

Customer Testimonial

ARL 4460 Spark-DAT



Inclusions analysis with Spark-DAT allows rapid payback of Thermo Scientific ARL 4460

TŘINECKÉ ŽELEZÁRNY, a.s. (The Třinec Iron and Steel Works) employs over 5'400 employees and produces more than 2.5 million tons of steel annually. The products portfolio consists of long rolled product such as wire rod, rebars and sections, special bar steel, rails, wide steel and semis.

Stanislav Zielina, Head of Chemical and Testing Laboratories, reports:

“The decision was made by Třinecké železářny, in the early 2000's, to focus on productivity enhancements that would assure the quality of new rolled steel products in order to fulfill the increasing demands of the automotive, oil, and other related markets.

The ongoing efforts to satisfy customers' growing requirements led to the necessity to increase analytical capabilities within the laboratory. Improvements in precision, reliability, speed of analysis including trace determinations including low level nitrogen, along with both low (<0.1%) and high level carbon (0.5-0.9%) was necessary.

At Třinecké železářny we have had good experiences with ARL spectrometers (OES and XRF) since 1970. The older models, ARL 31000 and 3560 were replaced by two ARL 4460 spectrometers in 1995. In 2004, it was decided to purchase a new spectrometer, and we decided to purchase a new ARL 4460 with CNO and Spark-DAT options to allow us to meet our more demanding requirements.

Our experience has been, as with our previous installations very good to date. The installation went smoothly and the unit performs very well as expected from our initial evaluation and pre-acceptance testing.

The Spark-DAT option was an innovation targeting a great new opportunity. Owing to outstanding collaboration between both laboratory and research specialists, we were able to start routine use of this method and our steelmakers consistently rely on the results of the on-line measuring tool as a gauge for steel cleanness characteristics.

Spark-DAT was successfully utilized in the following areas:

- Monitoring of steel cleanness during secondary metallurgy treatment (alloying, duration of refining and flotation, degree of de-oxidation). Corrective actions are now taken according to the Spark-DAT results.



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ARL 4460 Spark-DAT (cont.)

- Technology of controlled modification of both chemical composition and shape of inclusions for cleanliness and improving steel fluidity was successfully developed and introduced. CaSi was added to the steel melt to modify sharp-edged detrimental Al_2O_3 inclusions into non-detrimental globular $CaO \cdot Al_2O_3$ inclusions. However an excessive addition of CaSi caused oversaturation of melt by Ca and formation of undesirable CaS inclusions. This led to degradation of steel fluidity and subsequent problems in the continuous casting process. Spark-DAT results indicated clearly the moment of oversaturation by Ca and CaS formation. On this basis the amount of CaSi addition was optimized and the problems in the continuous casting process were removed.

- The new instrument provided immediate information on steel cleanliness during the steelmaking process, which led to alternative additives and their amounts, treatment shortening and overall process optimization. Spark-DAT data was directly utilized to refine our process to allow for the development and introduction of new steel grades of higher quality essential for the automotive and oil industry (tire-cord, bearing, case-hardening and microalloyed steels).

The decrease in production costs, owing to the optimization of the amount of CaSi additive alone. In the first year of operation, we realized savings equal to the investment cost for ARL 4460 equipped with Spark-DAT option. In 2005, it was decided to purchase the second ARL 4460 model with Spark-DAT and install it at our BOF production control laboratory.

Trinec, February 24th, 2009

Stanislav Zielina,
Head of Chemical and Testing Laboratories
TŘINECKÉ ŽELEZÁRNY, a.s., Czech Republic"

To know more on Thermo Scientific ARL 4460 OES spectrometer, please see our exciting, interactive presentation at www.thermo.com/ar4460

Thermo Scientific ARL 4460 and OXSAS analytical software
...metals analysis from a new perspective



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