

Wooden Beam Head Temperature Control in Interior Insulated Walls

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The invention prevents the condensation of water forming on the traverse heads of a wooden beam's ceiling when the exterior walls are insulated internally. Using heat conduction plates on both sides of the beam head between the wood and masonry enables energy-saving temperature control of the area. Thus a wooden beam ceiling can be renovated durably and preserved, even with interior insulation.

REFERENCE:
M059/10

POSSIBLE USE:

- Permanent preservation of historic constructions with simultaneous thermal renovation employing interior insulation
- Energy efficient conservation of listed buildings
- Interior insulation of 19th century houses

OPTIONS:

R&D collaboration, Licence agreement, Selling of patent

KEYWORDS:

wooden beam head heating, component temperature control, heat conduction plate, interior insulation, preventing dew point lower derivation, thermal renovation, wooden beam ceiling

DEVELOPMENT STATUS:

Laboratory prototype, hygro-thermal 3D-simulations

IPR:

European patent granted (EP 2511439)

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BACKGROUND

When thermally renovating the interior of insulated buildings there is a potential of consequential damage to the wooden beam ceiling's traverse heads as the dew point in the wall profile shifts towards the inside. To prevent a lower derivation of the dew point and wood rotting due to condensation in the joist end's area, the temperature must be raised accordingly. Temperature control of the traverse heads with heating pipes in the basement requires considerable energy input and is therefore uneconomical.

TECHNOLOGY

Heat conduction plates are applied to both sides of the traverse head, or alternatively under resp. above the beam between the wood and masonry, and thermally connected to a heating pipe running transversely to the traverses in order to conduct thermal energy into the masonry and to the end of the traverse. Thereby, a lower derivation of the dew point temperature in the bearing is avoided. With this technology, the energy requirement is very low because the thermal energy is conducted directly to where it is really needed.



Fig 1: temp. spread w/o temp. control

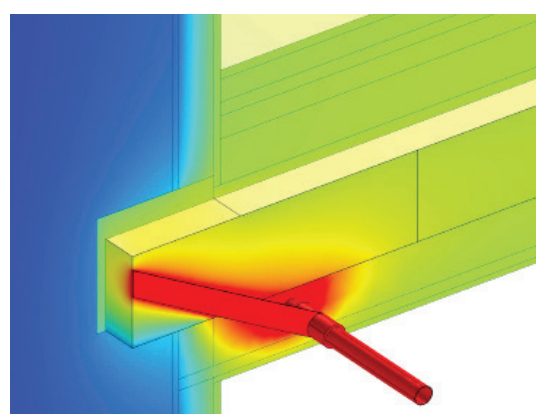


Fig 2: temp. spread with temp. control

BENEFITS

- Space-saving, easy to install, economical, improves the value of the property
- Minimal risk of damage
- Low energy requirement (1/10 of energy input required for temperature control of the entire ceiling connection)