TECU®

KME

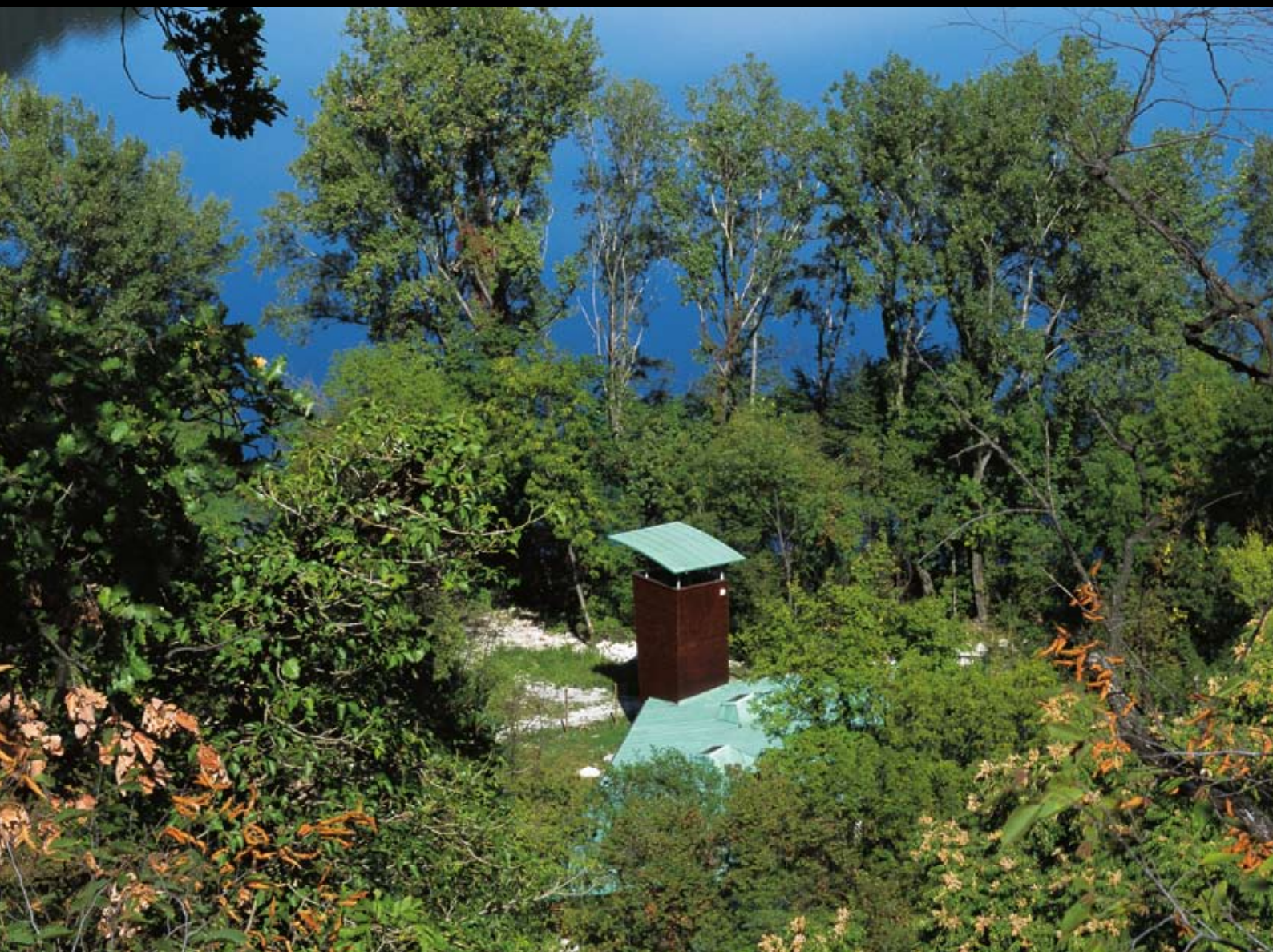
Architecture and Responsibility

Copper –
a sustainable material

Member of the KME Group

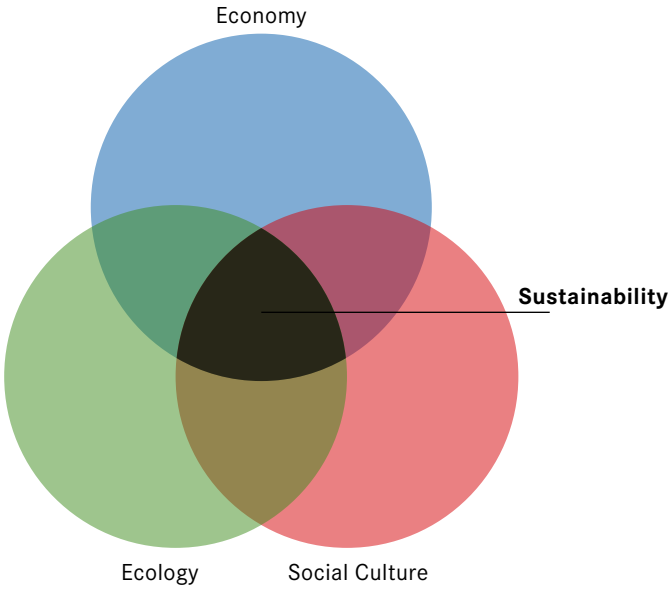
Show me what you build,
and I'll tell you what you are.

Chr. Morgenstern



Today, as much as ever before, the tasks facing architecture and the construction industry are immensely challenging. The real value of building in our environment has always been judged as much in functional as in social terms, in economic as much as cultural terms.

In the last two decades of the previous century, ecological values began to take on ever greater meaning, and the development has intensified in recent years in response to the on-going climate debate. Construction concepts and buildings, even building materials, are being subjected to a rigorous test of responsibility imposed by the now almost ubiquitous idea of sustainable development.



Sustainability has become a part of our everyday language over the last twenty years. The concept as it is generally understood comprises three areas of equal weighting, which define the Three Pillar Model of sustainable development. They are

economic development, which promotes a lasting, viable basis for employment and prosperity, while protecting our economic resources against exploitation;

social development, which demands decisions and developments which benefit all members of the community; and

ecological development, which aims to protect the natural environment and conserve it for future generations.

Materials made from copper and copper alloys are regenerative natural products that are almost as old as humanity itself. For as long as they have been used, their contribution to sustainable development has been substantial and continues to be considerable in many areas of our modern day-to-day lives. They ensure highly-efficient transport of energy for electrical engineering, rapid and reliable heat transfer for solar thermal energy, and extremely durable protection and long-term value maintenance in the construction industry, to name just a few of many examples.

TECU® products for external cladding of buildings and for roof drainage systems are manufactured exclusively from copper and copper alloys. Thus, the idea of sustainability is “in their very nature”.

Copper and copper alloys:

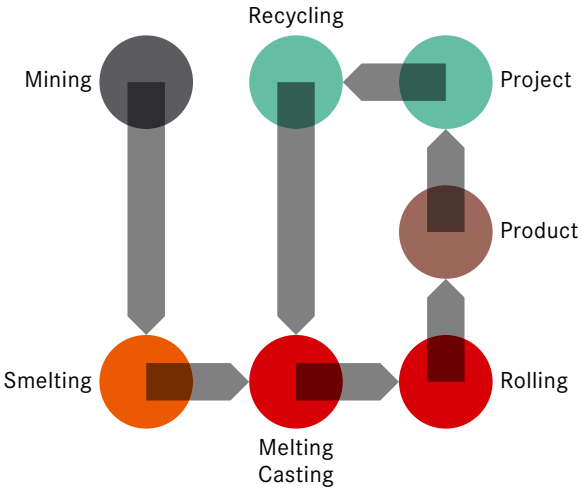
Efficiency delivered to your doorstep

Architecture is created today in accordance with economic, constructional and functional laws.

Egon Eiermann

Copper is one of the most efficient materials that exist. In its entire cycle from mining through processing to reprocessing, from use to reuse after recycling, there are as good as no waste products and no loss of quality. The economic advantages of this are reliable material characteristics in the long term, long-life products, and no need to worry about disposal, since copper can be recycled again and again practically without end.

Especially in the construction industry, copper and copper alloys – including of course all TECU® brand products – prove time and again to be highly efficient materials. When they are exposed to the open weathering of a building, they develop a protective layer of oxidisation, which produces the characteristic colouring and ensures long life. As the material ages, it retains practically all its value, since no waste is generated upon subsequent dismantling; on the contrary, it provides valuable, reusable scrap metal. The decisive economic factor is that copper is not a consumable material, but a utilisable material with an ever-repeatable life-cycle.



Recycling – the world's biggest copper mine

The complete recyclability of copper makes it extremely important as a material, not only in ecological terms, but also in economic terms. About half of Germany's current annual copper requirements are met from recycled material. Electrolytic refining now makes it possible to remove all impurities, thus removing any differences in quality between newly produced copper and copper derived from scrap metal. Thus, not only are resources conserved, but there is also a saving of energy for ore mining, processing and transport to processing plants.

The energy needed to melt down scrap material is only a fraction of that needed to extract metal from concentrates. Moreover, there is a saving of around 36% in CO_2 emissions. Companies such as KME ensure an economically viable recycling circuit in Western Europe with environmentally-neutral processing technologies and direct routes between industry and recycling plants.

TECU® – all the advantages of copper and more

The excellent recycling possibilities for copper and copper alloys play especially to the advantage of TECU® products. In comparison to the many technical applications that are more “concealed”, building claddings facilitate much simpler dismantling and make recovery extremely cheap. An advantage that paid off recently with the restoration of the roof of Hamburg’s ‘Michel’, the St. Michaelis church on the Elbe. KME supplied some 44 tons of TECU® Classic in strip format for the recovering of the roof, and in exchange the old roof copper was taken straight to the recycling plant, where it could be melted down and used to manufacture new products. An ideal process for a resource-conserving recycling circuit that saves costs and energy.

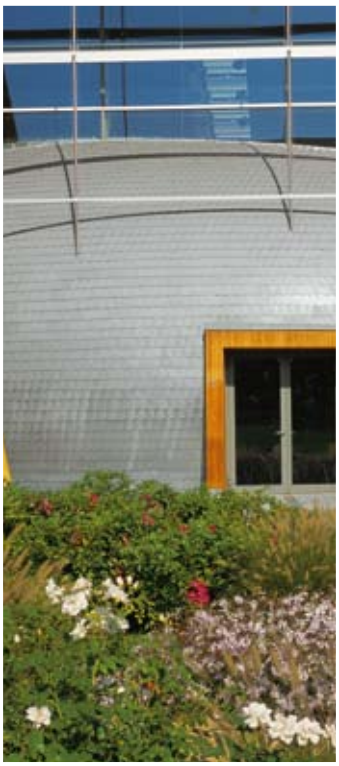
TECU® products made from copper and copper alloys are very easy to process for a wide variety of uses. They can be moulded without any great effort to give shape to individual design ideas and be adapted to the requirements of the building. Building with TECU® enables high-quality aesthetic solutions that significantly enhance the market value of a building. The excellent balance of costs over the entire life of the material comes not least from the fact that it guarantees that practically no maintenance is needed on the building. And this life is considerable. If fitted properly, TECU® products last at least as long as the building itself.

The TECU® brand:

Innovation and added value

Ideally, architecture is always directly concerned with people.

Richard Meier



TECU® – innovative construction with copper

Characteristic, vital and individual: innovative TECU® copper and copper alloy products make a sustainable mark on our environment. They enable architects and their clients to put their own new design ideas into practice as well as to restore existing buildings in appropriate ways. Pre-weathered TECU® surfaces extend the range of possible variations even further. They anticipate the highly aesthetic colouring changes typical of copper, with the products continuing to develop quite naturally after installation, and retaining without exception all the characteristics of copper.

Building with TECU® is especially innovative because no limits are set to the interplay of creativity and ecological awareness. Thus, the new TECU® products with perforated surfaces offer a wide range of new choices for extremely sustainable finishing. The partial transparency of the structure of the surfaces is achieved by punching out and stretching the material and, depending on the degree of perforation, makes it possible to work creatively with transparency and reflection. The advantages of the material, such as efficiency, long life and sustainability can be used to the full. Here, too, there is no waste. The stamped-out parts are simply put back into the recycling circuit.

Copper – basic material, economic factor and cultural vehicle

Copper and copper alloys such as bronze and brass are among the materials that have had immense significance in the historical development of humanity, and clearly continue to do so. Copper plays a decisive part in many areas of life. It protects and decorates roofs and facades of buildings both historic and modern, is in computer chips, solar collectors and hybrid engines. Thus, copper is both a vehicle of culture and a catalyst of innovation. Copper pipes and electrical components made from copper ensure hygienic drinking water supply and efficient use of energy. Copper is an important basic material, optimising the quality of life in almost every area of today's world.

TECU®: jobs and social prosperity

TECU® products and their raw materials with their long value chain make a decisive contribution to the preservation of jobs and to social prosperity. The copper industry secures trade volumes and jobs in raw material mining in the producer countries. It supports research and development to improve mining techniques and increase reserves of raw materials as well as to enable ever more efficient use of the material through innovative solutions. The processing of copper requires the skills of trained specialists just as much as constant technological improvement. KME's copper experts ensure constant high quality and marketable improvements in the manufacture and product support of the TECU® range of products.

And TECU® Project Consulting's experts are highly experienced in the construction industry and provide consultancy services to planners and architects in the selection and application of the products or in developing individual solutions. To install the products into buildings, specially-trained professionals are needed, who have the opportunity to attend KME seminars to develop their professional skills further. At the end and the new beginning of this long value chain are the recycling plants, whose skills and technical possibilities will become even more important in the future, both economically and ecologically.

TECU® – Natural products with an environmental edge

Copper concentrations in food according to Schlettwin-Dsell in mg/kg

Flour 0,4 – 8,0
Whole meal bread 0,6 – 14,5
Cocoa 19,4 – 50,0
Potatoes 1,1 – 1,5
Spinach 0,35 – 18,7
Fruit 0,04 – 4,4
Meat 0,1 – 6,8
Poultry 0,1 – 5,0
Fish 0,1 – 3,4
Eggs 0,3 – 2,3

Essential natural product

Being a natural product, copper goes through a cycle of use practically without any loss and without environmentally damaging waste products. This precious metal is practically indispensable, not only for the functioning of a great many products that surround us in our daily lives, but also, and especially, for our health. Copper is an essential trace element that is vital for our physical and mental well-being. Plants and animals, too, need copper for healthy growth.

Voluntary Copper Risk Assessment

The environmental burden from the copper industry and its products is reduced to a minimum. As early as 2000, the European copper industry initiated a voluntary Copper Risk Assessment. The findings of this far-reaching study, which have been confirmed by the Scientific Committee of the European Commission, were published in 2008. They allow conclusions to be drawn about the environmental burden caused by the manufacture, use and disposal of copper products. It has been shown that not only are the applicable statutory requirements being met, but that the requirements are in many cases significantly exceeded and that environment, people and workers in the industry are not exposed to any harmful substances.

KME: Best practice in production and recycling

KME works constantly on improving production and recycling processes for TECU® products. Comprehensive quality management ensures the highest possible level of control from the delivery of cathode copper and material for recycling right through to the dispatch of finished boards and bands. Scrap is analysed for the level of contamination, and then strictly sorted according to its composition and copper content, and sent for individual recovery processing.
A modern hi-tech smelting furnace is used for refining, that offers significant advantages in efficiency and environmental protection over the rotary drum furnaces that have been used until now in the copper industry. Laborious purification processes in the recycling of material become largely unnecessary, since dirt adhering to it can simply be burnt away in the furnace. Exhaust air is collected in an optimal way and cleaned cheaply and without after-burning in a dust-removal unit. Energy use, too, is significantly more efficient than rotary drum furnaces that are open on both sides; compared with the process in use until now, the new system incorporates energy saving of around 20 percent. Not least, CO_2 emissions are significantly reduced by the new type of furnace.

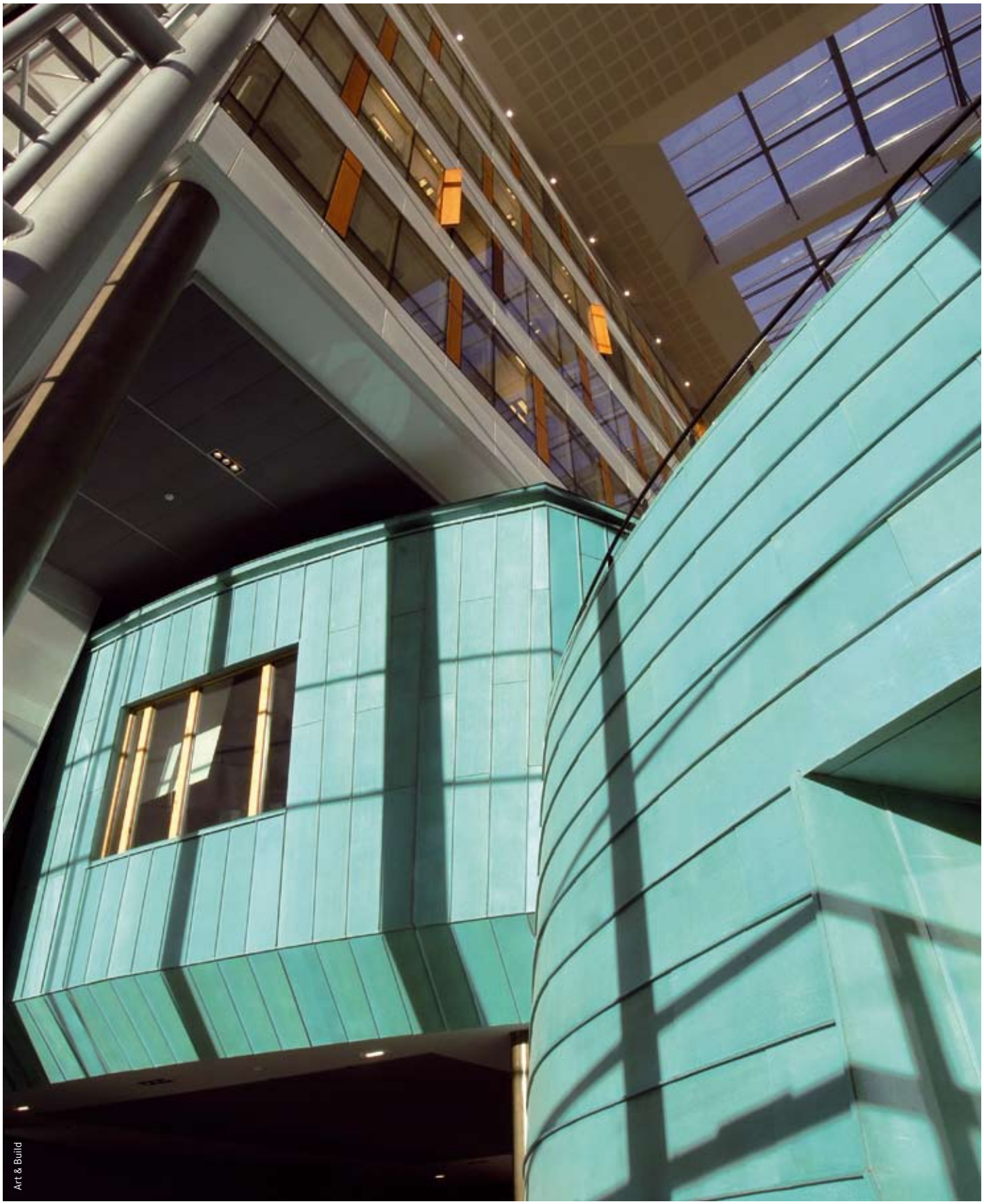
TECU® products: environmentally friendly and exemplary

Institut Bauen und Umwelt e.V.

Conservation of resources, low threshold values for emissions during manufacture and ecological harmlessness during the entire product life and beyond – these have become ever more important criteria in the choice of building materials. TECU® products for facades, roof cladding and roof drainage are absolutely ecologically harmless and environmentally friendly in their entire manufacturing and use cycle. And this has now been certified. Under an accredited environmental product declaration under ISO 14025, the copper products TECU® Classic, TECU® Oxid and TECU® Patina and the alloy surfaces TECU® Gold and TECU® Bronze carry the seal of the IBU – Institut Bauen und Umwelt e.V. The production parameters taken into account for this accreditation include the use of primary energy, greenhouse gas and ozone-depletion potential, as well as wash-off rates caused by rainwater during the normal life of the product.

First-rated:

Sustainable building with TECU®



Council of Europe Strasbourg, Administration Building
Architects: Art & Build, Brussels

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The new administrative building for the European Council in Brussels, completed in 2008, was awarded for its uncompromisingly sustainable building concept. Like any other building material used, TECU® Patina brand pre-patinated copper was chosen on the basis of all aspects of sustainability in terms of manufacture, delivery, processing, further development and ageing. In addition, all technical, ecological and economic decisions made during the planning and construction phases and also during the building's entire operational life were examined in detail in regard to sustainability. This method of working by Art & Build was especially acknowledged in June 2008. For the new general office building of the Council of Europe, the architects received the BEX Award 2008 in the sustainable building category. Each year, innovative projects in the field of architecture are distinguished with the awards from the BEX-Building Exchange international conference.

Isidore Zielonka and Steven Beckers, managing architects of Art & Build in Brussels and responsible for planning and realisation of the new administration building, made some remarks concerning their views on copper, building materials and sustainable planning.

Isidore Zielonka
about sustainable building and the human factor:

"Ecological building is also our topic, in every respect. But despite the high importance of ecological criteria, we must not forget the human factor, which for me is the most important element of all. The idea of sustainability should be based on this in the first place. For me, the highest compliment for my work is when somebody turns up and says: I feel very comfortable in this building. I love to be here and to work here.

Of course we keep our critical view on every building material, also on modern and future developments. Today every material has to face critical investigation regarding sustainability over and over again, and this applies just as much to copper in every respect. The responsibility of manufacturers in using this material is especially high. Because copper is a beautiful, unique and very precious material that surely will be as important for future generations as it is for us today."

Steven Beckers
about modern planning and critical choice of building materials:

"When planning the Council of Europe building we were lucky that we could stay very close to the original competition design, also in terms of material choice. Pre-patinated copper was part of that design from the very early phases. We used this material for interior parts and outside as well. The surfaces still have the same appearance today, outside and inside. This is very unique with patinated copper; there is hardly any other material offering that long-term quality in appearance for both applications.

Regarding sustainable building: During my studies, I was totally involved with ecological topics in architecture. They became more and more interesting and important then, but at the same time they were still quite distinct. Meanwhile the whole situation has become very complex. Today in every field of applications you can find materials suddenly in question that nobody worried about using yesterday. This is a very confusing and challenging situation, and our generation is the first to face it. At Art & Build we investigate building materials as far as possible, of course. But our eco team has only limited capacities in this complex field. Therefore, we have to remind manufacturers of their responsibility over and over again. They have to keep in mind the consequences of material use in any application, especially regarding high amounts of use. Because at the end of the day, it is always a question of resources."

KME Group S.p.A.
Via dei Barucci 2
50127 FIRENZE
ITALY
www.kme.com

KME Germany AG & Co. KG
Postfach 33 20
49023 OSNABRÜCK
Klosterstraße 29
49074 OSNABRÜCK
GERMANY
Fon +49 (0) 541 321-2000
Fax +49 (0) 541 321-2111
www.kme.com
info-tecu@kme.com

KME Italy S.p.A.
Via Corradino d'Ascanio, 4
20142 MILANO
ITALY
Fon +39 02 89388-206/-244/-452
Fax +39 02 89388-478
www.kme.com
info-tecu-italy@kme.com

KME France S.A.S.
11 bis, rue de l'Hôtel de Ville
92411 COURBEVOIE CEDEX
FRANCE
Fon +33 (0) 1 47896-849
Fax +33 (0) 1 47896-932
www.kme.com

KME Spain S.A.
Ctra. de Sabadell B -140, km5
Sta. Perpètua de Mogoda
08130 BARCELONA
SPAIN
Fon +34 93 5747090
Fax +34 93 5747091
www.kme.com
info-iberica@kme.com

KME Yorkshire Limited
Severn House, Prescott Drive
Warndon Business Park
WORCESTER
WR4 9NE
UNITED KINGDOM
Fon +44 (0) 1905 751800
Fax +44 (0) 1905 751801
www.kme.com
info-yct@kme.com

KME Architectural Metals GmbH & Co. KG
Eichendorffweg 10
48268 GREVEN
GERMANY
Fon +49 (0) 2575 309-0
Fax +49 (0) 2575 309-25
www.kme.com
info-metalle@kme.com

KME America Inc.
1000 Jorie Boulevard, Suite 111
OAK BROOK, Illinois 60523
USA
Fon +1 (0) 630 990-2025
Fax +1 (0) 630 990-0258
www.kme.com
info-america@kme.com

KME Asia Pte. Ltd.
51 Geylang Lorong 17
#06-01
Superior Industrial Building
SINGAPORE 388571
SINGAPORE
Fon +65 6337-8671
Fax +65 6337-8571
www.kme.com
info-asia@kme.com

KME Austria Vertriebsgesellschaft m.b.H.
Slamastraße 48
Postfach 128
1232 WIEN
AUSTRIA
Fon +43 (0) 1 6167986-0
Fax +43 (0) 1 6167986-36
www.kme.com
info-at@kme.com

NV KME Benelux SA
Leuvenbaan 3
1820 STEENOKKERZEEL
BELGIUM
Fon +32 (0) 2 720-1889
Fax +32 (0) 2 720-8780
www.kme.com
info-benelux@kme.com

Netherlands:
J.E. van Nieuwkoop
P/a Postbus 146
3300 AC DORDRECHT
NETHERLANDS
Fon +31 (0) 78 6212991
Fax +31 (0) 78 6212048
www.kme.com
info-nl@kme.com

KME Czech Republic s.r.o.
nám. Sítná 31 05
27201 KLADNO
CZECH REPUBLIC
Fon +42 (0) 312 608250
Fax +42 (0) 312 608251
www.kme.com
info-cz@kme.com

KME Danmark A/S
Næsbyvej 26
5000 ODENSE C
DENMARK
Fon +45 65 916410
Fax +45 65 916411
www.kme.com
info-dk@kme.com

Sweden:
KME Danmark A/S, Sweden
Box 118
64723 MARIEFRED
SWEDEN
Fon +46 15 910612
Fax +46 15 910613
www.kme.com
info-s@kme.com

KME Hungaria Színesfém Kft.
Andor u. 47-49
VI. em. 616-618
1119 BUDAPEST
HUNGARY
Fon +36 (0) 1 2059775
Fax +36 (0) 1 2059776
www.kme.com
info-hu@kme.com

KME Polska Sp. z o.o.
ul. Wszystkich Swietych 11
32-650 KETY
POLAND
Fon +48 (0) 33 841 09 95
Fax +48 (0) 33 845 19 54
www.kme.com
info-polska@kme.com

KME (Suisse) SA
Binzallee 22
8055 ZURICH
SWITZERLAND
Fon +41 (0) 43 3882000
Fax +41 (0) 43 3882001
www.kme.com
info-ch@kme.com

Case postale 111
Av. de Châteleine 91a
1219 CHÂTELEINE-GENÈVE
SWITZERLAND
Fon +41 (0) 22 9790660
Fax +41 (0) 22 7966610
www.kme.com
info-ch@kme.com

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