PRÜFTECHNIK

PARALIGN® Service

Service for the Paper Industry

PARALIGN® – how does it work

From the gyros as a toy to the parallelism measurement system

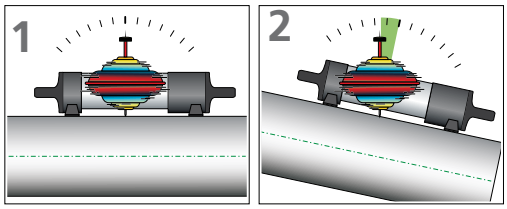
Moving gyros show a so called inertia and their relative position in space can hardly be changed (pct. 1). While the bearing surface is moved, the gyro axis stays constant and the angle of inclination can be displayed (pct. 2).

The same effect is used in PARALIGN®: Inside the measurement system there are three highly precise ringlaser gyroscopes. The same technology can be found in the navigation systems of spacecrafts.

Inertial Measurement Unit (IMU)

Each of the three gyroscopes measures the angle around its rotation axis. The three axes are orthogonally arranged, so the coordinate system is determined. Thus, the relative position in space can be calculated.

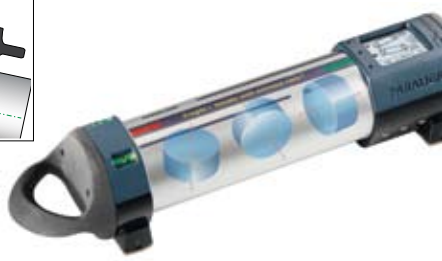
The ringlaser gyro shows the same inertia as the mechanical gyro. They also keep their rotation axes during a certain period of time. By placing the PARALIGN® on the first roll it learns about its rotation axis. During the following measurements on different rolls, their axes can be compared and misalignments in parallelism can be calculated and displayed in vertical and horizontal offsets to the chosen reference roll. The resolution of this measurement is 4µm/m.



How does the measurement work?

To perform the measurement, the PARALIGN® device is placed on the roll. Then the device is moved on the rolls' surface around its rotation axis or the roll is moved with the device on it. An angular range of 20° is enough to determine the rolls' exact position in space. Defective measurement points, for example by nonparallel placement of the device, are filtered out automatically by an effective algorithm. The measurement values are transmitted immediately via wireless connection to a laptop.

With the collected measurement values the PARALIGN® calculates the rolls' rotation axis. In an easily understandable, graphical report its offset to the chosen reference roll can be displayed. This contact measurement is incomparably faster than each traditional system.



The PARALIGN® housing contains three highly precise ringlaser gyroscopes

Advantages of PARALIGN®

- No line of sight needed
- Reduction in measurement time - up to 100 rolls per day
- Measurement preparation within minutes
- Instant automatic generation of user-independent measurement documentation
- Clear measurement reports
- High accuracy of 0.05 mm/m independent of roll location or ambient temperature

Wear and tear in couplings?

ROTALIGN® Ultra

Laser shaft alignment with the better partner.
Contact us for further information

www.pruftechnik.com

PARALIGN® in the drying section

A paper mill for magazine paper showed the following problem: One of the drying wires had to be changed after four weeks instead of a regular lifetime of twelve months.
Because of the housing shown in the picture a traditional measurement system can hardly access the rolls. On the other hand, the temperature gradient in the still hot drying group makes the use of optical systems very difficult. The deflection of light near the hot drying cylinders is different to the deflection at room temperature outside the machine.
The key argument for the production management to use PARALIGN® was the incomparably short measurement time. The critical feltrolls were placed in the cellar of the machine, so for an optical measurement it would take very long to place the needed mirrors and prisims to access the rolls in addition the repeatability of the measurement, for example after the correction, is hardly possible.
Within two hours the alignment condition of this drying group was measured with PARALIGN®. According to the immediately available protocol several alignment scenarios were simulated together with the maintenance department of the paper mill. Based on a cost-benefit analysis one of the scenarios was chosen. On the same day the maintenance team corrected seven rolls

including guide and tension roll. The corrections were proved immediately by a second PARALIGN® measurement.
Three months after the service the satisfied customer contacted us to confirm that the felt shows no abrasion or other irregularities. The lifetime of the felt was increased to the regular period.
The following page shows the PARALIGN® protocols of the discussed drying group before and after the alignment. The improvement of roll parallelism can be seen clearly.

Foundation settlement?

HYDRALIGN®

Precise measurements of foundation movement.
Contact us for further information.

www.pruftechnik.com

Advantages of PARALIGN® in the drying section

Longer lifetime of consumables:
- wires, felts, roll covers

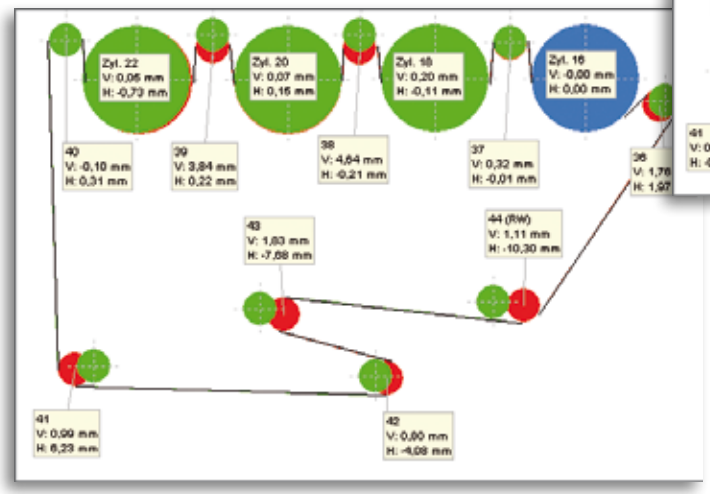
Higher machine availability:
- reduction in paper breaks
- rare replacement of parts results in reduced stoppages

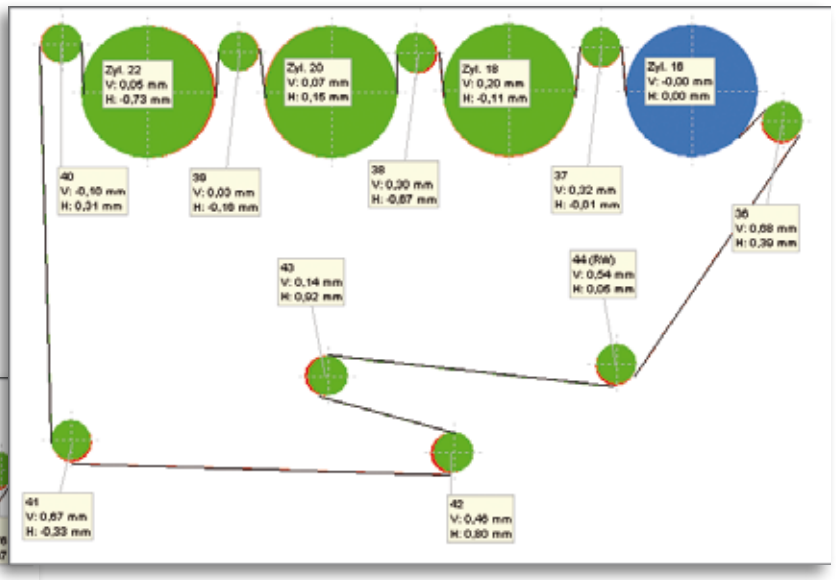
Increased quality:
- decrease in folds
- uniform moisture profile
- less waste

The PARALIGN® protocols

The PARALIGN® protocols of the discussed measurement are shown below. The first picture shows the alignment condition as found. The second picture shows the drying group after the corrections. The improvement of roll parallelism can be seen clearly.

Before alignment





After alignment

Roll face length: 7500 mm
Your point of view is the operator side of the machine, represented in green. The machine side is represented in red. The blue marked drying cylinder is chosen as reference roll, it is perpendicular to the drawing.

For further information please see www.paralign.info

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