Application Note:

Using the ThermoBiscuit™ and I-Probe™ for Bakery Production with Rotary-Rack Oven

Objectives:

Collect time vs temperature data for product and oven.
Generate a standard production report of baking process.
Verify a new production process.

Required Materials:

1. Measurement System
   - ThermoBiscuit™
   - I-Probe™
   - GateWay™

2. Rotary rack with multiple bakery pans

3. Muffin dough

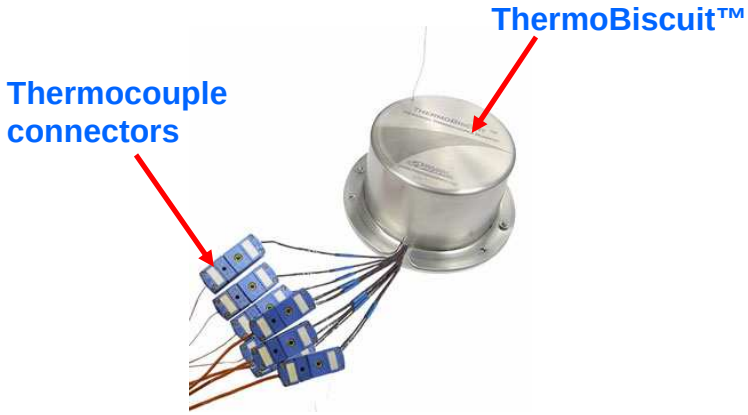
Procedure for collecting temperature data

Step 1. Setup ThermoBiscuit as a real-time data module

(1a) Install batteries in the ThermoBiscuit (do not replace ThermoBiscuit cover yet).
(1b) Connect ThermoBiscuit to the thermocouple connectors.
(1c) Start DataLink software on a laptop.
(1d) Set up ThermoBiscuit as a real-time data module following the instructions in ThermoBiscuit Quick Start Guide.

Note: ThermoBiscuit is now collecting temperature data from I-probes
See temperature updates on the real-time data displays

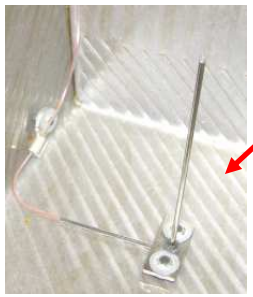
(1e) Replace and secure the ThermoBiscuit cover.



Procedure for collecting temperature data (cont'd)

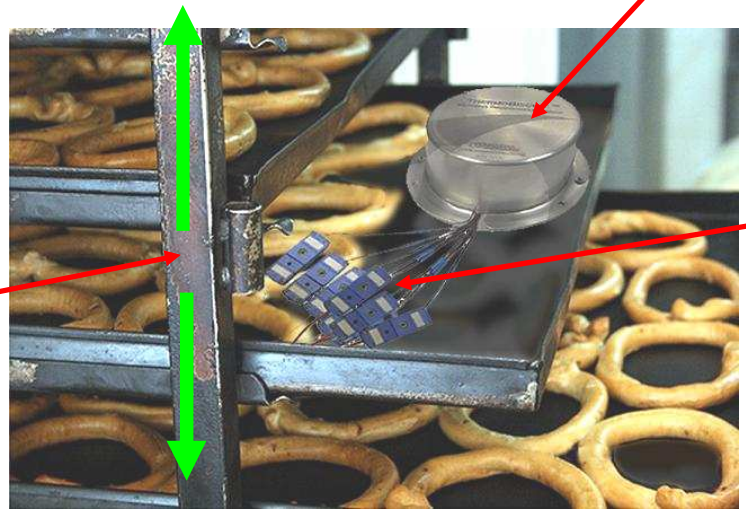
Step 2. Prepare hardware for placement in pan

(2a) Install the ThermoSleeve onto ThermoBiscuit
(2b) Adjust the I-probe positions to measure the pastry core temperature and the oven air temperature.



Use I-Probe stand for fixed height measurement

ThermoBiscuit™
(add ThermoSleeve for long bake time)



Extend thermocouple wires to connect with I-Probes

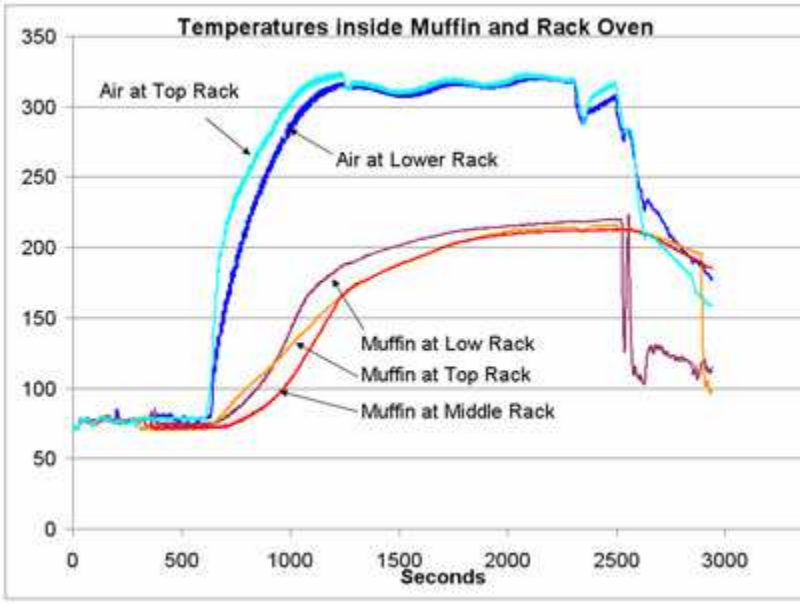
Thermocouple connectors

Insert I-Probes into bakery product or attached them to the bakery pan surfaces

Procedure for collecting temperature data (cont'd)

Step 3. Ready to bake: Move the entire rotary rack inside the oven

(3a) Check the real-time temperature curves rise according to the oven heat.
(3b) Wait for the baking to complete.
(3c) Observe the product core temperatures versus the product surface color.
(3d) When the product core temperature meets the specification, record the final bake time.



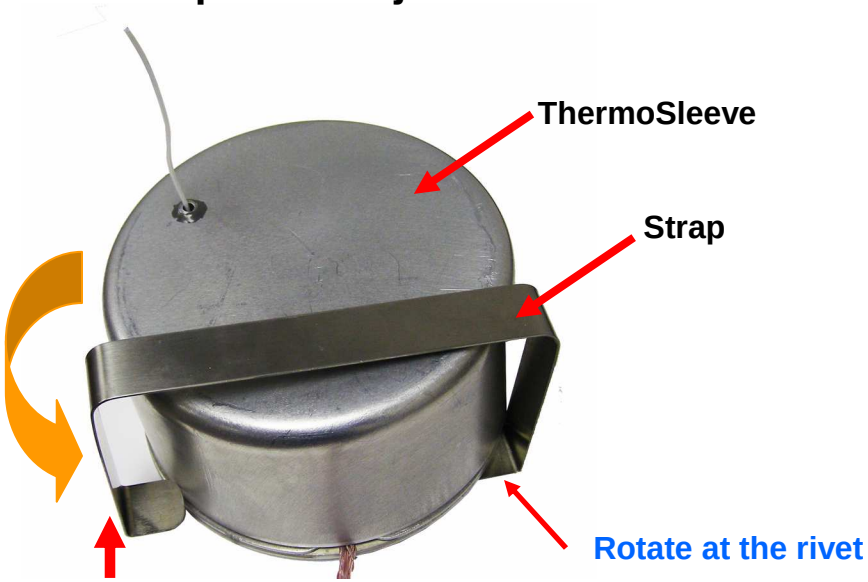
(3e) Ready to move the rack out of the oven.

Procedure for collecting temperature data (cont'd)

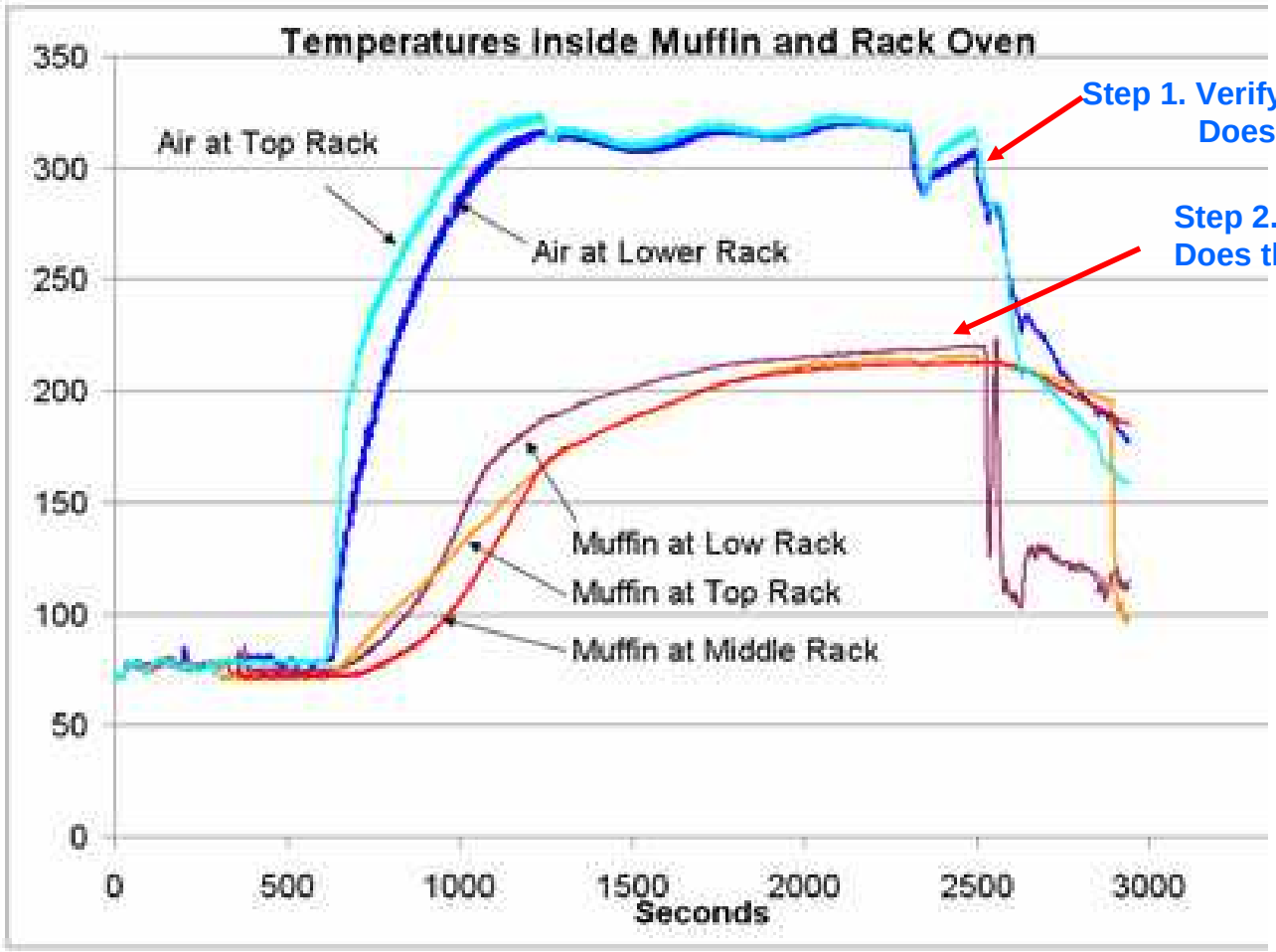
Step 4. Getting ready to generate a data report

(4a) Move the rotary rack out of the oven.
CAUTION- DEVICES ARE HOT! POSSIBLE BURN HAZARD!
(4b) Remove ThermoSleeve and strap from ThermoBiscuit
(4c) At the software DataLink, select [Stop Test]. The software will now start the report generation process. Follow the instructions to generate a data report.

Note: ThermoBiscuit has now completed its job.



Baking Analysis using temperature curves



Step 1. Verify oven temperature at each zone. Does it meet the zone set-point?

Step 2. Does the baking curve look right?

Step 3. Does the texture and color look right when the temperature meets the target value?

Scenario 1. Zone temperatures do not reach the setpoint

Step 1. Repeat the test and confirm that the air probes did not contact metal surfaces.

Step 2. If there are any inconsistencies, verify the oven thermometer reading and oven components.

Scenario 2. Baking Profile does not meet specification

Step 1. Compare product core temperature readings to confirm that they are consistent. The I-probe with stand measures the temperatures at specific core locations.

Step 2. Verify that bakery pan surface temperature probe meets the baking requirement..

Step 3. Re-run the test to confirm the baking profile consistency.

Senario 3. Generate a standard baking profile for production

Step 1. Use the JPEG chart to provide a **standard baking curve**.

Step 2. Generate a specific report for each product line configuration:
- Different zone temperature set points
- Different bakery ingredients

Step 3. Run every week to verify oven conformity and ensure production consistency.

Step 4. Track the product shelf life versus its baking profile.

Step 5. Develop the baking profile to optimize the product shelf life.

We are sure you will find
ThermoBiscuit system
useful for your production lines.

Please enjoy its convenience and benefits.