Promat HPI
in Concentrated Solar Thermal Power
Since the start of the industrial revolution our dependence on fossil fuels has steadily polluted our world. Greenhouse gasses, acid rain, and smog are all aspects of man made pollution. Today, the global focus is away from dwindling fossil fuel reserves and towards sustainable and renewable energy sources.

Concentrated Solar Power (CSP) is probably one of the most attractive technologies to help and achieve the targets set for producing sustainable energy because of the unlimited solar energy reserves available in the sunny regions of the world.

Promat HPI delivers insulation solutions for all Concentrated Solar Power technologies. We supply innovative systems for parabolic trough and solar tower applications and we are also actively involved in the solar dish and linear fresnel technologies. Promat R&D consistently introduce new state-of-the-art and cost effective engineered solutions. In addition, we also offer a product range that can be used as heat shielding for the area surrounding the solar receiver of a solar tower.

Microporous products

Promat HPI offers a wide range of microporous products ideally suited to the CSP market comprising rigid and flexible panels and moulded pipe sections.

All our microporous products have a thermal conductivity that is close to the lowest theoretically possible across all temperatures right up to 1200°C making them at least 4 to 5 times better performing then any conventional insulation material at 1000°C.

The unbeatable performance of microporous insulation results in a number of benefits including:
- Reduced thickness of insulation.
- Reduced insulation weight.
- The possibility to save space.
- The possibility to increase the internal capacity of an assembly.
- Reduction of heat loss resulting in energy savings.

High temperature modules (SCUTTHERM®)

SCUTTHERM® modules are high temperature resistant composite panels used for heat shielding on solar towers.

SCUTTHERM® modules offer some very important properties and characteristics:
- Good thermal surface resistance up to 1600°C
- High resistance to solar radiation
- High solar absorbance
- High UV absorbance
Solar tower CSP systems

In recent years, several EPC companies & technology providers have developed different types of solar towers. For each different approach, a solar tower system comprises multiple stages each of which can benefit from a Promat HPI engineered insulation solution.

These stages include:
- Solar receiver
- Heat storage vessels.
- Distribution piping to and from the receiver
- Hot air lines.
- Outside heat shield.
- Protection to cavity of the receiver area.

Microporous product such as MICROTERM® PANEL, MICROTERM® OVERSTITCHED and MICROTERM® MPS are widely used to insulate both volumetric and cylindrical receivers, hot boxes protecting pipes and valves connected to the receiver, and distribution piping in the solar tower.

Microporous products offer excellent performance even at elevated pressures and in atmospheres other than air.

For one project, Promat HPI delivered ALSIFLEX® refractory ceramic wools and modules that were used to insulate the heat storage vessels and the hot air lines. The main advantages of these lightweight RCF wools are the very low density resulting in lightweight linings, and the superior thermal shock resistance.

Promat HPI combines a vast product range with unmatched technical service and engineering capabilities. Our involvement from the project beginning at the design stage ensures that we are able to provide the most efficient and cost effective insulation solution.

External heat shielding to solar tower

SCUTTERM® are composite panels that are used in the design of engineered, custom made thermal heat shields. They are assembled as modules for fast and simple installation and can easily be fixed to either a metal structure or to the concrete wall of the solar tower itself, directly above and/or under the solar receiver.

Anchorage pins are cleverly designed to eliminate the possibility of solid conduction of heat through the insulation.

SCUTTERM® can also be used to protect the inside cavity of the solar receiver.
Parabolic trough CSP Systems

Throughout our involvement in this market we have developed several insulation solutions for Ball Joint Assemblies (BJAs) of parabolic troughs.

Promat HPI now offers several BJA design solutions:

- Our original solution based on tailored flexible jackets incorporating MICROThERM® OVERSTITCHED PANEL
- Our second generation system combining MICROThERM® MPS with an Alu Cladding.
- Our latest design solution utilising large size flexible jackets to protect recently developed flexible ball joint hoses.

Advantages of a Promat HPI insulation solution for BJAs include:

- They allow rotational movement at the joint while controlling loss of heat energy
- Increased plant efficiency by controlling heat losses
- Long lifetime
- Excellent passive fire protection (PFP) material combined with Alu foil internal finishing helps to prevent fire
- Leakages are quickly traceable
- Quickly removable for routine maintenance inspections.

Distribution pipe runs

The overall operational efficiency of any solar power collection system is directly related to the control of system energy losses. Promat HPI insulation systems utilising moulded pipe sections (MPS) for smaller diameters, and flexible insulation products for larger diameters, are fast to fit and totally cost effective when compared to less efficient conventional insulation products. As our microporous insulation is easy to cut and shape on site, difficult parts such as pumps and valves can be quickly and efficiently insulated to maintain a consistent thermal performance.

Pipe supports

Promat HPI offers simple solutions based on flexible microporous products for the insulation of pipe clamps. These give a number of technical as well as economic advantages including:

- Reduced heat loss from thermal bridges through direct metal contact
- Thinnest insulation keeping pipe clamps as compact as possible
- High compression resistance so the insulation thickness can be maintained irrespective of the weight of the pipe load being supported
- By reducing the temperature in the supports, lower grade steel can be used reducing the cost
OUR PRODUCTS AND BENEFITS

Parabolic Trough plants

- Solnova 1 (ES): 50MW, Flexible ball joint jackets
- Solnova 3 (ES): 50MW, Flexible ball joint jackets
- Extresol 1 (ES): 50MW, Flexible ball joint jackets
- Extresol 2 (ES): 50MW, Flexible ball joint jackets
- La Dehesa (ES): 50MW, Flexible ball joint jackets
- La Florida (ES): 50MW, Flexible ball joint jackets
- Andasol 3 (ES): 50MW, pipe clamp insulation
- Valle 1 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Valle 2 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Manchasol 1 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Manchasol 2 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Helio Energy 1 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Solaben 1 (ES): 50MW, BJA flexible hoses + Pipe clamps
- Solaben 2 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Solaben 3 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Solaben 6 (ES): 50MW, BJA flexible hoses + Pipe clamps
- Lebrija (ES): 50MW, Ball Joints: MPS + Alu cladding
- Solarcor 1 (ES): 50MW, BJA flexible hoses + Pipe clamps
- Solarcor 2 (ES): 50MW, BJA flexible hoses + Pipe clamps
- Borges Thermosolar (ES): 22.5MW, Ball Joints: MPS + Alu cladding + Pipe clamps
- Enerstar Villema (ES): 50MW, Ball Joints: MPS + Alu cladding + Pipe clamps
- Helios 1 (ES): 50MW, Flexible ball joint jackets
- Helios 2 (ES): 50MW, Flexible ball joint jackets
- La Africana (ES): 50MW, Ball Joints: MPS + Alu cladding
- Astexol 2 (ES): 50MW, Ball Joints: MPS + Alu cladding
- Arenales (ES): 50MW, Ball Joints: MPS + Alu cladding
- Guzman (ES): 50MW, Ball Joints: MPS + Alu cladding
- Hassi R’Mel (AL): 50MW, Flexible ball joint jackets
- Ain-Ben-Mathar (MA): 50MW, Flexible ball joint jackets
- Solar (US): 280MW, Pipe clamp insulation
- Mojave Solar (US): 280MW, Pipe clamp insulation
- Genesis Solar 1 (US): 125MW, Pipe clamp insulation
- Genesis Solar 2 (US): 125MW, Pipe clamp insulation

Power tower plants

- Julich tower (DE): 1.5 MW, Receiver, hot air lines & hot storage vessel
- Gemasolar (ES): 50 MW, Receiver + piping, outside heat shield
- PS 10 (ES): 11 MW, Outside & inside heat shield
- PS 20 (ES): 11 MW, Outside & inside heat shield
- CRS (ES): 4.6 MW, Outside heat shield
- Tonopah (US): 100 MW, Outside heat shield
- Aora (IR): 100 kW, Target heat shield