

Draw-peeling improves wire quality

In today's environment the process of draw-peeling is necessary due to much more stringent quality standards and expectations of "near perfect" surface quality. This trend of defect-free surface quality additionally requires continuous enhancements of systems engineering in wire processing. Through operation of an in-house testing line at Kieselstein International GmbH and tests in collaboration with interested parties, information is gathered continuously which is integrated directly into our process. The request of many wire fabricators is defect free wire, which to a certain extent is just an illusion for the most part. Therefore processes of surface quality evaluation and technologies of surface improvement are gaining great popularity as seen in the spring wire industry. With the draw-peel process, layers with surface defects are eliminated by chip removal. This kind of intensive cleaning removes grooves, scale scars, overlaps, scratches and similar defects at the border area of steel wire.

Steady growing testing centre

Thereby improving product quality which enhances further processing of the wire. Besides steel and iron the procedure is also used for non-ferrous metals and can be utilized for elimination of casting skins during production of copper alloys or for removal of oxides on aluminium and titan materials. Multiplicities of uses require continuous enhancements of technology and linked mechanical engineering and Kieselstein is known for this for many years now. Therefore Kieselstein operates a steady growing testing centre in Chemnitz which provides a centre for part submission warrant, feasibility studies and small subcontracts which are realized on production line. Our existing systems engineering allows the processing of steel wire in range of <8mm and wire of non-ferrous metals in range of <12mm. Kieselstein estimates that the process itself is economically suitable for a wire dimensional range of <20mm. The company has supplied many of these draw-peel lines worldwide, for many materials, thus giving us and advantage from our vast practical experience, testing capabilities and engineering technology.

Due to this intensive development works since 10 years the basic structure of draw-peeling units, as the centrepiece of the technology, has been advanced significantly. A new concept has been developed which offers significant advantages for particular



Trend to defect-free surface qualities requires the systems continuous enhancement: draw-peeling line. Photos: Kieselstein

fields of application as has been realized for superconductor application some time ago. Thereby draw-peeling of this material implicates particular mechanical engineering requirements and requires a very precise chip removal. Hence this system has been improved in order to use it for copper alloys. At the "wire" show, this improved draw-peeling unit will be displayed as well as a drawing block which also considers specifics of draw-peeling. Some highlights of the draw-peeling unit are

1. a precise production of the base machine
2. FEM optimized design and adjustment of the flux flow during chipping treatment
3. Modules for flexible adjustment of chip breaker position in order to realize an optimal chip break
4. increased driving speed of the chip breaker for higher digit rate during draw-peeling in combination with an optimized bearing
5. Optimal design of chip disposal of the draw-peeling unit for guaranteeing optimal temperature conditions
6. improvement of cooling with additional cooling spots
7. integration of an additional drawing die to accommodate the specifics of processing nonferrous metals.

The correspondent designed draw-peeling unit can be integrated into various lines and applications. Besides the use of draw-peeling plants as standalone solution, the inte-

gration into existing drawing machines is also possible. A process integration of the draw-peeling unit in combination with the drawing block in front of a wire rod drawing machine or a rolling mill for copper and aluminium machining as well as integration in drawing benches is possible.

In addition to continuous development of mechanical engineering the tools improvement is pushed by Kieselstein. As in the past carbide tool were used most of the time, most of the present drawing dies are coated. Also PKD is used for processing of non-ferrous metals. In these cases the company cooperates with corresponding tool manufacturers. In cooperation with manufacturers of drawing lubricants and emulsions Kieselstein can provide the complete technology including the necessary consumables to the potential customer. To build confidence there is always the possibility of doing tests within the already mentioned ranges at their plant in Chemnitz.

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Kieselstein International GmbH

Erzbergerstrasse 3
09116 Chemnitz/Germany
Phone: +49 371 9104100
info@kieselstein.com
www.kieselstein.com