

PRESS RELEASE

Measuring Accuracy Improves Ten-Fold

Replacement of an isotope thickness profile measuring system for aluminium with the latest IMS x-ray multichannel profile measuring system available

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The material behaviour and mechanical dimensions of rolled aluminium must be constant over the complete length and width of strip within the tightest tolerances. Only in this way can the evermore exacting quality demands of downstream processors be satisfied. With the several thousand metres of strip material wound on to a coil involved, this is a challenge and requirement for manufacturers that can only be met by using measuring systems placed at significant points in the production process.

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Measuring systems that detect online – i.e. during the running process – and are equipped with an intelligent quality management and evaluation system for precise plant control.

IMS Messsysteme GmbH has offered a variety of non-contact measuring systems for various measuring tasks in aluminium and other rolling mills since the 1980s. It builds systems for non-contact detection of thickness, thickness profile, width, wedge, coating, flatness and – most recently – also for surface inspection.

One of its most popular measuring systems is most certainly its strip thickness profile measuring system. Limited initially to americium isotope systems, the 4th generation of x-ray multichannel profile measuring systems is in use today. The advantage of x-ray radiation is obvious: unlike isotope sources, which can only be shielded, x-ray tubes can be switched off completely. This not only eliminates the need for increased safety precautions for maintenance work at the customer's plant, but also makes it much easier to dispose of the measuring systems at a later date.

One convincing quality feature of IMS measuring systems is their long service life, even under the most adverse environmental conditions, with consistently strong measuring performance. As a result, numerous isotope measuring systems are still in use in customers' rolling mills today.

As was also the case until end 2019 at Aluminium Norf GmbH (Alunorf) in Neuss, Germany, which, with an annual capacity of over 1.5 million tonnes of aluminium and more than 2,300 employees, is the world's largest aluminium rolling and smelting plant of its kind. An isotope thickness profile measuring system did reliable service there in the hot strip part of the plant for an impressive 27 years. Modernised technically numerous times in the past, it was the condition of the measuring frame housing that gave cause for concern after all these years. The accuracy of the measurement results, on the other hand, remained as precise as ever.

In 2017 Alunorf began thinking specifically about converting to an x-ray thickness profile measuring system with the latest application software, which, in addition to investment in a new measuring frame, would require extensive modification work for its installation at the corresponding mill stand. Equipped with the latest x-ray technology, the dimensions of a multichannel profile measuring system are significantly larger than its isotope predecessor, while the space available in the process line for installation remains limited. A design challenge for both parties.

One of the main reasons for the decision to modernise was the age of the radioactive sources. In addition to regular checking of these radiation sources for leaks, which to date had often required external specialist personnel and had been both time and cost-intensive, it was also necessary to include environmental factors in the decision.

After 18 months of intensive planning and extensive reconstruction work on the finishing line of the hot rolling mill by Alunorf and a smooth commissioning process, the new multichannel measuring system has been an integral part of quality assurance there since January 2020.



After just 10 months of operation, the customer has confirmed that measuring accuracy by the new IMS x-ray thickness profile measuring system has increased ten-fold compared to the former isotope measuring system. Thickness and thickness profile can now be controlled much more precisely. The exchange of the measuring systems has also optimised output, while simultaneously reducing the scrap rate, thereby minimising losses.

With the experience of more than 30 years of business relations based on partnership, Aluminium Norf (GmbH) trusts in the reliability and long service life of IMS measuring systems, even under the harsh environmental conditions of aluminium production. Today, IMS measuring systems are used at all stands of the hot and cold strip mills as well as at the slitting shears, all of which are largely responsible for the high quality of product. The decision to replace the strip profile measuring system with a new system from the world market leader in measuring systems was therefore also made with good reason.

Although all IMS measuring systems are essentially custom-built to fit local conditions at the customers, Alunorf specifically praised the high flexibility of IMS with regard to special wishes. Due to the aggressive rolling emulsions used, an absolute necessity for the new system was that the housing be made of a special construction steel and the joints closed by special welds to seal the measuring frame hermetically against them. The extremely cramped structural conditions on site also made it necessary to position door flaps for maintenance purposes exactly according to customer requirements. A further added value for IMS customers is the possibility to buy a software package programmed according to customer-specific requirements together with the individually manufactured measuring frame: an advantage which Alunorf also made use of in this case.

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Thanks to the convincing performance of the new 4th generation IMS multichannel profile measuring system, the measuring accuracies could be optimised further with guaranteed highest temporal and local resolution for continuous thickness cross profile measurement over the complete strip length. The comprehensive product data determined by radiometric measurement form the basis for optimised product quality through data feedback to the higher-level automation system. And the switch to the x-ray measuring system also accommodated the operator's responsibility towards its employees and the environment.