Basotect® acoustic and thermal insulation within the Hefei Grand Theater, China

Case Study

Innovative application of Basotect® dampens noise from air conditioning

Basotect®, BASF's flexible specialty foam, has been chosen as the acoustic and thermal insulation in the basement of the Hefei Grand Theater, Anhui Province, China, where the air conditioning is channeled through ducts from under theater seats. The lightweight BASF specialty foam lines the top of the basement structure that holds up the rows of theater seats.

Basotect®, which is known for its good acoustic absorption in the medium and high frequency ranges in particular, reduces echo caused by multiple reflection of sound on reverberant surfaces. It also provides excellent thermal insulation, which ensures that air conditioning remains cool as it passes through the ducts under the theater seats. "With its low thermal conductivity, Basotect® contributes to meeting the standards of energy-efficient construction," said Dr. Christof Moeck, Head of Global Business Management Basotect®, BASF.

"Thanks to its favorable combination of properties, Basotect® is particularly suited for thermal insulation and acoustic management in this project. As an eco-friendly material, Basotect® meets stringent emission requirements due to its flame-retardancy and fiber-free properties. Additionally, Basotect®'s natural resistance to fungi and bacteria growth makes it an ideal solution for this application," said Yan Xiang, director of the acoustic lab at the, School of Architecture, Tsinghua University, Beijing, and acoustic consultant for the Hefei Grand Theater. Basotect® is also air flow resistant. As such, it is able to withstand the long-term stress of the air conditioning pumped into the theater, without getting damaged or breaking apart.

Ecological energy saving design of Hefei Grand Theater

The Hefei Grand Theater, which will be officially opened in October 2009, covers an area of 57 thousand square meters and is known for the ecological energy saving technologies applied in its construction.

As opposed to the conventional method of introducing air conditioning from the ceiling, air conditioning pumped in from the base of the theater is a more energy efficient coding technique. However, the ecological energy saving design presented other challenges. This included managing the noise generated by the air conditioners, which was amplified in the tightly enclosed space beneath the theater seats.