelitityö states that the project posed an exciting challenge, as it was a unique opportunity – there was no previous experience of anything similar. It was extremely important to pay scrupulous attention to every detail to ensure the architect’s and the owner’s wishes were carried out exactly as intended. This, of course, required smooth cooperation among the different players. Careful planning and scheduling of delivery times of materials were also absolutely essential to assure the timely progress and completion of the project.

Written by Hannele Numminen
Building details

Originally the copper sheeting was intended to be 0.8 mm thick, but in the end 0.7-mm thickness was used. A total of 13,000 kg of Nordic Brown copper sheeting and Luvata NSF Panel 402 façade lamellas were used. However, the lamellas were slightly altered after sample installation. The alteration was easy to carry out as the sheet metal works had been commissioned to manufacture the lamellas. The 1,300 lamellas used were mainly sized 600x1800 mm. Also 200 kg of Nordic Prenet net sheeting was installed on the building. Stainless-steel brackets and screws were used as fasteners, and the seaming is mostly of double rebating type.

Additionally, there are curved surfaces, which form the lower ceiling at the ends of the building. Double rebating seaming could not be used on these surfaces, but they were seamed using the tongue-and-groove joints. The convex surface becomes partly concave with a varying radius. All these details were given careful consideration in advance, drawings were made and approval received from the architect before implementation. The substructure required uncompromised precision from the carpenters, but the closely cooperating building crew managed to overcome this problem, too.

The framework of the building is supported by steel arcs visible inside. Attached to the steel arcs are the glued laminated timber, the plywood, the supporting rails for the ventilation space, the surface plywood and the felt used as the actual waterproofing, on which the copper sheeting is installed. The main contractor of the building was YIT Rakennus Oy, which had also previously done building work in the Kotka area in cooperation with the sheet metal works. This meant that the supervisors as well as the carpenters knew each other from before, which facilitated the implementation of a demanding project like this, and ensured that scheduling and execution of the building work went according to plan. The completed Kotka Wooden Boat Centre is a fine example of superb design and skilled craftsmanship.
Casa Entreprise has moved into its new administration and warehouse building, where the client and architect chose to clad the administration section with cassettes of Tombak, an alloy consisting of 80% copper and 20% zinc.

Over time, the facade will change from its characteristic golden sheen to an attractive bronze colour.

The project involves around 2,000 m² split between two administration buildings and associated warehouse sheds. The sheds are built around a common manoeuvring area at the back of the buildings, so that the administration facade faces the entrance.

Because the warehouse sheds need a large manoeuvring area, it was only natural to keep their roofline the same as for the administration buildings. As such, the latter are integrated with the warehouse sheds, to achieve harmonious incorporation of the building elements.

The administration buildings are raised from ground level, to create a good view from the offices and space for parking underneath the building.

The sheds consist of light coloured concrete elements, and only the administration block is clad in Tombak.

The distinctive entrance consists of glass and black zinc.

AE Stål montage produced the 12 tonnes of 1.00 mm semi-hardened Tombak sheets for cladding with interlocking panels.

Client: Casa Entreprise
Architects: Vallentin & Haugland
Tombak facade: AE Stål montage
“De Korenbloem”

Creativity was given wings, when different surface patterns were alternated on the copper façade of a Dutch block of flats. Pre-patinated copper ribbons were toned in a patination procedure during production. When the shades and lengths of the ribbons were varied, the end result was entirely unpredictable. This kind of approach was adopted by Rietvink Architecten bna., a Dutch architectural office, which designed the business and apartment building in Hoorn – a perfect example of a successful and unprejudiced use of copper.

A mellow patchwork

In spite of its massive size, the building maintains a composed and peaceful appearance. The different height levels of the façade enliven and lighten the building. Initially the architect had planned to use rock and glass on the façade, but changed his mind after becoming acquainted with the Finnish copper architecture. Inspired by the widely admired Laajasalo Church, the architect decided to use copper ribbons of two different tones with varying amounts of patina on the surface. The use of two shades and different lengths of ribbons creates an interesting patchwork quilt effect. However, the gradation of similar shades conveys peacefulness and balance.

“Random harmony”

The street-level shopping centre merges into the building extremely well. The 34 apartments above the shops with their balconies and abundant glass surfaces lighten the colourful façade. The pre-patinated copper panels were installed without any precise plan to allow a fortuitous combination of tones. The result is a harmonious interrelation well balanced with the architecture in the rest of the building.

Equal amounts of the darker Nordic Green Living 1 copper and the lighter Nordic Green Traditional were used. The panels were 0.7 mm thick, and a total of 1,500 square metres of copper was installed. The finished shopping centre with the apartments is an interesting construction and certainly unique in Hoorn. The varied green of the patina tones with the lush park-like environment extremely well.

Pictures by Erik Droog from Rietvink Architects
Written by Hannele Numminen
in Hoorn – a celebration of copper colours

Architect: Rietvink Architecten bna
Oosthuizen, the Netherlands

Contractor:
Leebo in Drunen, the Netherlands

Pictures by Erik Droog from Rietvink Architects
Written by Hannele Numminen

Arkkitehti: Rietvink Architecten bna
Oosthuizen, the Netherlands

Urakoitsija:
Leebo in Drunen, the Netherlands
The five-star Astir Palace hotel on the Athenian Riviera on the Mediterranean coast offers the guests a wonderful escape to a world of luxury and indulgence. The hotel is surrounded by the rich colours of Greece ranging from the greens of the landscape to the blues of the Mediterranean. The hotel also has a spa and 77 bungalows entirely renovated over the past year. Prepatinated Finnish Nordic Green PLUS copper has been used as the roofing material for the bungalows.

**Blue and green**

In addition to the hotel and the spa the Astir Palace also has 77 bungalows built in long chains near the beach. The bungalows are built on different levels forming a terraced profile on the shore. The landscape around the hotel area mainly features various shades of blue and green, and one of the requirements set for the roofing material was that it would melt into the surroundings. Since the Astir Palace is located in a protected conservation area, which is archaeologically invaluable, a lot of factors had to be taken into account in the design stage.

The Zeppos – Georgiadi & Associates Architectural Office were well aware of these special conditions when they undertook the extensive renovation project. They were familiar with the Finnish Nordic products and asked for product samples of roofing materials. Among these samples they found exactly what they wanted! The samples of copper convinced the architects that prepatinated copper would create the effect they had in mind for the bungalows.

**Excellent choice**

The Greek contractor Achilleus Techniki S.A placed an order for 47 tons of Nordic Green PLUS copper ribbon. The ribbon was delivered prepatinated, which meant it was easy and quick to install. The shade selected appears naturally aged and is in perfect harmony with the surrounding cultural heritage. Besides, the other properties of copper also justify its use: it is a durable material able to withstand the weather by the sea.

Installation was done by DBS-Stefopoulos, a Greek sheet metal works. The complete renovation of the bungalows was an extensive project, but everything advanced speedily without any particular problems, and the project was completed in seven months!

The word copper is believed to originate from the Greek Isle of Cyprus, so Greece has a long tradition of the use of copper.
copper at the Astir Palace
EUROPEAN ARCHITECTURAL AWARDS LAUNCH

The 2009 ‘European Copper in Architecture Awards’ have just been launched. Architects involved with copper buildings are encouraged to enter and take advantage of this major opportunity to present their work to an international audience.

These well-established Awards recognise architectural excellence and celebrate the use of copper in all its forms. The last two decades have seen their transformation from a UK based programme highlighting craftsmanship, into a major, design-led Awards event for projects across Europe. Following the recent growth in entries – over 70 at the last event – from a wide range of countries, the 2009 Awards 14 will, for the first time, consider all entries together to select the very best in contemporary European architecture. This continuing growth in interest in the Awards mirrors the increasing popularity of copper and its alloys as inspirational, as well as environmentally sustainable, architectural materials.

The design-led competition covers recently completed buildings in European countries participating in the European Copper in Architecture Campaign. To be eligible, all entries must incorporate cladding, roofing or other architectural elements of copper or copper alloys, such as bronze. But any building type can be entered – from major landmark projects to more modest buildings. There is also a discretionary award for innovation in specific areas of relevance today, such as sustainable building, economical construction, prefabrication, conservation or new uses of copper.

Winning and shortlisted projects will be featured in a special issue of the international magazine ‘Architectural Review’, which will be available at the ‘World Architecture Festival’, held in Barcelona during October 2009. As with previous Copper in Architecture Awards, the best entries will also be covered in Copper Forum. All entries will be judged by a panel of practising architects at the forefront of design in Europe, chaired by Paul Finch, Editor of Architectural Review and Programme Director of the World Architecture Festival. These Awards are proving particularly important, not only to showcase the best and most innovative uses of copper in contemporary design, but also to discover and present to a wide international audience exciting and inspirational architecture that might otherwise be missed.

Images and information on winning and shortlisted projects from recent European Copper in Architecture Awards have been featured in previous issues of Copper Forum and brochures can be downloaded from the websites: www.copperinfo.co.uk/arch and www.copperconcept.org. Entry forms and details of the 2009 Awards are also available at these websites or via e-mail to: helpline@copperdev.co.uk. Entries must be submitted by 31 May 2009 and the winners will be announced at a presentation in London, UK during September 2009 before the World Architecture Festival.
“It will be a pleasure to chair the 14th series of the Copper in Architecture Awards. The standard of architecture in the submitted entries, and the imaginative use of this attractive material, has increased significantly in recent years, with the 13th Awards setting a very high standard indeed for those taking part in the coming year.

Architecture is an international activity these days, and the gradual evolution of the awards scheme to reflect the increasing specification of copper by architects working outside as well as inside their own countries has been appropriate and worthwhile.

I look forward to a stimulating day of judging in 2009, and to meeting the winners in due course.”

Paul Finch, Editor, The Architectural Review
There is a long tradition of using copper and its alloys for decorative embellishments and sculptural features, as well as a durable external surface for roofs, walls and other building elements (1). Although this tradition remains alive today through the skill of craftsman, it does not play a significant role in contemporary architecture.

At the start of the 20th century, the ‘modern movement’ heralded the active removal of surface decoration in architecture – summarised in the words of Mies van der Rohe: “less is more”. In this environment, copper proved to be particularly adept as a covering for the novel architectural forms that developed (2). Because of its unique characteristics, copper also offered architects a solution to satisfying another modern movement mantra: “form follows function”.

And it continues to do so today, as this modern example shows with a complex building form designed as a direct response to technical wind and snow requirements of its Arctic location, enabled by copper cladding (3). But the other modern movement credo “truth to materials” also held, so that copper was just used in flat sheets, jointed to suit technical rather than decorative requirements and with its natural finish simply allowed to change over time in the environment.

The first steps in adding choice to the traditional ‘bright’ mill finish of copper sheet were factory treatments providing immediately the dark brown oxidised copper or a green, textured surface with similar characteristics to the natural patina which takes several years to develop. Apart from the obvious benefits of these products, architects seized the opportunities to use them for design statements. For example, this British school is made up of interlocking cubic forms, each characterised by a different copper finish (4).

The patination process of copper has always intrigued architects and they continue to explore different creative surface treatments. For example, after completion of this shell-like, ‘Spiral Café’ in the Centre of Birmingham, an artist specialising in patination was commissioned to apply a coloured finish to the external cladding, resulting in a rich, textured and durable exterior (5).

In addition to these alternative surface finishes, new cladding techniques have also emerged, offering architects a variety of textures for their building facades. As well as traditional copper sheets jointed using standing seams or batten rolls which have a structured appearance, the long strip method was developed for greater efficiency. This method uses long, preformed ‘trays’ to minimise or eliminate horizontal joints - and has a profound effect on its appearance. Architects have taken this principle forward with striated cladding to stress horizontality – or alternatively verticality – whether in regular or more random bands (6).
Other techniques are also popular such as copper shingles that offer a distinctive ‘fish scale’ appearance using a variety of shapes including squares, diamonds and rhomboids (7). For a more linear appearance, copper panels pre-formed on two sides can be used vertically, horizontally or diagonally, while cassettes in more square proportions give larger areas of flat copper surface.

Most recently, alloys such as brass and bronze, and a ‘golden’ alloy of copper and aluminium have been developed for architectural applications. Again, architects have seized upon these opportunities to explore decorative treatments of effectively plain areas. In this Middlesbrough project, regular bands of metal cladding become abstract by the interplay of ‘golden’ copper alloy panels with both mirror and mat stainless steel (8).

This trend for making a flat elevation into a piece of public art is growing. Another recently completed example – this time a central London hotel – combines brass and ‘golden’ copper alloys to give apparently random, abstract coloured decoration to an otherwise flat, regular façade (9). But at close quarters, the variety and natural characteristics of the copper alloys add richness to the surfaces, bringing them to life (10).

With other recently developed forms of copper, its perception as just a solid, rigid sheet is being broken down. In this example, buildings are encased with a quilted curtain of copper alloy wire mesh (11). The phosphor bronze mesh panels are held in tension, retaining flexibility and giving a remarkable tactile quality (12).

A key word in architectural design today is “transparency”, with architects exploring screens in front of glazed facades – or in some cases within the glazing assembly. Generally they protect glazing from the sun and perhaps control views into the building whilst allowing views out. But, of course, these screens help to define the architecture of a building and copper solutions are particularly popular. In the simplest form, expanded copper sheets give a regular patterns over glazed facades (13). Lighter versions are also used, in this case in the form of a 1mm thick copper ‘net’ (14).

Perforated metal sheet is a well-used component of internal building fittings and furniture but perforated copper has caught the imaginations of many architects with its transparent qualities and surface decoration possibilities for facades. In this Luxembourg example, an irregular design of perforations is simply replicated on all panels, which are then juxtaposed together for a more random surface (15).

But probably the most innovative interpretation of this technique – and on a major scale – can be found at architects Herzog & De Meuron’s ‘de Young Museum’ in San Francisco, USA (16). This massive building is completely shrouded in a perforated copper skin. The pattern of perforations is not regular but generated by images of tree foliage translated onto the copper in varying hole sizes. This process mirrors the visual effects of dappled tree shading across the building’s external surfaces. Added to this complexity is the architects’ intention that prevailing winds on the site will accelerate the patination process to some elevations, creating a natural variety of colours to the transparent veil.

The approach taken with the de Young Museum exemplifies how architects today are exploring new ways to use the unique characteristics and opportunities of copper for architectural decoration.
The long awaited BRE (Building Research Establishment) Green Guide to Specification has now been launched in the UK. Although discussions will continue between the copper industry and BRE to resolve some issues, the Guide provides independent endorsement of the low environmental impact of both copper roofing and cladding. The Green Guide is a new, on-line tool – available at www.thegreen-guide.org.uk - providing architects with straightforward and independent guidance on making the best environmental choices for building materials. It looks at specifications for complete building elements, including structure, insulation, weatherproofing and internal finishes - not individual materials. It then rates a wide range of these elements from ‘A+’ for best environmental performance to ‘E’ for the worst, using Life Cycle Analysis (LCA) techniques.

COPPER RATED
The copper industry has been working alongside BRE for some time, providing the most popular copper-based roofing and walling specifications for consideration in the Guide, together with the most current LCA data. All the copper-finished roofs and most copper wall cladding specifications achieved the best ‘A+’ or ‘A’ summary ratings. Even the few cladding specifications with lower ratings could easily be improved by replacing particular components – but not the copper cladding itself - with more sustainable alternatives, something that the copper industry is still exploring with BRE.

Apart from providing architects with useful guidance when selecting materials, Guide ratings form an important component of other environmental assessment tools such as BREEAM 2008 and the Code for Sustainable Homes. BREEAM is the Building Research Establishment’s Environmental Assessment Method, a widely used environmental assessment method for buildings in the UK and other countries, with the new version taking effect from August 2008. Various versions of BREEAM 2008 have been created to suit common building types – such as healthcare, schools, industrial, offices, retail, law courts and prisons - as well as a bespoke version for others types of building. With BREEAM 2008, credits are awarded in nine categories according to performance and added together to produce a single overall score on a scale ranging from ‘Pass’ to the newly added ‘Outstanding’ category.

SUSTAINABLE HOMES
A similar approach is also taken with the Code for Sustainable Homes, which replaces BREEAM Ecohomes. Homes are rated from Code Level 1 – “above regulatory standards” to the highest Level 6,
an “aspirational standard based on zero carbon emissions for the dwelling and high performance across all environmental categories”. The British government has confirmed that it is mandatory for all new homes to have a rating against the Code and it is also expected that national building regulations across the UK will one day require new housing to achieve specific Levels.

For use of materials, both BREEAM 2008 and the Code for Sustainable Homes include ‘credits’ directly related to BRE Green Guide ratings for key elements such as external walls and roofs. These credits range from 3 for an A+ Guide rating to 0.25 for D and none for E ratings. So, we can see that selecting constructions made up of environmentally sound materials has a direct influence on the sustainability assessment of buildings. And in future, this in turn will determine whether or not the building complies with UK law.

THE GREEN HOUSE

However, it is still early days for the Code for Sustainable Homes and there are few examples achieving the higher Levels built yet. But on one new house achieving the highest ‘Level 6’, copper cladding helps demonstrate that there is no reason why meeting the highest sustainability standards should stifle architectural design. Opened in May this year, Green House is the first home by a “volume” house-builder to achieve Code Level 6. Designed by Gaunt Francis Architects, it aims to make sustainable housing mainstream and is designed as a test bed for Code-compliant materials, technologies, systems and strategies - with potential for mass production in mind. This prototype building will be rigorously tested over the next two years to assess its design, construction and materials. Green House achieved an overall score of 15 Code credits for its key materials.

Copper was chosen by the architects for its special architectural cladding qualities to contrast with white rendered walls, alongside its sound environmental credentials. The three-storey, three-bedroom family home was specifically designed to look more conventional than its neighbouring projects at the BRE Innovation Park - comprising the most progressive, experimental, sustainable homes in Europe. Green House has proved very popular with consumers as well, winning the 2007 Home for the Future competition with 22,000 readers of a national newspaper voting for it.

By Chris Hodson
Helsinki Music House

current status

The winners of the design competition for the Helsinki Music House were announced in 2000. The location of the House in the Töölö Bay area had been selected on the basis of extensive studies, deliberations and public debate.

At the first stage of the competition, 243 approved entries were received. Six of them were awarded as showing most potential for development. The second stage was open for all the participants who had submitted an approved entry at the first stage, i.e. almost seventy entries. The jury chose "a mezza voice" as the winner, and the current designs are primarily based on the solution presented in this winning entry.

The primary objective of the location and layout of the building masses as well as the environmental approach has been to produce an integral and peaceful general appearance for the building. The House is fixed to the environmental coordinates, with the two sides of the main mass following the directions of the Finlandia House and the Parliament House, while the tallest part of the main mass continues along the eastern wall surface of the Karamzin Park. The tallest sections of the building are also as close to the green zone as possible to create an impression of a continuing belt of public buildings into the park.

The open glass side of the Music House displays the activities carried out inside the building and connects it with the more recent buildings and architecture on the east side of the area. The more solid façade on the street side is a perforated copper façade with green patination, seeking contact with the buildings in the Etu-Töölö town block and the flush park areas.

The Parliament House is a significant contributor to the layout of the square. The view down from the stairs of the Music House toward the parks and further to the Parliament House is open. The inclined deck of the lower building part has been treated like a park environment, descending toward south and giving space to Kiasma’s independent architecture.

The entrance square at the same level with Mannerheimintie Road continues as a pedestrian and bicycle road to Kiasma and as a footpath down to the event square at Töölö Bay level. This citizen square has been designed as a venue for outdoor concerts and similar events, with the upper inclined deck, Mannerheimintie Road and even the stairs of the Parliament House providing more space for spectators. The productions realised in the Music House or also international music events could in the future be shown on a giant screen erected on the square.
Green mass as a continuation of the park zone

Client
KOY Helsinki Music House

End-users
Sibelius Academy / Senate Properties
Helsinki Filharmonia HKO
Finnish Radio Symphony Orchestra RSO

Project Management Consultant
ISS-Proko Oy

Main/Architectural/Interior design
LPR-arkkitehtit Oy

Acoustic design
Nagata Acoustics Inc.
Insinööritoimisto Akukon Oy

Structural design
Insinööritoimisto Mikko Vahanen Oy
Insinööritoimisto Oy Matti Ollila & Co

Site plan
The Client has defined openness as an objective for the Music House. The aim has been to create an active connection between the House and its environment and to provide an assembly place for the audience.

The House wishes to facilitate interaction between music professionals, students and spectators. The lobby part of the building that is connected with the event square is designed as a mainly open space for visitors, with different music events organised in the various parts of the lobby. The foyer areas are during the day utilised as cafeteria and exhibition facilities.

The second entrance to the building at the Töölö Bay level also provides access to the main lobby and further to the foyer. The glass walls of the foyer open up toward the park views, the event square in the south and the downtown parts of the City. The core of the building, a vineyard type concert hall is accessed from the ringed foyer level and the wall between the two parts consists of two sound absorbing glass walls through which the crater like concert hall can be seen from the foyer and lobby areas. The visual connection can be blocked by a curtain lowered into the space between the glass walls. The concert hall seats 1650 spectators, partly on the fairly narrow gallery level.

In addition to the concert hall, there will be five smaller music rooms, each with 150-300 seats. The purpose of use of each room has been taken into account in the design of the acoustic features. This makes it possible to perform different types of music in a central location in downtown Helsinki. The ground level of the building contains the concert hall stage, the rehearsal rooms and the loading area. Most of the artists' rooms for both orchestras are also located on this level, round the two atriums. The administrative facilities of the Music House and the orchestras occupy the top part of the tall foyer on the south side.

The classrooms and the offices of the Sibelius Academy are grouped on seven floors round the atrium that looks toward the Karamzin Park. The public music library and the studios of the Academy are located on the two lower floors, near the ground lobby.

The foundation engineering works as well as the construction of the maintenance tunnel under Töölölähtti Street are currently under way on the Music House plot. The costs are still being clarified as the plans progress and develop. The Music House is estimated to be completed in 2010.
Green façades of pre-patinated copper on the tall building mass.

Foyer facilities on the side of "Citizen Park".

Lobby with the bridge of steel construction in Sibelius Academy.

Vineyard type concert hall. 1:10 acoustic scale model.

Foyer with beams and columns of steel construction.

Green façades of pre-patinated copper on the tall building mass.
Award-winning, luxurious "Stella Maris"
The five-storey “Stella Maris” apartment building is a fine example of modern architecture and high-class homes in today’s St Petersburg. Side by side with the old and historically valuable buildings there are luxury homes that represent the latest in modern architecture and feature every conceivable service under one roof. Architects have been able to come up with and implement innovative ideas more or less unheard-of in ordinary building construction. Stella Maris is one of these fascinating buildings, and it was awarded a silver medal in the “Rakennustaide 2007” Architectural Competition.

Elements of a luxury hotel in an apartment building

A company called OOO “Settle City” commissioned Architectural Office Gerasimov and co with S.V. Petrova as the main architect to design the apartment building. The façade of the building consists of four different units connected by bright glass-walled lobbies. The 19-apartment Stella Maris is not far from the centre, on the beautiful Ristisaari Island. The island is in the River Neva Delta, where local people often gather to enjoy their leisure time. It is easy to reach by underground. There are a lot of other highly respectable houses and parks on the island that people go to see and admire for their architecture.

Stella Maris has its own granite street leading up to the building. Instead of the ordinary, usually boring staircases, the building welcomes those who enter with bright and spacious lobbies. The building also features a beautiful conservatory where the lucky residents can enjoy an ever-lasting summer round the year. In the building there is also a SPA department and a gym, which enables the residents to keep fit without stepping outside. The basement also houses a safe car park, and boat owners can dock right in front of the building. Anything that the residents could possibly desire is certain to be available.

This type of community could also be called “a big family” as the residents can spend time together on common premises. With shared facilities it is, of course, extremely important that the residents have similar values and enjoy each other’s company. All this has been taken into consideration in the marketing of the apartments, and the buyers are carefully selected. This guarantees that the luxury homes will hold their value and be attractive to future buyers, too.

The Nordic Green PLUS copper on the roof

As a whole, Stella Maris is the ultimate in class with nothing but the best materials used in construction. The exceptional shape of the roof draws a passer-by’s attention, and the four roof arcs can be seen as waves in the sea. The façade of the building has a lot of glass, which means the inside is bathed in light and offers magnificent views of the river. Finnish copper manufactured by Luvata Pori Oy has been used for the roof. The malleable material is easy to shape, so the creation of the curves and bends of the building involved no difficulty. The shade of colour used is the patina green Nordic Green PLUS to match the surroundings and complement the combination of glass and brown rock. The superb “Stella Maris” won a silver medal in the Rakennustaide Architectural Competition in 2007. The apartments under the glowing copper roof are certain to live up to the expectations of the most demanding resident.
Architects Heikki and Kaija Siren won the invitational design competition in 1960 and the Building was completed in 1968.

The design concept of the building is built on a circle placed at the joint of two rectangular coordinate systems running in different directions. It thus creates a link in the townscape. The base diameter of the building is 76.4 m and the depth of the frame is 17.2 m.

The circular building is an office block with commercial facilities on the ground floor. The cubic volume of the building is 125 000 m³.

The building displays some modernistic architectural elements, such as the continuous windows on the façades and the flat roof. Continuous windows dominate the façades in a consistent manner. The clean geometric shape of the building, on the other hand, suggests classical architecture, or modernism with classical influences. It could also be said that the building bears resemblance to the 19th century architectural heritage of Helsinki. The asymmetrical parts of the building are found in the area of the first two floors.

The building envelope is covered with Tombak (architectural bronze). The information on the companies and organisations that occupy the building is displayed on the façade as part of the architectural appearance of the building, with a carefully thought-out relationship between the text and the façade. The text type used in the displayed information has also been defined, and the density contrast between the information and the background has been optimised. No major deviations from the plans have occurred after the building was first completed.

The building was renovated in 2004. Renovations covered a total area of ca. 36 000 m² and the court-yard was also remodelled. The renovations were designed by architect Jukka Siren, who continues the work of his parents. The objective of the renovations and the alterations was to increase light inside the building and to modernise the facilities taking the character of the building into account.

The building has become patinated over time. The circular building is a significant element in the townscape, and the form language and the technical implementation are of a good standard. It is an internationally known object of architecture.
The building mass

The renewed plans. The drawings are from the year 2004.

View from Hakaniemi square

Site plan

Facade

Section
Architecture from

Austria • Belgium

Czech Republic • Denmark

Finland • France

Greece • Germany

Holland • Hungary

Italy • Luxemburg

Norway • Poland

Russia • Spain

Sweden • Switzerland

United Kingdom

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