



Superconductors for
science, energy and healthcare

LUVATA

Visionary thinking Seeing is believing

Luvata is a world-leading manufacturer of copper and other non-ferrous metal products. One of our strengths is superconductors, and we have been producing superconducting wires and cables for over thirty years. Luvata wires and cables are being used in the majority of the world's MRI scanners and in high-profile scientific research projects around the globe, playing a vital role in shaping future technology.

Our leadership position is the direct result of manufacturing high-quality superconductors to exacting specifications and the long-term relationships we forge with our customers. We have an impressive legacy of creating long-lasting partnerships, working together to help solve our customers' specific challenges and meeting the demands of their marketplace.

Partnerships Beyond Metals

We work with our customers to provide better end products, improve their manufacturing or supply processes and to streamline their operations to increase the efficiency of their business. This is the meaning of 'Partnerships Beyond Metals'.

"At Luvata we don't just supply products. We know that we can make a difference in the world around us. Our superconductors have paved the way for advances in medical technology that have genuinely enhanced people's lives. We design components for some of the world's most ground-breaking scientific projects and are contributing revolutionary new ideas that we believe will make the world a better place.

Working together with our customers to produce products that overcome existing challenges and help solve our future needs. This requires close contact and trusting relationships with many across the scientific community. We understand the importance and commitment required to build lasting business relationships.

These are exciting times, and at Luvata we are thrilled to be a part of them."



Antti Kilpinen
Executive Vice-President,
Superconductors Business Unit

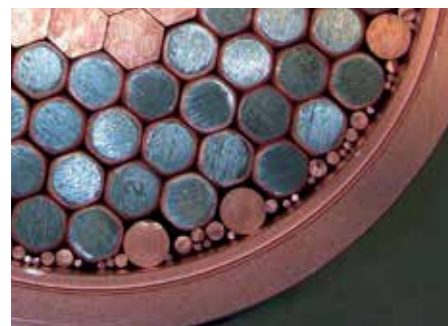
Driven by need, encouraged by results

Luvata is a recognised leader in the supply of superconducting wire for medical diagnostic systems, analytical instruments and special projects. We are driven by the growing need for the latest magnetic resonance imaging (MRI/medical) and nuclear magnetic resonance (NMR/analytical) technologies, which, over the past few years have become essential in hospitals and research.

Our superconductor wire design team works closely with all MRI customers to not only improve existing system performance but also to explore the potential for tomorrow's needs. We will review new system requirements and develop cost efficient proposals that will exceed performance across all key indicators. Our early intervention into new designs allows customers to proceed with new system development that comes on-line correctly the first time both cost effectively and on time.

Consider utilizing the wealth of knowledge and experience that our Superconductor Design Team can bring to your product development process.

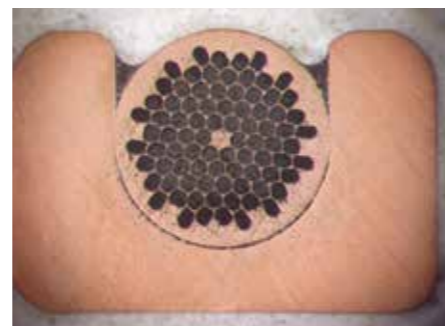
Additionally we employ the latest in Lean manufacturing technologies. Luvata Production System has solved the manufacturing efficiency dilemma releasing significant amount of effective capacity with world leading product lead times. Consider Luvata superconductors for all of your current and future system requirements.



Multifilament billet assembly



NMR/MRI wire, available also as rectangular



MRI wire-in-channel (WIC) conductor with 84 filaments

Global presence to better serve our customers worldwide

Luvata has a strong presence in Asia, Europe and the Americas, with dedicated superconductor manufacturing facilities in Zhongshan China, Pori Finland, Waterbury and Branford, Connecticut in the USA. Our global presence has opened up many opportunities to build strategic partnerships with the industry's key players while laying the groundwork for sustainable growth.

It is an exciting time in the world of superconductors, as applications for their use extend beyond their primary commercial use in MRI imaging. As the industry leader in manufacturing MRI superconductor wire, Luvata is well positioned to meet the global need for superconductor wire and cable.



Multifilament billet assembly



Braided wire inspection



Superconductor rod production

Pushing the boundaries of knowledge and innovation

In addition to our expertise in mass production, we have a wealth of experience in one-off design. We have been involved in several high energy physics projects, fusion energy development and other applications where quality, delivery and performance are critical. In many of the high-profile scientific projects we have often broke new ground with highly inventive solutions to the unique challenges.



Large Hadron Collider (LHC) at CERN

CERN

Luvata superconductor strands are used at the heart of the Large Hadron Collider (LHC) at CERN in Switzerland, the world's largest high-energy particle accelerator, where scientists are recreating the conditions that occurred immediately after the Big Bang.

The superconducting magnets operate at around -270° Celsius. We supplied 2,280 kilometers of cable, with 36 strands per cable and 6,400 filaments per strand. That's over 525 million kilometers of superconducting filament, the equivalent to 684 return journeys to the moon.

We were also sole supplier manufacturing the advanced superconducting NbTi wire needed for the second big experiment at the LHC; the CMS detector. We are proud of our contributions to this project, which aims to unlock some of the most powerful secrets of the cosmos' origins.

ITER

The International Thermonuclear Experimental Reactor (ITER) project, based in Cadarache France, is a partnership between the People's Republic of China, the European Union, India, Japan, the Republic of Korea, the Russian Federation and the USA, and will play a significant role in the production of energy in the future.

Using a \$20 billion plasma device designed by ITER scientists, the project aims to demonstrate the scientific and technological feasibility of fusion power. The device utilises extremely powerful superconducting magnets to enable the fusion process, which

releases vast amounts of heat that can be harnessed to generate carbon-free electricity.

Luvata has delivered on-time and to an exact specification, the superconductive material for the US Department of Energy for the TF-magnet coils. We supplied 86% of the US commitment for superconductive wire and copper wire needed to complete this massive and scientifically significant project. In addition Luvata was the sole supplier of 62 tons of chrome-plated copper wire for Europe's share to make the same TF-magnet coils.

CEA SACLAY

Luvata has supplied superconductor cable to CEA Saclay in France for the world's strongest MRI machine which, at 11.75 Tesla is four to ten times more powerful than most clinical MRI machines.

As the sole superconducting wire supplier to the project, we delivered two types of superconductor including 158 kilometers of cable-in-channel for the main coils and 60 kilometers of wire-in-channel for the shield coils. Both were successfully manufactured and delivered.

The incredibly powerful 11.75 Tesla whole-body MRI system is designed to scan body tissue structures with a clarity that has never before been possible. It will reveal details that are invisible in lower magnetic fields and will provide earlier detection and treatment for many diseases as well as new insights into brain activity that could pinpoint the causes of Alzheimer's.

About Luvata

What does Luvata see for the future?

We will use our unique technology know-how to influence the development of a sustainable modern world. We have always aimed to improve our customers' products and processes, and to help them increase the efficiency of their businesses. But our vision is bigger than that. If human society is going to maintain the lifestyle that we all enjoy today AND offer it to emerging societies, we will all need to become much more efficient and to take much less from the planet. We are helping companies to make their products, processes and production more sustainable: do more, waste less, and pollute less.

What's Luvata's plan for getting there?

Luvata looks to build on its distinct strengths, bringing expertise and dedication to high growth regions and adjacent markets around the world. We are stepping into niche and specialist markets with our

high-value, engineered solutions, and we are developing new solutions in partnership with our customers to conquer challenges at the front end of market demand.

How does Luvata behave?

In doing all this, we resolve to be the partner of choice for our customers, the employer of choice for our staff, and to be a positive and responsible friend to everyone else. We strive to be open-minded and focused on getting results; and when we promise, we deliver.

Where in the world are we?

Our global footprint stretches across the Americas, Europe and Asia. Our diversity of locations, cultures and markets gives us access to a wealth of knowledge and expertise that simply keeps growing. It means that we are local to our customers, wherever in the world they are and can be responsive to their needs, including fast local delivery straight to the door.

1400 employees, 12 locations, 7 countries



Americas

Luvata Appleton LLC
Special Products Appleton
Kimberly, WI USA
Phone: +1 920 749 3820 or
+800 749 5510

Luvata Ohio, Inc.
Formed Products
Delaware, OH USA
Phone: +1 740 363 1981

Luvata Waterbury, Inc.
Superconductors
Waterbury, CT USA
Phone: +1 203 753 5215

Accurate Wire, Inc.
Superconductors
Branford, CT USA
Phone: +1 203 488 5956

Luvata São Paulo
Formed Products
São Paulo, Brazil
Phone: +55 11 4624 7661

Europe

Luvata Pori Oy
Special Products Pori
Pori, Finland
Phone: +358 2 626 6111

Luvata Welwyn Garden Ltd.
Formed Products
Welwyn Garden City, UK
Phone: +44 1707 379 789

Luvata Wolverhampton Ltd.
Special Products Pori
Wolverhampton, UK
Phone: +44 1902 324 747

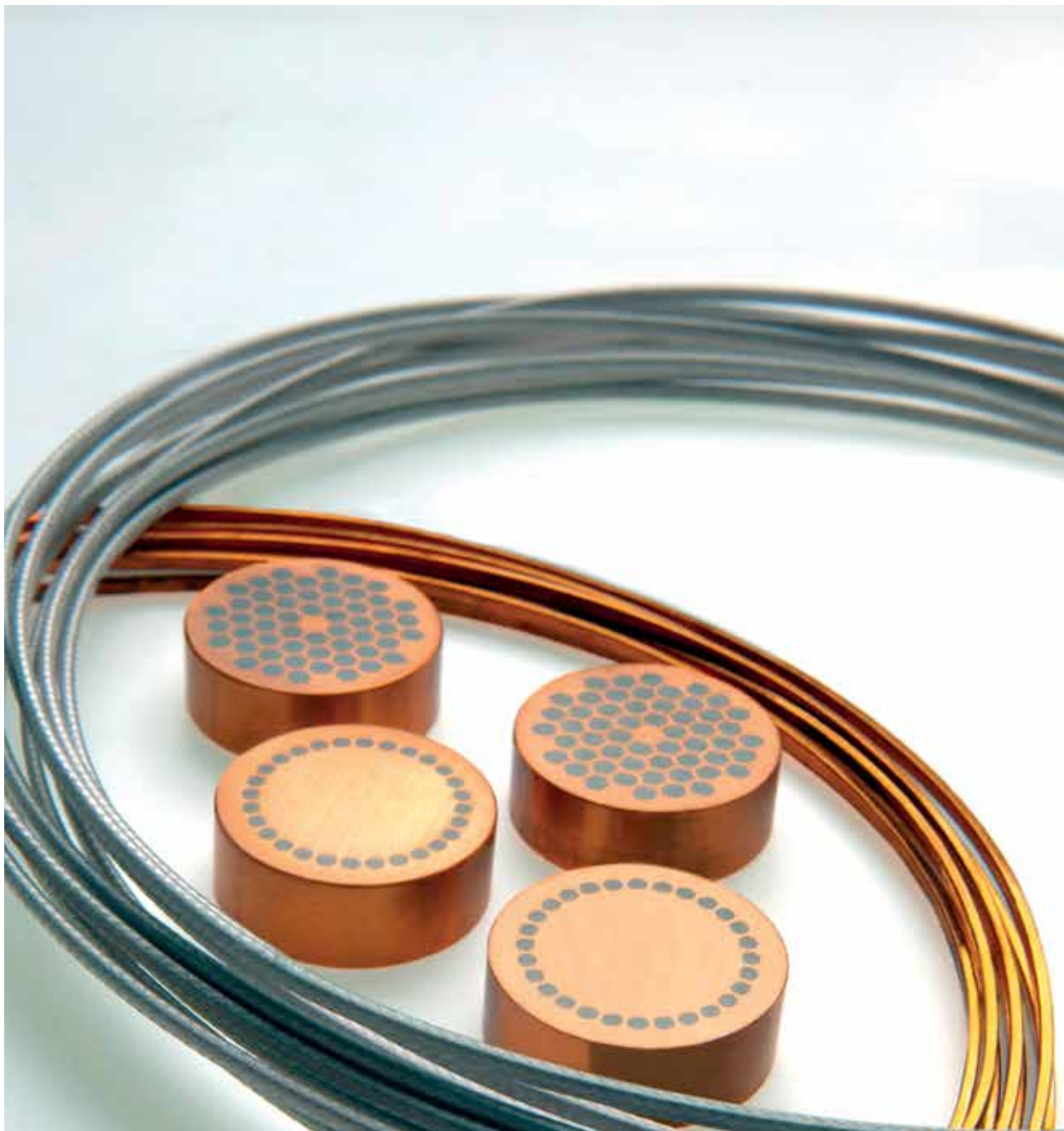
ZAO Luvata St. Petersburg
Sales office
St. Petersburg, Russia
Phone +7 812 449 27 97

Asia

Luvata Malaysia Sdn Bhd
Electrical Power Asia
Pasir Gudang, Malaysia
Phone: +607 252 6688

Luvata Superconductors Ltd.
Superconductors
Zhongshan City, China
Phone: +86 760 2321 0793

MM Metal Products Suzhou
Formed Products
Suzhou, China
Phone: +86 512 6285 1018



About Luvata

Luvata is a world leader in metal solutions manufacturing and related engineering services to industries such as renewable energy, automotive, healthcare, and power generation and distribution. The company's continued success is attributed to its longevity, technological excellence and strategy of building partnerships beyond metals. Employing over 1,400 staff in 7 countries, Luvata works in partnership with customers such as ABB, CERN, Siemens and Toyota. Luvata is a group company of Mitsubishi Materials Corporation.



www.luvata.com



Copyright © 2018 Luvata

A Group Company of  MITSUBISHI MATERIALS