

Title: Fire wall

Description

The present invention relates to a fire rated wall to prevent the spread of fire, which can be installed in the region of a fire protection partition.

Such fire rated door is for example disclosed by EP 0401555 A2, where a glass pane is mounted in a metal frame equipped with a circumferential groove. In this case, the glass pane ends before the frame and is connected with the metal frame by means of additional metal edge strips serving as compensating adapters. The metal strips are connected in this case with traditional fire rated glue, for example made on water-glass base.

A frame profile for fire rated doors is disclosed by EP 0444393 A2, where a glass pane is retained in a strong frame profile. The frame profile is executed as hollow section and it presents, inserted into its chambers, fire rated plates that guarantee the fire resistance of such a door.

A fire-resistant glazing is described in DE 2645259 A1. In this case, silicate glass panes made from tempered glass are used on the one side, and, on the other side of an intermediate air gap, a reinforced silicate glass pane is used. The construction of such fire-resistant glazing is realised by means of a metal frame embracing and overlapping the border edge.

DE 2742665 A1 reveals a fire retarding swing door or a center pivoted door, where the door case respectively the edges of the door leaves present a thermal insulative material, extending over the entire length respectively width. This thermal insulative material will expand when heat develops, such that in the event of a fire, the door component includes a secure fire barrier. This door is composed of plane material, which is not transparent and, in a partial section, is interrupted by a window to be mounted.

Moreover, fire rated walls are masoned from fire resistant material. If however, fire rated walls should blend in with contemporary architecture, the generally known fire rated walls are not suitable. Today's architectural approach features well light-flooded building interiors with transparent structures. In said application, a wall masoned from fire resistant brick is not appropriate at all. Therefore, it is the object of the invention to propose a fire rated wall that can be produced economically and flexibly and which is moreover suitable for retrofitting and adapts to the before described architectural aesthetics of modern buildings. Simultaneously this solution should include an increased safety feature.

The object of the invention is solved by the characteristic of patent claim 1. The sub-claims represent a further embodiment of the inventive idea.

It is therefore proposed to manufacture a fire rated wall from modular conceived partial elements. The partial elements basically consist of a perimetrical frame composed of individual profiles. The glass panes respectively cover the frame such that the glass panes extend, spaced apart, over the frame. In this case, the frame profiles enclose the glass panes at the edges. With the intention to make the frames invisible, a partial enamelling of the glass panes respectively of the frame covers this eye-catching portion.

The profiles are conceived such that they present at least one hollow section, with an opening or with a deepening oriented towards the exterior edges. On the one side, a closing profile can be mounted at this opening and moreover also a connecting element, which for example positively and non-positively connects at least two partial elements to each other. In this case, in the region of the adjoining closing profiles, a fire rated laminate is respectively incorporated into the closing profiles, which laminate intumesces due to heat development such that a hermetically sealed fire rated wall is built.

Furthermore, each edge of the closing profiles is equipped with perimetrical T-shaped grooves into which sealing means are introduced. Hermetic sealing of the partial elements within a wall opening is therefore securely established.

The connecting element, which in multiple execution is used to connect partial elements to each other, is realised as bolt-type element. In this case, there are interlocking elements at the end of the bolt, which are positively and non-positively connected with the bolt. A rotary mechanism is incorporated in the centre of the bolt, which, by means of a tool, allows rotating the connecting elements previously inserted into the frames. The rotation

forces the interlocking elements to engage in the hollow section of the profile and makes a separation of the partial elements impossible. The rotary mechanism can for example consist of a square or of a hexagon positively and non-positively mounted to the bolt. Furthermore, it is also possible to mount a disc thereto, on which circumference appropriate boreholes are provided to allow a tool to engage.

The profile for the frame as well as the closing profile can be made from plastic, steel, wood or light metal. In case plastic is employed for the manufacturing process, it is proposed to preferably use glass fiber reinforced plastic, which is fire resistant.

Depending on the fire rating class, a defined fire resistance of said fire rated wall could be achieved through the spaced glass panes. When reaching a higher fire rated class, the intermediate space between the spaced glass panes can be either filled with a fire protection gel or through the use of a special fire rated glass pane, the fire rated wall can be equipped for higher fire resistance.

It is evident, that the modular construction method of the fire rated wall, while using the same basic components, for example the frame and the glass panes, which are made from safety glass, and just adding a fire protection gel respectively a fire rated glass pane, creates a transparent fire rated wall having identical exterior structural features, however with a higher fire protection efficiency.

It is obvious that moreover a fire rated door can be installed in said fire rated wall. Such fire rated door or fire rated window can be executed as single leaf or double leaf swing door or also as center pivoted door. The construction of such fire rated door respectively such fire rated window would be realised with the same basic materials, as those used for the fire rated wall described above.

In further execution of the inventive idea, the aforementioned glass panes can be abandoned, to use instead other fire resistant material like steel, plastic, light metal or correspondingly treated wood.

The invention is explained on the basis of one possible embodiment example diagrammatically represented in the drawings. It shows:

Figure 1: a sectional drawing through a connection portion of two partial elements in a trimmed representation;

Figure 2: a connecting element.

Figure 1 illustrates two partial elements identified by 1 and 2 and connected to each other. The partial elements 1 and 2 represented in this embodiment example are of identical construction and are built by means of profiles 5 connected to each other to form a frame, without reference numeral, and at the same time spacing apart two glass panes identified by 3 and 4. The profile 5 contains in this case at least one hollow space 8. In the embodiment example of figure 1, the profile 5 presents two hollow spaces. In the region where the profile 5 gets into contact with the glass panes 3 and 4, a partial enamelling 19 is provided, which prevents the frame from being visible. However, it is also possible to mount the frame visible between the spaced glass panes 3 and 4, whereby the glass panes 3, 4 are always positively and non-positively connected with the frame.

The profile 5 shows at its edge side, that means at the edge of the partial element 1 or 2, laterally conformed projections 20, which cover the glass pane edges 6 of the glass panes 3 and 4. Consequently, at the same time an efficient edge protection is provided for these glass pane edges 6. In the embodiment example of figure 1, the glass panes 3 and 4 present a recess 7 in the region of the glass pane edges 6. In accordance with the invention, it is however also possible to provide the glass pane edges 6 with chamfers. The profile 5 with its projections 20 is covered by a closing profile 12. The closing profile 12 has got a projection 14, which penetrates into a groove provided within the profile 5. Therefore the profile is securely and correctly placed and it can be positively and non-positively connected to the profile 5 by means of appropriate screw elements.

At its ends, the closing profile 12 presents projections 13 which are executed such that they properly cover the recesses 7 at the glass pane edges 6. T-shaped grooves 10 are included close to the lateral edges in an outer contour 21 of the closing profile 12, into which grooves seals 11 are introduced. The embodiment example of figure 1 demonstrates that a closed frontage is realised through the use of seals 11 when joining the partial elements 1 and 2, and thus smoke can not penetrate. Furthermore, there is a recess in the outer contour 21, into which a fire rated laminate 15 is incorporated. This fire

rated laminate has got the function to intumesce under the effect of increased temperature in the event of a fire and to block the partial elements 1 and 2 towards each other and towards the ceiling and the wall and thus to guarantee a secure fire protection partition.

In order to connect the partial elements 1 and 2 to each other, a connecting element 22, as shown in figure 2, is introduced. The connecting element 22 basically consists of a bolt 18, at which ends interlocking elements 9 are positively and non-positively conformed. In the centre of the bolt 18 is incorporated a rotary mechanism, which can be executed for example as a square or as a hexagon. It is however also possible to directly include appropriate boreholes in the bolt 18 or to include them by means of a disc, in order to achieve a rotation of the connecting element 22 when it is mounted. In this case, the interlocking elements 9 on the one hand engage into the hollow space 8 of the profiles 5 and, on the other hand, they are spaced apart by means of the rotary mechanism 16. Thanks to this dimensional tuning, an exactly defined distance is guaranteed between the partial elements 1 and 2. By rotating the connecting element 22 via the rotary mechanism 16, which can be realised while pushing back the seals 11, a secure positive and non-positive connection is established between the partial elements 1 and 2. This device also allows a connection to below and to above within a building. Simultaneously it is also possible to incorporate overhead skylights within a fire rated wall.

To establish a connection of the partial elements 1, 2 with regard to existing walls, ceilings, floors, the same profiles 5 can for example build a locating and connecting possibility at the walls, the ceilings and the floors.

References

1. Partial element
2. Partial element
3. Glass pane
4. Glass pane
5. Profile
6. Glass pane edge
7. Recess
8. Hollow space
9. Interlocking element
10. T-shaped groove
11. Seal
12. Closing profile
13. Projection
14. Projection
15. Fire rated laminate
16. Rotary mechanism
17. Intermediate space
18. Bolt
19. Partial enamelling
20. Projection
21. Outer contour
22. Connecting element

Claims

1. A fire rated wall to prevent the spread of fire, which is installed in a region of a fire protection partition, characterised in that the fire rated wall consists of modular constructed partial elements (1, 2), which basically contain profiles (5) composed to build a perimetrical frame, and which simultaneously space apart two glass panes (3, 4), said glass panes (3, 4) extend as far as to the exterior edge of the profiles, and the frame is covered by a partial enamelling (19) on the glass panes and the partial elements (1, 2) can be connected to each other by means of connecting elements (9) with intermediate layers of fire rated laminates (15).
2. A fire rated wall according to claim 1, characterised in that a transparent fire protection medium is included between the spaced glass panes (3, 4).
3. A fire rated wall according to claim 1, characterised in that the profile (5) presents at least one hollow space (8), said hollow space (8) includes an opening or a deepening suitable to connect further profiles respectively to mount the connecting elements (22).
4. A fire rated wall according to claims 1 and 2, characterised in that the profile (5) presents projections (20) on each side, which completely or partially cover the glass pane edges (6) of the glass panes (3, 4).
5. A fire rated wall according to claims 1 to 4, characterised in that the glass panes (3, 4) present recesses (7) in the region of the glass pane edges (6) which are filled in by a leg (13) of a closing profile (12).
6. A fire rated wall according to claims 1 to 4, characterised in that the glass panes (3, 4) in the region of the glass pane edges (6) present chamfers, which are covered by the closing profile (12).
7. A fire rated wall according to claims 5 and 6, characterised in that an outer contour (21) of the closing profile (12) is laterally discontinued respectively by a T-shaped groove (10).



8. A fire rated wall according to claim 7, characterised in that a seal (11) is incorporated into the T-shaped groove (10).
9. A fire rated wall according to one or several of the preceding claims, characterised in that at least a fire rated laminate (15) is incorporated in the outer contour (21).
10. A fire rated wall according to one or several of the preceding claims, characterised in that the closing profile (12) can be connected to the profile (5).
11. A fire rated wall according to one or several of the preceding claims, characterised in that the connecting element (22) consists of a bolt-type component including a rotary mechanism (16) arranged in the centre, whereby respectively at the ends interlocking elements (9) are arranged positively and non-positively.
12. A fire rated wall according to claim 11, characterised in that the rotary mechanism (16) presents a square or a hexagon.
13. A fire rated wall according to claim 11, characterised in that the rotary mechanism (16) is realised by means of boreholes in the bolt (18).
14. A fire rated wall according to one or several of the preceding claims, characterised in that the interlocking elements (9) engage through the opening in the profile (5) and through rotation, they block the connecting element (22) in the partial elements (1, 2) and simultaneously positively and non-positively connect these to each other.
15. A fire rated wall according to one or several of the preceding claims, characterised in that the profile (5) and the closing profile (12) are made from plastic, steel, wood or light metal.
16. A fire rated wall according to claim 15, characterised in that the plastic is a glass fiber reinforced plastic.
17. A fire rated wall according to claim 1, characterised in that a fire rated door is mounted within the fire rated wall.



18. A fire rated wall according to claim 17, characterised in that the fire rated door is a single leaf or double leaf swing door.
19. A fire rated wall according to claim 17, characterised in that the fire rated door is a single leaf or double leaf center pivoted door.
20. A fire rated wall according to one or several of the preceding claims, characterised in that the glass panes (3, 4) are made from safety glass.
21. A fire rated wall according to claim 2, characterised in that the fire protection medium is a fire protection gel.
22. A fire rated wall according to claim 2, characterised in that the fire protection medium is a fire rated glass pane.
23. A fire rated wall according to one or several of the preceding claims, characterised in that non-transparent plane materials replace the glass panes (3, 4).
24. A fire rated wall according to claim 23, characterised in that the material is plastic, wood, steel or light metal.