

#98: IRT/C'S -- USE WITH HEATED METAL ROLLERS / WEB PROCESSES TO INCREASE PRODUCTION (OEM & RETROFIT)

By using IRT/c sensor technology, a dramatic increase in high quality output of web processing can be achieved. Use the IRT/c's with chrome-plated, stainless steel, or other uncoated metal rollers as well as with coated rollers. IRT/c systems enable the user to:

- Increase throughput speeds up to 20%, or more, on the same machine
- Reduce scrap up to 75% or more
- Shorten set-up times
- Process a greater variety of web materials on the same machine

Applications / Processes that would benefit from the use of IRT/c technology:

- Textile Processing
- Paper Processing
- Opaque Films Processing
- Any continuous web processes using heated (or cooled) rollers

Use of Exergen's unique patented, non-contact infrared sensors solves past technical difficulties associated with temperature measurement of shiny, uncoated metal rollers (due to the high infrared reflectivity of the uncoated metal surfaces). Exergen has developed and tested a two stage approach to accurately measure and control the heat output of heated (or cooled) metal rollers using our IRT/c's—even at very high speeds.

Stage 1: START-UP and STAND-BY Temperature Control

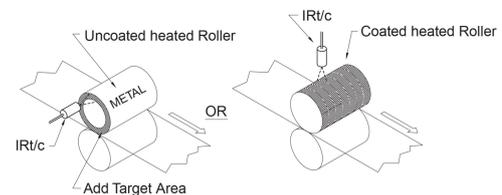
During start-up and stand-by conditions, the temperature of the heated roller will become fairly uniform throughout the roller surfaces. Because of this, the temperature can be reliably measured at any convenient location on the surface, or the edge, of the rollers.

So, for **Stage 1**, simply install an IRT/c so that it can see a reliable signal from the roller.

Uncoated metal rollers

On an unused edge of the roller, install a durable non-metallic target surface finish. This can be done with:

1. a durable epoxy paint
2. the addition of a thin metallic hoop, or ring, with a Teflon coating
3. or the addition of a thin hoop, or ring, of black, hard-anodized aluminum



Stage 1: Start-up, Stand-by

Install an IRT/c sensor so that it looks at this coated surface. Use this sensor to control the temperature of the roller during start-up and stand-by modes

Coated metal rollers (silicon coating, Teflon, any non-metallic coating, etc.)

Install an IRT/c to aim at the center, or any convenient location, on the surface of the roller.

Stage 2: Running Temperature Control

For **Stage 2**, install an additional IRT/c sensor to look directly at the web surface after it contacts the heated roller. As the web begins to move, (or, at a preset rpm) the temperature control system for the roller should be switched over to a control system connected to this IRT/c sensor.

This IRT/c sensor should be mounted so that it looks at the side of the web material that is heated by the roller. For webs heated on two sides, sensors should be mounted on each side to control each heated roller.

For wide webs: multiple IRT/c sensors can be installed across the web.

For multi-zone rollers: use at least one IRT/c for each zone across the web.

Explanation

The most common errors in web processing are as follows:

Temperature Measurement Errors - errors due to incorrect temperature measurement.

- Thermocouple "Slip ring" signal errors
- Internal temperature sensor location errors

Heat Transfer Errors - errors caused by variations of heat transfer to the web.

- Web material changes in thickness, moisture content, etc.
- Dirt build-up on the heater roller surface that can impede heat transfer to the web
- Changes in pressure applied to the web as it contacts the heated roller

As the roller speeds up, heat is removed from the roller surface by the web material. Temperature gradients appear inside the roller, and on the roller surface. Conventional embedded, surface, or edge temperature sensors cannot adequately track and compensate for all these temperature variations, nor can they adequately measure the amount of heat transferred to the web material. Exergen's Two Stage IRt/c Sensor & Control System automatically reduces all these sources of web temperature processing errors. Thus, the actual temperature of the webs can be both tightly (to within a few degrees) and consistently controlled through the use of IRt/c sensor technology. The rugged IRt/c sensors need no power supply, no periodic calibration, and are designed for years of trouble-free operation. For additional technical assistance, please contact CleverIR.