

Application: PARALIGN in a drying section

To many readers the following scenario may be well known: because of an increase of the production speed, felt rolls were changed. Instead of the old ones, such with higher diameter were mounted. A good question is: After replacing the roll, who did the necessary adjustments and how they were done. Was enough time available to measure the rolls with a laser based optical measuring system? In case they could be measured, how was the accessibility for optical systems? Because of the drying hood or in the cellar of the machine, the direct access for optics is limited.



Picture 1: Drying section in a paper mill. Because of the housing in this part of the machine, the use of optical measurement methods is limited. Rolls above or below the drying cylinders can only be measured with additional optical equipment like mirrors or prisms. Such additional equipment reduces the accuracy of the measurement seriously.

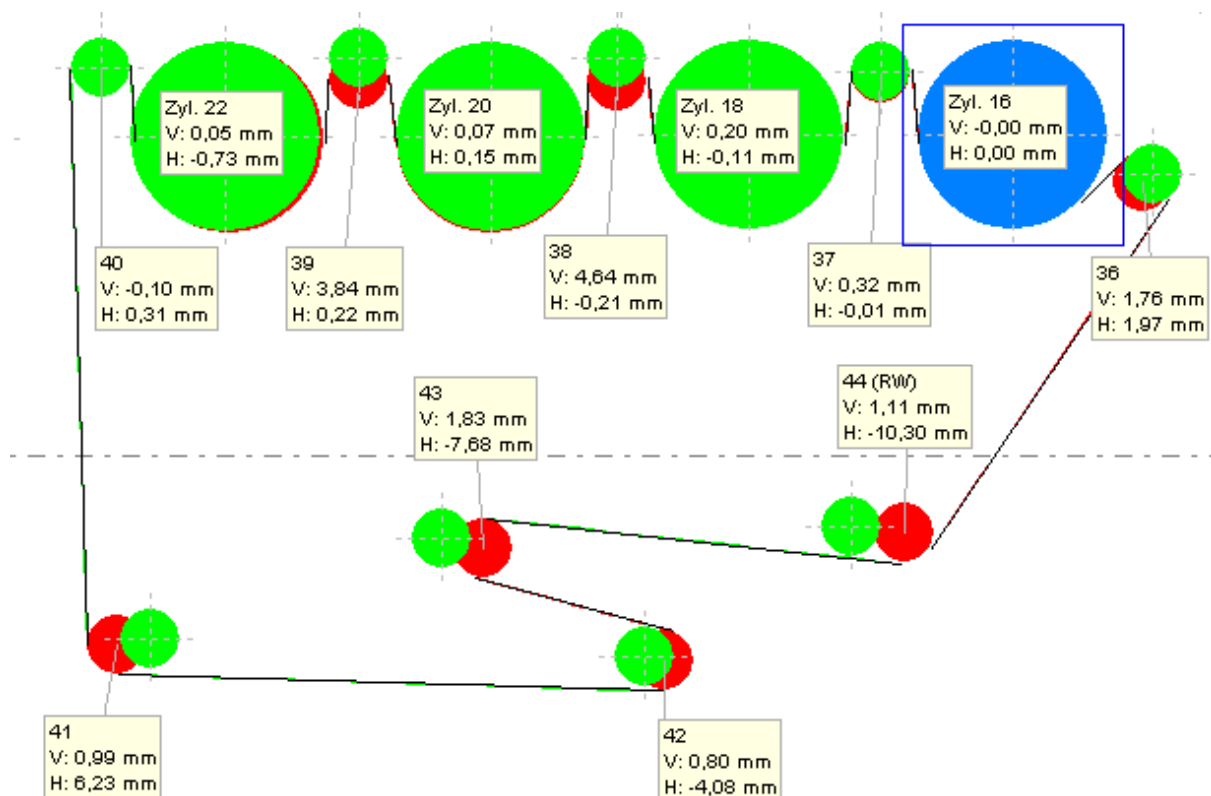
Because of the housing shown in picture 1 the accessibility for traditional measurement systems is often not available. On the other hand the temperature gradient in the still hot drying section complicates the use of optical systems. The deflection of light near hot drying cylinders varies from the deflection at ambient temperature outside the machine.

Unlike traditional measurement systems, PARALIGN uses three so called ring laser gyroscopes. These gyroscopes allow PARALIGN to measure rolls without a line of sight or an outer reference. Thereby the measurement of rolls in the drying section is simplified. Of course this system can also be used in other sections of a paper mill. Picture 2 shows the measurement device, three ring laser gyroscopes are orthogonally arranged inside the device.



Picture 2: On the left, the measurement device PARALIGN with the ring laser gyroscopes in blue. Each gyroscope measures the angle of its rotation axis shown in red. Unlike traditional systems, no line of sight to the rolls from outside the machine is needed. In the right picture the use of PARALIGN is shown. The device is placed on the surface of the roll; afterwards the roll's position is measured by moving the device along the roll.

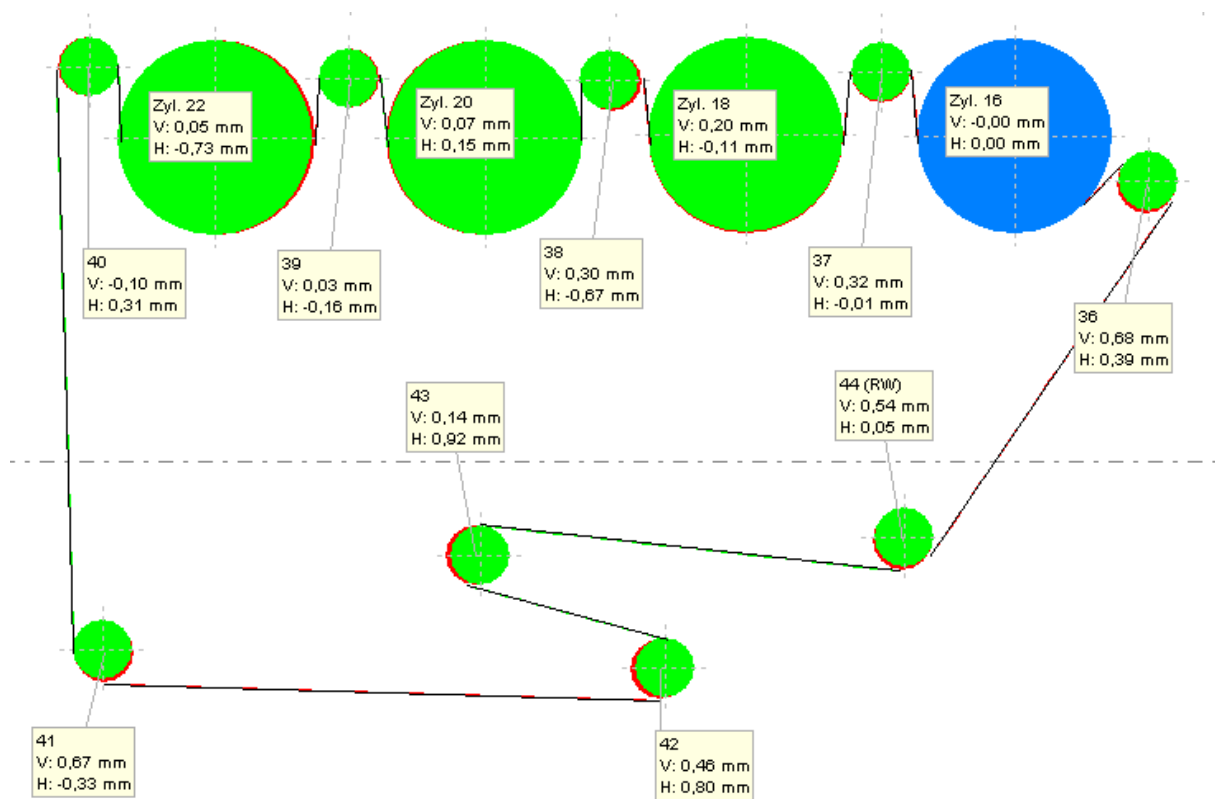
The following article illustrates the operation of PARALIGN in a drying section. Before the measurement the drying wire had to be replaced every six months, instead the usual 12 months. The machine clothing was worn out in half of the planned durability, so a replacement was necessary. The misalignments are shown in the following protocol (pct. 3). The measured offsets are not uncommon; as a matter of fact they are usual after years of production.



Picture 2: Present condition of the drying section before alignment. While the drying cylinders are parallel, the felt rolls show huge offsets. In particular, the offset of rolls with huge enlacement causes not planned wastage of the clothing.

According to the PARALIGN protocol, available immediately after the measurement, several alignment scenarios were simulated before the alignment was carried out. The maintenance field workers corrected the relevant rolls on the same day. The

corrections were verified by immediate remeasuring. The alignment results are shown in the following protocol (pct. 4).



Picture 3: The felt rolls after the correction. Afterwards, the guide and tension roll were aligned, measured and recorded.

After the corrections the lifetime of the drying wire met the planned durability. A reduction of spare part cost was achieved as well as a reduction of not planned downtimes.

In addition to roll exchanges with insufficient alignment there are several other reasons for misalignments. Little by little the roll positions are changing during the years of production.

A not uncommon phenomenon is the rupture of a wire during production. Thereby the framing of the machine can be affected seriously and the position of rolls changes.

The sum of the mentioned events makes a complete measurement of for example the drying section reasonable – also in the light of increasing production speeds in the course of time. The use of PARALIGN during the usual maintenance can save consumable costs especially regarding the machine clothing, and it can also increase the machine availability.

Please find additional information at www.paralign.info.

Matthias Ecker
PRÜFTECHNIK Alignment Systems GmbH
Freisinger Str. 34
85737 Ismaning