

# Boiler tubes for coal-fired power plants





## High quality stainless tubes for demanding applications

*Sandvik is a well-established supplier of high quality stainless tubes for coal-fired power plants. We're also an active partner in the development of the next generation high-efficiency plants that require materials capable of withstanding increased pressures and temperatures.*

*Our research-driven and customer-oriented product development supports the industry's ambition to reduce carbon dioxide emissions from coal-fired power plants.*

*We offer metallurgical expertise to take the technology forward.*

*We offer consistent product quality that comes from controlling the entire steelmaking process, from steel melting to finished tube.*

*And last but not least, we offer application experience that comes from decades of partnership with leading companies around the world.*

## Competitive products to a world in need of power

The global demand for electricity is growing rapidly. New power generation will be based largely on coal, the fuel behind 40% of the world's production of electricity today. Coal reserves are more widely dispersed around the globe than other fossil fuels. Proven coal reserves will last more than 130 years at today's rates of production.

As one of the world's leading manufacturers of seamless stainless steel tube, Sandvik has a long and successful history as a tube supplier to the power generation industry. Together with our manufacturing and customer service expertise, this means that we can provide competitive solutions for the boiler industry of today – and tomorrow.



## World-class tube technology

Positioned at the forefront of the development of advanced steels, we have been able to supply customers worldwide with competitive solutions to their challenges.

Sandvik's world leading position in composite boiler tubes demonstrates the abilities of our R&D.

The manufacturing method for composite tubes, where two different alloys are processed to make a single tube, was pioneered and developed by Sandvik. By combining materials optimized to withstand challenging corrosion conditions as well as maintaining high temperature strength, we have become the preferred supplier for recovery boilers in the pulp and paper industry.

## We turn customers into partners

Sandvik is a research-intensive company. Much of our product development is carried out in close cooperation with customers and other companies. Sandvik takes on the challenge to develop new materials and solutions to provide constant improvements and to meet new demands. We take active part in development projects, such as the growing need for increased efficiency in the coal-based power industry.





## **Boiler tubes for today and tomorrow**

*Sandvik manufactures and delivers a broad range of austenitic seamless stainless steel tubes for today's boilers.*

*High steel quality and close production control assure consistent tube quality.*

*Sandvik is constantly improving tube material and production methods to comply with increasing demands on stainless steel tubes for power generation efficiency.*

*Sandvik Sanicro<sup>®</sup> 25 - designed for use at material temperatures up to 700°C (1292°F) - is the latest Sandvik contribution to the development of the next generation coal-fired steam boilers for high efficiency power stations.*

## A solid range of austenitic grades

Sandvik austenitic steel tubes for superheaters and reheaters are designed for demanding environments in today's coal-fired power boilers. The table below shows the grades that are produced. Apart from these grades,

other special grades are produced for particular customers or markets. For more information and datasheets, please visit [www.smt.sandvik.com/boiler](http://www.smt.sandvik.com/boiler)

Sandvik grade	EN 10216-5 Steel number	Steel name	US standard ASTM TP	UNS	Germany W.Nr.	GB BS
5R10	1.4948	X6CrNi18-10	304H	S30409	1.4301	304S51
6R35	1.4940	X7CrNiTi18-10	321H	S32109	1.4878	321S51
8R30H	1.4941	X6CrNiTiB18-10	–	–	1.4941	–
6R44/8R40	1.4912	X7CrNiNb18-10	347H	S34709	–	347S51
8R41	1.4961	X8CrNiNb16-13	–	–	1.4961	–
Esshete 1250	1.4982	X10CrNiMoMnNbVB15-10-1	–	S21500	*	215S15
3R69BT	1.4910	X3CrNiMoBN17-13-3	316N	S31651	–	–
6LR62	1.4401	X5CrNiMo17-12-2	316H	S31609	1.4401	215S51
8R61	1.4918	X6CrNiMo17-13-2	(316H)	–	–	–
7RE10	–	–	310S/ 310H	S31008/ S31009	1.4845	–
Sanicro 31HT	1.4959	X8NiCrAlTi32-21	(Alloy 800HT)****	N08811/ N08810	1.4959	NA15(H)
Sanicro 41	–	–	(Alloy 825)****	N08825	2.4858	–
Sanicro 28	1.4563	X1NiCrMoCu31-27-4	(Alloy 28)****	N08028	1.4563 **	–
Sanicro 25	PMA	–	–	S31035	***	–

\* Approved according to VdTÜV-Werkstoffblatt 520

\*\* Approved according to VdTÜV-Werkstoffblatt 483

\*\*\* Approved according to VdTÜV-Werkstoffblatt 555

\*\*\*\* Common name



## Superheater tubes for the next power plant generation

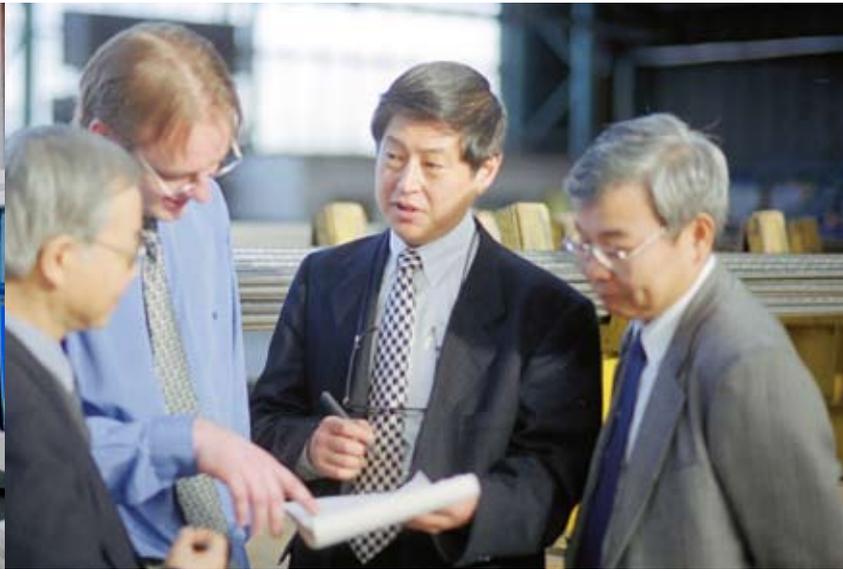
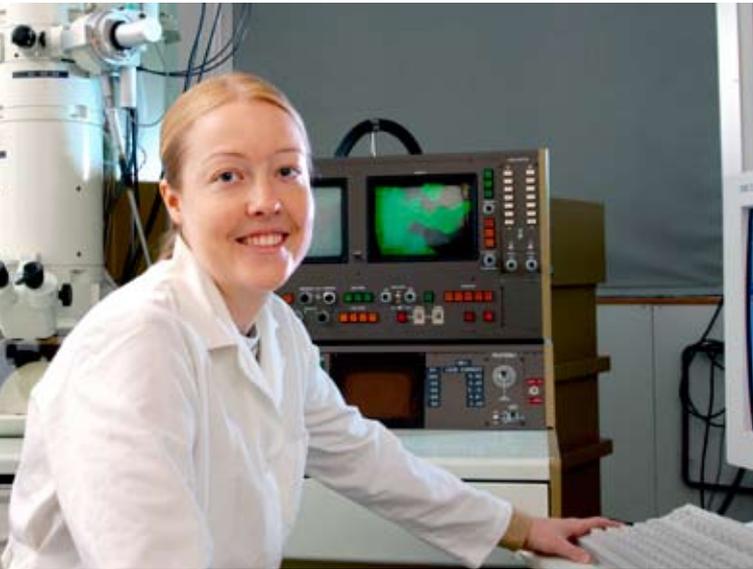
As the strongest CO<sub>2</sub>-emitting fossil fuel, coal has been questioned as a future fuel for power generation.

The power industry's answer is to push the technology in order to reduce, and in the future also capture CO<sub>2</sub>-emissions from power plants.

A large group of European power companies and equipment manufacturers have joined different R&D projects aimed at converting coal to power with an efficiency of more than 50% (compared to today's 35-45%).

Sandvik has contributed to these '700 degrees technology' projects through the development of a new tube material, Sandvik Sanicro® 25. The ability to run a coal-fired steam boiler at higher temperatures and pressures increases efficiency and reduces carbon dioxide emissions per kW of electricity produced.

Sandvik Sanicro® 25 combines high creep strength with oxidation resistance, structural stability, and good fabrication capability. Thanks to its excellent resistance in a coal ash environment, it is ideal for use in reheaters and superheaters.



## The resourceful tube supplier

Sandvik Materials Technology controls the entire tubular steelmaking process – from the melt to the finished product. In our R&D center, 250 engineers are developing new materials and making improvements to existing products in order to satisfy new and future market needs.

Extensive development work together with power engineering companies, power utilities and other leading power companies reflects Sandvik's strong R&D focus. While developing new stainless steels, we ensure that compatible welding material is in place to enable sound and cost-efficient weld deposits.

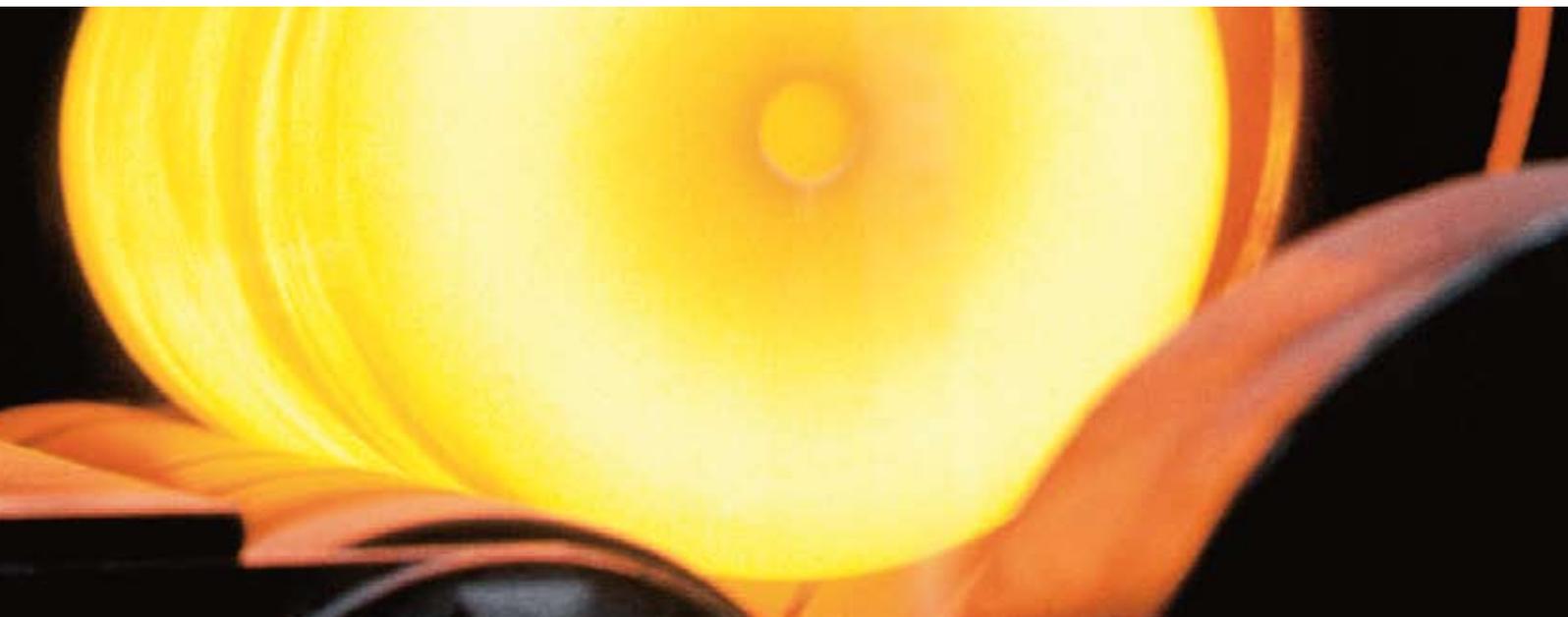
As a Sandvik customer you are always supported by our local representatives as well as by our extensive resources in research and development.

### **Sandvik Group**

The Sandvik Group is a global high technology enterprise with 50,000 employees in 130 countries. Sandvik's operations are concentrated on three core businesses: Sandvik Tooling, Sandvik Mining and Construction and Sandvik Materials Technology – areas in which the group holds leading global positions in selected niches.

### **Sandvik Materials Technology**

Sandvik Materials Technology is a world-leading manufacturer of high value-added products in advanced stainless steels, special alloys, metallic and ceramic resistance materials, as well as medical implants and process plants.





### **Quality assurance**

Sandvik Materials Technology has Quality Management Systems approved by internationally recognized organizations. We hold, for example, the ASME Quality Systems Certificate as a Materials Organization, approval to ISO 9001, ISO/TS 16949, ISO 17025, and PED 97/23/EC, as well as product approvals from TÜV, JIS and Lloyd's Register.

### **Environment, health and safety**

Environmental awareness, health and safety are integral parts of our business and are at the forefront of all activities within our operation. We hold ISO 14001 and OHSAS 18001 approvals.





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