

The information and data contained in this document were prepared by a technical committee of the Association. The committee and the Association assume no liability or responsibility in connection with the use of such information or data, including but not limited to any liability or responsibility under patent, copyright, or trade secret laws. The user is responsible for determining that this document is the most recent edition published.

Conducting a corrugator temperature audit

Scope

Corrugating Process Temperature Audits are crucial to a well run boxplant. The Temperature Evaluation of heated surfaces during the manufacture of corrugated board provides valuable troubleshooting information. This TIP will limit its focus to general evaluation techniques. Each boxplant will want to develop a program of regular temperature checks as part of their quality process.

Definitions

Evaluation equipment

- (1) *Infrared Non-Contact Pyrometer.* This is a very valuable, safe tool to use. Read the Manufacturer's Instructions regarding emissivity adjustments which depend upon surface color or gloss. Inexpensive non-gloss gray/black primer spray paint can sometimes be used to dull a surface to allow for accurate measurement.
- (2) *Contact Pyrometer.* Requires probes which will contact the heated surface. Work as safely as possible with this type of equipment!

Safety precautions

Use extreme caution during heated surface testing. Steam vessels under pressure can be an explosion hazard.

Contents

Evaluation points

Either the operator side and/or drive side of the corrugator.

- (1) Main Steam Headers
- (2) Steam Inlet and Outlet pipes for each heated surface
- (3) *Heated Surfaces.* Corrugating Rolls, Pressure Rolls, Liner Preheater Rolls, Gaylord Showers, Preheaters, Preconditioners, Glue Machine Stationary Preheaters, Hot Plates

TIP Category: Data and Calculations
TAPPI



Documents
Document Sharing Hub

Evaluation techniques

- (1) The manufacture of corrugated board is a wetting/drying process that is completely dependent upon the amount of available heat and upon the transfer of this heat to the paper components.
- (2) Heated surface evaluation data is most viable when collected as board is being manufactured.
- (3) When large diameter rolls are being evaluated, check the top and the bottom surface temperatures to determine if there is a temperature differential.
- (4) Use a prepared form to collect the temperature data. If the data can be downloaded to a spreadsheet, the evaluations can be charted over a specific time frame.
- (5) Obtain a steam pressure/temperature conversion chart for comparison purposes.
- (6) Using OEM specifications, prepare a list of target temperatures/pressures for each heated surface. These can be included on the evaluation form.
- (7) Develop a pattern of evaluation whereby the same point of evaluation is used repeatedly. This will help minimize large swings in reported temperature for each heated vessel. Be sure to include the steam pressure along with the temperature whenever possible as backup information.
- (8) Discuss the desire to evaluate heated surface temperatures with your equipment supplier. Ask for their recommendations regarding safe measuring equipment and techniques for specific pieces of equipment. It may be better, for example, to measure the temperature of the hot plates from underneath the machine rather than on the surface in contact with the paper from a safety standpoint.
- (9) By including the steam inlet and outlet temperatures for each vessel in our analysis, we can determine if we are getting enough of pressure drop across the machine, which will be an indication of delivering heat to the surface in question.
- (10) Many steam or heat issues are the result of insufficient information. Consult both your corrugating equipment manufacturer and steam equipment supplier for updates regarding maintenance and heat evaluation techniques.

Keywords

Temperature, Measurement, Corrugating machines, Heating, Rolls, Plates

Additional information

Effective date of issue: March 19, 2002.

Working Group Members:

Peter A. Snyder - Chairman, Harper/Love Adhesives Corporation
Richard J. Croker, Georgia Pacific Corporation
Ray Schultz, Beacon Container Corporation

