

related test method	<b>EN 1634-1: 1999 Fire Resistance tests for door and shutter assemblies Part 1: Fire doors and shutters</b>
subject	<b>Testing of glass fire doors and need / how to measure temperature of (leaf) frames</b>
reference of original query	TC2 N262rev2 Helpdesk 2000-04 & 05, TC2 N321

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**Problem**

The standard defines (§ 9.1.2.3c) that the maximum temperature of the door or shutter leaf shall be measured 100 mm in from the edge of the door leaf. In doors incorporating discrete areas of different thermal insulation, e.g. glass doors with a metallic (or other material) leaf frame this point often coincides with the joint between the different areas of thermal insulation, i.e. the joint between the glass and the metallic (or other material) leaf frame.

The standard also defines (§ 9.1.2.4c) that the maximum temperature (supplementary procedure) of the door or shutter leaf shall be measured using additional thermocouples placed 25 mm in from the edge of the door leaf.

EN 1634-1 does not clearly define what to do in respect of thermocouple placement in doors incorporating discrete areas of different thermal insulation where the specified thermocouple positions coincide with the junction between these areas of differing thermal insulation.

Supplementary question: is it necessary to control the temperature of (leaf) frames in glass doors when testing to I<sub>2</sub> criteria?

**Recommendation**

Where door leaf(ves) incorporate discrete areas of different thermal insulation [e.g. doors with leaf frames of different composition to that of the main part of the door] these areas are required to be evaluated separately, and the maximum temperature rise of these areas shall be measured from thermocouples distributed in accordance with EN 1634-1 § 9.1.2.3c and figure 22 as follows:

- If the width of the leaf frame is greater than 115 mm, position the thermocouples on the leaf frame at 100 mm in from the clear opening of the leaf.
- If the width of the leaf frame is between 85 mm and 115 mm, position the thermocouples as close as possible to the joint between the discrete areas of thermal insulation.
- If the width of the leaf frame is less than 85 mm, position the thermocouples on the main discrete area of thermal insulation at 100 mm from the clear opening of the leaf.



Thermocouples shall be fixed to the inside edges of the clear opening for:

- *hinged or pivoted doors opening towards the furnace*
- *shutters or sliding doors installed on the exposed side of the supporting construction*

Thermocouples shall be fixed to the visible part of the edge of the door leaf for:

- *hinged or pivoted doors opening away from the furnace*
- *shutters or sliding doors installed on the unexposed side of the supporting construction"*

Where door leaf(ves) incorporate discrete areas of different thermal insulation [e.g. doors with leaf frames of different composition to that of the main part of the door] the maximum temperature rise of these areas (supplementary procedure) shall additionally be measured from thermocouples distributed in accordance with EN 1634-1 § 9.1.2.4c and figure 22 as follows:

- If the width of the leaf frame is greater than 40 mm, position the thermocouples on the leaf frame at 25 mm in from the clear opening of the leaf.
- If the width of the leaf frame is between 10 mm and 40 mm, position the thermocouples as close as possible to the joint between the discrete areas of thermal insulation.
- If the width of the leaf frame is less than 10 mm, position the thermocouples on the main discrete area of thermal insulation at 25 mm from the clear opening of the leaf.

Thermocouples shall be fixed to the inside edges of the clear opening for:

- *hinged or pivoted doors opening towards the furnace*
- *shutters or sliding doors installed on the exposed side of the supporting construction*

Thermocouples shall be fixed to the visible part of the edge of the door leaf for:

- *hinged or pivoted doors opening away from the furnace*
- *shutters or sliding doors installed on the unexposed side of the supporting construction"*

It is agreed that if the test is being performed to evaluate compliance against  $I_2$  criteria only, it is not necessary to place thermocouples on (leaf) frames.

If the test is being performed to evaluate both  $I_2$  and  $I_1$  criteria, then thermocouples shall be placed on (leaf) frames using the thermocouple locations defined above.