

## Process & Manufacturing

### Prüftechnik Alignment Systems: Paralign, a new technology to determine the parallelism of web leading

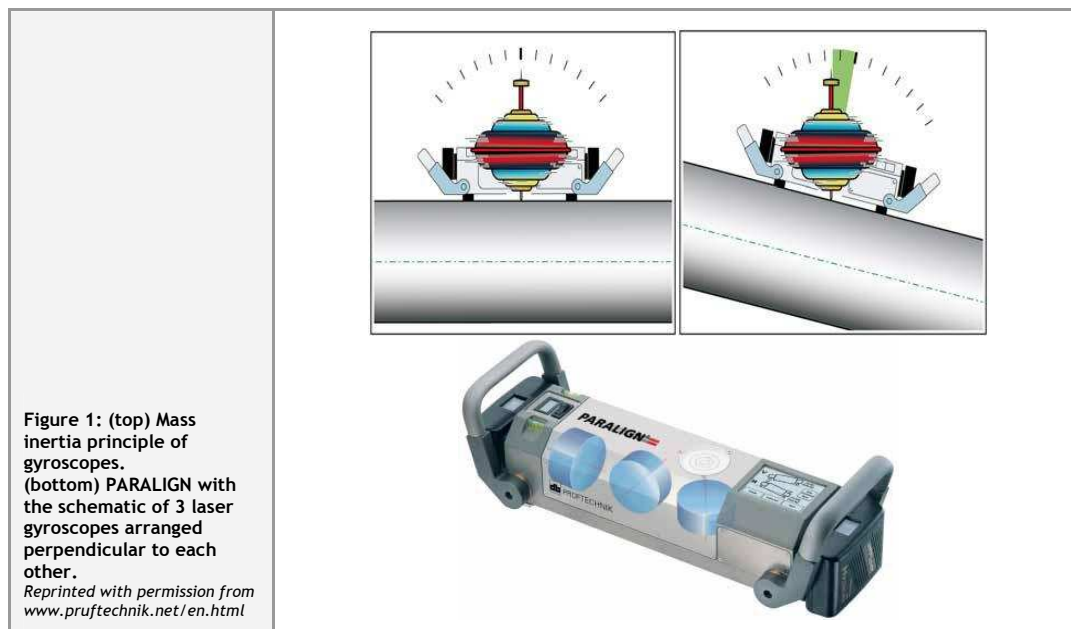
U. Fügmann

Roll alignment without  
human operator intervention



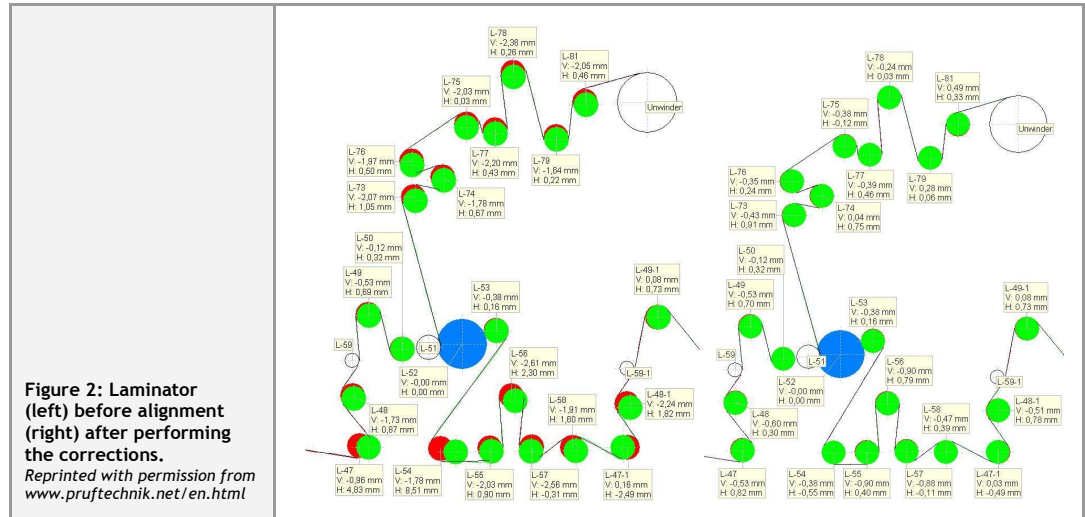
The company **Prüftechnik Alignment Systems** has developed a roll alignment system using aviation technology. Conventional measurement methods for alignment are theodolites, micrometers and other optical systems. Paralign is the first to use an inertial measurement system.

It consists of three orthogonally assembled ring laser navigation gyroscopes, like those used in spacecraft and aircraft guidance systems. Those three gyroscopes allow describing the three degrees of freedom in space (Figure 1). As a laser gyroscope keeps its axis because of mass inertia, the alignment of rolls is independent of the operator of the measuring device. It can be used in enclosed (housed) machinery and in inhomogeneous temperature profiles too. With the help of a reference roll or reference plate the parallelism of rolls can be determined with high accuracy.



After the measurement of several rolls, their axes can be compared and possible offsets can be shown precisely. It is indeed important for printing or laminating processes which requires a maximum of accuracy.

On Figure 2, the green circles mark the rolls from the user point of view while the red ones mark the position on the machine side. The exact values are given by vertical and horizontal offsets. A significant improvement of the lamination process can be seen after the correction.



This alignment of rolls and cylinders will be very useful in varied industries such as paper making, steel and aluminium rolling, printing and foil production.

With the aid of this high precision alignment system the exact web handling process necessary for electronic printing can be achieved. The parallelism of rolls is an important factor for accuracy of register. The depositions of rolls are absolute values. The Paralalign device allows for a measurement without a line of sight or a mechanical connection with a very high accuracy of 30  $\mu\text{m/m}$ . The resolution of the gyroscopes and the repeat accuracy is much higher (5  $\mu\text{m/m}$ ). This accuracy is indeed necessary for polymer printing.

"Navigation system for the packaging industry: <PARALIGN> The new technology to determine the parallelism of web leading rolls"; C.M. Reidler; *Coating International* 08/2009.