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Encoders in Wire Mill
Nicely drawn

The manufacturing company Kistner in Unna has specialised in special-purpose machines for wire mills. To ensure that the time the wire spends in the annealing unit remains constant, Kistner uses encoders from Wachendorff.

The Kistner Anlagenbau company was founded by Johannes Kistner in 1994. Originally, the focus was on service and maintenance activities, but it soon widened to include the modernisation of wire drawing installations using the latest electronics. Today, the company's offering includes servicing, modernisation and control cabinet building as well as the development and supply of complete installations for the entire steel wire sector. In these activities, Kistner relies on colleagues from the wire industry who know the business and have a good understanding of the performance the machines need to deliver.

While it used to be wire drawers pulling wire stock through ever finer openings of the draw plate until it was of the required size, machines now perform this task. Since this is a cold working process, which produces tensions in the material structure, the wire has to repeatedly undergo an annealing process to ensure even strength. However, the operation is not complete once the desired diameter has been achieved. Surface treatment also forms part of the work in wire mills. Wires can be delivered in a bright, galvanised or phosphate-coated finish, for instance. As well, particularly for the drawing process, wire surfaces are coated with so-called drawing soap to reduce friction and achieve better slip characteristics. Different profiles are also possible, ranging from round to square to custom profiles to suit customer requirements.

The more specialised the end product, the more complex the mechanised drawing process, which makes great demands on the control technology. Normally, wire is wound onto carriers or coils and rewound from one coil to another in the course of the drawing or annealing process. "Depending on the coil diameter, the wire moves at different speeds with the same rotational speed," says Thorsten Klöne, who is responsible for the development and construction of the machines in his role as plant manager. However, the drawing speed affects the structural strength of the wire, which means that it should remain constant. The same applies to the time the wire undergoes the annealing process. To ensure that these parameters remain unchanged irrespective of the current coil diameter, Kistner uses encoders from Wachendorff. They measure the actual feedrate, and the machine control unit precisely regulates the speed of the motor driving the coil on the basis of the collected data. "This is the only way for us to ensure that the wire is drawn at exactly the same speed or annealed for the same amount of time when wound onto an empty, small-diameter coil or onto a full one. We can thereby guarantee consistent wire quality to our customers," explains Thorsten Klöne.

Most recently, Wachendorff encoders were built into a rewinding installation to be delivered to a customer in Austria for use in the manufacture of welding wire. Several incremental encoders of the type WDG58 H with through-bore hollow shaft were fitted. This type is available in different diameters. With pulse counts of up to 25000 ppr, this model offers a particularly high resolution. According to Thorsten Klöne, the main reason for using Wachendorff encoders is their extraordinary robustness; wire manufacture produces a great deal of fine dust, which normally has a very detrimental effect on the exposed encoders. However, Wachendorff devices remain totally unaffected, a fact that is also reflected in the manufacturer's 5-year guarantee.

Besides this robust industry standard, which characterises all Wachendorff devices, the used encoder offers protection rating IP65, which means that it is also particularly resistant to humidity, and an early warning output provides additional safety. Wachendorff also supplies accessories, such as torque supports, connectors and couplings. The very latest addition to the programme is an encoder with a 15 mm blind hollow bore shaft. It even offers IP67 and was designed for extreme shaft loads.

Image 1-3: Kistner produces welding wire in Austria on this installation.

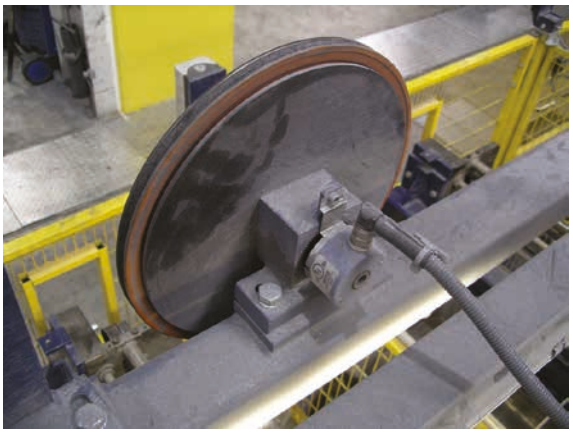

Image 4-5: Since the encoders are totally exposed, they need to be particularly impervious to external influences. No problem for Wachendorff devices, which are extremely robust.

Image 6: Wachendorff encoders ensure that the wire is subjected to the annealing process for a consistent time.

Image 7: Plant Manager Thorsten Klöne is responsible for installation development at Kistner.

Image 9-10: Once the wire has passed through the annealing unit, it is once more wound onto coils and processed further.

Image 8: Wachendorff encoders measure the exact feedrate to allow precise regulation of the motor drive by the control unit.

Image 11: Mechanised wire drawing is not feasible without high-performance control equipment.

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