# UPCAST REVIEW2020

*UPCAST OY is the leading supplier of upward continuous casting technology for a wide range of non-ferrous applications.*

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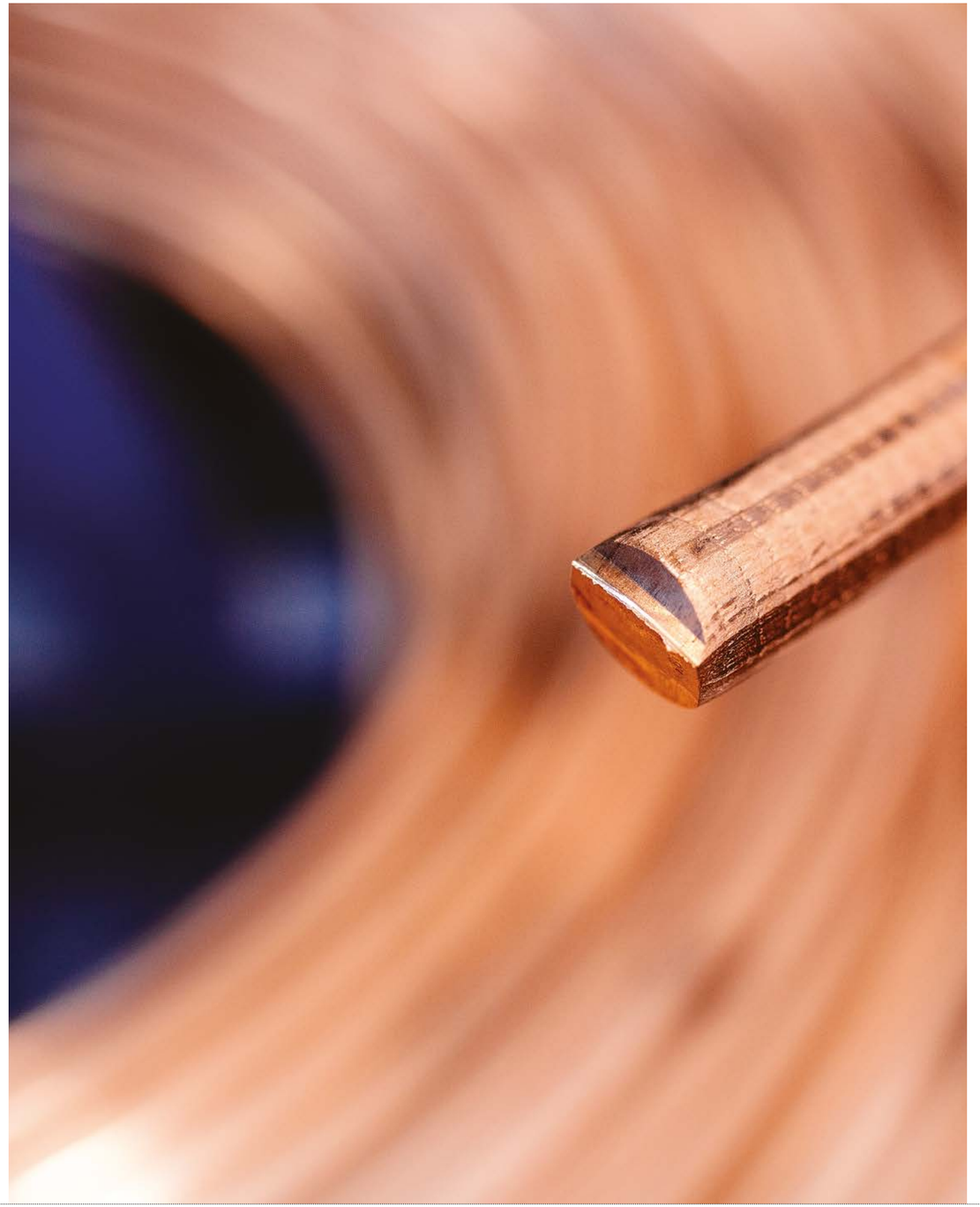



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# Looking over the horizon

We have just stepped in to the 2020´s and live in a world in which there are big things going on and which all impact our lives one way or another, and not necessarily always in a positive way. We see political and military crisis, trade wars seem to have once again – after a longer period of time – become a normal practice in international trade and the EU is waiting to see what Brexit will bring along.

However, what has globally drawn the biggest attention and created the broadest discussions is climate warming. There is so much information, estimations and calculations about the topic, that it is impossible for anyone to absorb it all, and perhaps the most difficult task is to separate the correct information from the mass.

**UPCAST® upward casting process is classified as BAT technology in its field.**

The accelerated melting of the polar ice field and the ascent of the measured average temperatures, however, show that something is happening. Whether human actions are, wholly or partially, causing this is not known for sure, but there are many targets that have been set and plans done by several governments and other parties.

One action item high on the agenda list is the striving for carbon-neutrality within a certain time period. In order to execute this, we must, radically and quickly, reduce the use of fossil fuels in energy production and transportation, as well as in industry. Some estimations even state that reversing the climate warming would require giving up fossil fuels within a couple of decades.

To prevent climate change, every person must weigh up matters and make choices in his/her life, either voluntarily or according to laws and regulations. How do I heat or cool my home, what kind of vehicles do I use for transportations, should I change my consumption habits and how, etc. The same exact choices, just in a larger scale, need to be made in our own industry.

The necessary changes in energy production and transportation mean an enormous increment in electricity production and transfer and in its use. Techniques exist already and new ones are being developed all the time and what – almost without an exception – is common to all of these is the role of copper as the raw material.

The refinement chain of copper – from the mine to the finished product – is a multi-phase passage that includes several processes, in which all the environmental requirements have to be taken into account. UPCAST® upward casting process is classified as BAT (Best Available Techniques, Reference Document for the Non-Ferrous Metals Industries 2017) technology in its field. Despite already holding this status, we at UPCAST are continuously looking for new process improvements that pay attention to the environmental aspects. This way we will, together with our customers, have an impact in controlling climate change.

Let us cast our minds back 50 years. I do not know what one of the pioneers of upward casting technology was thinking (hardly not climate change) when he wrote in an internal Outokumpu report:

– *What to do with upward casting?* This method has so much potential that it deserves its own inhouse development. It should no longer be just a hobby of the Foundry Manager, but should be treated as a valuable technological innovation that requires active development.

How right he was! ●

**Jukka Lähteenmäki**
Managing Director
jukka.lahteenmaki@upcast.com

# The coming decades of copper

Due to its unique conductivity, durability and recyclability copper will play a significant role in the coming decades, writes **Pia Voutilainen**, Director at Scandinavian Copper Development Association.





**We have been working on UPCAST® UPtime maintenance software for about a year, which time will certainly reward the development team as well as UPCAST customers.**

– UPCAST® UPtime, page 14 –

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 | **TEXT:** PIA VOUTILAINEN | **PHOTOS:** OLLI URPELA, UPCAST, UNSPLASH

# THE COMING DECADES OF COPPER

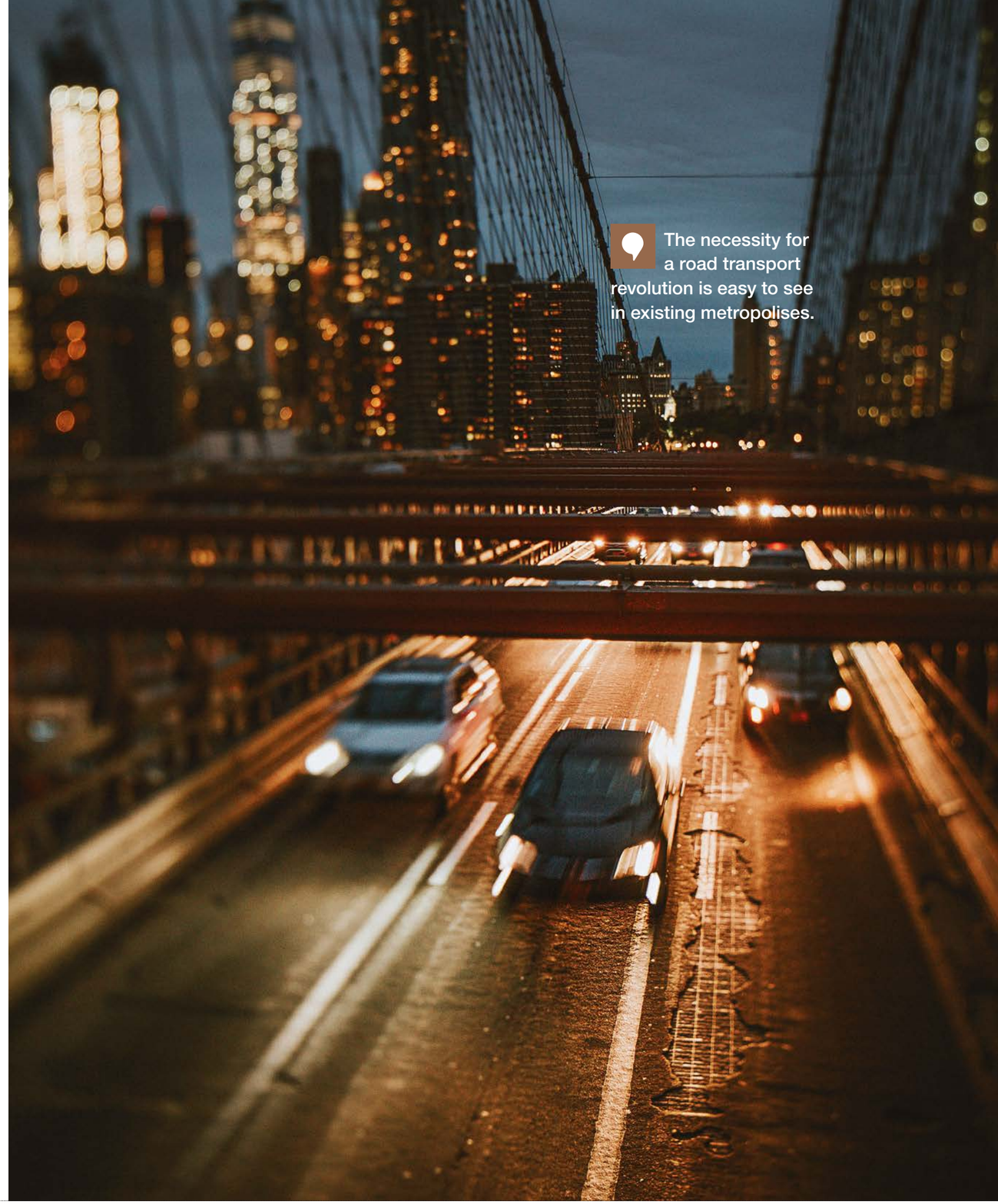
The coming decades will bring along technology leaps and major changes to many energy related technologies. The world will see a shift of paradigm, and we will be surprised about the range, variety, scale and speed of the changes. In these changes, copper will play a significant role, due to its unique conductivity, durability and recyclability, writes **Pia Voutilainen**, Director at Scandinavian Copper Development Association.

Upcoming changes include a transition to a variety of new energy producing and storing technologies, the development of advanced, energy efficient heating and cooling technologies, recovering and making increasingly good use of waste heat and heat losses, all accompanied by smarter systems to enable the most efficient production, storing, distribution and use of energy.

At the same time, it is necessary to keep in mind how a large share of the global population live out of reach of electricity, running water, sewage systems and heating and cooling. Inevitably all necessities and conveniences that the developed world is already enjoying shall be extended to less developed parts of the world. To prevent or at least mitigate an explosive increase of emissions from material and energy production, mankind has to make sure that new investments are based purely on sustainable technologies. This may not even be enough; carbon dioxide will need to be utilized for something useful, instead of heating the atmosphere, like synthesizing new minerals, growing food, algaes for energy production or forestation.

## Revolution in transport is needed

Energy transition includes the development of road and land transports, which many experts say is the easiest item to tackle and is doable in two decades. Also, in transports, and even maybe most likely there, the technological leap will astonish us. The necessity for a road transport revolution is easy to see in existing metropolises. The trend is towards urbanization all over the world, and congestion on roads will be solved with new smart thinking over the whole concept of mobility. Wasting precious time from a working day in an inefficient and polluting means of transport shall be solved within a timespan that would be hard to believe. Owning a car may well be only useful in very rural distant places, and personal mobility may be developed on a service basis and self-driving vehicles in cities. Generations younger than 30 years already think very



The necessity for a road transport revolution is easy to see in existing metropolises.


differently than previous generations about leasing, renting, sharing and borrowing goods. Ownership is no longer something to strive for. This is just one example of a revolutionary shift of paradigm, which will cause a big change in the everyday life of people.

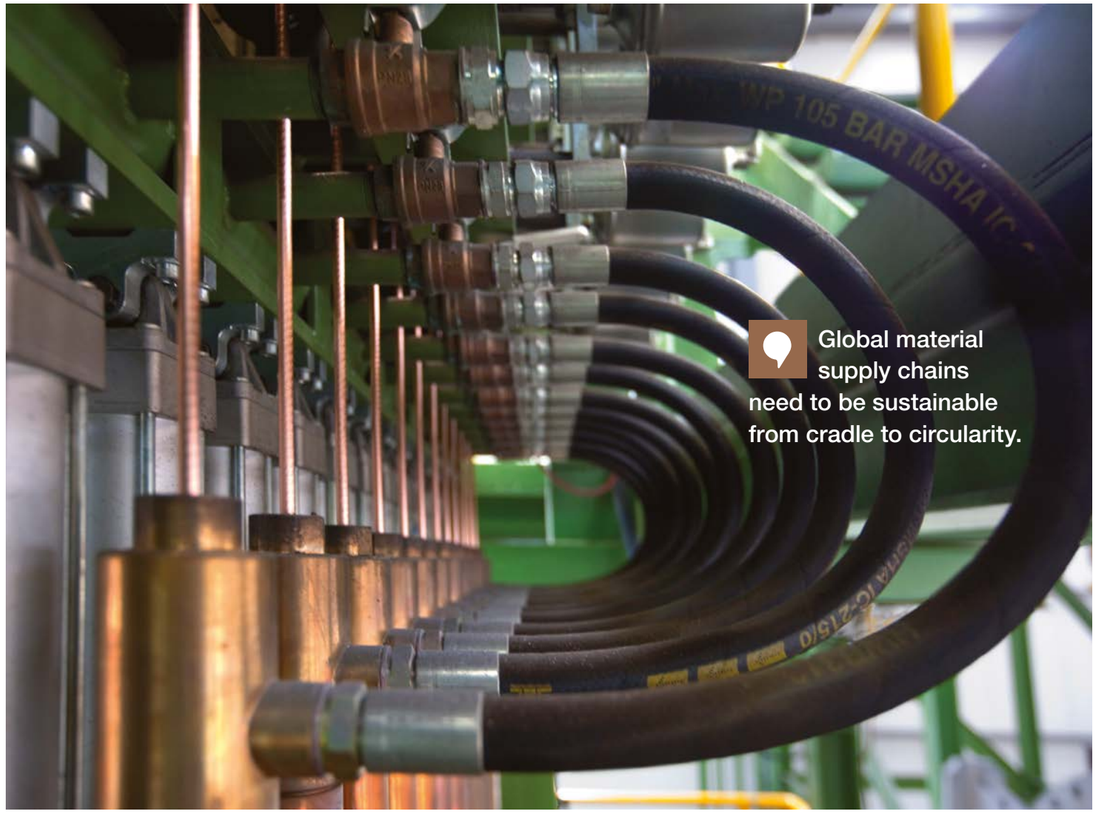
We will see an increased demand for copper and added innovativeness in copper uses.

A lot has to change, much needs to be done. Global warming has not yet shown any sign of shifting towards a decreasing trend. Too many investments are still being made in the energy sector to conventional technologies and energy forms. Renewable energy producing technologies, energy efficiency improving technologies, non-climate-heating heating and cooling technologies, smart systems in hardware and software, and smart transportation, all have copper as a key material due to its characteristics that enable sustainability. We will see an increased demand for copper and added innovativeness in copper uses.

Global growth will not stop. The world will become smaller and smaller for more people. The wealth and health of the global population has improved, along with education reaching more and more people. There is and will be plenty of capacity and willingness in the world to make the necessary changes come true. Politically, much more unity is needed in understanding how globalization works in a way that is constructive and not destructive.

## Copper plays an important role

Global material supply chains need to be sustainable from cradle to circularity. Copper also has a brilliant record in this aspect. Smelting copper minerals to metal is done by utilizing their embodied energy content from oxidizing iron and sulphides, producing sulphuric acid and many valuable by-product metals. Produced heat energy is always recovered as steam and used to electricity production, and condensate is used for heating utilities inside and where applicable, also dwellings outside production facilities. Valuable minor elements, such as precious metals, PGMs and rare earths, originating from ores or recycled feed are recovered by refining by-products. Intensive research is ongoing to further improve yields of rare elements.




Global material supply chains need to be sustainable from cradle to circularity.

Copper is also recycled well back into new products after its use. Its lifetime is hardly ever terminated by reasons due to the copper itself, but almost always due to an end of the technical lifetime of the appliances in which it is used. New recycling methods are developed to be able to handle the ever growing complexity of material mixes in advanced applications. We need to pay attention to design for circularity and develop recycling methods for products at the same time as new products are designed. All new innovations need to contribute to sustainability and sustainability needs to follow the whole value chain, including an assessment of necessity, footprint and lifetime aspects all the way through the product design span. There will be a scarcity of some elements needed in advanced innovations, and before this occurs, new recycling technologies have to be in place. Improving logistics for collecting post consumer scrap require attention and investments to avoid losses to waste dumps.

Millennials will be in charge to innovate and implement the major technological leaps.

## Strive for a sustainable future

Millennials and today's teenagers will be in charge in the coming decades to innovate and implement these major technological leaps. Wisdom and broadmindedness are required to manage everything in a sensible manner and avoid disruption. I believe that many of you readers of this magazine belong to the same generation with me. Our task is to make the society open and positive to upcoming big changes. Global political consensus has to be achieved. We shall give courage and confidence to younger generations to look into the future as a feast of opportunities and possibilities. We should avoid emphasizing and concentrating on threats and bad prophecies.

Dear UPCAST Users, you can be proud of your selection of the most sustainable casting technology and contributing to the combat against climate change as an important player in the supply chain of one of the most sustainable materials in a key role enabling the technological breakthroughs. ●

**TEXT:** TOTTI TOISKALLIO | **PHOTOS:** METALL-EXPRES, MAARIT HÄMÄLÄINEN/UPCAST


# Dynamic growth through timely investments

Four years ago, the Polish materials supplier **Metall-Expres** commenced an investment program with the aim of broadening its scope from distribution to production. The opening of a new plant in 2018 was followed by a decision to procure an UPCAST® line for the continuous casting of oxygen-free copper rods. One of the key criteria for the procurement was the ability to reuse copper scrap from the production process.

> We believe that the demand of non-ferrous conductive products, especially those made of oxygen-free copper, will increase in the near future.

Poland has for a long time been regarded as one of the top 'copper countries' in the world – in 2015, it was ranked fifth among the countries holding the largest anticipated economic resources of copper. With decades of deep-rooted history in the mining business, the country has made use of its resources and has become the major minerals producer in Central Europe, overmatching almost all the other European countries.

It was not, however, the Polish resources or traditions that made Metall-Expres a well-established expert in its field of operations: since its founding in 2003, Metall-Expres has grown from a four-person company to employing 120 people, thanks to dynamic decisions and timely investments.

> Metall-Expres provides its customers with a wide range of products made from copper, aluminum, brass and stainless steel.

– Merely a year after the founding of Metall-Expres, Poland joined the European Union and new markets opened up in front of us. Now, after 17 years of operation, we are still growing dynamically and for the past four years, we've been shaping our business to achieve even new market areas, says **Mr. Robert Żak**, Deputy Director of Metall-Expres.

## Self-contained supplier

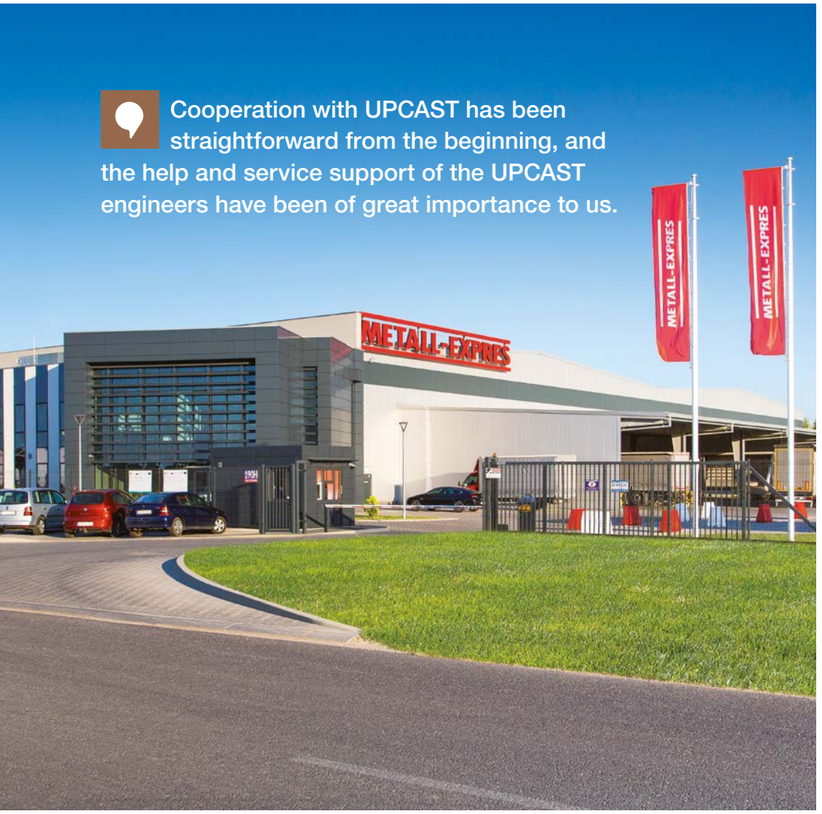
Metall-Expres provides its customers with a wide range of products made from copper, aluminum, brass and stainless steel. The company's offering covers virtually everything from flat bars and rods to profiles, wires, tubes, sheets and strips – sold either as standard or customized products to meet the customers' exact needs.

Until recently, Metall-Expres acted solely as a distributor, but in 2018 the company took a giant leap forward, as it opened a new plant in Zaczernie in southeastern Poland and started its own production.

– We believe that the demand for non-ferrous conductive products, especially those made of oxygen-free copper, will increase in the near future. By starting our own production of wires, profiles and rods, we will be able to answer those needs with high quality products, says Żak.

When asked about the driving forces behind the expected growth, Mr. Żak names one above the others: energy. As the ways of energy production evolve, the need to minimize losses during energy transmissions will become even more crucial. That's why oxygen-free copper, known for its high electrical conductivity, plays an essential part in the future of energy distribution – and the future Metall-Expres as well.

– The commencing of our own production of oxygen-free copper profiles and rods has allowed us to expand our geographical focus. We are now also able to provide our products to customers outside Europe.




> Cooperation with UPCAST has been straightforward from the beginning, and the help and service support of the UPCAST engineers have been of great importance to us.


**Continuous casting**

Although there are a large number of copper mines and, thus, sources of virgin copper in Poland, the ability to reuse copper scrap was one of the key criteria when Metall-Expres began to look for possible suppliers of a new casting line. Now, the new plant in Zaczernie accommodates an UPCAST® production line with an additional melting furnace for post-production copper scrap.

– The non-scrap process can be run at the same time as the additional furnace melts down scrap copper. This way, the reuse of scrap copper will not result in any additional downtime. Being able to run the line continuously is crucially important from an economic point of view, says Żak.

The maximal utilization of their new UPCAST® line ensures that Metall-Expres can produce sufficient quantities of oxygen-free copper rod with a diameter between 8 and 25 millimeters. But quantity alone won't be enough: the rod must also be of the highest quality. That's why Metall-Expres has its own laboratory, equipped with the latest equipment, where they measure the oxygen levels, chemical contents and mechanical properties of their products before they are delivered to customers.

> We are now able to provide our products also to customers outside Europe.

– We want our customers to get the best possible products for their needs. That's why we only use raw materials that fulfill the highest quality standards. Of course, we apply the same quality standards to our own processes and demand the best from our suppliers. With our new UPCAST® line, we can achieve the quality standards we push for.

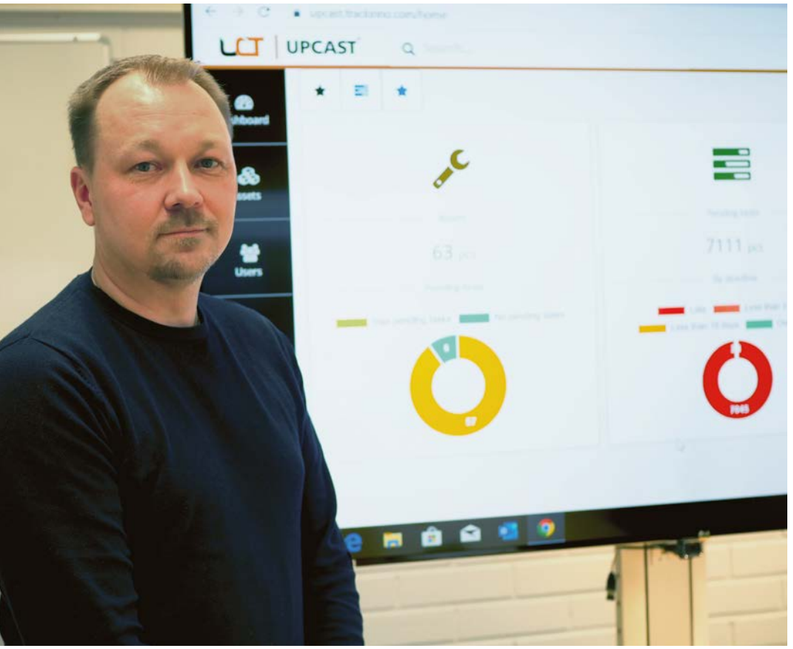
While the new UPCAST® line at Zaczernie is just at the beginning of its lifecycle, Robert Żak trusts that it will serve just as expected for years to come.

– Cooperation with UPCAST has been straightforward from the beginning, and the help and service support of the UPCAST engineers has been of great importance to us. We can always rely on their technical support, says Żak. ●

**Tuomas Rajaviita,**
**Sales Manager at UPCAST**

– From the first meeting, it was clear that Metall-Expres was familiar with the copper business. They had a clear vision on how to make the most of the casting line. They have good quality copper scrap available and instead of selling the scrap it is a good idea to charge the clean scrap to UPCAST® process and produce oxygen-free copper rod.

 **TEXT:** MIIKKA RUSI | **PHOTOS:** MAARIT HÄMÄLÄINEN/UPCAST




# One Stop for All Maintenance

The new **UPCAST® UPtime** maintenance software brings clarity for the maintaining of casting lines and transfers excel tables into history.

You can hear a peaceful satisfaction from the voice of **Janne Hosio**, sales manager at UPCAST.
The reason behind his smile is the new maintenance software, UPCAST® UPtime, which will take the easiness of use, as well as the reliability of upward casting lines, a few steps forward.
– Until now all data about maintenance had to be looked up in manuals. Now you just open one application and find a list showing all the required measures in chronological order, he says.

The idea for the new application developed by UPCAST, together with the program design company Trackinno in Tampere, is that it is as simple as possible for the line operators to adapt and use. One can sign off the prescheduled tasks in any desired order. In addition to this, the user can pull out the drawings, manuals or instructions for the required tools in order to carry out a specific maintenance operation.
– Our target was to develop a program, which is at the same time both simple and multipurpose, Hosio describes.

If necessary, the program allows for comments or attachments, which will be forwarded to the superior. The application follows you easily on your mobile at work.
– The work can be done even by having the tablet with you with the instructions showing while carrying out the task. Or the malfunction notice can be sent right there and then.

### Good maintenance indicates high quality

For superiors, there is also a desk version of the UPCAST® UPtime sw available, which is a little more versatile than the mobile application of the operators. It collects the maintenance history of the line and thus eases the quality control.
– In the program one can, for example, add repetitive measurements in certain cycles. This makes it possible to keep even better track of any measurable variables and values, which helps to evaluate the conditions of these equipment, Hosio explains.

> Our target was to develop a program, which is at the same time both simple and multipurpose.

The program is compatible with all the new UPCAST® lines and with almost all the old ones, too. We have been working on it for about a year, which time will certainly reward the development team as well as UPCAST customers, Hosio believes.
– It has always been important for us at UPCAST to take care of our customers after the commissioning of the casting line. This again is one product adding the value for the customer. ●

*It has always been important for us at UPCAST to take care of our customers after the commissioning of the casting line.*

trackinno

# TRACKINNO WANTS TO DEVELOP USER-FRIENDLY APPS

UPCAST has partnered with the startup company Trackinno from Tampere, Finland, in its maintenance software development operations. The five-year-old company has grown steadily and is now looking to access the international market.

Trackinno Oy's story began in 2014 at the Tampere University of Technology, where the prototype of the current Trackinno platform was developed by a group of students as a course project. It was soon discovered, however, that the asset management application developed by them had the potential to be applied more extensively.

The application was thus developed further, and a company dedicated to it was established the following spring. According to Trackinno's CEO **Timo Ruostila**, the focus of the development work has been on the ease of use.
– Our basic principle is that using the system must be easier than previously used recording methods. A lot of companies still use a pen and paper or Excel to make their records, he says.

Ruostila is excited about the collaboration with UPCAST. Maintenance software development is a slightly different context for the Trackinno platform, which is why it is so interesting and special for the people performing this work.

> Our basic principle is that using the system must be easier than previously used recording methods.

– Our collaboration with UPCAST has been very straightforward, and it has been delightful to work with them, says Ruostila.

Trackinno is now expanding its operations to the international market. The company currently employs six people, and it is looking to recruit more people and increase its sales in Central Europe in 2020. ●

**TEXT:** JUAN CARLOS BODINGTON | **PHOTOS:** UPCAST

# Casting high-conductivity oxygen-free copper rod from scrap: **myths and reality**

To preserve the properties of high conductivity oxygen free-copper rod, the most ductile of all copper grades, special care must be taken when it is produced either entirely from scrap or from a cathode/scrap combination. This presentation describes the effect of some melt pollutants on conductivity and drawability.

UPCAST® by its own right is not a refining process. In standard cases, the only element that is removed from the melt is oxygen. By some physical and chemical means, and if the system is purposely designed so, some other impurities may be eliminated by oxidation or the addition of additives promoting slag formation, or even mechanically (i.e. hydrogen). However, as oxygen free high conductivity (OFHC) copper rod (UNS C10100 and C10200) becomes the raw material of choice in ever more demanding applications such as high speed multiwire fine and superfine drawing, ultrafine magnet wire production, among others, the need to produce rod with a consistent excelsior quality crashes with the possibility of using lower quality scrap as raw material.

**This article describes the effect of some melt pollutants on conductivity and drawability.**

As presented in the title, the focus in this paper is on the most demanding application in terms of scrap use as raw material: high conductivity oxygen-free copper rod (Cu-OFHC). Nevertheless, lesser quality scrap may be "upcast" into products which chemistry and electrical properties are less constraining, as for instance the big family of binary and tertiary brasses, among other products.

Some casting equipment manufacturers offer magic solutions that allow the use of low quality scrap for manufacturing OFHC copper, but regretfully alchemy is not chemistry, and magic and science are not best friends. In standard UPCAST® lines producing Cu-HCOF, in-plant scrap is normally fed back into the operation at a rate that is typically not bigger than 10%, while the balance of the feeding material is made up of copper cathodes. However, running on a higher scrap-to-cathode ratio or even 100% scrap, represents a different working condition bringing in a different set of variables.

***Environment.*** This is the first point. Depending on scrap grade the content of organic substances, among other pollutants, may be significant. For instance, the weight percentage of enamel in magnet wire may range from less than 0.5% for bigger sizes to around 3% in submm sizes. Burning those organics, either before or during the melting stage, tends to generate furans and dioxins, as copper works as a catalyzer for their formation.

***Gases.*** The high solubility of oxygen and hydrogen in molten copper represents an important challenge. While O2 can be dealt with by sizing the system in order to allow enough dwell time for full deoxidation to occur, once $H_2$ reaches an oxygen deplete melt, it is very difficult and costly to remove it. Options may include mechanical means, as argon or nitrogen bubbling. In case of hydrogen, the absolutely best option is not allowing it into the melt. One of the possible effects of high Hydrogen content in the melt – microporosity – can be observed in Fig. 1. Substances that are main hydrogen contributors include moisture (water) and hydrocarbons (emulsions, oil, grease, enamel (from magnet wire)), among others.

***Cu-HCOF electrical conductivity.*** High conductivity 8 mm oxygen-free copper rod is typically cast with less than 2.5 ppm of oxygen in order to obtain the best quality results.

Reduction reaction takes place by means of carbon addition, normally in the form of charcoal and/or flake graphite. By checking on the Ellingham diagram for

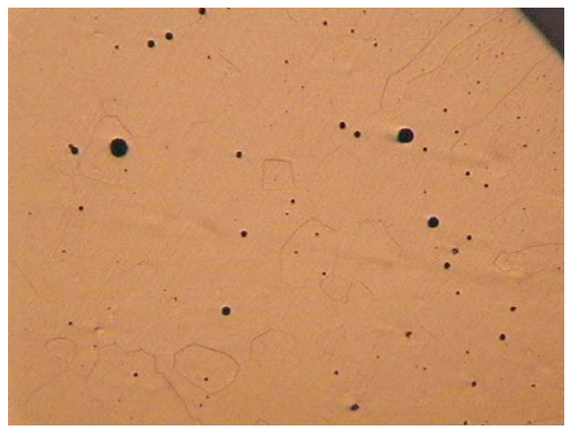


*Fig. 1. Microporosity caused by high hydrogen concentration in melt.*

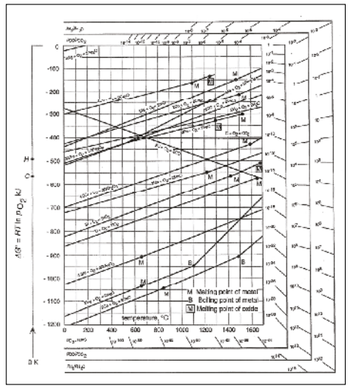


*Fig. 2. Ellingham diagram for selected oxides.*

some oxides (see Fig. 2), it can be noticed that at normal melting/casting temperatures for Cu-OF, copper will not be the only de-oxidized (reduced) metal; others, like iron, nickel or cobalt, will be reduced to their metallic form. While metal oxides migrate to the grain boundaries of the solidifying shape, non-oxidized metals do not migrate but remain inside the grains (solid solution), reducing the electrical conductivity. In that sense, in order to maximize electrical conductivity for Cu-HCOF – typically well above 101% IACS – the level of metallic impurities must be kept low. The effect of some metallic impurities on Cu-OFHC electrical conductivity can be observed in Fig. 3. It shows that iron, silicon and residual phosphorus are the most detrimental single elements for electrical conductivity, but conductivity is affected by impurities in an additive form.

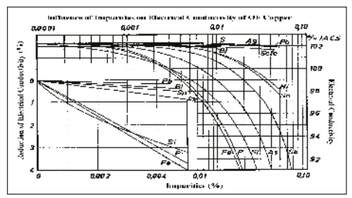


*Fig. 3. Influence of some impurities on electrical conductivity of oxygen-free copper.*

***Annealability.*** Anneability (softening temperature) can be affected by elements that rise the softening temperature of a work-hardened wire. Among those elements, the most important are: antimony, arsenic, lead, bismuth, tin, sulfur, tellurium and phosphorus. Table I shows the effect of 20 ppm of selected elements on softening temperature of Cu-HCOF after work-hardening (75% area reduction).

| Impurity – 20 pp | Softening temperature (°C) |
|---|---|
| O | 140 |
| Fe | 146 |
| Sb | 192 |
| Ag | 148 (100ppm – 207°C) |
| P | 258 (100ppm – 300°C) |
| Te | 212 |
| Se | 222 |
| Zn | 148 |
| Si | 161 |
| Pb | 250 |
| Sn | 198 (100ppm – 315°C) |
| S | 181 |

*Table 1. Effect of some impurities on Cu-HCOF softening temperature (75% area reduction).*

***Drawability.*** Bismuth, lead, selenium and telurum are low-temperature melting elements, have a small solubility in copper and form molten films or brittle phases on grain boundaries. This will lead to breaks during casting and further drawing. Bi is especially sensitive.

***Furnace charging.*** As melt cannot be exposed to atmosphere in Cu-HCOF production systems, metal to be charged needs to go through the covering layer, as mentioned earlier, typically charcoal or flake graphite. Another point is the apparent density of baled copper scrap being much smaller than that of molten copper, so the bale tends to float on the melt. Floating material or material above the carbon protection layer will tend to oxidize, bringing more oxygen into the system once molten.

## Cu-HCOF produced from 100% ETP scrap

After several trials in UPCAST® pilot plant for process fine tuning, and long hours of engineering, an UPCAST® line suitable for processing clean 100% ETP scrap (250–300 ppm O2) as in-feed material into high conductivity oxygen-free rod, came into production during the first half of 2014 with a capacity of 12,000 tons per year. Its successful operation ever since confirms the suitability of both process and equipment design for this demanding application.

## Conclusions

Quality of Oxygen Free High Conductivity Copper (C10100 and C10200) is very sensitive to impurities, particularly those affecting electrical conductivity and drawability. In order to get standard OFHC copper quality out from scrap in-feed material, only Mill Berry scrap can be used. If other kind of scrap is to be added (in small quantities), calculations must be performed in order to guarantee that the final melt chemistry is inside standards. Lower quality scrap may be used for upcasting brasses for instance.

UPCAST designed, built and successfully tested a fully automated UPCAST® system capable of producing high conductivity oxygen free copper (UNS C10200) from 100% ETP scrap copper infeed. While the system was initially designed for 12000 tons per year, it was found that it could produce an output of up to 14,000 tons per year. ETP scrap to Cu-HCOF rod transformation cost is comparable to that of producing rod from cathodes. Systems could be scaled up or down by sizing the furnaces according to the desired capacity. ●

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**Juan Carlos Bodington** is technical advisor for UPCAST OY, Pori, Finland, responsible for customer service, plant commissionings, technical support to sales, and R&D.

**TEXT:** JUUSO ENALA | **ILLUSTRATION:** TIINA VALVE/HANSDOTTER

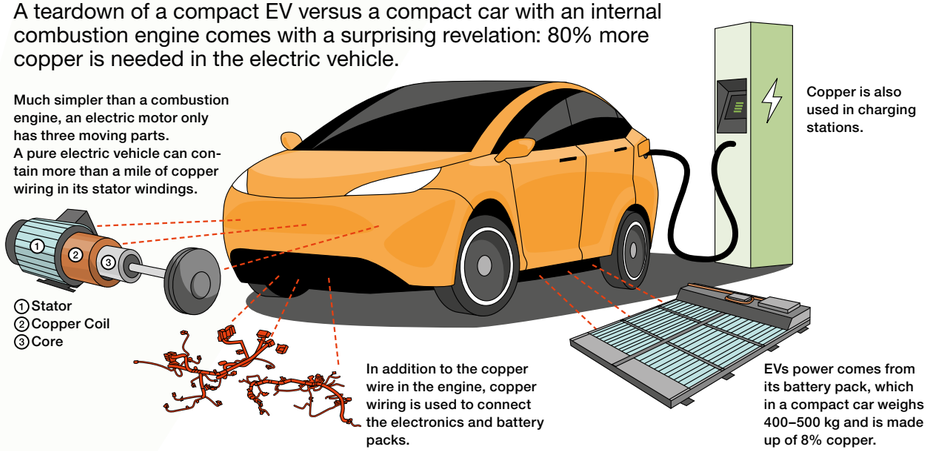
# How to build the heart and veins of electric vehicles?

The market for electric vehicles (EV) is rapidly changing as leading manufacturers debut new products, battery prices drop and government incentives continue around the world. Copper is essential to EV technology and its supporting infrastructure.

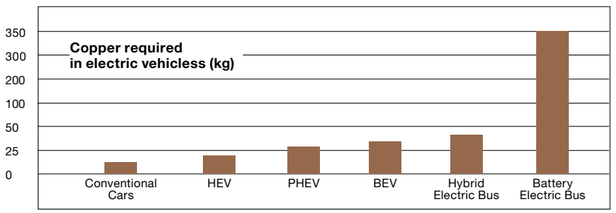
The deployment of electric cars has been growing rapidly over the past ten years, with the global stock of electric passenger cars passing 5 million in 2018, an increase of 63% from the previous year. Around 45% of electric cars on the road in 2018 were in China – a total of 2.3 million. In comparison, Europe accounted for 24% of the global fleet, and the United States 22% (Global EV Outlook 2019). The number of charging points worldwide was estimated to be approximately 5.2 million at the end of 2018, up 44% from the year before.

Copper is essential to electric vehicle technology. The increase in the electric vehicles market will have a significant impact on copper. Copper is a major component in EVs used in electric motors, batteries, inverters, wiring and in charging stations. The demand for copper, due to electric vehicles, is expected to increase by 1 700 kilotons by 2027. As the world continues to move toward a sustainable and energy efficient future, copper has a major role to play. Beside vehicles, the metal is used to increase the efficiency of numerous electric technologies from motors and transformers to solar and wind energy systems. ●

A teardown of a compact EV versus a compact car with an internal combustion engine comes with a surprising revelation: 80% more copper is needed in the electric vehicle.




While conventional cars have 25 kilograms of copper, hybrid electric vehicles (HEV) contain approximately 40 kilograms, plug-in hybrid electric vehicles (PHEV) use 60 kilograms, battery electric vehicles (BEVs) contain 85 kilograms, a hybrid electric bus contains 90 kilograms, and a battery electric bus contains 350 kilograms, most of which is used in the battery and wiring in stator windings.



**TEXT:** SARI LOMMERSE | **PHOTOS:** YKK CORPORATION OF AMERICA

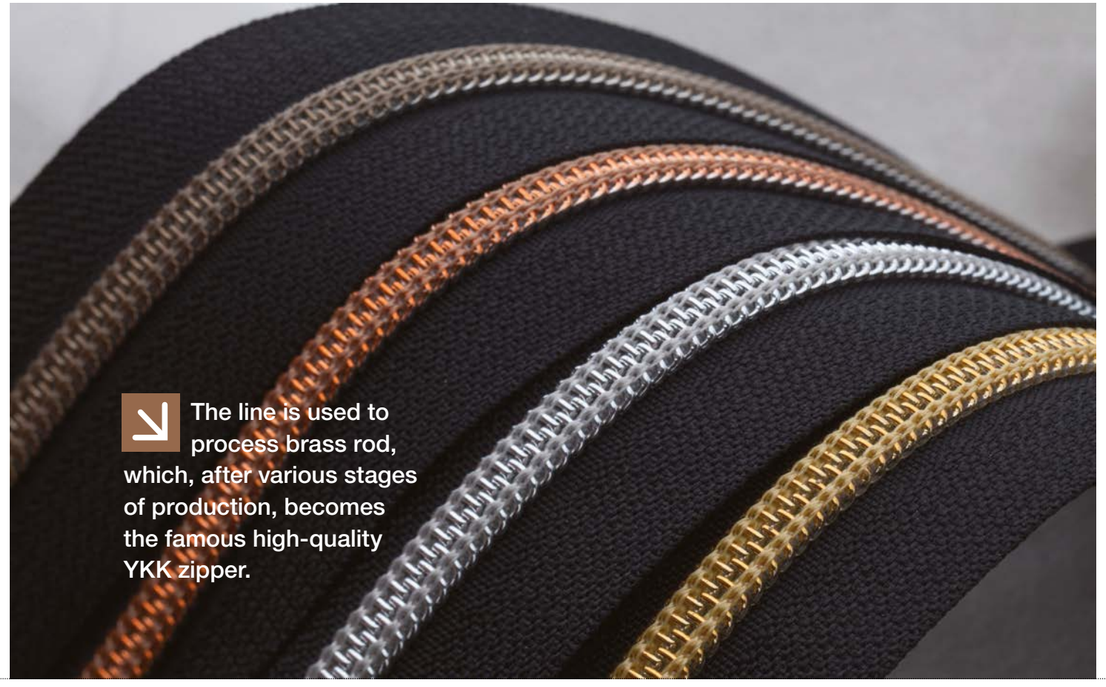
# A durable fastener

Copper and Cu alloys can be used in a variety of ways, one of which is making zippers, which are universal and prevalent in our daily lives.

**YKK Fastening Products Group** is one of the best-known zipper manufacturers in the world. YKK began using an UPCAST® upward casting line already in 1996. The line is operational around the clock, and it is used to process brass rod, which, after various stages of production, becomes the famous high-quality YKK zipper. YKK zippers are used, for example, in pants, dresses, sweaters, shirts, jackets and handbags all over the world.

Since the company's founding in Tokyo in 1934, YKK has continuously set industry standards for quality, service, value, and innovation in the production of zippers, plastic hardware, hook and loop fasteners, webbing tapes, and snap and buttons.

With integrated production and supply systems in 72 countries and regions around the world, YKK is positioned to meet the needs of the textile and sewing product industries as they increasingly diversify and require shorter product cycles. Guided by the CYCLE OF GOODNESS® philosophy – no one prospers without rendering benefit to others – YKK aims to contribute to a sustainable society through its products and manufacturing operations and constantly seeks new ways to serve the changing needs of its customers, while at the same time investing in its employees and giving back to its communities. ●



The line is used to process brass rod, which, after various stages of production, becomes the famous high-quality YKK zipper.





**TEXT:** SARI LOMMERSE | **PHOTOS:** MAARIT HÄMÄLÄINEN/UPCAST

# SHIFTING WARDS

Design Engineer **Aki Kuusiniemi** is the new enforcement of UPCAST´s design team. When it is time for **Pertti Pihlajamäki** to retire, Aki will be ready to take the responsibility for the design department.

Every day and every single project is different at the design department – that is what Aki Kuusiniemi has learnt since he started his work as a designer at the beginning of June. Aki does, however, have some experience of the company from the years 2009 and 2011 via a rental employee service. Already back then he thought that this could be a future job for him.
– I really enjoyed my time at UPCAST and felt that this is a place I would like to work at, if there is an open position someday, Aki tells.
– The design programs and equipment are updated and modern, which I consider a big plus, he continues.

Before joining UPCAST, Aki used to work as chief designer at Boliden with the overall design responsibility of their nickel smelter. Before that he was a chief designer at Outotec.

## New perspective

Pertti Pihlajamäki, for his part, has been working at UPCAST for almost 35 years and has a long career as a chief mechanical designer and is currently the design manager. When Pertti retires in June 2021, Aki will continue his work.

The manager position mainly involves coordination and scheduling of the entire design work. As the project progresses, the manager will assure that the work is on schedule and that all the details agreed upon with the customer have been taken into account.
– I am happy to leave Aki an interesting job. After all these years I still enjoy coming to work in the mornings. The work is never boring, but varies a great deal from day to day: in addition to our main design tasks, we support sales, R&D and the spare parts department in many ways. Aki will certainly bring some new ideas and ways to our design team, Pertti says.
– Variability interests me a lot and I always gain energy from learning new things. I hope that I can bring some new perspective and leave my own fingerprint in the work in the course of time, Aki comments.

Pertti´s advice to his successor is "always be careful".
– Even though you might need somewhat more time, you will be able to win it back in the manufacturing, as well as in the installation time abroad, by avoiding unnecessary mistakes.

## Long familiarization period

Aki´s job at UPCAST began by getting to know the equipment and the procedures. Aki will also have a role in the customer trainings.
– The new casting line customers come to Finland for the installation training, which includes e.g. going through and checking all the mechanical design drawings. Aki has already participated in a couple of these. And his work also involves meetings with the subcontractors, Pertti explains.

Transferring the knowledge and know-how regarding the work is very challenging, but the familiarization will be carried out over a long period of time and very thoroughly. Aki is very happy that there is enough time for changing the shift.
– In many companies the person is replaced only after he or she has left, in which case you do not have any apprentice period. It is excellent that you do not need to start from scratch, but the information is distributed over the time. ●


# UPCAST® User Meeting in Leipzig

The UPCAST® User Meeting in Leipzig, Germany, in September 2019 was the 10th since 2000. The customers from all over the world have happily come together to these meetings to hear the latest from UPCAST OY and, what is just as important, to exchange experiences and ideas with other UPCAST® continuous upward casting line users.

The Leipzig meeting was once again a success and there were numerous discussions on the various topics. In addition to the seminar presentations, the group had dinner at the Panorama Tower – the highest building in Leipzig – where they also heard about the interesting history of this famous city.

A big thanks also to KME Mansfeldt company! Their team participated actively in the meeting, and all the participants had the chance to visit the factory in Hettstedt. ●



# You can find us in the following exhibitions during 2020. At your service – continuously.

Düsseldorf GERMANY
We will keep you updated on the date of the exhibition.
wire Düsseldorf
Tube Düsseldorf

Shanghai CHINA September 23–26 2020
wire CHINA

## Our exhibitions in 2019

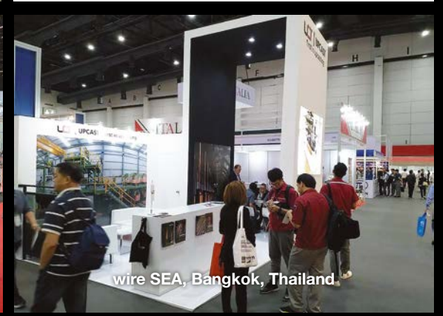
wire RUSSIA, Moscow

UPCAST OY has always actively participated in various seminars and exhibitions in its field. Exhibitions are an excellent opportunity to meet both current and potential new customers – it is very important for business relationships to discuss important topics face to face and to get to know each other.

**Hope to see you soon!**

Interwire, Atlanta, USA

wire South America, Sao Paulo, Brazil



wire SEA, Bangkok, Thailand

GIFA Düsseldorf, Germany

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