OUTLINE

[0016] In one broad aspect there is provided a fire resistant lightweight cladding comprising thin sheet material having an outer layer which is predominantly steel and a thicker inner layer which is predominantly aluminium, the inner layer being a supporting layer and the sheet material being formed into a panel of predetermined outline, panel attachment means being provided for the purpose of anchoring the panel to a substrate. The relative dimensions of the layers and the overall sheet thickness being so made and arranged that under a fire test of a specimen of said panels in a wall panel assembly according to British Standard BS 8414-2 2015 (amdt 1) as modified by Australian 5113-2016 (amdt 1). Preferably, the steel layer is about .4mm thick and the aluminium layer is about 2mm thick. Preferably, the cladding sheet density ranges from 6kg/m^2 to 9kg/m^2. Typically each panel includes a molten metal collector behind the sheet. More preferably, each cladding sheet has a folded edge formation with a terminal edge of the sheet concealed inside the folded edge formation. While it is preferred that there only be two layers, the invention concerns at least those two layers so the addition of other non-combustible layers will not affect the working of the inventions although these may add to the weight and cost of the panels.

[0017] In another aspect there is provided a cladding panel having a relatively thick inner layer of aluminium or equivalent and a relatively thin outer layer of steel or equivalent, the relative dimensions of the layers and the overall panel thickness being so made and arranged that under a fire test of a specimen of said panels according to British Standard BS 8414-2 2015 (amdt 1) as modified by Australian 5113-2016 (amdt 1) the specimen passes the classification criteria 5.4.5(g). Under the test condition set out hereto, the preferred panel provides, quite unexpectedly, under classification criteria 5.4.5(g), a result of less than .1kg of debris falling from the test specimen.

Figures 30-35 are graphical representations of the measured temperatures over time.

METHOD OF PERFORMANCE

[0027] Referring to the drawings and initially to Figures 1A through 1D there is illustrated in Figure 1A a partially completed panel 10 having a partially formed edge formation along edge 11 and a further stage of the formation along edge 12. The final formed panel is in Figure 1C and an anchor bracket fitted to the panel is shown in Figure 1D as part of an anchoring arrangement. The arrangement is optional as many proprietary anchoring arrangements for panels are known and the panels may be configured to suit known anchoring arrangements.

[0028] The panel, in this example, is made from a square or rectangular blank of composite material being a thin front layer or outer layer of mild steel with a second thicker layer of aluminium. The sheet overall thickness is 2.5mm. The front layer is sold under the Bluescope Steel trade name Zincanneal and is mild steel with a protective zinc coating. The composite is formed using .4 mm Zincanneal and 2mm Aluminium with a .1mm bonding membrane between the two for a total thickness of 2.5 mm. The Aluminium side is shown upward in Figures 1A-1C. A PVDF coating may be applied to the outside of the zincanneal. Three coats are preferred. The raw panel sheet material may be obtained from VANCO® having website vancopanel.com. It will be appreciated therefore that in referring to a steel layer, the layer envisage predominant steel layer but it may be protected by various treatments known in the art as in for example the zinc hot dipping and annealing process used in the production of Zincanneal. Any equivalent known to the skilled person will be suitable. Likewise the Aluminium is employed in the design process to enable a lightweight fire panel in a form which quite unexpectedly has the benefits herein described. Thus the Aluminium is effectively a carrier for the steel layer. The composite may be formed as in pressing, rolling or cutting. Thus the relative dimensions is a balance of the practical use of the panel which dictates the relative dimensions in terms of thickness and area selected for the application, while still retaining the desirable outcome as set out in the test example which follows later in this description.

[0029] Edge 11 shows the result of earlier cutting, namely, three cutouts 13, 14 and 15 aligned with cutout slots 16, 17 and 18. These cutouts fold over the slots in the finished panel. Each

Claims

1. Fire resistant lightweight sheeting when used as vertical wall cladding applied to a substrate comprising thin sheet material having an outer layer which is predominantly steel and a thicker inner layer which is predominantly aluminium, the inner layer being a supporting layer, wherein the assembled cladding is fire resistant according British Standard BS8414-2 2015 (amdt 1) as modified by Australian 5113-2016 (amdt1).

2. Fire resistant lightweight cladding according to claim 1, the panel having attachment means provided for the purpose of anchoring the panel to the substrate.

3. A fire-resistant cladding according to claim 1 or claim 2 wherein the steel layer is about .4mm thick and the aluminium layer is about 2mm thick.

4. A fire-resistant cladding according to claim 1 or claim 2 wherein cladding sheet density ranges from 6kg/m^2 to 9kg/m^2.

5. A fire-resistant wall panel assembly according to claim 1 wherein each panel has a lower edge formed behind the sheet and extending toward the substrate.

6. A fire-resistant cladding according to any one of claims 1 to 3 wherein the panel has a folded edge formation with a terminal edge of the sheet concealed inside the folded edge formation.

7. A fire-resistant cladding according to claim 6 wherein the panel has an open box form with the folded edge formation being an upstanding surrounding flange, the terminal edge being located inside the flange.

8. A fire-resistant cladding according to any one of claims 1-5 wherein the panel has an open box form with the folded edge formation being an upstanding surrounding flange, the flange having spaced openings used to anchor the panel to a substrate.

9. A fire-resistant wall panel assembly according to any one of claims 7-9 wherein the

folded edge formation is a double fold.

10. In a fire-resistant cladding panel as claimed in use in claim 5, the composite sheet having a sheet density ranging from 6kg/m^2 to 9kg/m^2, the thin steel layer, the thicker aluminium layer, being pre formed then folded to provide a folded edge formation with a terminal edge of the sheet concealed inside the folded edge formation to protect the terminal edge.

11. A panel according to claim 10 wherein the steel layer is about .4mm thick, the aluminium layer is about 2mm thick.

12. A panel according to claim 10 or 11 wherein the panel has an open box form with the folded edge formation being an upstanding surrounding flange, the terminal edge being located inside the flange.

13. A panel according to claim 10 or 11 wherein the panel has an open box form with the folded edge formation being an upstanding surrounding flange, the flange having spaced panel attachment means used to anchor the panel to a substrate.

14. A method for forming a panel as set out in any one of claims 1-13, the method comprising:

a. providing a rectangular sheet of predetermined external dimensions having respective marginal edge sections terminating in respective terminal edges of the sheet;
b. cutting corners from the sheet;
c. pressing fold lines in the marginal edge sections;
d. folding the marginal edge sections about the fold lines to form a double fold folded edge formation, with the terminal edges concealed inside the flange.

15. A method according to claim 14 including the further step of cutting spaced slots between the fold lines before performing step d.

16. A method according to claim 14 including, in no particular order, but before step d. the further steps of, cutting spaced slots at a position set to be between the fold lines and cutting the terminal edges with cutouts aligned with the position of said slots.

17. A method according to claim 14 including the further step of providing spaced slots in said flange.

18. Sheet material when used in any one of claims 1-17, said steel layer being Zincanneal or equivalent.