

Spring 2017

LUVATA

Mileon® News

The newsletter for Luvata's hollow conductors
www.luvata.com/mileon-news



Every bit helps
in finding a cure

By Tuomas Korvenkangas
Product Manager Special Products Pori

Copper has been used for medicinal purposes for thousands of years. Even today, at the beginning of the twenty-first century, its antimicrobial properties and intrinsic characteristic of very high electrical conductivity are underpinning a renaissance in healthcare and high energy physics.

For Luvata, this revival translates into smaller diameter, yet longer hollow conductor that deliver higher magnetic fields per meter. It may also involve the use of enameling, coatings or tapes to allow for new coil designs.

In addition to traditional manufacturing processes such as hot extrusion and drawing, Luvata is introducing new ways that deliver enhanced physical or mechanical characteristics to the finished hollow conductor. We're finding better manufacturing solutions to manage the impact of extreme power and very tight mechanical tolerances.

While the fundamentals of magnet design still involve high power input and a minimized physical footprint, Luvata hopes to contribute by improving the hollow conductor found at the heart of new coil technologies.

If we consider how far we've come from the first uses of copper to sterilize drinking water or wounds, to where we are today in terms of its use in waveguides, particle accelerators, proton beam therapy and 11.75 Tesla MRI machines – we've made tremendous strides. And in looking forward, perhaps finding alternative energy sources or a cure for cancer, Alzheimer's or Parkinson's isn't that far away after all.

Luvata is reacting to the rapidly changing needs of industry.
To learn more, read the article on the back page.

We're listening and making changes

Luvata has been manufacturing hollow conductors (HC) for nearly sixty years. Originally the end-use customer base for HC was largely high energy physics (HEP) studying alternative energy sources and induction heating and melting applications. Later came the more widely commercial use of HC in magnets used in MRI machines or more recently proton beam therapy.

The pace at which manufacturers need to respond to the requirements of the HEP industry, sometimes fueled by politics, funding or the research itself, is accelerating. A similar pace, for similar reasons, is also maintained by the healthcare industry.

While the HC demands for both industries often still revolve around high purity, oxygen-free copper (OF-OK®) made to exacting specifications, other key areas are rapidly changing, namely:

- Shorter lead times
- Smaller orders
- Longer lengths
- Alternative alloys and coatings
- Wider range of specifications

Shorter lead times and smaller orders

As a result, Luvata has accelerated its order delivery system. What used to take 5-6 weeks, now can be delivered in 3. We have also reduced our minimum order requirements. The challenges of the HC hardening or becoming rigid due to winding on smaller barrel spools, have been overcome.

Longer lengths

Luvata offers the longest jointless HC, branded Mileon®, available on the market today. In spools weighing roughly 2000 kg, Mileon gives the flexibility of making bigger, or smaller, magnets depending on the application. Regardless of magnet size this equates to zero scrap and zero chance of leaking.



Alternative alloys and coatings

In health and science's pursuit for answers, Luvata's oxygen-free copper may not be the only answer either. Luvata also offers HC made from oxygen-free certified grade copper (OFE-OK®), HCP and DHP copper grades, as well as silver bearing alloys.

No one alloy, or one coating, will work in all instances. The right alloy(s), in combination with the right use of enameling, coatings or tapes, can be used to further reduce losses

and increase performance. Luvata works with its customers to determine the optimal solution.

Wider range of specifications

One area we are seeing a diverging direction between HEP and healthcare is with the HC specifications. While the majority are still looking for square HC with a round or rectangular hole, the demand for different outer dimensions (OD) and hole sizes is growing. While HEP magnets are getting bigger, so is the hollow conductor OD and hole sizes. In contrast for the healthcare industry, where turns and Teslas are everything, we are seeing smaller OD and hole sizes.

Regardless these incremental improvements are making it easier and quicker for both industries to get the custom made HC they require – in the specific quantity they need – delivered directly to their door.

And after nearly six decades, we're still listening. Let us know how we can help you.

The European XFEL

Contained within the electromagnets of the European X-ray Free-Electron Laser (XFEL) is over 20 kilometers of Luvata's jointless hollow conductor branded Mileon®.

Read more about European XFEL which will generate extremely intense, ultrashort x-ray flashes – 27000 times per second and with a brilliance that is a billion times higher than that of the best conventional x-ray sources.

Tools to help you

To help you find the exact hollow conductor (HC) you require for a particular application, Luvata offers two online tools to make the process quicker and easier:

Tool List



Visit: www.luvata.com/tool-list

Tool Calculator

Visit: www.luvata.com/tool-calculation

Please contact us for more information or go to www.luvata.com to learn more.

Luvata Pori Tel: +358 2 626 6914 Email: tuomas.korvenkangas@luvata.com