# Ideas & Products for Success

by:
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## "Better Smart Than Hard" — Intelligent guiding, straightening and transporting of wire materials into fastener production machinery.

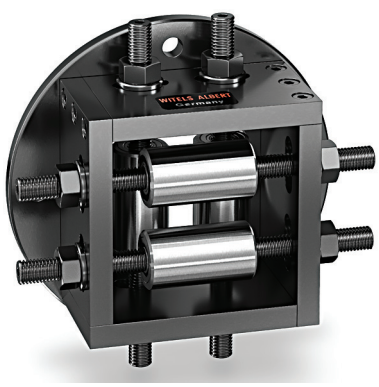
### Guiding Wire Up to 5 & 10 mm

Roller boxes of the RK and RK VE series have been part of the product range of **WITELS-ALBERT GmbH** for decades. The robust designs are used to stabilize the path of process materials in a defined horizontal and vertical direction. Due to the permanent contact of the process material, wear and tear often only occurs in a very small area on the rollers, especially if the guide gap is set close to the process material diameter. Usually only 25% of the roll length is damaged. In order to avoid damage to the process material, standard maintenance strategies recommend replacing only locally damaged rollers. Although this is good for the final product quality, it has a detrimental effect on the cost-effectiveness of the production.

Roller guides of the new RK VE SH series provide a solution to this problem as they permit both radial and axial displacement and securing of the individually positioned rollers.

The radial adjustment and securing of the roller axles with the rollers is achieved by means of slotted holes in the basic body of a roller box and associated hexagon nuts. This is known from the RK VE series.

Due to the special design of the roller axels, axial displacement of the roller axles with the rollers is also possible. The multi-part and externally threaded roller axles protrude more or less laterally from the basic body of a roller box section after axial displacement. This may take some getting used to, but it gives users the advantage of setting the contact or wear point correctly and achieving a four times longer roller life.



**RK VE SH series roller boxes allow the defined adjustment of the wear point on each roller individually.**

The roller guides of the RK VE SH series are available in two sizes for process material diameters that are up to 5.0 and 10.0 mm.

### Guiding Wire Up to 20 & 30 mm

In addition to the radial and axial adjustment of roller axles and rollers, the selection of the roller material has a decisive impact on the service life of the tools of roller guides.

The WITELS-ALBERT GmbH models RK 20 and RK 30 are made of the wear-resistant material 1.2436. Each roller is also fully hardened to a nominal hardness of 63 HRC. Rough environmental conditions and wire surfaces as well as ever higher process material speeds cause wear, which must be avoided as far as possible from the point of view of the efforts to permanently reduce costs. Use of alternative materials is recommended that can be hardened to 68 HRC. However, the disadvantage of these materials is that they are costly, which makes it possible to reduce costs only to a limited extent. Of course, ceramics and tungsten carbide can also be considered, but the prices of these materials are much higher. From our point of view, these materials do not represent a solution for the economical production of solid roller bodies for roller guides.

**RK HM series roller guides are designed for tough conditions in the wire industry.**

Nevertheless, how can the service life be increased? This is achieved by a design that uses a high-quality material such as tungsten carbide in a special geometry, which can be produced inexpensively and is available at a reasonable price.

The roller designs of the newly developed RK HM series roller guides use tungsten carbide bars placed over the roll circumference. The bars are supported by a rotation-symmetrical design element, which also houses the bearings of a guide roller and the axle studs.

Due to the gaps between the individual bars, the effect of the automatic proportional descaling of the process material results when guiding wire rod.

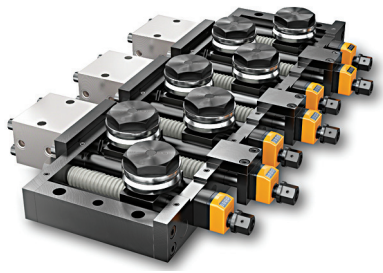
Nevertheless, if the tungsten carbide rods installed in the contact area with the wire are worn out after some time, they do not have to be replaced. A simple turn around the longitudinal axis by 90° increases the service life significantly. The disassembly and assembly required for this purpose can be carried out quickly and easily within the scope of maintenance.

### Straightening Larger Sized Wire

The processing of wires with a diameter of more than 8 mm is associated with handling challenges, since the large moment of resistance requires correspondingly high forces and moments to be applied when processing the process material. In addition, there are binding health and safety requirements, such as those contained in *Directive 2006/42/EC*. This Directive requires that the physical stresses on operators must be reduced to a minimum.

This is where the new products for processing large wire diameters from WITELS-ALBERT GmbH come into play, regardless of whether it is the processing of rolled wire, reinforced steel wire, cold heading wire or spring steel wire.

If the geometric and mechanical parameters of a wire as well as the parameters of the straightener or the straightening machine are known, the forces and moments occurring during straightening can be calculated with good approximation. For large wire diameters there are sometimes straightening forces of over 100 kN per straightening roller. A simple mechanism for the individual adjustment of straightening rollers under this load is possible and available. A compact and affordable mechanism for the quick-opening/closing mechanism working against all straightening rollers and using only the muscular power of the operator is not, however.



**RA 7 H PO straightens wires in ranges 9 to 15 mm, 15 to 25 mm and 25 to 40 mm.**

Therefore, it was considered impossible to implement the such features for processing large wire diameters in one design. WITELS-ALBERT GmbH has solved this conflict and introduces a total of 9 new straightening machines for the processing of wires with a total diameter range from 9 to 40 mm. Depending on the application area and wire properties, models with five, seven or nine straightening rollers can be selected.

All RA H PO straightening machines come ex-works with hydraulic cylinders for the quick opening/closing mechanism and with straightening rollers of the WR series. Depending on the application, the wire material, the yield point of the wire and/or the wire speed, it can be useful to use rollers of the GB SL series on straightening machines. These high-performance straightening rollers have special bearings, a fully hardened sleeve made of a very wear-resistant steel material and they can be re-greased.

## Strip Straightening

The processing of flat wires and strips with a large ratio between width and thickness is possible with BKV strip straighteners, whose straightening rollers are supported on both sides. With sufficiently rigid designed straightening rollers, this roller support ensures parallel and/or conical straightening gap geometries under load, so that both the flat and the edge-bow straightening process can be performed with just one straightener.

**Continued...**

BKV 7 series straighteners cover straightening ranges 0.6 to 1.5 mm, 1.5 to 3.5 mm and 3.5 to 7.0 mm. Four of the seven turnable straightening rollers of each straightener are fixed mounted in the main body and represent a fixed bottom line of a strip regardless of specific strip thickness. The remaining three straightening rollers are arranged shifted and can be adjusted. Each of the adjustable rollers is equipped with two spindle mechanisms whose mechanical position indicators PO allow a defined and reproducible roller setting.

Each strip straightener BKV 7 series is equipped with a quick opening/closing mechanism supporting a rapid change of the process material. The upper frame of a BKV straightener opens around a pivot point after unlocking. The strip can be inserted and the straightener can then be closed and locked. At a given closing moment, the greatest closing force is achieved near the pivot point. Correspondingly, it is advisable to place a strip straightener BKV series in a processing line in such a way that the pivot point of the quick opening/closing mechanism is located at the strip entering point, where the largest roll adjustments are realized and the greatest roller forces are to be expected.

**Strip thickness or the thickness range of the process material determines the required BKV straightener.**

Very thin and wide flat wires and strips, which also have increased elastic limits, need to be straightened more and more frequently. As a rule, seven straightening rolls are not sufficient for their processing.

With this in the background, the newly developed BKV 9-60 straighteners are used. They have nine fully hardened straightening rollers with a diameter of 16 mm only. With an also adjusted roller spacing, strip thicknesses between 0.1 and 0.6 mm can be deformed successfully. As with the strip straighteners BKV 7 series, the upper straightening rollers of the straightener BKV 9-60 can be adjusted on both sides, so that both the flat and the edge-bow straightening process can be performed with just one unit.

## Accessories for ER Series Straighteners

The best-selling accessories from WITELS-ALBERT GmbH for straighteners are PO mechanical position indicators for the defined and reproducible adjustment of straightening rollers. The PO position indicators are available in various sizes and can be mounted on almost all series of straighteners. New in the range are the ER 5-0.8 PO, ER 7-0.8 PO, ER 9-0.8 PO, ER 11-0.8 PO and ER 13-0.8 PO straighteners, which are suitable for processing wires with diameters ranging from 0.5 to 0.8 mm.

The designs of these straighteners use a new PO top bar and a new design for the spindles, which serve the defined and reproducible adjustment of the grooved pieces, respectively,

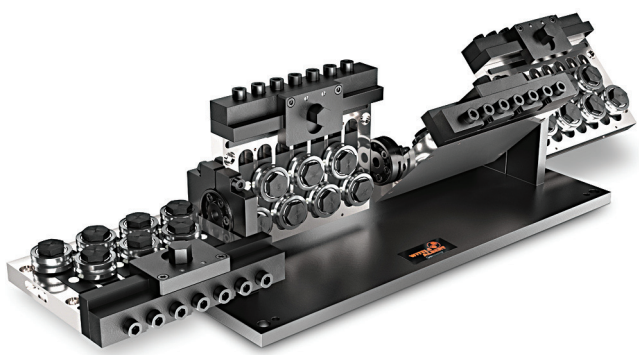

**PO position indicators come in various sizes and can be mounted on almost all ER series straighteners.**

of the straightening rollers. The new design principle offers many advantages. Fewer individual parts are required for each unit, the adjustment spindles are not affected by pin bores and time is saved when mounting the straightening units. For the daily routine of the defined adjustment of straightening rollers, this means time savings and a completely new level of robustness of the straightening units, especially with regard to the incorrect operation of the adjustment spindles.

## Accessories for RT & RTS Units

Assemblies with base plates for the design of straightening systems are available for the series ERS, KV, LR, PR, PS, RA and RB. Usually two straighteners are mounted in different planes. Assemblies with base plates are now also available for RT and RTS series straighteners.

Up to six RT/RTS straighteners of the same size can be connected to form a straightening system or straightening chain. At least two straighteners of a straightening system or straightening chain must have an identical number of rollers. Connecting brackets VW are always part of a design.



**Assemblies with base plates for straightening system designs are available for RT and RTS series straighteners.**

Discover our smart and ready-to-install assemblies, making it possible to straighten round wires in up to four straightening planes and achieving a convincing straightening quality.

For more details, contact the author in Germany or visit **www.witels-albert.com**. In North, South and Central America, contact **Bob Flower** at **Witels Albert USA Ltd.**, Oxford, MD, USA, by visiting **www.witels-albert-usa.com**, which is now servicing countries outside of the Americas. FTI