

# No trade-offs: How Alleima R&D balances innovation and sustainability

In a world increasingly defined by material complexity and climate urgency, few industrial players have embraced the future with as much clarity and conviction as Alleima. With over 250 professionals, Alleima's R&D team bridges cutting-edge materials science, customer intimacy, and an unrelenting commitment to sustainable innovation. In a conversation with key members of the team, Eva Lindh-Ulmgren, Karin Forsling, Daniel Gullberg, and Eleonora Bettini, Heat Exchanger World explores what makes this division the silent force behind some of the industry's most advanced developments.



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By Iryna Mukha, Heat Exchanger World

Formerly known as Sandvik Materials Technology, the company has long stood at the forefront of metallurgical innovation. With a legacy that reaches back to 1862 and a track record of alloy development that spans from traditional stainless steels to cutting-edge solutions for hydrogen, renewables, and beyond, Alleima's Research and Development (R&D) team plays a foundational role in both its past and future.

Yet, despite its reputation, many of the company's most transformative efforts are happening behind the scenes. At Alleima, these "hidden heroes" of R&D are redefining what advanced materials can achieve—quietly, expertly, and in close partnership with industry.

"We are a global team of researchers and developers, united by a single purpose — to solve the unsolvable and to develop materials that meet tomorrow's industrial challenges today," says Eva Lindh-Ulmgren, Vice President and Head of R&D for Alleima's Tube Division. "Our R&D capability is the backbone of Alleima's leadership in sustainable, high-performance materials, with the vast legacy of innovation stretching back over 160 years." This declaration sets the tone for a compelling journey into the heart of Alleima's R&D engine, a department deeply integrated into the company's

DNA and critical to its position as a world leader in heat exchanger materials.

## Forged in history, built for the future

To understand Alleima's modern R&D strength, one must begin with its roots. Founded in Sandviken, Sweden in 1862, the company began as Sandvikens Jernverk, pioneering the Bessemer process in Sweden and building a foundation of steelmaking excellence that would shape generations of metallurgists. Throughout the 20th century, the company expanded its research capabilities alongside its product lines. By the 1920s, it had begun developing corrosion-resistant alloys, paving the way for its leadership in stainless steel. The post-war era saw the introduction of seamless stainless steel tubes, followed by a wave of duplex stainless steels that would eventually include hallmark grades like SAF™ 2205 and SAF™ 2507, which have since become standard-bearers in harsh industrial environments.

This deep heritage culminated in a major strategic shift in 2022, when Sandvik Materials Technology was demerged from the Sandvik Group and rebranded as Alleima.

As Karin Forsling, R&D Manager for Tubular Products, puts it: "Our history gives us confidence, but our team is always looking forward. We are

proud of our roots with our eyes set firmly on the future."

## A unique, integrated R&D culture

What sets Alleima apart isn't just its facilities or technical depth, although those are considerable, but its culture of collaboration and customer proximity. The Tube R&D function, based in Sandviken, Sweden, comprises more than 200 employees working across product and process development, quality assurance and materials testing.



The goal of Alleima's Tube R&D is to solve the unsolvable and to develop materials that meet tomorrow's industrial challenges today.

"We are global in our reach, but local in how we work together," says Karin. "We don't sit in isolation, we are part of the value chain, from the pilot lab to the customer's site."

This sentiment is echoed by Daniel Gullberg, Manager of Product Development for Corrosion Resistant Alloys (CRA), who adds: "Our job isn't just to invent new materials. It's to understand customer challenges, evaluate options, and deliver robust, applicable solutions that work in the field."

Alleima's R&D experts work hand-in-hand with technical sales teams, production units, and customers worldwide. Regular site visits, application analysis, and conference participation help ensure that new innovations are not only scientifically sound but market-relevant.

For Eleonora Bettini, Manager of Product Development for High Temperature and Special Metals, this interface with industry is essential. "Our customers come to us with their most difficult challenges, such as high temperature, corrosive chemicals, and mechanical stress. We translate their needs into material solutions. That connection is where real innovation begins."

## No compromise between performance and sustainability

Alleima's materials are increasingly being developed not just for technical performance, but for long-term sustainability. In fact, the company has made it a strategic pillar that performance and sustainability should not be trade-offs as they must coexist.

"We start every material discussion with both sustainability and performance in mind," says Daniel. "That means reducing environmental impact throughout the entire lifecycle, from raw materials to production, application, and eventual recycling." The company walks this talk with a robust sustainability profile:

- Its production uses approximately 81% recycled steel.

## See Alleima at upcoming events:

- 9-12 September: Gastech, Milan
- 15-17 September: OMAN Materials Corrosion & Integrity Summit, Muscat
- 17-19 September: Smart Energy Week, Japan
- 18-20 November: Stainless Steel World, Maastricht





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- All operations are powered by approximately 96% fossil-free electricity.
- And its materials directly support sectors like renewables, hydrogen transport, carbon capture, and waste-to-energy.

This ethos is shaping both existing and emerging product lines. "The green transition is not just a trend, it's a structural shift," says Eleonora. "We're designing alloys specifically for the hydrogen economy, for corrosive clean-energy systems, and for energy-efficient operations."

#### Material breakthroughs that matter

Innovation at Alleima is visible in its portfolio of breakthrough alloys, many of which were developed and refined through in-house R&D over the last decade.

One standout is Sanicro®35, a high-performance austenitic stainless steel that bridges the gap between standard stainless steels and nickel alloys. "Sanicro®35 offers excellent corrosion resistance in both acidic and chloride environments, while being more cost-effective than nickel-based materials," says Daniel. "It's a game changer for many heat exchanger applications."

Newer additions to the product family include:

- SAF™ 3006, a super duplex stainless steel tailored for heat exchanger applications in acidic and alkaline conditions. It combines excellent general corrosion resistance with high mechanical strength.
- SAF™ 3007, developed for the umbilical industry, where extreme strength, chloride resistance, and production robustness are required.

"These are materials that push the envelope," Daniel continues. "But they're also designed to be user-

friendly in production and fabrication, which is what we call 'forgiving materials.'"

Also on the near horizon is the launch of SAF™ 2906, a proven long-standing material for the urea industry. While the grade itself is not new, its availability for this critical chemical sector is a strategic expansion of Alleima's offering.

#### Digital modelling, AI, and accelerated development

One of the company's biggest R&D strengths is its sophisticated use of digital tools, particularly in alloy design and knowledge retrieval.

Before even casting a new alloy, the team uses advanced simulation software to predict alloy



Eleonora Bettini, Karin Forsling, and Daniel Gullberg at Alleima's headquarters in Sandviken, Sweden.

properties. "This helps us to design efficient test matrixes, saving time and resources," says Eleonora. "It brings down the lead time from idea to prototype."

Once a candidate passes modelling, Alleima can produce it at lab or pilot scale, test it in-house for mechanical, physical, and corrosion properties, and bring it to full industrialisation, all within its own facilities.

This agility is supported by Alleima Guru, the company's custom AI interface utilising decades of internal research. "We have close to 60,000 technical reports stored," explains Daniel. "With the Guru, we can now access them through an AI engine that delivers instant insights, turning legacy knowledge into real-time value."

#### Built to keep pace with a changing world

As industries evolve and regulations tighten, R&D at Alleima is constantly adapting. The team is not only solving present challenges but investing in future knowledge through university partnerships, industrial PhDs, and internal research programs. "We build everything from immediate product enhancements to 10-year exploratory projects," says Karin. "Our span goes from the fundamental to the practical."

*"At Alleima, research and development is more than just a department—it's part of our DNA. It's a critical enabler of the advanced materials that define us today and will lead us into the future."*  
— Eva Lindh-Ulmgren



Eva Lindh-Ulmgren, Vice President & Head of Alleima's R&D tube division.



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The global transition toward electrification, green ammonia, CO<sub>2</sub> capture and storage, and energy efficiency is driving new materials needs. According to Eleonora, success in these spaces demands deep understanding at both atomic and system levels. "We work at multiple scales, from crystal structures to full-plant applications. That's what allows us to deliver materials that perform in entirely new environments."

Examples include:

- Hydrogen-compatible stainless steels with high strength
- High-temperature alloys for more efficient energy conversion
- Corrosion-resistant materials for bio-refinery applications

#### Why Alleima's R&D is more relevant than ever

As Karin reflects, the team's unique mix of history, expertise, and forward-thinking makes it well-positioned to meet today's industrial and environmental challenges.

"It's not just the facilities, or even the alloys. It's the people," she says. "We have incredibly skilled engineers and technicians, many with PhDs, many who've worked here for decades, and several who are currently pursuing industrial PhDs with university partners. It's that accumulated knowledge that lets us be bold."

Daniel agrees. "Whether it's expanding the duplex family, refining Sanicro®35, or simulating the next generation of alloys, our R&D team is working with intention. The complexity of materials today demands that level of insight."

Eleonora adds one final thought: "Innovation is never just technical, it's human. And the way our team collaborates, questions, and shares knowledge is what truly sets us apart." ■