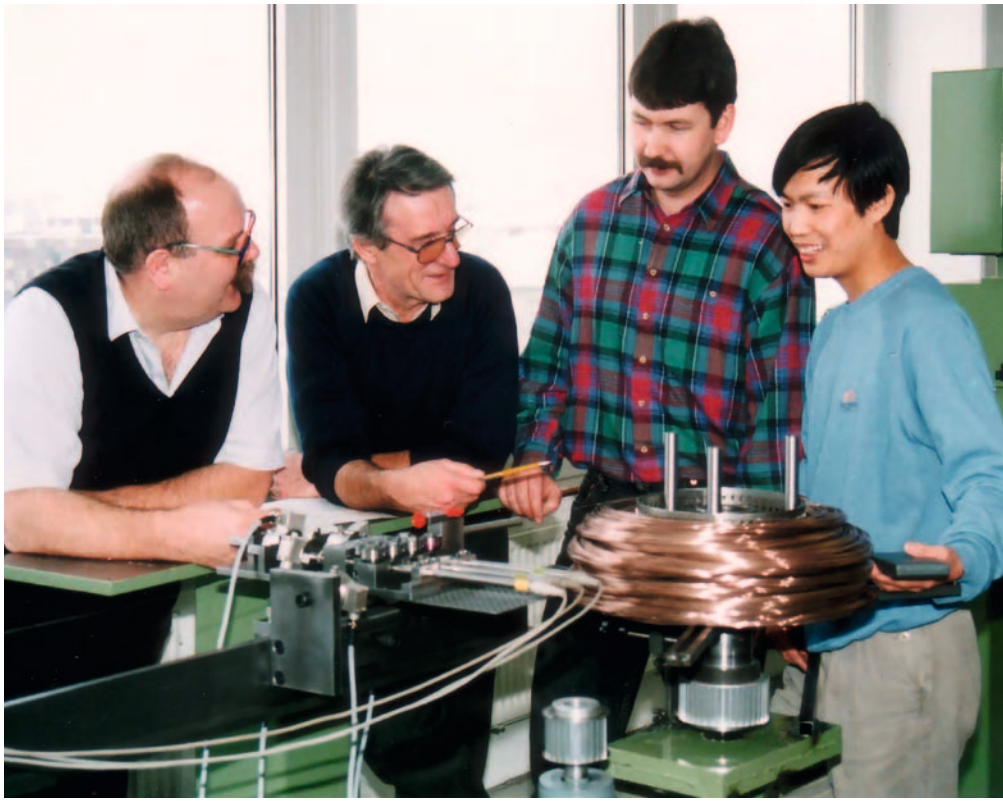
60 YEARS 1951 – 2011

Wire straighteners by tradition

The basic principle of straightening is the elasto-plastic deformation of the process material. Ideas and discoveries have been drawing on it for decades to create smart products and services for and concerning all aspects of the straightening process. Witels-Albert has been a part of it since the very beginning.

The roots of Witels-Albert GmbH in Berlin go back to 1946 and the mechanical engineering master Walter Wittig. Witels GmbH+Co. KG makes an impressive name for itself with packaging machines for the foodstuffs industry and drawing die processing machines for the wire and cable industries. This is also clearly evident in the Maschinenfabrik Albert in Bredenbuch. The site in the Sauerland region of Germany manufactures wind ups, uncoilers, spoolers and rod rolling machines, glow systems, single wire pulls and drawing machines. The range at Maschinenfabrik Albert also includes straightening machines and straightening stations.

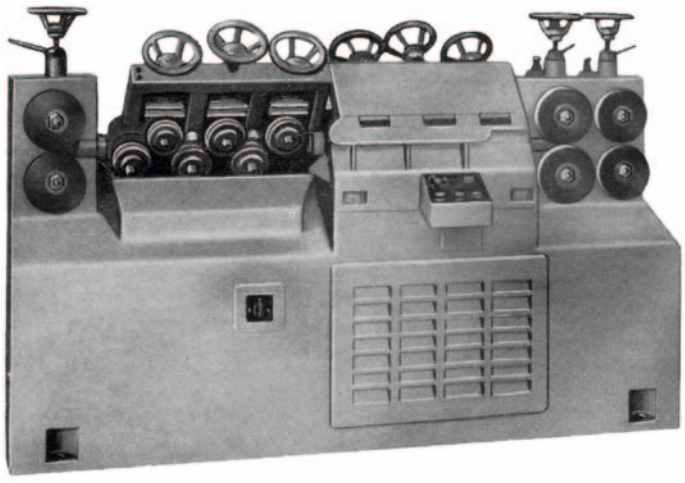
After the takeover of Witels GmbH+Co. KG in 1971, these products are manufactured in Berlin. Specially tailored to straightening and on the basis of always thinking in terms of cost, Witels Albert+Co. KG develops a modular system for straightening stations, which offers the advantage of using standardised components and thus guarantees flexibility at reduced procurement, installation and maintenance costs. In addition to mass production, small batches can also be produced.



Collection and discussion of process parameters in the test area at the Berlin company.

Systematically researched processes

Over the years, Witels Apparate-Maschinen Albert GmbH +Co. KG's product range are complemented with roll guides, drive units and complete straightening machines using the components manufactured in our works. The managing partner, Eckehard Albert, and his employees research the processes of the wire, cable, rope, strip and tube industries and further the design and global marketing of new products for the guiding, straightening, preforming, postforming and transporting of process materials. In addition to the manual adjustment of the straightening rollers with simple tools, electromotive positioning is also increasingly used. It offers the advantage of defined, reproducible setting of the straightening rollers. The CS 43-4 straightening and bending machine uses partially automated straightening instruments, which straighten and bend flat wires up to 4.5mm in width and up to 1.5mm thick in two lines. This allows the manufacture of one-dimensionally or two-dimensionally curved flat wire sections, which are required by suppliers of automobile manufacturers for the production of windscreen wipers. The core of the entire system is a PLC, which designs the straightening and bending processes in interaction with an operating terminal, software and user inputs. 500 data sets – each of which contains 40 items of data – are used and administrated to set the machine quickly for a large spectrum of materials and finished articles. The partially automated setting of the straightening rollers reduces the set-up time by up to 75% and the scrap rate to almost



Straightening machine from the earlier Maschinenfabrik Albert for wire rods. Photos: Witels-Albert

zero. A similar result is possible with the so-called roller setter or computerised tool, which is launched in cooperation with a Swabian inventor at the end of the 1990s. The revolutionary aspect is that with just one intelligent, electromotively operated tool, as many straightening rollers as required can be definitively adjusted one after another.

The basic idea of the flexible tool insert for conventional straightening instruments is the model for the new category of setting for straightening rollers. The reduced component costs contribute considerably to reducing the investment costs required by the procurement of technology for the defined adjustment of straightening rollers. At the same time, the users have more flexibility. They can use one roller setter on many wire-forming machines. Product development for partially automated straightening technology and for the roller setter is accompanied by straightening tests in the company's test area and tryouts in the wire industry. The company takes on new employees, who venture into unknown territory at Witels Apparate-Maschinen Albert GmbH+Co. KG.

In mass production: five-roller straightening instrument with two Witels-Albert AS 1-20 PO modules.

Collecting setting data virtually

Measuring and automation technology is indispensible and the simulation era is dawning. In addition to straightening products, the company is increasingly focusing on the straightening process. At the Duesseldorf trade fair wire in 1996, they demonstrate a simulation program for the straightening process, which calculates the requisite setting value for the rollers. The defined roller setting is dependent on the virtual collection of the setting data taking the parameters of the goods to be straightened into account. Up until now, the setting data were set by testing and continuously inspecting the output wire. Witels-Albert GmbH, as a subsidiary of the Reutlingen-based Wafios AG, has been involved in the trend of providing the market with tried-and-tested components and innovations since 2000 with the managing directors, Horst Schneidereit and Marcus Paech. In this way, straightening rollers are developed which are adapted to the increased wire pulling speeds and which are better suited to high wire speeds thanks to the special bearing technology and the use of new materials. The RS precision straightening instruments, DRS double straightening instruments, ERS H and ERS HL PO heavy-load straightening instruments and new NADV drive units open up new possibilities for precision straightening as well as in the straightening and transport of massive round wires and tubes of up to 40mm in diameter.

Since 2001 it has been possible to plan the straightening process in the planning process using the Sim Data software. Interested parties are quickly requiring additional services such as the advanced calculation of roller and transport forces as well as service life or service elements. At the same time, the modular system is developed further. In 2006, Witels-Albert GmbH discretises a straightening instrument for the first time by using individual straightening modules. Each module contains all the elements of a defined and reproducible working roller adjustment system, whereby the roller adjustment can be optionally performed via electrical or hydraulic actuators. The straightening modules can be used to design any number of straightening instruments with different numbers of rollers or roller pitches. The modularised product straightening instrument transforms the user into the developer and creator of his own technical solution.

The patented inline wire diagnosis is a foundation stone for the future. The procedure will calculate the geometrical and mechanical properties of the process material wire over the length. Knowledge of the qualitative adjustment of wire parameters can be used to derive strategies to influence the straightening and accompanying processes. In addition, the wire quality is objectively appraisable for wire purchasers and sellers. This creates a transparent value system for the product: wire. The basis of the procedure is the measurement of the wire diameter and the determination of the adjustment of an elasticity limit in non-proportional elongation, which is continuously visualised via an intermediate size by a straightening instrument tailored to the process.

Former small-batch production of straightening stations at Witels Albert+Co. KG.

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