

## Technical Information

## Flammability assessment based on DIN 4102

DIN 4102 is a standard that defines the fire behaviour of building materials and elements. It primarily applies to materials classed as building components, such as wall and ceiling panels, floor coverings, air shafts, general building materials, etc.

### Building material classes A1 and A2

Products in this class are defined by the building inspectorate as non-combustible materials. A great many standard building materials, including stones, steel, copper, etc., are listed in DIN 4102 Part 4 and do not need further testing.

Materials not covered by DIN 4102 Part 4 are tested in a complex procedure using a fire model to simulate a growing, partly fully developed fire. For example, before the flame is applied, the specimens are heated in a furnace to 750 °C.

**Building material class A1** means that under these conditions the materials do not release any significant amount of heat or any ignitable gases.

**Building material class A2** means that under these conditions the materials release all but a very low amount of heat and only a limited amount of ignitable gases, with safe levels of smoke development.

Building material classes B1, B2 and B3

Products in this class are defined by the building inspectorate as follows:

- B1 not easily flammable materials
- B2 flammable materials
- B3 easily flammable materials

### Building material class B1

The meaning of class B1 varies depending on the installation situation of the material to be tested.

Building materials except cladding for external walls and floorings

The test provides a fire model simulating a single burning item (e.g. waste basket) in a room with a ceiling. The fire must not spread significantly beyond the primary fire area and the heat release must be minimal.

Cladding for external walls

The test provides a fire model simulating flames penetrating through a wall opening. The fire may not spread significantly beyond the primary fire area.

Floorings

The test provides a fire model simulating a situation in which the flames penetrate into the next room through a door opening. The horizontal flame spread and the smoke development must be insignificant.

Flooring is subjected to a special test that reflects the above situation.

All other material is placed in a fire shaft with a flame applied to the specimens in vertical position.

Parameters used in the assessment include residual length of the specimens, smoke gas temperature and density, and flaming droplets.

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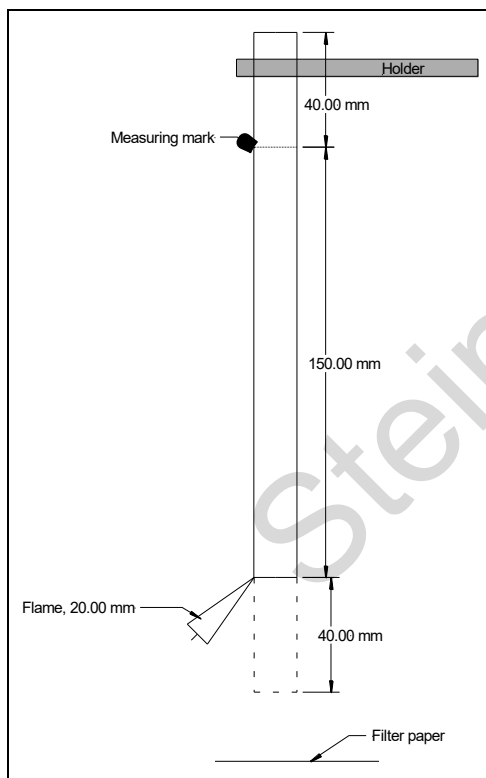
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### Building material class B2

The test provides a fire model simulating a small flame attack (e.g. match flame). The flammability and the flame spread over a defined time period must be limited.

The specimen is arranged in vertical position and a 20 mm high propane gas flame is applied for 15 seconds either to the edge (edge flaming) or to the surface (surface flaming). Filter paper placed under the specimen is used to observe the occurrence of flaming droplets. Edge flaming tests are carried out on building materials without protected edges. Testing with protected edges is performed only if the edges will not be exposed after installation. If the edges may become exposed in use, a surface flaming test is carried out additionally.

The test is carried out on a set of 5 specimens each with the dimensions of 90 x 190 mm for the edge flaming and 90 x 230 mm for the surface flaming



Test setup for edge flaming  
(specimen length 190 mm).

For the surface flaming, a 230 mm long specimen is clamped so the flame is applied 40 mm above the bottom edge of the specimen.

If materials are used in composite structures together with other materials, e.g. bonded to a metal plate, these are tested together.

The test specified for class B2 is deemed passed if in none of the 5 specimen tests the flame front in edge flaming and, where applied, in surface flaming reaches the measuring mark within 20 seconds. If the filter paper ignites within 20 seconds after the start of flaming or if flaming droplets from the specimen burn longer than 2 seconds on the filter paper, the building material is rated normally flammable with flaming droplets.

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### Building materials class B3

Building materials class B3 applies to all materials which cannot be classed in any of the categories described above. No tests are provided for this class.

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