



Standard Heating Product Catalogue



T&D THORNE &
DERRICK UK

Tel: +44 (0)191 490 1547

Fax: +44 (0)191 477 5371

Email: northernsales@thorneandderrick.co.uk

Website: www.heattracing.co.uk

www.thorneandderrick.co.uk

THERMOCOAX
from vision to reality

THERMOCOAX

from vision to reality



A Solutions Company

THERMOCOAX is the worldwide leading company of Mineral Insulated Cable Technology for more than 55 years.

- Over 50 countries are covered by THERMOCOAX products,
- More than 500km of mineral insulated cables are produced annually in our own cable manufacturing workshop,
- 100 000 thermocouples, 15 000 heating elements are delivered each year to high-tech industries,
- 30 km of signal transmission cables are destined each year to nuclear plants worldwide.

The customer at the heart of our business

THERMOCOAX has always put the customer at the core of its activities.

In order to meet the most specific requirements, THERMOCOAX has specialised in an organization by market segments (Nuclear Energy, Aeronautic / Defense / Space, Semiconductors / Electronic, Petrochemical / Medical / Analytical, Gas turbines, Industries...). THERMOCOAX has supplied customized solutions specifically designed to meet any technological and financial customer requirements.

The Market Demands – We Supply

With more than 55 years of experience, THERMOCOAX has acquired great knowledge to lead innovating projects in order to provide to its customers a ready-to-use custom solution.

www.thermocoax.com



Standard Product Range

Under the Isopad brand, THERMOCOAX specialises in the design and manufacture of electric heating solutions from frost protection to heat management systems upto 1000°C. Isopad design engineers have access to the world's most comprehensive range of heating products from self-regulating, constant wattage or mineral insulated heating cables and tapes to silicone heaters, heating jackets, heated hoses, radiant heaters and drum heaters.

THERMOCOAX has continuously developed innovative new products to meet the ever-increasing industry needs. Today, the Isopad brand is recognised as the undisputed leader in unique electrical heating solutions for Industrial, Photovoltaic, Packaging, Telecommunications and Food Service applications.

With over 50 years industrial experience solutions can be identified from within the range of standard products or fully engineered to meet any custom requirement.

From a single heating problem to a full scale design review and volume production in partnership with the original equipment manufacturer, Isopad offers the solution. **We also have a number of controllers and accessories to complete the range.**

Customised Heating from the Experts

Isopad specialise in providing electric heating products which are often beyond the capabilities of most electrical heating providers and has an ethos of total customer satisfaction in providing much more than a product: a high quality solution to heating problems surpassed by none in the industry.

For custom heaters, the process typically begins with a questionnaire to capture as much information as possible to ensure the right heater is chosen for the specific needs of the client. The next stage involves a design review by a dedicated engineer before a quotation and detailed specification is issued for review. For customised heaters the post-order stage begins with the preparation of a detailed drawing for approval before manufacture begins. This ensures the supplied heater exactly meets the client's needs and offers the level of detail not always possible in a specification overview.

Isopad provide heating solutions into most industries imaginable from pharmaceutical to packaging companies, from perfume manufacturers to gas analyser providers. Orders are accepted from one off to full scale production, supporting every phase of design and product development from prototyping to production.

Isopad has the product and the experience to solve your heating problem.



Heating Cables and Tapes

Heating cables and tapes are one of the most versatile product lines in the Isopad range. Available in a vast array of technologies, the Isopad range is surpassed by none.

Isopad offers a variety of heating tapes and cables to give fast and efficient direct contact heating. They are suitable for a wide range of applications from simple frost or condensation protection through to process requirements up to 1000°C.

Where space is tight, heating tapes are the perfect solution, allowing high temperatures to be reached quickly and maintained on pipelines, containers and other irregular shapes. In addition pre-terminated tapes are available in a variety of popular lengths, ready to install and easy to use requiring no special skills or tools.

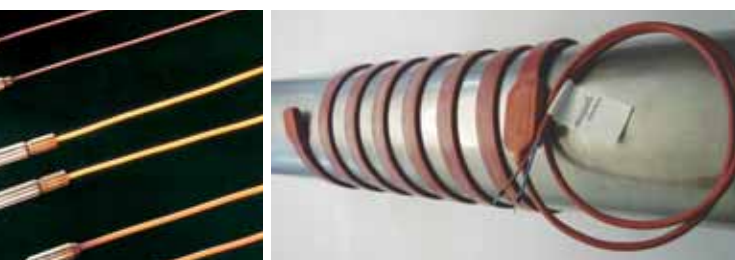


Technology


Constant wattage tapes

These flexible and rugged tapes are constructed from parallel resistive cores insulated with various materials from silicone to quartz glass. Strict manufacturing tolerances ensure these heaters have a uniform element resistance, and due to the relationship between current, resistance and power, they deliver a constant, predetermined power density along the entire length.

Heating Cables and Tapes



Mineral insulated heating cables

Mineral insulated (MI) heating cables and units are rugged, long lasting and suitable for extreme conditions for example, to 1000°C for very low vacuum/high pressure (or 600°C for  applications). They are constructed from a metallic tube and a conductor which is supported and insulated from the tube with an inorganic insulating powder, magnesium oxide. The conductor is usually Nichrome 80/20 although other materials such as copper and ferric can also be supplied for specific applications. The most common sheath materials are 321 stainless steel and Inconel 600, copper and cupronickel are also available.

Various methods can be employed to connect the MI heating element to the cold lead cable such as brazing or silver solder, however, no method offers the same temperature rating or proven longevity as that of the laser-welded cold lead joint developed and employed by Isopad. A significant improvement on previous jointing techniques, this laser welding provides a totally mechanically secure joint. As the welding is done at lower temperatures, heat stresses to the sheath material and the danger of the main failure mechanism of moisture ingress is avoided.

Applications

Due to the versatile nature and broad range of applications for Isopad heating cables and tapes it's impossible to list all of the industries serviced, the following are just a few.

Food processing



Cables and tapes are used in a variety of ways in the food industry: for keeping freezer doors and drain lines frost free, heating conveyor systems, creating anti-stick surfaces, heat for sealing applications including lids on pre-packed foods and sealing plastic bags.

Condensation protection for motors

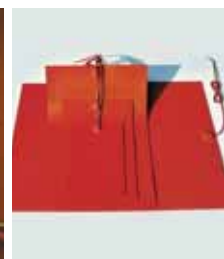
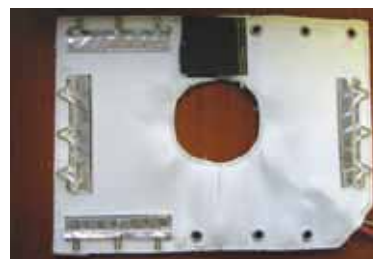


Isopad anti-condensation motor (ACM) heaters have been specifically designed in conjunction with major motor manufacturers to prevent condensation in motor windings which would otherwise lead to sudden or premature failure of the equipment; they are installed around the stator and are popular with manufacturers and motor rewind companies alike.



Heating Panels

Isopad heating panels are suitable for applications where uniform surface heating is required to maintain or increase the temperature of machine parts or equipment. Available in a variety of materials, sizes and fixing methods there is a panel in the Isopad range for almost all requirements.



Technology

Silicone heating panel (200°C)

Isopad silicone panels are fully waterproof and suitable for applications up to 200°C. Formed by encapsulating a resistive heating element between two layers of semi vulcanised silicone rubber and then sealed under temperature and an even pressure to form a single vulcanised silicone sheet.

Uniform heat density is achieved using decades of experience at the design stage and the heating element is precisely laid using a numerically controlled 2 axis positioning system.

Isopad silicone panels use no adhesive and as they are essentially a single piece of silicone and there is no seam which is a common failure mechanism in panels manufactured using lower quality methods.

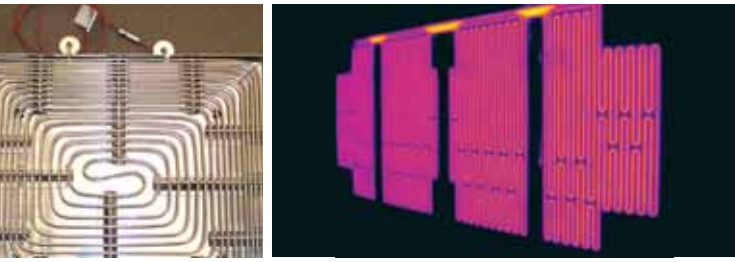
Isopad silicone panels provide good resistance to ozone, oxygen, weathering, ageing effects, bacterial and fungal attacks. They are also highly resistant to various chemicals such as alcohol, acetylene, mineral oil, acids, glucose, and glues. Isopad silicone heating panels can also be toughened with glass cloth when improved mechanical strength is required.

Glass silk heating panel (450°C)

A highly flexible and versatile panel suitable for applications up to 450°C and produced by encapsulating a resistive heating element in glass silk. Isopad offer this product with several fixing methods from hooks and eyes, to lace, to Velcro depending on the client's specific needs.

Quartz cloth heating panel (900°C)

Identical to the glass silk heating panel from a construction perspective the maximum operation temperature is increased from 450°C to 900°C by changing the insulation material to quartz cloth.



Metal cased heating panel (1000°C)

At the core of an Isopad metal cased heating panel lies an MI heating cable which results in an inherently robust product. The MI element is precisely formed to achieve a uniform heat density and fixed to a metallic plate for use as a radiant or contact heater.

Isopad metal cased heating panels are ideally suited for use in high vacuum applications where it is essential to address the potential failure mechanisms at the design stage, for example

- Minimum number of vacuum feed-throughs
 - THERMOCOAX has access to the longest lengths of mineral insulated cable in the industry and therefore a minimum number of feed-throughs and cold-lead joints is possible
- High temperature, reliable cold-lead joints
 - Isopad cold-lead joints are laser welded which, not only increases the operation temperature compared to brazed joints, but also greatly improves the reliability of the joint
- Avoid introducing possible sources of volatile contamination
 - The all-metal construction is very suitable for use in high vacuum equipment as it prevents contamination from volatiles. Vacuum feed-throughs and sensors are supplied as part of the assembly to remove the risk of contamination prior to installation.

Radiant heaters

Where heat transfer through physical contact is not possible or desirable, an Isopad radiant heater is the ideal solution. It combines the uniform heat density and robust properties of a mineral insulated heating cable with a highly polished, support plate. Directed heat with a withstand temperature up to 1000°C is possible and panels can be manufactured up to 5 square meters.

Platen heaters

Isopad platen heaters are produced by mounting a mineral insulated cable within an aluminium plate which has been machined to exacting tolerances and controls. Typically weighing up to 500 kilos and measuring up to 5 square meters Isopad supply some of the largest heating platens in the industry. *Ask us for our dedicated Solar Brochure.*

Applications

Fluid storage and transportation

Transportation of chemicals, fuels, adhesives, paints, foodstuffs and beverages via road tankers and in Intermediate Bulk Containers (IBCs) is commonplace but it presents several issues which can make it difficult or even impossible, the two main issues are :

- Temperature maintenance to prevent spoiling
- Temperature heat-up to reduce viscosity and ease/allow removal

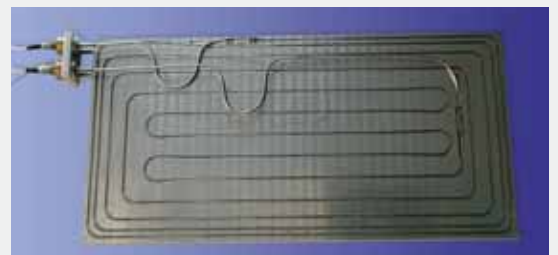
Isopad provide a complete range of IBC heating panels from silicone to metal cased which solve these problems. Popular with transportation companies and end users alike they not only improve efficiency but they also provide an additional revenue stream by adding value to existing product lines.

Food industry

In high throughput industries downtime can have a significant impact on productivity and cost. Isopad heating panels have been extensively used to improve the flow characteristics of ingredients and finished product within the food industry by applying gentle, controlled heat to the underside of hoppers, shoots and flues, reducing the need for full product line shut down to allow cleaning, in some instances removing it entirely.

Thin film deposition

Isopad radiant heating plates and heating platens have been widely adopted within the thin film deposition industry, for example silicon deposition in PECVD processes used to manufacture thin film solar panels.



Constant and uniform heat density, integral sensors, minimum feed-throughs and stringent quality controls make the Isopad heating platen the preferred option by many, favouring it over other technologies. The large size possible with Isopad platens has facilitated the manufacture of some of the largest solar panels currently available.



Heating Jackets

Isopad heating jackets provide a convenient solution blending the versatility of a heating panel with the convenience of integral insulation. A heating panel excels when it is required to heat a flat surface, where a jacket is the product of choice when a uniform heat source is required to a surface in more than 2 planes, for example pipes, filter housings, valves and tees.

A distinct advantage is maintenance down-time; it is significantly quicker to remove a jacket with integral insulation than it is with other heating methods such as a heating tape with sensor, lagging and securing tape.

Isopad heating jackets can be manufactured to almost any shape, temperature range and operational consideration.



Technology

Silicone jackets (200°C)

Isopad silicone jackets are fully waterproof and suitable for applications up to 200°C. At the core lies an Isopad silicone panel, insulated with silicone foam and fully encapsulated is silicone rubber.

There is often no need for mechanical fixing as the Isopad silicone jacket is flexible enough to open and position on to the product to be heated but rigid enough to hold itself in position.

Uniform heat density is achieved using decades of experience at the design stage and then the heating element is laid using a numerically controlled 2 axis positioning system.

Isopad silicone jackets provide good resistance to ozone, oxygen, weathering, ageing effects, bacterial and fungal attacks. They are also highly resistant to various chemicals such as alcohol, acetylene, mineral oil, acids, glucose and glues. Isopad silicone heating panels can also be toughened with glass cloth when improved mechanical strength is required.

Applications

Heating Jackets



Glass silk heating jacket (450°C)

A highly flexible, versatile jacket suitable for applications up to 450°C and produced by encapsulating a resistive heating element within a glass silk outer. Isopad offer this product with several fixing methods from hooks and eyes, to lace, to Velcro depending on the client's specific needs.

Quartz cloth heating jacket (900°C)

Identical to the Glass silk heating jacket from a construction perspective the maximum operation temperature is increased from 450°C to 900°C by changing the insulation material to quartz cloth.

Metal cased heating jacket (1000°C)

Isopad heating jackets can be designed utilising any of the heating cables and tapes within the Isopad range in order to form a robust and protected product. Available with ATEX approval, the Isopad metal cased heating jacket has provided a versatile solution where no other jacket is suitable.

Frost protection heaters

In 2010 it cost the UK an estimated £27m to rectify the damage caused by frozen pipes, in addition water supply, drainage and soil systems became inoperable for extended periods. Isopad heating jackets have been used to ensure key supply and waste services operate consistently in sub zero conditions, for example the jackets in the above image were designed for the soil system of a temporary toilet facility set-up by the military ensuring toilets remained operational in extreme conditions.



Heating complex shapes



Isopad have designed and supplied countless heating jackets for complex shapes which not only ensures an even heat density but also reduces expensive site time at both installation and maintenance stages.

Heaters for filtration systems

Heating filter housings aids filtration, separation and purification by eliminating condensation and residual water, reducing liquid viscosity and maintaining the temperature of the medium slightly above the dew point to prolong the life of the cartridge.



Heat promotes the flow of fluids through the filter cartridge, this reduces the load on the pumps and filters and results in longer maintenance intervals. By maintaining the medium at a constant working temperature, with no hot spots, there is no degradation or crystallisation of the liquid being filtered. Isopad filter heater jackets are permanently moulded to shape with integral insulating silicone foam, there is no need for straps or bolts to hold it to the filter housing, which reduces maintenance time.

Heaters for intermediate bulk containers



Designed for caged, plastic, or metal tote tanks / IBCs, the wrap-around blanket design evenly heats a tote tank externally, helping to maintain a constant temperature.



Heated Hoses

Many products are heated in containers or processes to improve their flow characteristics or homogeneity. Moving these materials between processes or from storage vessels can be problematic as rigid pipe work combined with cumbersome heating methods can be undesirable at best and is often impossible. Isopad heated hoses solve these issues by seamlessly blending industry standard hoses and fittings with world leading heating technology into a flexible hose with integral heater and sensor.

Isopad hoses are designed and manufactured to optimise heat uniformity and control characteristics using an integrated temperature sensor and evenly distributed resistive heating element. Decades of engineering experience ensure the hose will maintain the medium being transferred at an even, pre-set temperature, avoiding hot spots or changes in viscosity, eliminating condensation, degradation and crystallisation.

The flexible properties of the heated hose eliminate many problems with alignment and machine vibration.



Technology

Inner hose is in direct contact with the liquid or gas. Standard hoses are high-quality polytetrafluoroethylene (PTFE) which exhibit many characteristics that make it the ideal choice from a very low coefficient of friction to a high chemical resistance and a temperature range of -70°C to 250°C. Other materials can be used to manufacture hoses for specific applications.

Stainless steel braiding is required for high pressure use. The PTFE inner hose is provided with a stainless steel braiding. Up to 3 layers of braiding can be applied to increase the operational pressure up to 500 bar @ 24°C (6 mm diameter inner).

Heating element is precisely wound around the hose at a constant predetermined pitch to ensure accurate and uniform heat density.

Temperature sensor ensures accurate system control. Isopad heated hoses have an integral sensor, several types are available e.g. Pt100 resistance temperature device, type K thermocouple, type N thermocouple.

Fleece ensures the heating element and sensor pitch remains unchanged during the repeated manipulations the hose will endure during operation.

Applications

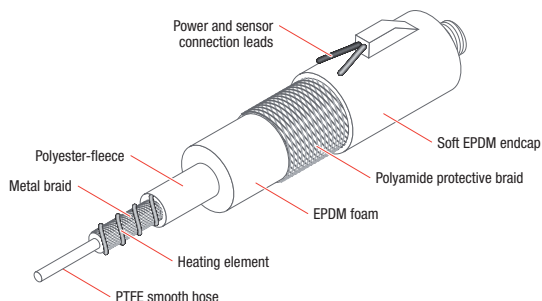
Heated Hoses



Insulation material and thickness is calculated to minimise heat loss and ensure the maintain temperature specified by the client is achieved.

Braiding is not only aesthetically pleasing but it's also designed to ensure the insulation material remains undamaged and firmly held in place as well as meeting the static and dynamic bend requirements of the client.

End cap with cable entry has dual use, firstly to ensure the hose remains intact during operation and secondly it provides a secure and convenient location for both the power and sensor connection cables.



Gas analysers

When analysing gas it is critical that the composition of the gas is unchanged between the gas sample point and the gas analyser itself, none of the constituent parts can change phase or the analysis will be inaccurate.



Isopad heated hoses have been extensively used in this field to maintain the temperature and prevent external contamination thus ensuring an accurate analysis, for example, exhaust gas analysing equipment used by leading car manufacturers.

Automotive / robotic industry



The automotive industry has been revolutionised by robotics but new challenges had to be overcome, for example, many car windcreens are secured using a "hot" adhesive applied using an articulated robotic arm, the glue must be maintained within a specific temperature range for optimised adhesion which is simply not possible using fixed pipe work or an unheated system.

Isopad, in partnership with a leading robotics company, designed a heated hose that could withstand the rigours of the automotive industry, this was particularly challenging due to the degree of articulation and the number of repetitions required by the client.

Oil pumping

Oil transportation has become difficult as more and more heavy oil is extracted, there is currently more than twice the reserves of heavy oil than there are conventional oil. To meet the demands of this challenging industry Isopad design heavy duty heated hoses specifically to reduce the viscosity of oil to allow it to be pumped between containers and transporters.



Isopad hoses are also used with light oil in areas with severe winter conditions, the cold temperatures increase the viscosity of the light oil making it very difficult to pump unless heated.



isopad

Drum Heaters

Isopad offers a range of drum and base heaters that provide a reliable way to reduce viscosity, protect stored product from frost and enable product removal. Available in both nonhazardous and hazardous area versions with reliable temperature control, Isopad drum heaters offer the ideal heating solutions for viscous products stored in drums, for example: adhesives, asphalt, waxes/paraffin, chemicals, chocolate dyes and varnishes. Three types of drum heaters are available a metal drum heater, a soft jacket drum heater and a silicone drum heating band.



Technology

Metal drum heater design

Isopad drum heaters have a unique "clam shell" design and castors, heaters can simply be wheeled up to and closed around the drum, eliminating overhead lifting. The clam shell design allows the heater to be stored open, against a wall taking up less space. Castors are antistatic and have parking brakes to prevent heater movement whilst in use.

Supplied as a complete unit with integral insulation and lid the Isopad drum heater is very efficient with the added benefit of allowing the drum to be heated at or close to where the product is needed.

Manufactured in heavy gauge sheet steel with a double skin construction housing, the electric heating elements cover the entire inner surface. The heating elements are provided with reinforced thermal insulation to prevent heat loss through the outer wall. Inner walls are painted with a thermally conductive paint to give maximum heat transfer.

Drum Heaters



Compatible drum materials

Isopad drum heaters can be used with ferrous and plastic drums as heat is provided via an electric heating element as opposed to induction heating.

Energy efficient

Isopad drum heaters are designed to reduce energy consumption through a combination of thermal insulation and temperature control. The drum heater is the entire length of the drum and the surface is in close proximity to the drum itself which minimises the power required to heat the product, particularly in comparison to drum ovens or shorter drum heaters.

Heating in hazardous areas

Isopad drum heaters are available with IECEx and ATEX system approval. Drum and base drum heaters for hazardous areas are equipped with a self-regulating heating system negating the need for a separate temperature limiting device.

Soft jacket drum heater

Isopad soft jacket drum heaters are designed to wrap around a drum and combine the convenience of quick heat-up time and the precision of a digital controller. Fixed with a hook and loop Velcro fastening and insulated with glass silk cloth, these heaters can heat up to 232°C.

Silicone drum heating band

Silicone band heaters consist of a resistance heating cable and silicone carrier. There are two versions available, one with an internal Pt100 sensor and temperature limiter to 180°C and the other with a built-in adjustable thermostat with a control range of 10°C to 218°C.

Applications

Food production



Many products such as glucose, chocolate, molasses, syrup and honey are transported and stored in drums, yet the ambient temperature viscosity means they are very difficult or impossible to remove from the drum effectively. Isopad drum heaters are employed extensively in these industries to provide an efficient, safe method to heat the drum and the product sufficiently to remove it from the drum.

Petroleum industries



Heavy oil and high wax content petroleum are notoriously difficult to remove from transportation drums due to their high viscosity, this is compounded by the difficulties associated with the direct application of heat within hazardous areas. Isopad ATEX / IECEx drum heaters offer the ideal solution solving both major issues by safely improving the flow characteristics.



Gas Bottle Heaters

Isopad gas bottle heaters have been designed specifically to solve the issues associated with gas usage in cold climates i.e. gas separation, gas liquefaction and reduced capacity. There are two versions available, a heavy duty metal version which is based on the same technology as our metal drum heater and is suitable for use in hazardous areas and a soft lag gas bottle heater.



Technology

Metal gas bottle heater Physical design

Isopad gas bottle heaters have a unique “clam shell” design and castors, heaters can simply be wheeled up to and closed around the gas bottle, eliminating overhead lifting. The clam shell design allows the heater to be stored open, against a wall taking up less space. Castors are antistatic and have parking brakes to prevent heater movement while in use.

Manufactured in heavy gauge sheet steel with a double skin construction housing the electric heating elements that cover the entire inner surface. The heating elements are provided with reinforced thermal insulation to prevent heat loss through the outer wall. Inner walls are painted with a thermally conductive paint to give maximum heat transfer.

Gas Bottle Heaters



Heating in hazardous areas

Isopad gas bottle heaters carry IECEx and ATEX system approval. Hazardous area approved designs are equipped with a self-regulating heating system negating the need for a separate temperature limiting device.

Soft lag gas bottle heater

Isopad soft jacket gas bottle heaters are available in different gas cylinder sizes with a 240 V power supply. Fixed with a hook and loop Velcro fastening and insulated with glass silk cloth, these heaters feature a grounded heating element.

Applications

Gas bottle heaters in a power station



Compressed gas is used during the commissioning and start-up phases of gas turbines, it's critical that a reliable and constant gas supply is available. ISOPAD Hazardous area gas bottle heaters were recently used to guarantee the bottled gas supply met the client's requirements during the start-up ignition sequence at a new plant in Yemen.

Reduced gas cost

In cold climates, the volumetric output from a gas bottle reduces as the material in the bottle becomes / remains in a liquid state, for example, several Isopad customers were questioned by their gas supplier when they returned gas bottles which still contained useable material, the issue was the gas wasn't useable at the cold site owned by the customer and, in fact, the customer thought the bottles were empty. The solution was an Isopad gas bottle heater which allowed the client to use all of the material purchased thus reducing gas cost as well as delivery charges.