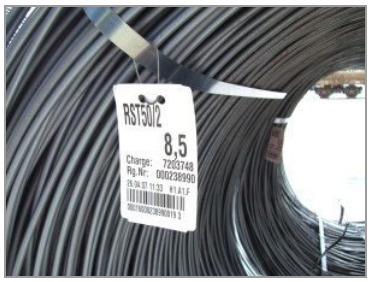
BSW – Badische Stahlwerke GmbH



Hot stuff:
Badische Stahlwerke use labels at temperatures above 500 °C

The manufacture of rolled steel is subject to strict quality standards and high legal requirements with regard to lot traceability. Another factor is the international competition and price pressure which makes extremely efficient production and logistics imperative. However, identification in rolling mills really is hot stuff: straight after manufacture, the temperature of the steel is still up to 600 °C. Instead of the metal tags which have been used until now, Badische Stahlwerke now label their products with new, temperature resistant plastic labels – increasing the reliability and efficiency of their logistics processes.

Suspended from a conveyor belt with huge hooks, the wire coils are moving out of the rolling mill. The hot-rolled steel makes the air shimmer. A man wearing thick gloves steps forward and quickly and skilfully attaches an inconspicuous, thin tag, labelling all the coils straight after production. He hasn't got much time and he has to be extremely careful as the temperature of the coils is 600 °C. And even after a huge forklift truck has moved the coils to their storage locations on the vast site, you still need to keep your distance: even hours after manufacture the temperatures in the stacks still reach several hundred degrees Celsius.

"Labelling in the rolling mill is a great challenge. Identification applied straight after manufacture needs to adapt to the high temperatures, applying the identification at a later stage in the storage location after is has cooled down is prone to errors and therefore involves great process risks", explains Volker Preiß of the Industrial Engineering department at Badische Stahlwerke GmbH (BSW).

Until now, the industry has been using embossed tags as the means of identification. Their advantage – high temperature resistance – comes at a price: the metal tags are expensive to produce and can usually only be marked with a simple number. This will provide the required lot traceability at coil level, however, it is totally unsuited to the automation of the subsequent logistics processes. "The embossed tags with their number are sufficient to cover lot traceability. However, they are a minimum solution, as for a warehouse operator this simple number doesn't mean very much and automated capture with scanners or other technologies is not possible either", says Volker Preiß. "Therefore identification and tag have become key elements in the optimisation of our logistics process."

The engine of innovation within the company

This drive for constant innovation is a tradition at BSW. In the industry, the company is regarded as exemplary and has set up BSE - Badische Stahl-Engineering GmbH, a member of Badische Gruppe, who are advising steel companies all over the world in the optimisation of production and logistics processes. Many of their new ideas are initially tested in their own rolling mill at Kehl, Germany.

For the development of a new identification system Seidl + Partner GmbH, well-known specialists in identification systems, were consulted. What's special about the identification experts from Kissing near Augsburg in Southern Germany, is that they have their own development capacity which enables them to develop label materials and adhesives for special requirements.

Two-step solution

As the first solution a system was developed in rolling mill 1 where self-adhesive labels were stuck onto metal carriers which are then attached to the manufactured long items, via a welded pin.

Label printing was synchronised with production via the production control system. The printing system was a standard thermal transfer printer.
An additional advantage: the labels carry a lot more information than the old embossed tags. All relevant production data is printed on the labels as numbers and barcodes and, additional text information, e.g. the customer's name when manufacturing for a particular order make the handling of the goods in the warehouse easier.

This system was already a marked improvement. Producing the labels was easier and could be synchronised perfectly with production thanks to the IT integration. The identification of the goods was much more meaningful which made the subsequent logistics process easier. "But we still weren't quite satisfied", as Karl Tochtermann, Seidl + Partner's marketing and sales director explains the start of the follow-on project. "The handling was somewhat complicated and with the metal carriers and the labels, there were two components involved."

Plastic label withstands temperatures to 580 °C

And so Seidl + Partner started the development of a new label material. The requirements were high: the new label needed to be able to resist high temperatures and be sufficiently robust and tear-resistant for the transport of the coils and, printing should be carried out by standard systems such as thermal transfer and laser. During the tests it emerged that the mechanical stress during the transport in the warehouse and on lorries or railways is extremely high: the airstream drags and during the rolling and stacking processes the rough rolled steel constantly rubs against the labels.

At the end of the development work there was a new S+P high temperature label which can withstand temperatures of 580 °C for more than 30 minutes and continuous temperatures of more than 350 °C. In spite of this robustness the surprisingly flexible label can be printed easily.

For BSW, this innovation brings great benefits: "Lot number, bundle number, dimensions, production data, quality control and order data – everything can be added to the new label flexibly, directly and so that it is machine-readable. The labels are printed synchronously with the hook conveyor straight at the labelling station and can be attached to the coils reliably and quickly, using wire clips", reports Volker Preiß. "Not quite 6 months after the introduction we are beginning to see the benefits for our logistics processes." The combination of label information, ERP system and the BSW production control solution therefore ensures the basis for full traceability from the coil at the customer's premises via the BSW production all the way back to the raw material supplier's scrap yard.

Radio-controlled loading onto lorries

The process reliability and speed of loading lorries has markedly increased. Incoming lorries are recorded at the works entrance, combining orders and transport. The individual items of the loading order are then entered by the IT system into the "radio area": "Then our crane and forklift truck drivers can call up the order at their terminals. During loading the data of the steel bar bundles are then entered via scanner, allocated to the order data and the lorry and, each loading process acknowledged by radio. When loading on the vast storage area is completed, the lorry drives back to the works entrance, where the loading and delivery notes which were printed in the meantime, are handed to the driver as he exits the works.

"In the steel sector, grades are standardised and there are only small variations in raw material and production costs across the mills. With the logistics optimisations achieved by the new identification system we can also generate important additional profit margins. We are optimising routes in the vast loading area, minimising loading errors, reducing our costs relating to complaints and are also benefiting from the fact that our customers and distributors recognise the high-quality identification as a mark of our quality at BSW", Klaus C. Wolter, production director for rolling mills at BSW, summarises the benefits of the high temperature label.