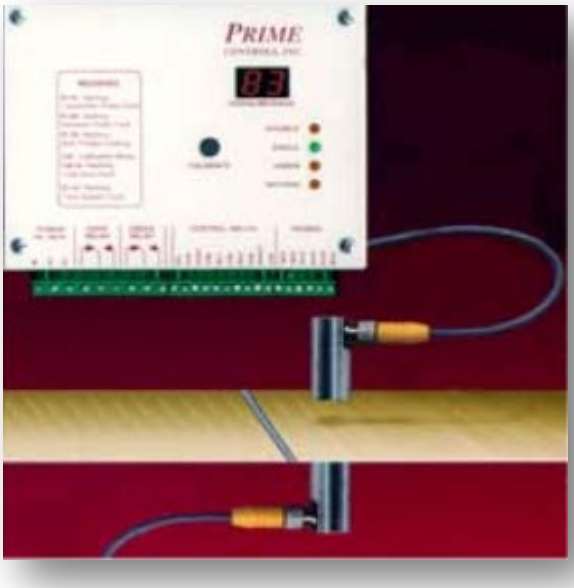
METAL THICKNESS DETECTION FOR STEEL STITCH IDENTIFICATION

Some steel suppliers provide steel coils to plants with welds that splice two separate coils together. This is done to recover prime metal from a partial coil that is either damaged or was left over from an order that did not require a full coil. This provides substantial savings to steel users who are able to overcome the flaws. Those savings are as much as 75%.

Several small coils are run back through a rolling mill or coiler in order to splice (aka stitched) together into one large coil. The quality of these splices vary from "hardly noticeable welds" to "real tool killers". Allowing a weld to enter a press or roll former may cause serious damage to tooling, bearings, shafts as well as potentially create defective formed products. Welds are also aesthetically unwanted by most users.



It is the responsibility of the operator to detect the weld with aid of a marker. A photoelectric sensor is sometimes used to sense a hole placed near the weld by the rolling mill operator/supplier. However, a photoelectric sensor is susceptible to failure from metal dust, solvents or the supplier neglects to punch the hole. Instances were an operator is responsible, puts the tooling at risk when he is distracted by other duties.

To our detectors the weld looks like thicker metal. We originally tried to solve this problem with a Model DS150. After we determined that the solution required many additional features, the application evolved to a Model DS1500, and then our Model DS1510. The Model DS1510 and many of its unique features are a result of this problem. The Model DS1510, Metal Thickness Detector detects the stitch directly without the aid of a warning hole. It features automatic calibration, reference tracking, and much more.

It's sensing assembly is mounted where metal enters machine. The electromagnetic field of the sensing assembly is continuously monitored by Prime's Model DS1510 detector for any thickness increases that indicate a stitch. The detector operates with two probes (transmitter & receiver) that are mounted on opposing sides. The receiver probe is mounted 10-15mm above the transmitter probe. As the metal passes between the probes, an electromagnetic field created by the transmitter is monitored by the receiver. The received signal changes in proportion to the metal thickness and stitch. This effect causes the control output to respond.

The signal from the receiver probe is converted in the DS1510 to a digital signal that is equivalent to the thickness of the steel. The display on the front of the control chassis provides a visual readout of signal strength. The Model DS1510 also considers the rate of thickness change. We call this "reference tracking". A weld causes a sudden decrease in signal causing the OVER output relay contact to open. The over output is normally closed for fail-safe purposes. A provision is made to optionally allow slow increases in metal thickness to pass.

The Over output relay which is used as the stitch indicator, connects to the machine run circuit or to a warning device. The output will remain closed until it is reset by depressing an external reset push-button switch or through energizing external contacts when the machine is restarted. Below our specifications for the Model DS1510.