



Microtherm[®] Insulation for Rail Applications

Lightweight protection for passenger comfort and safety

STRUCTURAL FIRE PROTECTION

Microtherm[®] Passive Fire Protection systems can fully protect the underside of an aluminium carriage floor. Our PFP systems, that are based on the thinnest flexible insulation panels possible, are appropriate to meet regulations such as: EN 45545, NF 1363, NF 1603-1 and ASTM E119

EXHAUST INSULATION

Microtherm[®] flexible insulation panels are widely used to insulate diesel engine exhausts. The excellent thermal protection from Microtherm flexible panels allows safe, simple routing of exhausts through passenger compartments and restricted places.



Microtherm[®] - cool answers to hot problems

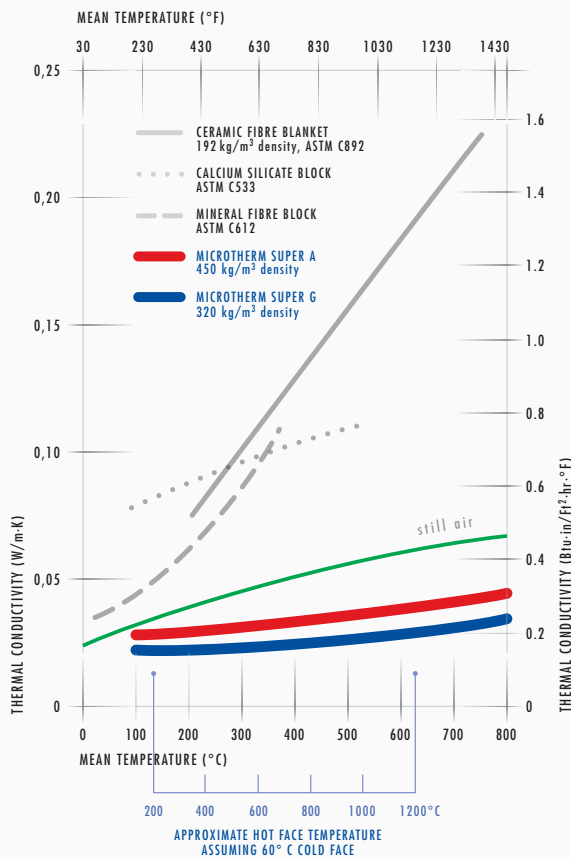
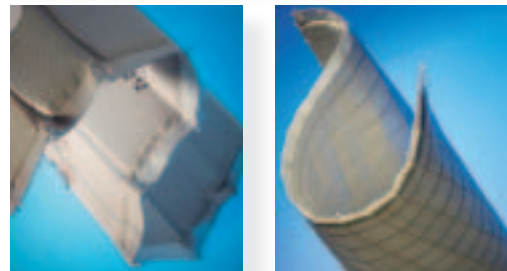
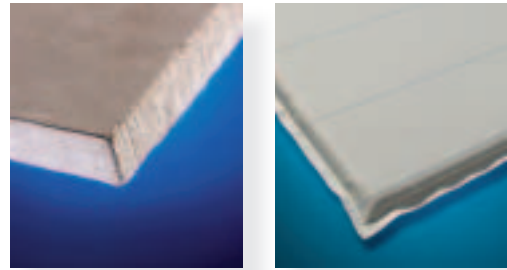


The company, the products, the benefits

The Microtherm Group of companies has been the global market leader in high temperature thermal insulation solutions for almost 40 years.

Microtherm® is a microporous insulation with a thermal conductivity so low that it is almost down to the lowest theoretically possible figure according to the laws of physics - an insulation with a thermal conductivity even lower than that of still air!

Moreover, this very low thermal conductivity is, and stays stable over a wide range of temperatures right up to a maximum of 1000 °C (1832 °F) due to the inclusion of an opacifier to block the transmission of all infra red radiation.



Thermal conductivity values for insulating materials other than Microtherm Super G and Super A are taken from relevant ASTM specifications. Microtherm Super G and Super A values are as measured by the National Physical Laboratory, UK, according to ISO 8302.

Properties

- Formulation based on pyrogenic silica with a mineral oxide opacifier and E-glass filament reinforcement.
- Capable of continuous exposure to 1000 °C (1832 °F).
- PFP systems are hydrophobic.
- No known health hazards when used within prescribed working temperature limits.
- Non-combustible.
- Environmentally safe.

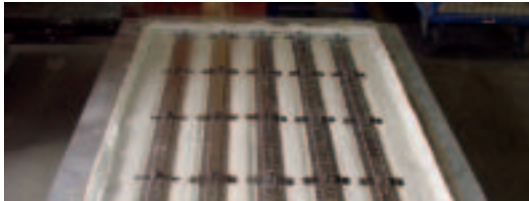
Benefits

- Only around one quarter the thickness of conventional insulations at high temperature.
- Lightweight but load bearing.
- Thinnest protection optimises internal carriage space.
- Can be supplied pre-formed or can be easily shaped on site.
- Widest product range includes rigid panels and block, flexible panels, pourable granular products, moulded products, and mouldable paste.

Passive fire protection (PFP) of aluminium carriage floors



Detail of fixing clip



Sample before fire testing



Sample after fire testing

The challenge

The passive fire protection of the aluminium floors of railway carriages to fire standards EN 45545, ASTM E119, NF 1363 and NF 1603-1.

A typical solution

A fire protection system comprising Microtherm® flexible insulation panels clipped to the C-slot fixation rails. This is used in combination with the upper floor materials and the aluminium floor extrusion.

A Microtherm® PFP system is innovative, simple and fast to install. It is also extremely robust and will maintain a stable protection over many years of use.

Insulation protection for diesel engine exhausts



Microtherm® Quilted Panel provides the thinnest and lightest insulation systems for diesel exhausts.

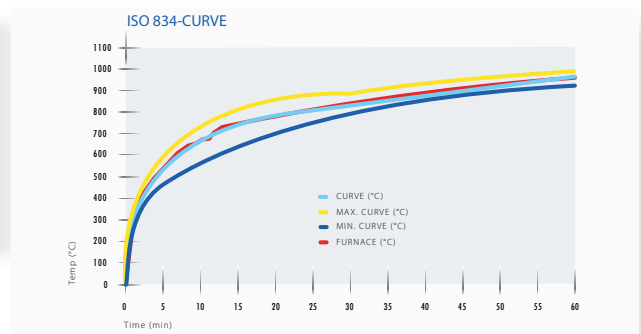
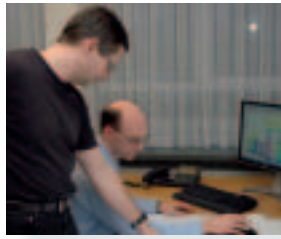
The benefits

- Lightest and thinnest protection.
- Flexible panels allow easy fit around exhaust.
- Compact system allows easy routing of exhaust within carriage.
- Lowest temperature drop along exhaust.
- Will not deteriorate with time.
- Easily removed for maintenance access.
- Safe – contains no harmful respirable fibres.

Microtherm - the complete service package



Cross section alu-floor



Detail of c-slots insulation

- Problem analysis
- Thermal calculations
- Product design
- Performance testing
- System design
- Performance verification
- Installation support and co-ordination

The Microtherm Group - truly global service of the highest standard



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