

FIRE DOOR OR WINDOW

Description

The present invention relates to a fire rated door or a fire rated window according to the generic part of patent claim 1, which are installed in fire protection partitions to prevent the spread of smoke and fire.

This fire rated door type is for example disclosed by EP 0 401 555 A2, where a glass pane is mounted in a metal frame equipped with a surrounding 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 glued with traditional fire rated glue for example made on water-glass base.

EP 0 612 910 A2 displays a closing ledge for metal doors, which ledge, to increase stability in the lower part, is pressed between two protruding legs.

A door frame profile for fire rated doors is disclosed by EP 0 444 393 A2, where a glass pane is retained in a strong door frame profile. The door frame profile is executed as hollow section and it presents, inserted into its chambers, fire rated plates that guarantee the fire resistance of such door.

A fire-resistant glazing is described in DE 296 45 259 A1. In this case, silicate glass panes made from tempered glass are used on the one side, and a reinforced silicate glass pane is used on the other side of an intermediate air gap. The construction of such fire-resistant glazing is realised by means of a metal frame embracing and overlapping the border edge.

DE 297 42 665 A1 reveals a fire retarding swing door or center pivoted door, where the door frame respectively the borders of the door leaves present a thermal insulation material, extending over the entire length respectively the entire width. This thermal insulation material will expand when heat develops, such that in the event of 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.

The object of the invention is to conceive a fire rated door or a fire rated window abandoning the materials conventionally used for fire protection purposes, like light metal, wood or steel, and to manufacture said construction units at reduced cost.

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

It is therefore proposed to manufacture the mobile as well as the stationary door frame of a fire rated door or of a fire rated window with profiles made from a fire resistant plastic material. Fire rated doors and windows are installed into fire rated walls and in the event of danger, serve the purpose to stop the spread of a fire and also of smoke. For this reason, fire rated doors and fire rated windows are classified according to corresponding

fire rating classes. These individual fire-rating classes are organised according to the time the individual construction units will resist to a fire.

The profiles, no matter whether they are solid profiles or hollow profiles with different cavities, are preferably arranged to build frames used for fire rated doors or fire rated windows. Either a multilayer glass pane, generally used as fire rated glass pane with correspondingly arranged fire protection layers, which will absorb the thermal radiation due to the heat development, or a fire resistant plastic material composed as plane material, can be employed as filling compartment within the frame.

According to the invention it is also conceivable, to manufacture the frame and the filling compartment as a single piece in mouldings. Likewise in case of a low fire rating class, a fire rated door or a fire rated window may be arranged in that the frame manufactured from plastic is embedded between two glass panes. In this case, the spaced glass panes can extend as far as to the exterior border of the mobile frame. In case a higher fire rating class is chosen, a transparent fire protection material can be introduced between the spaced glass panes. This fire protection material can consist of a fire rated glass pane as described before or also of a liquid fire protection gel.

The fire resistant plastic material consists of a support material in form of endless glass fiber rovings arranged in axial direction of the profile. This "raw profile" is moreover reinforced in radial direction with an additional glass fiber complex. For this purpose, the glass fibers are impregnated with a resin matrix and hardened in a moulding that corresponds to the profile's form. The moulding is in this case heated to ensure a faster manufacturing process.

The employed resin matrix basically consists of unsaturated polyester resins including appropriate hardeners, accelerators, additives and this is the most important, fire retarding fillers. Corresponding colours are added in form of colour pastes to achieve an adaptation to the aesthetics of existing buildings. Such fire rated doors can be executed as sliding doors, as well as single leaf or double leaf doors with or without rebate. As the production of such profile forms is almost without limits, it is also possible to combine corresponding profiles.

With corresponding design, such mobile frame can also be manufactured from fire resistant plastic material as stationary frame. If hollow profiles are used, they can be filled partially or completely with fire protection material.

Claims

1. A fire rated door or fire rated window to prevent the spread of smoke and fire, suitable for use in the region of a fire protection partition, said fire rated door or fire rated window comprises a mobile frame with its filling compartment, which consists of a fire resistant material, and the mobile frame is partially or completely enclosed by a stationary frame component, characterised in that the fire rated door and the fire rated window consist of a fire resistant plastic material, whereas the plastic material is a glass fiber reinforced plastic material using glass fiber roings as support material wihich are arranged in axial direction.
2. A fire rated door or fire rated window according to claim 1, characterised in that the mobile frame and the stationary frame are manufactured from profiles.
3. A fire rated door or fire rated window according to the claims 1 and 2, characterised in that the filling compartment of the mobile frame partially or completely consists of fire resistant plastic material.
4. A fire rated door or fire rated window according to the claims 1 to 3, characterised in that the filling compartment and the mobile frame consist of one single piece.
5. A fire rated door or fire rated window according to the claims 1 to 3, characterised in that the filling compartment of the mobile frame completely or partially consists of a fire rated glass pane.
6. A fire rated door or fire rated window according to the claims 1 and 2, characterised in that the mobile frame is embedded between two spaced glass panes.
7. A fire rated door or fire rated window according to claim 6, characterised in that the glass panes extend as far as to the exterior edge of the frame.
8. A fire rated door or fire rated window according to claim 6, characterised in that transparent fire protection material is included between the spaced glass panes.
9. A fire rated door or fire rated window according to one or several of the preceding claims, characterised in that the mobile and the stationary frame consist of solid material.
10. A fire rated door or fire rated window according to one or several of the preceding claims, characterised in that the mobile and the stationary frame consist of hollow profiles.
11. A fire rated door or fire rated window according to claim 10, characterised in that the hollow profiles are completely or partially filled with a fire protection material.
12. A fire rated door or fire rated window according to claim 6, characterised in that the fire rated material is a fire protection glass pane.
13. A fire rated door or fire rated window according to the claims 8 and 11, characterised in that the fire rated material is a fire protection gel.

14. A fire rated door or fire rated window according to one or several of the preceding claims, characterised in that the plastic profiles in radial direction are reinforced with a glass fiber complex, said glass fibers are impregnated with a resin matrix and hardened in a heated moulding.
15. A fire rated door or fire rated window according to claim 14, characterised in that the resin matrix basically consists of unsaturated polyester resin, hardener, accelerator, additives, colour pastes and fire retarding fillers.
16. A fire rated door or fire rated window according to one or several of the preceding claims, characterised in that the fire rated door or fire rated window is a single leaf or double leaf door.
17. A fire rated door or fire rated window according to the preceding claims, characterised in that the fire rated door or fire rated window is a sliding door.

Abstract

Fire rated door or fire rated window to prevent the spread of smoke and fire, which is suitable for use in the region of a fire protection partition, said fire rated door or fire rated window comprises a mobile frame with a filling compartment consisting of fire resisting material, and the mobile frame is partially or completely surrounded by a stationary frame component, said fire rated door and fire rated window consist of fire resistant plastic material.