ÉMI

NON-PROFIT LIMITED LIABILITY COMPANY FOR QUALITY CONTROL AND INNOVATION IN BUILDING

Doorsets with fire resisting characteristics. Requirements, tests, classification. Potential usability of simulation softwares.

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Basic rule:

The performance of fire resisting doorsets

- have to be in accordance with the appropriate product standards (standard, non-fire resistant doors)
- shall meet extra requirements for testing in accordance with EN 14600 supporting standard

Generally, a test specimen ...

- shall represent a structure to be used in practice, in the most critical arrangement (the largest size, the least favourable arrangement, etc.), and
- shall incorporate elements of building hardware (hinges, door closers, etc.) which comply with harmonised technical specifications, and
- shall incorporate seals, gaskets, stripes which are part of the doorset for testing, and
- shall incorporate glazed elements (including the largest one) if the doorset is planned to incorporate glazing

Tests to be performed:

Fire resistance test, in accordance with EN 1634-1 standard

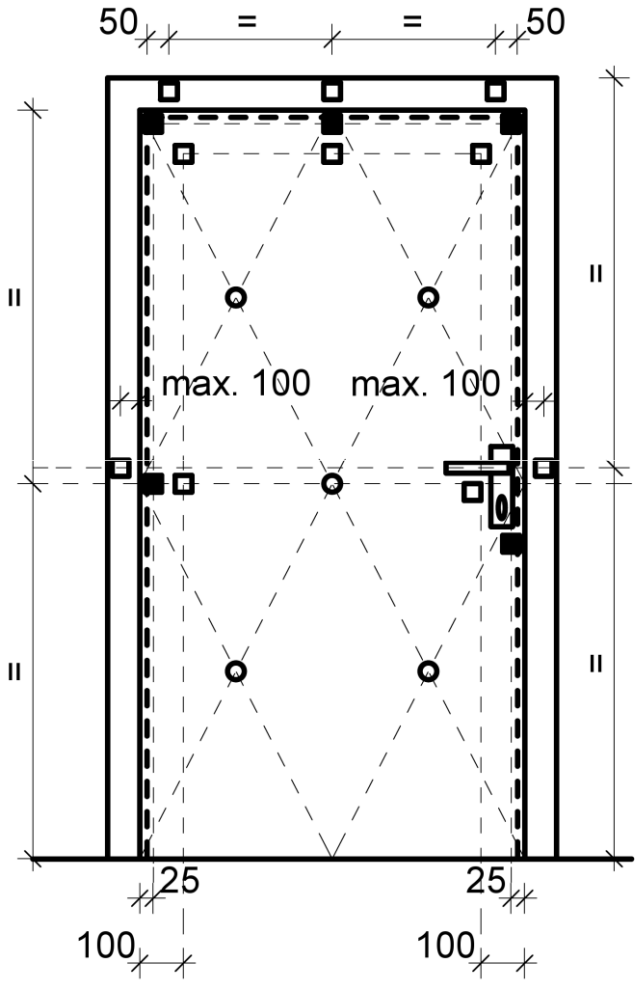
Durability of self closing, in accordance with EN 1191 / EN 12605

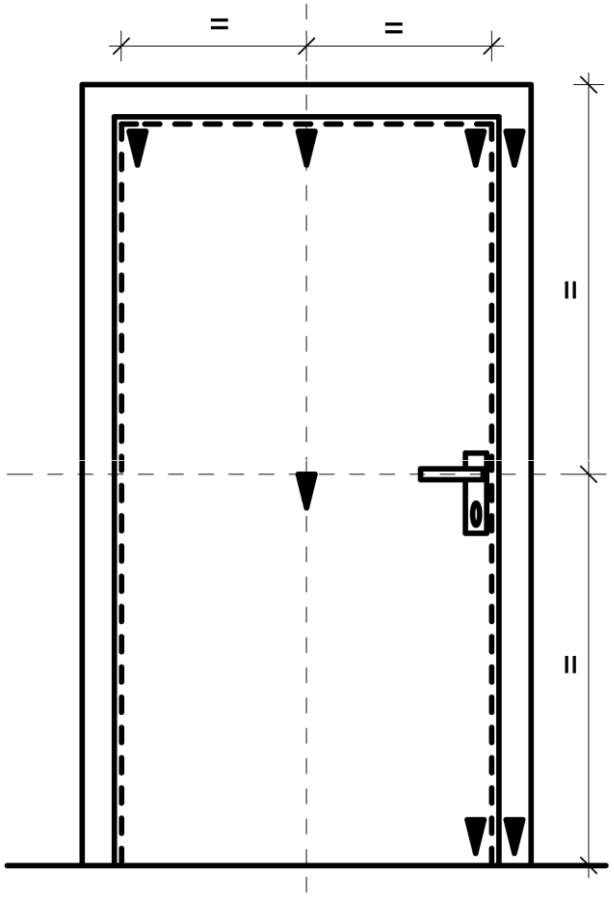
The specimen to be tested to EN 1634-1...

- shall be full size (size of industrial doorset ↔ size of furnace 3×3 m)
- shall be built into a standard rigid or flexible supporting construction, inside a standard testing frame
- shall be checked in the test frame
  - for operability (from fully closed to fully open, 25 cycles)
  - for self closing at the allowed maximum closing speed
  - for correct setting of gaps and retention force

During the fire resistance test ...

- integrity (E) performance is checked through using a cotton pad, gap gauges, and through visual monitoring
- insulation (I) performance is judged through monitoring
  - average temperature rise (max. of 140 K)
  - maximum temperature rise: I_1 (max. of 180 K, supplementary proced.)
  - maximum temperature rise: I_2 (max. of 180 K / 360 K)
- radiation control (W) can be measured, but often judged indirectly





o TC for average temperature rise

□ TC for maximum temperature rise (I_2)

■ TC for maximum temperature rise (I_1)

▼ suggested position for measuring deflection

Durability test of self closing

- on the specimen to be fire tested, prior to the fire test

or

- on a separate specimen

Classification of fire resisiting doorsets

- integrity (E)
- integrity and insulation (EI_1, EI_2)
- integrity and radiation (EW)

⇨ E 60 / EI_1 60 / EI_2 60 / EW 60-C5
E 60 / EI_1 45 / EI_2 60 / EW 60-C5

in accordance with EN 13501-2,

- durability of self closing

in accordance with EN 14600 and EN 13501-2.

The allowable changes - direct application of test results (EN 1634-1).

'Conservative' principles permit

- increase materials' density;
- increase the number of building hardware elements;
- decrease width and height of the doorset, *while only quite limited increase is allowed.*

Extended application standards

- based on experts' opinions
- additional considerations, additional informations

Potential usability of simulation softwares

- provide informations for extended application of fire test results
- provide principles for future harmonised product standards
- help the development of new products

Questions

- Changes in materials' properties
  - availability of numerical values?
  - usability of changing values?

  → cooperation of manufacturers & laboratories
- Choosing parameters?

  → cooperation of leading experts

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Thank you for attention!

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