A structural panel for interior use made of a polystyrene foam core of either extruded polystyrene foam (XPF) or an expanded polystyrene foam (EPF) and a rigid face material having a higher density and being thinner than said foam core and attached to each opposed face of said foam core to capture said foam core.
BACKGROUND OF THE INVENTION

1. Field of the Invention

The invention relates to an economical light weight structural panel comprising an extruded or expanded polystyrene foam core and thin face materials such as hardboard, fiberboard and various kinds of plywood designed for use as an interior panel such as wall partitions, ceiling panels, store fixtures, exhibits, furniture, signage, shelving theater props, table tops, motor homes, boats, etc. and is used as a replacement for particle board, plywood, medium fiber density board and other panels designed for interior use.

2. Related Art

Composite structural panels of the general type of the invention are of course known to the art. Such panels may consist of an insulating core such as plastic foam and a pair of opposed outer facings bonded to the panel's insulating core. However, the structural panel of the invention is a more economical and light weight structural panel designed for use as an interior panel than known structural panels.

3. Building Material; discloses various combinations of materials forming a slab covered on one side with wood veneer and a body consisting of a mixture of wood wool and cement.

4. Composite Sheathing; discloses a laminated composite sheathing including a thermally insulating layer of foam bonded on one or both faces to a relatively rigid laminated sheet preferably formed of a fiberboard core adhesively secured between facing sheets of kraft paper bonded together with a resilient polymeric material.

5. Surface Bonded Entangled Fibrous Web and Method of Making and Using; discloses an absorbent low-linting structure comprising an entangled web of synthetic fibers, wherein fibers of at least one of the top surface and the bottom surface are surface bonded by thermal or adhesive bonding.

6. High Strength Structural Insulated Panel; discloses a structural building panel including an inner insulating core of plastic foam and a pair of opposed outer facings bonded to the panel's insulating core.

7. Fiber-Reinforced Sandwich Panel; discloses a sandwich panel having first and second face panels formed of a fiber-reinforced cementitious material. A support frame supports the first and second face panels in a spaced apart configuration.

BRIEF DESCRIPTION OF THE INVENTION

The foam core board product of the invention with rigid face materials on opposing sides result in such a product that is 80% lighter than plywood, particle board and MDF. The face materials enable conventional attachment methods and edge treatments. The foam board product of the invention may be used for a variety of applications including shelving, wall systems, ceiling panels, displays, exhibits, doors, cabinets, table tops, or any application where weight is a consideration.

The foam core product of the invention is constructed by capturing a polystyrene foam core with higher density face panels to provide a strong light weight panel with structural integrity. Two core materials are used in this product. One is an extruded polystyrene foam (XPF) that is closed cell in structure and provides a consistent and uniform surface to machine. The other core material is an expanded polystyrene foam (EPF) with a slightly lower density. The sandwich panel construction method of the invention incorporates the use of thinner outer panels bonded to a thicker lighter core which provides for a strong light panel that can be compared to a truss beam. The panel concept spacing thin stronger face panels apart with a thicker core ensures that the combination will be stiff and strong.

The foam core product of the invention is moisture resistant to water. The face panels are laminated with moisture resistant glue leaving only the face susceptible to moisture.

A variety of edging options include edge capture, edge insert, outer edge band, edge banding and corner post.

The panels of the invention enable hinges to be installed and different corner options.

DETAILED DESCRIPTION

As shown in the sole FIGURE, the balanced constructed foam board 10 is made by capturing a polystyrene foam core 14 with high density, relatively thin, face panels 12 and 16 which are attached to the foam core 14 by a moisture resistant glue 18 and 20. Preferably two core materials are used in the foam board 10, namely an extruded foam (XPF) that is closed cell in structure and provides a consistent and uniform surface to machine; and an expanded polystyrene foam (EPF) with a slightly lower density.

The sandwich construction just described incorporates the use of thinner outer panels 12 and 16 bonded to a thicker light foam core 14 thereby providing a strong, light panel that can be compared to a truss beam.

The core thickness and thickness of the face materials may be varied to suit the thickness of the balanced constructed foam board.

Examples of face materials are hardboard, fiberboard, Lauan plywood, poplar plywood and birch plywood.

Therefore it is desired that the present invention not be limited to the embodiments specifically described, but that it include any and all such modifications and variations that would be obvious to those skilled in the panel construction art. It is my intention that the scope of the present invention should be determined by any and all such equivalents of the various terms and structure as recited in the following annexed claims.
1. A structural panel for interior use, comprising:
   a polystyrene foam core; and
   a rigid face material having a higher density and being
   thinner than said foam core and attached to each
   opposed face of said foam core to capture said foam
   core.
2. A structural panel as in claim 1, wherein said foam core
   is an extruded polystyrene foam (XPF).
3. A structural panel as in claim 1, wherein said foam core
   is an expanded polystyrene foam (EPF).
4. A structural panel as in claim 2, wherein said rigid face
   material is from the group comprising hardboard, fiberboard
   and various kinds of plywood.
5. A structural panel as in claim 3, wherein said rigid face
   material is from the group comprising hardboard, fiberboard
   and various kinds of plywood.
6. A structural panel as in claim 4, wherein the rigid face
   material is laminated with moisture resistant glue to said
   foam core.
7. A structural panel as in claim 5, wherein the rigid face
   material is laminated with moisture resistant glue to said
   foam core.