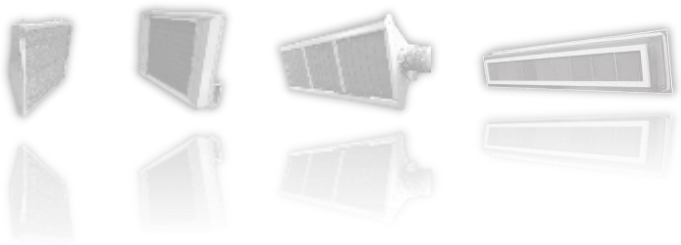
SUNKISS MATHERM RADIATION

Product Information



SUNKISS MATHERM RADIATION
Working with

Unitech Machinery
Manufacturers of Infra-Red Ovens
UK & Ireland

Unitech Machinery, Unitech House, Prospect Road, Burntwood, Staffordshire, WS7 0AL
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Company profile

SUNKISS MATHERM is the designer of the Thermoreactor® range of products and the first manufacturer who designed an innovating technology for infrared radiation, adapting excellently to the requirements of drying, fusing and polymerizing of paints and varnishes.

SUNKISS MATHERM, is the first manufacturer to create, perfect and improve infrared radiation technology that is particularly efficiency for a substantial reduction of polymerizing time. Today SUNKISS MATHERM designs and builds installations for many industrial manufacturers which are looking for savings in time and space, better product finish, energy savings and more flexible operation.

SUNKISS MATHERM is as also a designer and supplier of industrial ovens that gives you the security that your project will be led from the beginning to the end based on a partnership which is characterized by competence and know-how.

All our Thermoreactors® and catalysers are manufactured and assembled in our factory in Bressolles, France to ensure us an optimum quality control.

SUNKISS MATHERM is preparing the infrared technology of the future, and we are also working on coating ovens with low energy consumption.

SUNKISS MATHERM, located in France, and has many distribution partnerships worldwide. We also work directly in all continents.

Unitech Machinery is our integrator & partner for the UK & Europe

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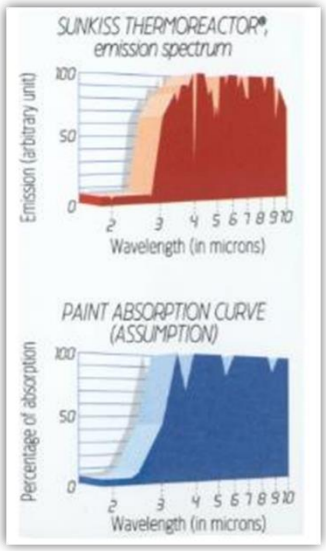
Thermoreactors® overview

A Thermoreactor® is a heating system with gas fuelled device as a radiant panel that uses a catalytic reaction of fuel, oxygen and heat to generate Infrared. This produces energy, an air/gas mixing passes through an adapted catalytic pad that oxidizes the mixing with a temperature lower than flame.
The principle of the Thermoreactor® is the transfer of effective energy to the centre of the coating, using the diffusion of constantly fluctuating electromagnetic radiation across a very wide infrared spectrum, and hence the perfect absorption by all organic coatings (paint, adhesives, etc.)

Matching of spectra:
Situated in a range from 2 to 10 microns, the Thermoreactor®'s infrared emission spectrum covers the absorption spectra of the organic coating completely and perfectly. This matching of spectra results is an excellent transfer of energy and an evaporation, drying, fusion and polymerization processes.



Safety:
The total safety of the Thermoreactor® in the presence of organic solvents (VOCs) has been tested in a special explosion test box. Because of its combustion efficiency, the Thermoreactor® generates neither carbon monoxide (CO) nor nitrogen oxides (NOx).

Time saving:
Drying time is always one third to one eighth of the normal time because of the rapid rise in temperature and acceleration of evaporation, fusion and polymerization processes.

Space saving:
This saving always results in a more compact and shorter tunnel, which favours installations where space is limited.

Quality:
Improved finished appearance and paint film hardness occur because of core drying, solvent or water evaporation from inside to outside, and because of the very quick fusion of powder paint.

Solvent vapor removal:
The solvents (VOCs) in contact with the Thermoreactor® during the drying phase are destroyed by flameless oxidation.

Energy savings:
The reduction in energy consumption, which can be more than 50 per cent, can be explained by the direct transfer of energy from the Thermoreactor® to the organic coatings.

Freedom from dust:
Dust contamination is avoided by rapid drying.

Productivity:
Faster throughput resulting in minimal numbers of paint sprayed items queuing for Thermoreactor® treatment.

Rapidity:
The start-up time for a tunnel with a Thermoreactor® system is only ten minutes.

Running:
The Thermoreactor® unit automatically preheats for 10 minutes.
When the operating temperature, to start the catalytic reaction, is achieved then the preheating resistor power is cut off. The catalytic reaction is immediately stating by the opening of the running gas solenoids. Then, the oxygenation (module air fan) starts: the Thermoreactor® unit is then operational.

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Thermoreactors® installation

Construction of the oven and Thermoreactors® integration

The dimensions of the tunnel oven must be adjusted to suit the product. Thermoreactors® walls of the enclosure structure are made of welded-frames and galvanized steel panels, they can be vertical or adapted.

A primary gas train should feed pressure and gas flow necessary to Thermoreactors®. Finally, an electrical control cabinet controls and manages emissions.

Thermoreactors® power regulation

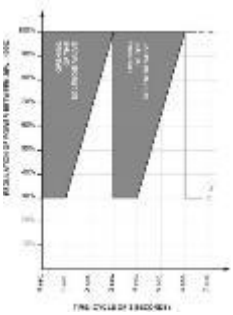
The power regulation can be controlled by two principles made by the integrator company.

Power percentage

The temperature control is made by an electronic temperature controller which defines a percentage of power. This control is carried out from the electrical control cabinet. The operator manually sets a percentage of power and there is no temperature sensor in the oven.
The percentage of power (between 30% and 100%) controls the gas power of all Thermoreactors® (only one temperature zone).
The gas power control is provided by a gas pressure regulator (motorized valve mounted in the primary gas train) that modulates the gas flow/gas pressure of each Thermoreactor®.

Gas pulse regulation

The temperature regulation is made by a control, in the electrical control panel, which controls a pulse modulation system for solenoids.
The gas pressure at the injector remains constant at 150 mbar. Control is driven by the remote gas and electrical panel unit. The range is between 30% and 100%. It controls the opening and closing time of the solenoid valve (100%: valve always open, 30%: 1 second opened and closed 2 seconds). The total cycle time is 3 seconds according the diagram. The regulation can be carried out either by Thermoreactor® individually or by grouping dependent of the equipment configuration.



Thermoreactors® ATEX (intended for use in potentially explosive atmosphere)

Ours Thermoreactors® ATEX are certified by EC-type ATEX examination according Directive 94/9/CE with the marking:

II 2 G Gases and Vapours – INERIS 10ATEX0002X

Our Thermoreactors® are ATEX category 2G (high protection) and can be used in zone 1 and zone 2 (according Directive 1999/92/CEE). We comply with the safety requirements to be compliant the standard EN 1127-1: Explosive atmospheres – Explosion prevention and protection – Part 1: Basics concepts and methodology.

Only some models of Thermoreactors® are ATEX compliance, ask those models if necessary (possible surplus value for this compliance). EX-type examination certificate for models: on demand.

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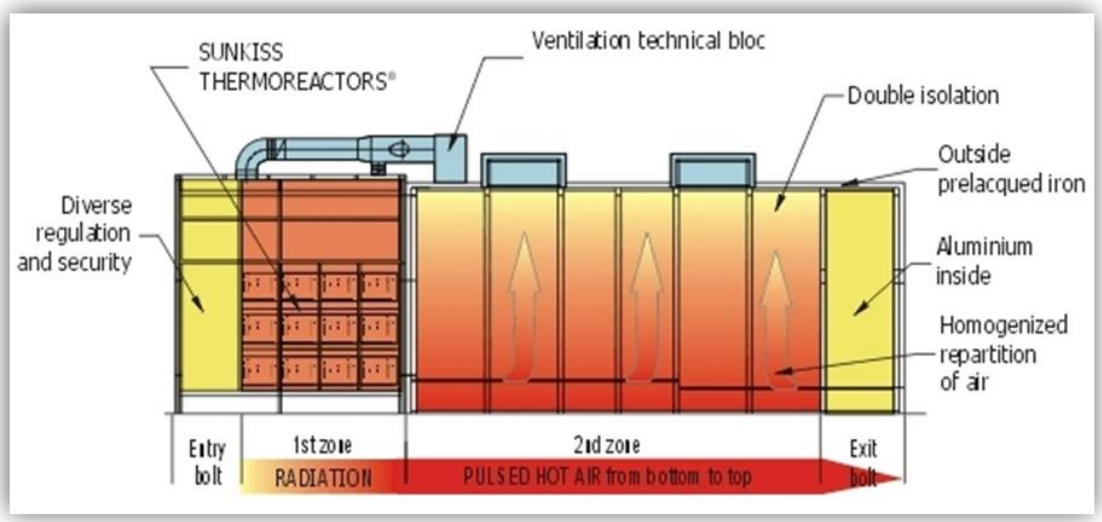
Drying of complex geometrical parts

Mixed tunnel: Thermoreactors® + hot air

It is the best solution to polymerize liquid paint and powder coating on complex geometrical parts or for companies which has a large range of parts to dry.

Two technologies are placed side by side: the Thermoreactors® radiation (which provides a quickly powder gelation and which provide to reach the necessary temperature) and the hot air circulation (which maintain the substrate at the polymerization temperature level by air circulation from bottom to top oven).



Time saving examples

Parts designation	Paint type	Polymerization time by pulsed hot air hot	Polymerization time by Thermoreactors®
Metal drum	Glycerol liquid	35 min.	4 min.
Cycle frames	Liquid PU	30 min.	5 min.
Aeronautics parts	Liquid PU	60 min.	15 min.
Valve bodies weight 160 Kg	Powder	75 min.	15 min.
Railway and metro car	Liquid PU	4 Hours	55 min.
Miniature cars	Powder	20 min.	5 min.
Pencils	Liquid PU	20 min.	4 min.
Seat structure	Powder	20 min.	6 min.
Structure steel	Powder	25 min.	5 min.
Television casing	Water soluble paint	20 min.	3 min.
Glass bottles	Water soluble paint	20 min.	5 min.
Hub cap	Liquid PU	12 min.	5 min.
Gas tank	Powder	40 min.	15 min.

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Training and technical support

To ensure a better integration of Thermoreactors® and to get the full potential from the Thermoreactor® and Catherm®, technologies we offer training and technical assistance.

This training take place on our Bressolles site in France by our teams of engineers and technicians in our design office and in our R&D laboratory.

The themes for mastery of Thermoreactor® and Catherm® technologies are:

- Catalysis;
- Gas Technology;
- Possible applications of Thermoreactor® and Catherm®;
- Expertise Thermoreactor® and Catherm®;
- Installation of Thermoreactors®;
- Integration Thermoreactor®;
- Design of ovens;
- Control and regulation of Thermoreactors®;
- Ventilation and air recycling systems;
- Commissioning of Thermoreactors®;
- Commissioning tunnels and ovens;
- Maintenance of Thermoreactors®;
- Maintenance of tunnels and ovens.

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