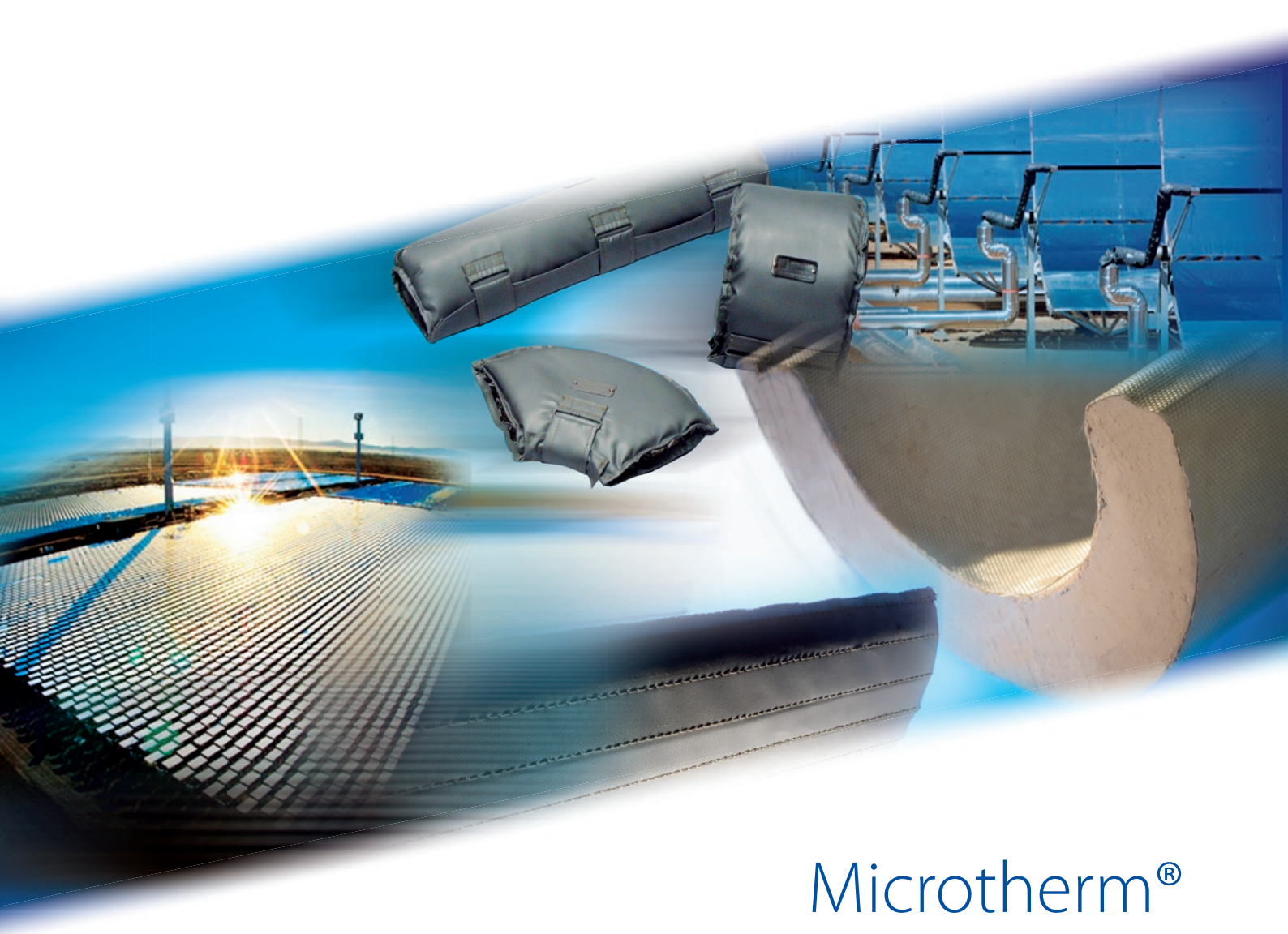
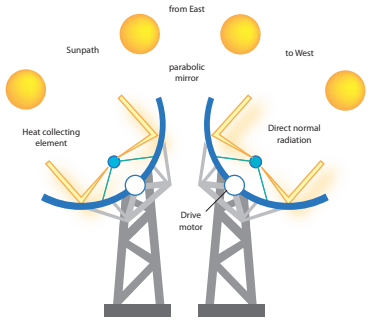


Microtherm®

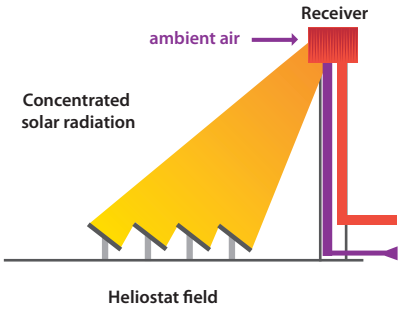
Insulation solutions for Concentrated Solar Power

Thinnest insulation systems with lowest energy losses.



PARABOLIC TROUGH REFLECTOR SYSTEMS

The collector field consists of many parallel rows of solar collectors each of which has a linear parabolic-shaped reflector that focuses the sun's direct beam radiation onto a receiver pipe located at the focus of the parabola. The collectors swivel to follow the sun's path. The receiver pipe contains a heat transfer fluid (HTF) which stores and transmits the heat energy. Microtherm® controls energy wastage from the system.



SOLAR TOWER COLLECTION SYSTEM

A field of huge mirrored heliostats, each up to 120 m^2, reflect and focus heat radiation from the sun onto a central solar tower receiver. The solar radiation is directed to one or more thermal collectors in the receiver that are protectively insulated with Microtherm® for optimised thermal efficiency.
The collected thermal energy is transferred through an insulated piping system either by a heat transfer fluid (HTF) in the receiver, or by heated forced air, to generate steam for a conventional turbine.

Microtherm® - cool answers to hot problems

MICROTHERM
THERMAL INSULATION SOLUTIONS

The company, the products, the benefits

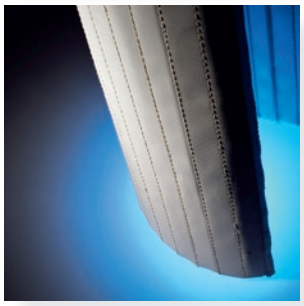
The **Microthern Group** of companies has been the global market leader in specialised high temperature thermal insulation solutions over more than 40 years.

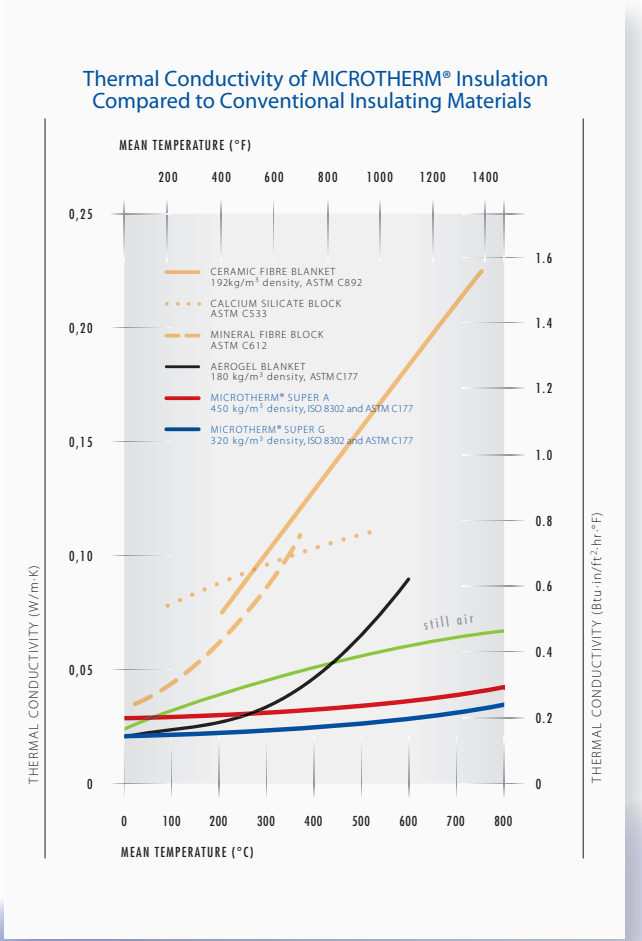
Microtherm® is a microporous insulation with a thermal conductivity so low that it is almost down to the lowest theoretically possible figure according to the laws of physics - an insulation with a thermal conductivity even lower than that of still air!

The thermal conductivity remains very low over a wide range of temperatures right up to a maximum of 1000 °C (1832 °F) thanks to the inclusion of an opacifier to block the transmission of all infra red radiation.

Microtherm® performance means that it is ideal for use in insulation systems where weight, space and heat loss are critical.

It is the most compact insulation available yet it still ensures that system energy losses are kept to an absolute minimum.





Properties

- Formulation based on pyrogenic silica with a mineral oxide opacifier and glass filament reinforcement.
- Lowest TC right up to maximum continuous use at 1000 °C (1832 °F).
- No known health hazards when used within prescribed working temperature limits.
- Non-combustible.
- Products may be enclosed in a woven glass cloth covering for dust free fitting.
- Easily optimised by pre-shaping and covering for fastest assembly.
- Easily demountable for maintenance inspections.
- Environmentally safe.

Benefits

- Only around one quarter the thickness of conventional insulations at high temperature.
- Lightweight but load bearing.
- Offers thinnest and lightest insulation protection.
- Can be supplied fully pre-formed for fast fitting during assembly.
- Widest product range includes flexible panels and rolls, moulded pipe sections (MPS) and pre-formed products.

Microtherm® in solar power applications

Parabolic trough collectors

The collection reflectors are arranged in parallel rows that connect to a common HTF system for subsequent conversion of the heat energy into electricity.

Because the reflectors need to rotate around their N-S axis to remain focused on the sun, a swivelling ball joint connection is essential in the feed system from the receiver.

A Microtherm® jacket system allows the rotational movement at the joint while controlling loss of heat energy and is also quickly removable for routine maintenance inspections.

Microtherm® insulation increases plant efficiency by controlling heat losses with the additional benefit that the insulation system will act to minimise fire risks at and around the ball joint assemblies.

Solar tower Systems

Microtherm® is widely used to insulate both volumetric receivers using forced air transfer of the heat energy, and cylindrical receivers feeding a heat transfer fluid system.

The Microtherm® offers excellent performance even at elevated pressures and in atmospheres other than air.

For each type of receiver, the Microtherm® ensures minimum insulation thickness and weight while helping to optimise the thermal efficiency by minimising heat losses.

Plataforma Solar de Almeria

Distribution Pipe runs

Control of energy losses is critical to the overall operational efficiency of any solar power collection system.

Microtherm® systems utilising moulded pipe sections (MPS) for smaller diameters and flexible insulation products for larger diameters are cost effective when compared to less efficient conventional insulation products.

A Microtherm® system with a maximum thickness of 25 mm (1") provides optimised control of thermal energy losses from any solar power collection.

Microtherm®

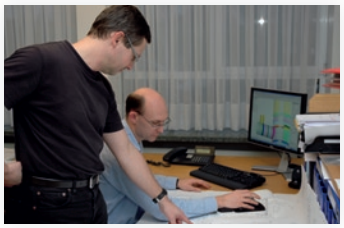
Pipe supports

It is essential to prevent heat loss at pipe supports due to thermal bridging by direct metal contact.

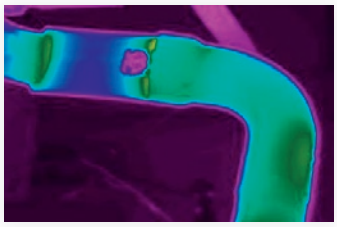
Microtherm® insulation occupies the minimum thickness possible. Because Microtherm® has excellent compression resistance, the insulation thickness is maintained irrespective of the weight of the pipe load being supported.

MICROTHERM
THERMAL INSULATION SOLUTIONS

Microtherm® – the complete service package

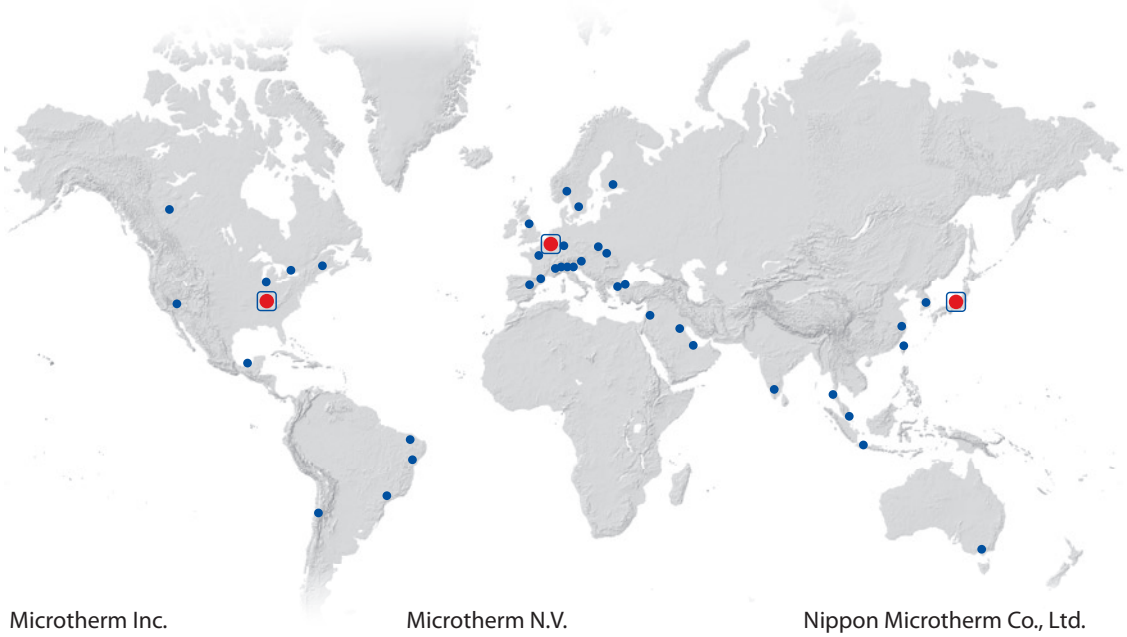


- Problem analysis
- Thermal calculations
- Full system design
- Performance testing – in-house materials laboratory
- Installation support and co-ordination



We continue to develop our thermal insulation solutions for solar power applications.. This brochure gives an indication of our capabilities. If you have a special need that is particularly challenging, why not contact our Design Team for advice.

The Microtherm Group - truly global service of the highest standard



Microtherm Inc.
3269 Regal Drive
Alcoa, Tennessee 37701
USA
T. (+1) (865) 681 0155
F. (+1) (865) 681 0016
E. sales@microtherm.us

Microtherm N.V.
Industriepark Noord 1
9100 Sint-Niklaas
Belgium
T. (+32) 3 760 19 80
F. (+32) 3 760 19 99
E. info@microthermgroup.com

Nippon Microtherm Co., Ltd.
Korakuen Shinjuku Bldg,
4-15-7, Nishi-shinjuku
Shinjuku-ku, Tokyo 160-0023, Japan
T. (+81) 3 3377 2821
F. (+81) 3 3378 2821
E. sales@microtherm.co.jp

www.microthermgroup.com

Issue ref.300910/01

MICROTHERM
THERMAL INSULATION SOLUTIONS