530-G Southlake Boulevard
Richmond, VA 23236
tel 804-379-2250
fax 804-379-0189
e-mail info@vibralign.com

MULTIPLE PARALLEL ROLL APPLICATION

Problem

Quality assurance in a major tape and sand paper manufacturer's plant was reported as unacceptable. Reject levels of product from the plant showed figures suggesting 14-15% scrap, and rising. These figures translated to around $200,000 a month. It was estimated that 62% of this could be attributed directly to roll misalignment.

A service company was contacted to ascertain if they could do anything for the plant following a demonstration of Fixturlaser equipment in the customer's plant.

The service company determined that about 4 days would be necessary to position 45 rolls, with no disassembly, with a projected tolerance of +/-.002". The plant's present tolerance requirements were +/-.015" across 4'-0 rolls, and took 2-2½ weeks to complete.

Method of Solution

A datum line was established outside the machine parallel to the center line of the machine within +/-.125". This datum was the laser beam. The height was also adjusted using a measuring tape within +/-.125" from gauge blocks in the floor. This was our datum.

We could now install a rotating prism anywhere in this laser and bend the beam through 90° +/- 1 sec of arc through 360° of rotation. This would enable us, if we took any one side of a roll as zero, to read a variation at the other end. This we did first of all with the "King" roll to establish if it was at 90° to the datum. If we did not get a reading of zero at both ends, and in this case we did not, we take two courses of action. First we could adjust the king roll to the datum, but in most cases this is not possible as the "King" roll is fixed, so secondly we could move the laser accordingly till we got 0.00 at both ends. This was the procedure we used in this instance. The datum is now perpendicular to the king roll.

The next step was to position the penta-prism in the beam in such a position that each roller could be measured individually establishing zero at the

end closest to the beam and a measurement away from the beam. Adjustments were made with the prism at each individual roller aiming for 0.00 at each end.

Several rollers had to be redowelled and holes had to be machined to accommodate bearing movement. The final result after 2½ days we had all rolls within +/- .0005”/ft. In the horizontal plane and, to save time and a second set up only, within +/- .001” in the vertical plane using a good quality machine level.

Special attention was given to rolls with more than 45° of wrap and especially to those with 180° plus of wrap. Where accessibility was poor to the rolls a stand or rod was installed between the roll face and the detector (we only measure variation).

Results available to date indicate:

- an improvement of 65-70% in scrap reduction
- quicker start up time and easier feeding of base material
- an increase in run speed is potentially possible if required by the manufacturer.

An analysis of the adjustments made possible by use of “Fixtur-Laser” equipment and the documentation it provides is as follows:

Savings per year = Previous Scrap x % saving x period - Laser Equipment Value

= ($200,000 x 65% x 12 months) - $30,000
= $1,530,000

This means that with an initial investment of $30,000 for the laser equipment to solve the problem, the plant still realized a savings of over $1,000,000.