

related test method	<b>EN 1363-1: 1999 Fire resistance tests – General requirements</b>
subject	<b>Deduction of the insulation performance criteria</b>
reference of original query	EGOLF TC2 Round Robin (RR TC2 09-1)

---

### Problem

The results from the EGOLF TC2 Round Robin (RR TC2 09-1) has shown that 1/3 of the participating labs made errors in the deduction of the insulation performance criteria. Many of these errors were caused by a misunderstanding of the rules on determining the time of failure of the insulation criteria.

The purpose with this EGOLF recommendation is by two examples to clarify the rules on determining the time of failure of the insulation criteria.

### Recommendation

Unexposed temperature measurements are for resistance to fire test with reference to EN 1363-1 performed in two ways, by fixed thermocouples and by using the roving thermocouple. The fixed thermocouple is a continuous measurement performed each minute where as the roving thermocouple is an instant measurement (similar to the gap gauge and cotton pad test). The difference in interval between continues and instant measurement results in a difference in the interpretation of the results.

### Deduction of the insulation performance criteria using results from fixed unexposed thermocouples

In EN 1363-1 the performance criteria for insulation (§ 11.3) is defined as:

*the time in **completed minutes** for which the test specimen continues to maintain its separating function during the test without developing temperatures on its unexposed surface which either:*

- a) increase the average temperature above the initial average temperature by more than 140 °C; or*
- b) increase at any location (including the roving thermocouple) above the initial average temperature by more than 180 °C.*

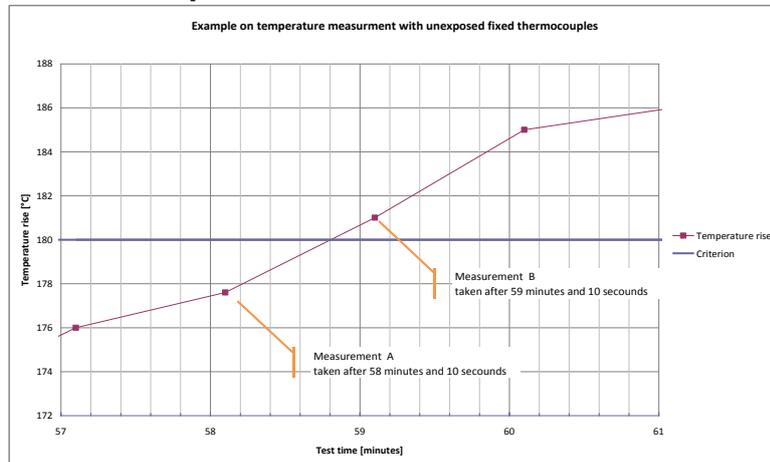
In EN 1363-1 the time of insulation failure is defined the last full minute where the test specimen still fulfils the insulation criteria NOT en time when the first measurement above the criteria is recorded. The difference is illustrated on the example 1 *Determination of insulation failure for maximum temperature rise using fixed unexposed thermocouples.*



Measurement A is the last measurement below the criterion. It verifies that the criterion is fulfilled for 58 minutes and 10 seconds => 58 full minutes. Measurement B is above the criteria and it implies that the test specimen did not fulfill the criteria after 58 minutes and 10 seconds.

The conclusion is therefore that the test specimen fulfilled the criteria for 58 minutes (or that failure occurred after 58 minutes)

### Example 1 Determination of insulation failure for maximum temperature rise using fixed unexposed thermocouples

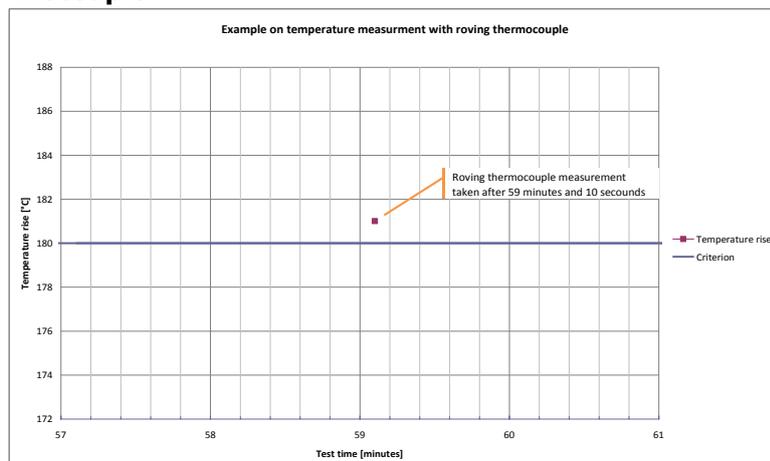


### Deduction of the insulation performance criteria using results from the roving thermocouple

Because the roving thermocouple is an instant measurement, any measurement performed with the roving thermocouple that exceeds the criterion can only be used to verify that the test specimen no longer fulfills the criterion.

The consequence of this is illustrated in the example 2 *Determination of insulation failure for maximum temperature rise using the roving thermocouple.*

### Example 2 Determination of insulation failure for maximum temperature rise using the roving thermocouple



The measurement is taken after 59 minutes and 10 seconds and the result is above the criterion. The measurement can therefore "only" verify that the failure of insulation has occurred after 59 minutes. Assuming that in this case all fixed thermocouple measurements fulfil the criteria the conclusion in the report should be that the test specimen fulfilled the criteria for 59 minutes (or that failure occurred after 59 minutes).