



# FAQ - Frequently Asked Questions

## FESI- Acoustic Commission

### 4. Thermal insulation composite system (TICS) - internally

#### **Question:**

How does an internally mounted thermal insulation composite system determine or change the transmission loss of an external wall and of internal walls or ceilings?

Which solutions do exist and what needs to be paid attention to?

#### **Answer:**

When improving old buildings, especially when protected facades are involved, only an internally mounted thermal insulation is acceptable as an additional thermal protection. As with externally mounted thermal insulation composite systems (ETICS), the internally mounted insulation system too influences the sound reduction of external noise, but also strongly determines the sound insulation between rooms.

Compared to an uninsulated external wall, improvements, but deteriorations too, of the sound insulation can occur, dependent upon the execution, because of changes in the longitudinal sound reduction, that is to say the flanking transmission.

A distinction needs to be made between a separate internal insulation in the area of walls and ceilings (Figure 1), and a continuous insulation in the area of partition-wall light frame constructions.

Decisive in a separate internal insulation are the stiffness of the insulation material, the plaster weight, and its fixing. The position of the resulting system resonance frequencies determines whether an improvement or a deterioration result.

Improvements occur with a full surface gluing of elastic polystyrene with low resonance frequencies or extremely stiff full surface glued materials such as calcium silicate or foam-glass with high resonance frequencies. Non-elastic polystyrene, on the contrary, leads because of its stiffness to a deterioration of the longitudinal and thereby of the system sound reduction. (see example).

With a continuous internal insulation, additional deteriorations through sound transmissions along the light insulation material can be avoided through bulk-heads in the area of the light partition wall (Figure 2).

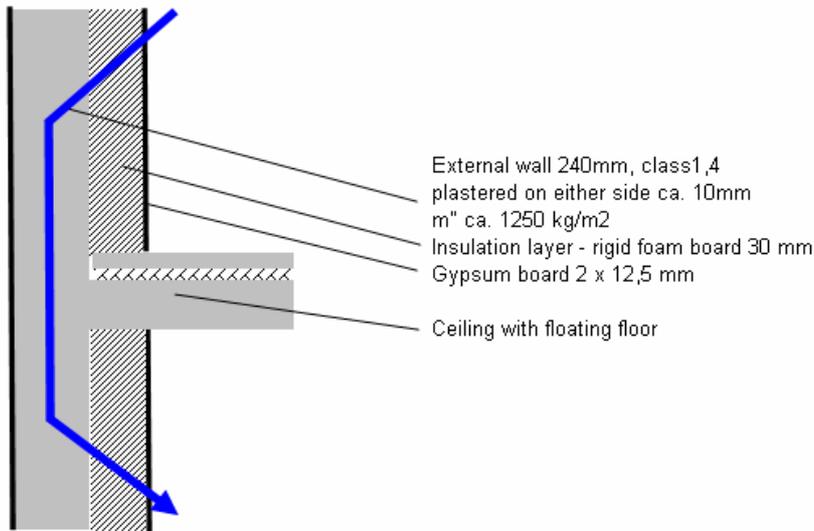


Figure 1: Separate internal insulation

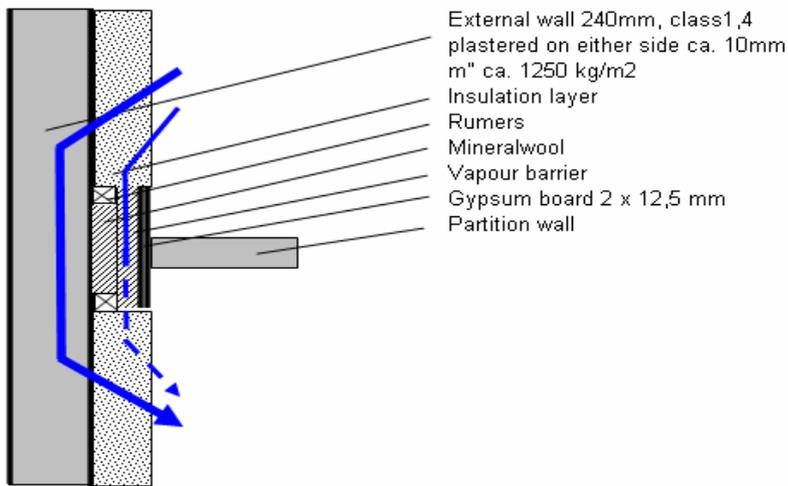
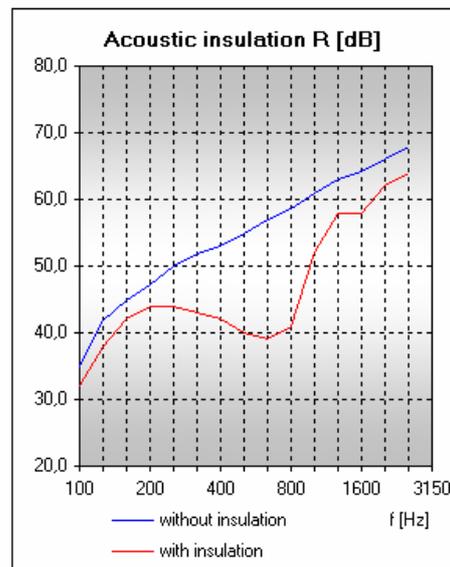


Bild 2: Continuous internal insulation, here with a bulk

f [Hz]	without inner insulation	with inner insulation
100	35,0	32,0
125	41,9	38,0
160	45,0	42,0
200	47,2	44,0
250	50,0	44,0
315	51,9	43,0
400	53,0	42,0
500	55,0	40,0
630	57,0	39,0
800	58,6	41,0
1000	61,0	52,0
1250	63,0	58,0
1600	64,2	58,0
2000	66,0	62,0
2500	68,0	64,0
3150		
R'w	56	47



Sound insulation of a separate, stiff, non-elastic polystyrene internal insulation as shown in Figure 1.