

Procedure for Measurement and Classification of Temperature Uniformity in Ovens**Effective date: 2025-08-31****1. Purpose and Scope**

This standard defines the procedure for measuring, calculating, and classifying temperature uniformity in ROMER ovens. It serves as the basis for quality assessment as well as for determining warranty and pricing parameters.

2. Definitions**2.1. Uniformity Tolerance**

The temperature difference (delta) between readings of 9 type K thermocouples, measured in an empty oven, without any load, during a heating cycle. The measurement must be taken at least 5 minutes after the setpoint temperature is reached on the controller and at least 5 minutes after door closure (if doors are part of the design).

2.2. Measurement Points

Measurements are taken in a minimum of 9 points within the heating zone:

- 4 points in the front corners
- 4 points in the rear corners
- 1 point centrally in the middle of the structure

Minimum distance of measurement points from walls/doors: 10 cm.

2.3. Cycle

One cycle consists of a setpoint temperature and a soaking time.

2.4. Consumption per Cycle

Estimated energy consumption required to heat the maximum permissible load (made of carbon steel) to the specified temperature.

2.5. Heating Cycle

A cycle consisting of a single heating step.

2.6. Heating Step

Step in which the oven heats up from a measured lower temperature to the specified higher setpoint temperature.

2.7. Cooling Cycle

Step in which the oven cools down from a measured higher temperature to the specified lower setpoint temperature.

3. Measurement Procedure**3.1. Measurement Conditions**

- Empty oven, without load
- Use of 9 type K thermocouples
- Measurement during heating cycle
- Stabilization time: at least 5 minutes after reaching the setpoint temperature
- If doors are part of the design: at least 5 minutes after closing them

3.2. Sensor Placement

Sensors must be placed in 9 points according to section 2.2, maintaining a minimum distance of 10 cm from walls and doors.

Special note:

If, during normal operation, the oven design does not include closed doors, measurements are taken in the usable heating zone, at a distance not less than the height of the loading opening. Measurements are performed along the travel path of the workpiece.

If there is an air curtain, it is treated as an external surface — not as a heating zone. Measurement points must be placed accordingly away from the curtain.

3.3. Documentation

A photo documenting the placement of the measuring sensors must be taken.

4. Temperature Uniformity Classification

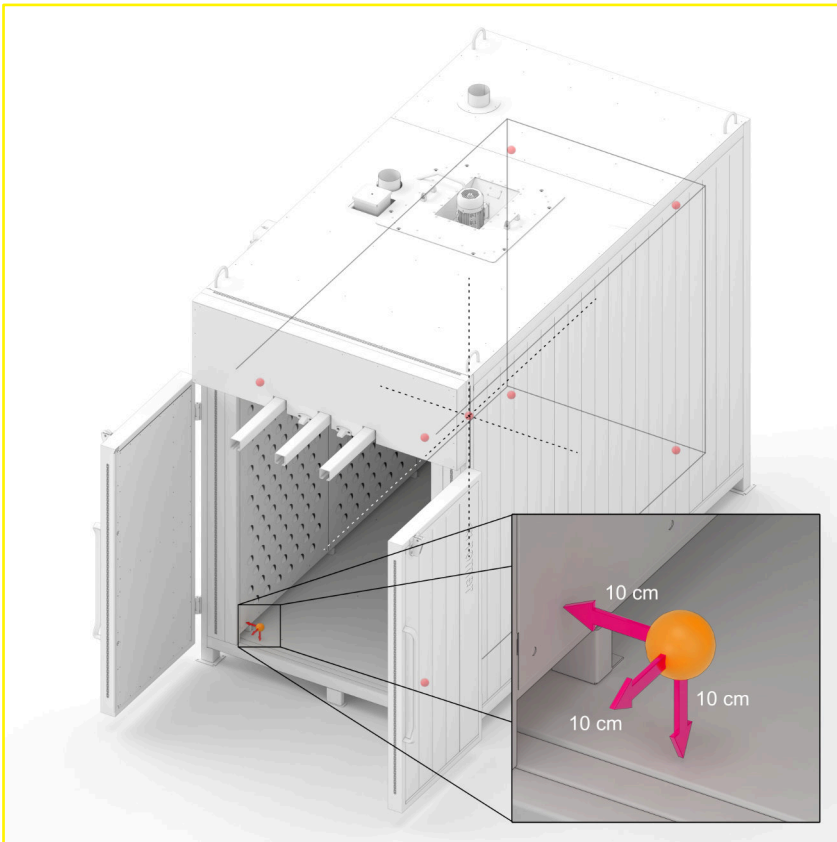
Classification principle: The greater value between absolute [°C] and relative [%] is taken.

Class	Absolute Value [°C]	Relative Value [% of setpoint temperature]	Classification Criterion
1	3°C	1.5%	Greater value decisive
2	6°C	3%	Greater value decisive
3	8°C	4%	Greater value decisive
4	10°C	5%	Greater value decisive
5	14°C	7%	Greater value decisive
6	24°C	12%	Greater value decisive

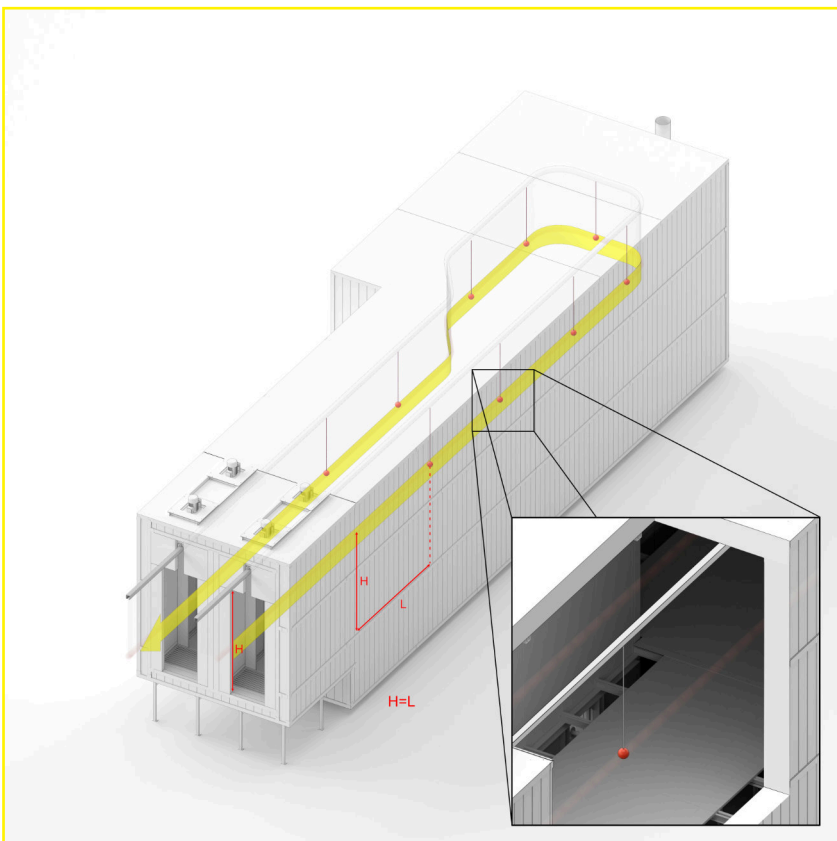
5. Attachments

- Attachment A: Diagram of Measurement Point Layout

Attachment A: Diagram of Measurement Point Layout



Oven



Tunnel automatic oven
