Partner of Experts

Presseartikel | Press Article

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STAHL CraneSystems GmbH
Daimlerstraße 6
74653 Künzelsau

Your contact for questions on the content:
Heike Metzger
Tel. +49 7940 128-2388
Fax +49 7940 128-2300
heike.metzger@stahlcranes.com
www.stahlcranes.com

Author/Photographer:
Dipl.-Ing. Jan Türk
VISUELL Studio für Kommunikation
Tel. +49 711 64868-0
jan.tuerk@visuell.de

New crane, new possibilities

14 tons per magnet

Magnet cranes enable quick, safe and non-damaging work processes and the steel industry today cannot be imagined without them. Since material properties, shape, size and weight of the load are of critical importance when it comes to designing the magnet, magnetic lifting beams to pick up the steel are usually individual products made to specification. The corresponding crane system is also no catalogue article: with the controls for the magnets and higher safety requirements, magnet cranes are challenging special solutions that are only offered by experienced crane-building experts.

Dewald Stahlhandel sells and delivers rod steel – Europe-wide, just-in-time, in all branches of industry. At its company premises in the Swabian town of Pleidelsheim Dewald has a storage area of 8,000 square metres. To expand further and enlarge its range of products, the company needed space. And a stronger crane. That the neighbouring hall was vacated at the end of last year was a lucky coincidence for the steel trader. With a further 1,000 square metres of space and two new magnet cranes, Dewald can now lift individual pieces up to 14 tons heavy, offer larger diameters of rod steel and thereby serve its customers even better than before. An experienced crane builder was quickly found – Innokran, a partner of the crane technology specialists STAHL CraneSystems – works in the building opposite. "We had high expectations of the new crane system and were pleased about the good advice from the company Innokran", says Thorsten Maier, one of Dewald's managing directors. After an exact analysis of the processes and requirements, Innokran engineered a crane solution tailored specifically to the workflow of the steel trader Dewald.

Tailor-made crane

When you saw steel rods, they become shorter. That can come as no surprise, but poses a tricky challenge for the crane designer: long material is usually lifted with a lifting beam. If this lifting beam is too long, it is not possible to lift short parts safely and to put them down space-savingly in tight parts of the store. If, however, the lifting beam is too short, it is not possible to lift long rods safely. If – like here at Dewald – offcuts and short rods also need to be transported, it is expedient to use a two-part lifting beam that can be inclined. In this way there are either all four magnets available for long objects or just two at different heights with which short steel rods can be lifted optimally. This solution requires a special lifting beam and two hoists that can be controlled separately of each other when necessary.

Tandem as standard

The two hoists on the crane normally run in tandem mode: The crane operator places the magnetic lifting beam down on the steel by radio remote control, activates the four electromagnets with a button and the load is held safely by the crane. If short parts need to be picked up, the two parts of the lifting beam can be moved to different heights with the help of the wire rope hoists and their magnets can be switched separately of each other. In this way it is possible to also transport short steel rods.

Magnetic and safe

Magnet cranes must fulfil strict safety requirements. It is possible in the case of selective lifting that the magnetic force weakens. The full magnetic force is then applied automatically after lifting. A safety control prevents unintentional detachment of the load during the lifting process. Large-sized back-up batteries at the crane bridge ensure that the load is still held safely even in the event of a power failure.

Bright LED spotlights under the crane see to optimal working conditions. For this, Christoph Fischer, managing director of Innokran, uses a product from a further customer, the company Riva in Backnang, to which the crane builder delivered 12 indoor cranes last year. "With modern LED spotlights it is possible nowadays to illuminate the work area inexpensively and reliably", says Fischer.

Strong crane technology

The crane works with two 8-ton wire rope hoists from STAHL CraneSystems' SH series and a magnetic lifting beam from Scheffer. Christoph Fischer explains: "We were able to use CraneKits from STAHL CraneSystems for this special construction. Thanks to our long experience with STAHL CraneSystems technology, it was easy for us to adapt the components for the special application at Dewald." The advantage, says the crane builder, is obvious: "The customer benefits from the high quality of the serial products, but doesn't have a standard wire rope hoist, but a solution specially adapted to his application."

Frequency inverters at the hoist and travel motors see to gentle, soft movements. Thanks to them, it is also possible to put down heavy steel rods precisely. The controlled starting and braking reduces the time-consuming swaying of the load and also reduces the effects on the crane runway and thus the hall construction.

Apart from the 16-ton magnet crane, a second newly installed crane with two SH wire rope hoists with a lifting capacity of 6.3 tons each and crane components from STAHL CraneSystems also runs in the hall. This 12.5-ton crane also serves to move the long steel

rods. Its main task is, however, to lift cut steel slices out of the saw. The slices are placed on pallets and then loaded on to trucks by forklift. A special single magnet that is hung from one of the wire rope hoists is used for fastening. The power connection needed for this is located at the load hook. Since the steel slices stand upright after cutting, but need to be transported lying down, the special tip magnet offers the possibility of turning the load in the air, which facilitates handling for the workers at Dewald considerably.

Maximum height of lift

One of the requirements for the design of the crane was to make best-possible use of the height of the hall in order to achieve the greatest-possible height of lift. The criterion was to be able to unload rods with the greatest possible diameter over the board walls of 40-ton articulated trucks. The crane was to use the maximum hall clearance so that it could in uppermost hook position – including the headroom of the magnetic lifting beam and the diameter of the steel rod – pass the truck's board wall of about four metres high. With a crane runway at 5.68 metres and a specified clearance of 6.89 metres, Innokran had no other alternative than to construct the crane as double girder overhead travelling crane and to place the hoists above the crane bridge.

Exact load measurement

One of Dewald's wishes was to use the double girder overhead travelling crane to check the weight of the steel rods on delivery. Exact weight measurement was necessary for this, which could not be achieved with the serial electronic load monitor. For this reason, Innokran implemented an additional exact load measurement via two bolt load cells. The bolts were installed directly at the two suspension points of the magnetic loading beam so that blurring from the roller cylinder and rope weight could be ruled out. The measuring accuracy achieved by this solution amounts to one percent of the nominal load.

Technology in use

Installation of the crane system proceeded quickly and smoothly and both cranes have proven their worth since then in daily operation. Thorsten Maier is satisfied: "We relied completely on the expertise of Innokran and this has paid off. The additional hall offers us new possibilities that we can make perfect use of with the new crane." There are already plans for the next extension because in spite of this one, Dewald is already running out of space for its ambitious expansion plans. "We will definitely turn to Innokran again for our next expansion", promises Maier.

Background:

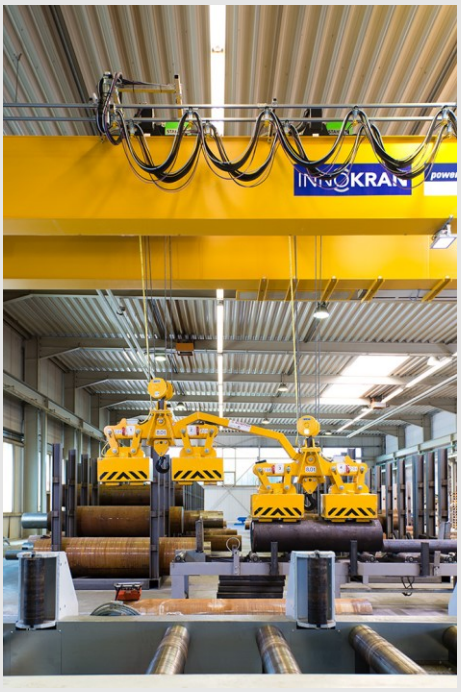
Innokran, which is located in Pleidelsheim near Stuttgart, has been planning, building and modernising crane systems on the German and international market since October 2010. Although Innokran is a young company, it has grown into one of the leading crane builders in Germany in just a few years. The managing directors of Innokran are old hands in the material handling industry: the engineers Christoph Fischer and Rüdiger Bähker can look back at long and successful careers in crane building. In addition to standard bridge cranes, the company has been able to offer sophisticated special solutions, for which a high level of design know-how and long experience is necessary, as from day one. With STAHL CraneSystems as its exclusive supplier of crane technology, Innokran has the perfect partner for its exacting work: the crane technology specialist from Künzelsau offers

the largest range of high-quality hoisting technology worldwide and is known internationally for its special-purpose solutions.
With its "Partner of" concept, STAHL CraneSystems has been pursuing a strategy of separating crane building and crane technology from each other successfully since 2009. In this strategy, local crane builders see to consultation, planning and production of the crane systems, while STAHL CraneSystems concentrates on the development and production of hoists and crane technology of world-class standard.

Photos (lead and detailed photos):

Photos released for use by STAHL CraneSystems and Dewald.

The new crane at Dewald lifts 14-ton steel rods by magnet. When engineering the crane, Innokran had to take the height of the stanchions in which the steel is stored and the hall height available into consideration.



When lifting short rods, the two-part lifting beam can be inclined so that only two of the four magnets are used.

STAHL CraneSystems GmbH | Daimlerstr. 6 | 74653 Künzelsau | Germany
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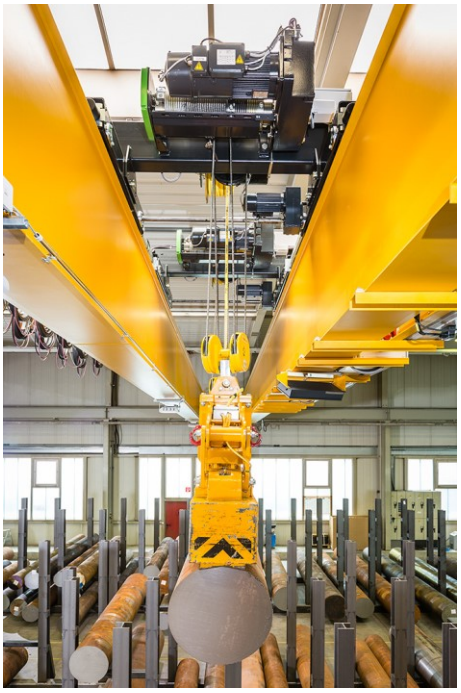
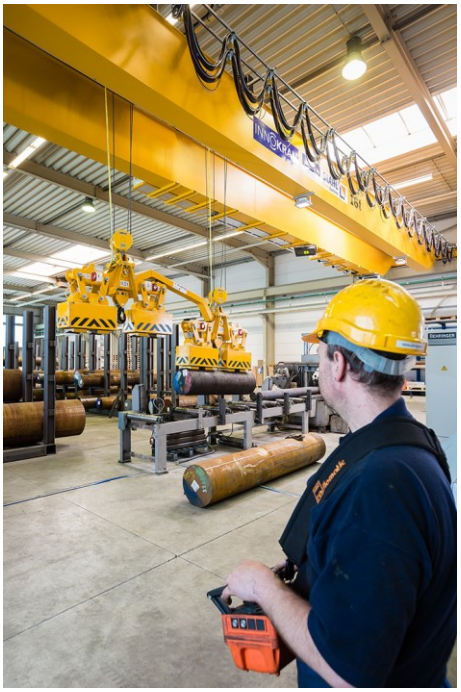


To gain additional lifting height, the crane was constructed as double girder overhead travelling crane. The wire rope hoists run on top of the crane bridges. As a result, steel rods with large diameters can also be lifted over the load wall of articulated trucks.



The crane and adjustable magnetic lifting beam are operated by radio remote control.

The complete crane controller and the back-up batteries for the magnetic lifting beam are located on the crane bridge.

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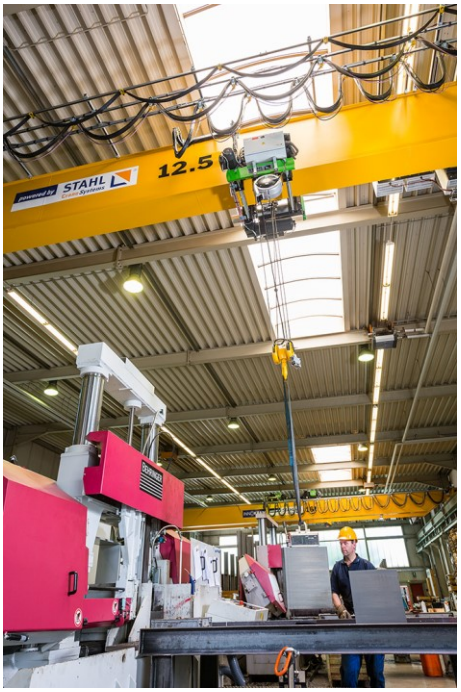
Compact but strong: two SH wire rope hoists from STAHL CraneSystems are used in the magnet crane for lifting.



The second crane serves to lift cut steel out of the saw. The hook is equipped with a power connection for operation of a special single magnet for lifting and turning the steel slices.

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