T 76 TECHNICAL BULLETIN

Component Selection for Tectum™ Composite Decks

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Tectum III and E roof decks were developed to meet a need in the market for a product that was acoustical, lightweight, insulative, and would accommodate steep roofing materials. These decks are made from three components. Each component needed to meet specific design and physical property requirements, as well as the composite.

The Tectum substrate that was selected was one and one half inch thick. This thickness was selected because it meets the requirements for a thermal barrier, it is lightweight, it has good acoustical properties, and has excellent strength as a panel facing material.

The cores chosen were polystyrene, both extruded and molded. The extruded foam (Dow Styrofoam brand insulation) has excellent properties of dimensional stability, insulation value, and water resistance. Molded polystyrene meeting the requirements of C578 Type I was selected as a lower cost core with dimensional stability, insulation value, and is available in the sizes and thicknesses required.

Other cores were considered and some testing and evaluation conducted. Of these other insulations, phenolic lacked the properties needed for use in a composite panel. It has been taken off the market in the United States because of other problems associated with its use.

Polyisocyanurates, both cut from bun stock and foam in place were evaluated. While the cut from bun stock had stability, it lacked flexibility in sizes and was not cost competitive. Foam in place products have one very severe problem associated with their use. Shrinkage after manufacture can be in the order of one percent, or about an inch in eight feet. The polyiso industry considers this acceptable. Shrinkage of the foam core of a composite panel results in stresses on the panel that can result in foam line stresses, bowing of panels and in some instances core shear. To compensate for this a thicker substrate is required to reduce the bowing effect to an acceptable level. This adds unnecessary weight to the panels.

The top surface selected was waferboard panels that met the model code requirements for sheathing. Waferboard was replaced by oriented strand board (OSB) as the industry improved their products. OSB remains the choice because of availability is sizes required for panels and its acceptance by the model codes.

The panels are then laminated together using code recognized structural laminating adhesives. The adhesives meet the same requirements as those used in the glue laminated lumber industry.

All of the component products are manufactured under code recognized quality control programs as well as the assembly of the composite panels. High quality, lightweight panels listed by model code evaluation services is the result.

TECTUM INC.
The Noise Control Solution