

## Non-contact Temperature Measurement Within a Gap

Non-contact temperature measurement of sheet metal characterized by low thermal radiation—such as cold rolled steel strips or laminated steel—can be problematical, especially at low temperatures. Because of the material's low emissivity, a pyrometer will detect additional radiation reflected onto the metal sheet or strip. Changes in ambient temperature or in the strip's emissivity, for instance due to different lacquer coatings, will—at a constant strip temperature—effect a change in the temperature reading displayed.

In order to obtain a reliable measurement with reproducible temperature values, a pyrometer can be aimed into the gap or wedge between the material and the guide roller. The pyrometer must be positioned on the side where the sheet loses contact from the guide roller. We can assume that, immediately after the strip separates from the roller, the metal strip and roller will have the same temperature (this is true as long as the roller is neither cooled nor heated). When measuring the metal strip at this position within the gap, the radiated thermal energy which the pyrometer detects will be constant, irrespective of the material's emissivity or reflectivity.

In such a geometric arrangement, extraneous reflected radiation will not have any bearing on the temperature reading.

