



STALAM

LONG-WAVE INFRARED TECHNOLOGY
FOR INDUSTRIAL APPLICATIONS

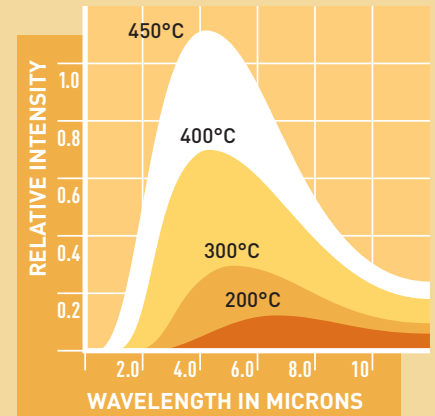
WHY CHOOSE STALAM LWIR TECHNOLOGY?

The LWIR emission is generated by **innovative radiating panels**, patented worldwide. The panels are electrically powered and built using suitable materials for guaranteeing the **maximum radiating efficiency** towards the product.

Appropriately arranged STALAM LWIR panels allow the process to be completed **extremely quickly in an absolutely uniform manner**.

Thanks to these unique characteristics, the treated material is free from surface defects such as **fiissures, cracks and so on** and is ready immediately for the next processing operations.

LWIR panel emission spectrum at the various temperatures



RADIATION PENETRATION DEPTH VARIABLE
from a few microns to a few centimetres.



ADJUSTABLE SPECIFIC RADIATED POWER
from a few W/m² to over 5 kW/m².



FAST, EVEN HEAT TREATMENT
in all parts of the product.



ELIMINATION OF THE PROBLEMS OF FISSURING, CRACKING AND OTHER IRREGULARITIES that generate rejects in the production process.



ASSURED REPEATABILITY OF THE TREATMENT, even in different environmental conditions.



CONSIDERABLE REDUCTION OF WAREHOUSE SPACE for products being treated.



RATIONALIZATION OF THE PERSONNEL assigned to the various processes.



REDUCTION OF overall production cycle **TIMES**.

SINCE 1978 STALAM

has been a worldwide leader in the conception, design and manufacturing of electrothermal equipment for heating and drying processes on raw materials, intermediate and finished industrial products.

MADE-TO-MEASURE TECHNOLOGY

STALAM manufactures LWIR equipment specifically dimensioned and structured on the basis of the Customer's specific technology and production needs.

STALAM is available to interested Customers to carry out tests in its workshop with pilot LWIR technology systems.

INFRARED RADIATION

INFRARED TECHNOLOGY FOR INDUSTRIAL APPLICATIONS

INFRARED RADIATION

Infrared radiation is a particular electromagnetic emission which manifests itself as heat in bodies with which it collides. It is the same mechanism by which the Sun heats the Earth. Infrared rays do not heat the air but only bodies that absorb them.

All bodies emit infrared rays, depending on the material they are composed of and the temperature they are at.

The wavelength of infrared radiation ranges from 1 μm to 100 μm , in the immediate vicinity of visible light. However only wavelengths from 1 to 10 μm are considered for industrial infrared applications.

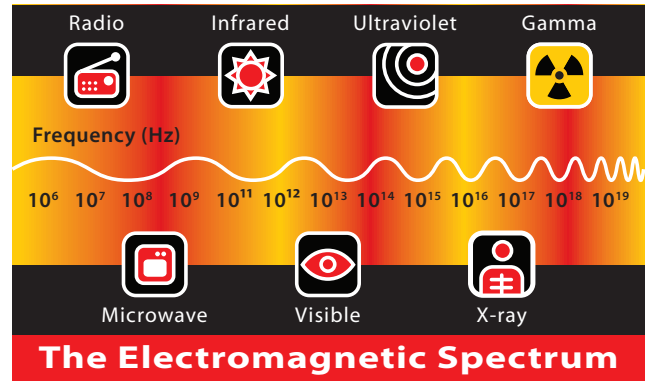
Depending on the wavelength of the emission, infrared radiation can be classified as:

Short-wave (SW): from 1 to 2 μm

Medium-wave (MW): from 2 to 4 μm

Long-wave (LW): from 4 to 10 μm

Because of its characteristics, infrared radiation is ideal for surface heat treatment applications.



STALAM LWIR TECHNOLOGY

STALAM LWIR (Long-Wave Infrared) technology offers **all the advantages of infrared radiation for surface heat treatments**, while eliminating the problems associated with short and medium-wave radiation at the same time.



DEEP PENETRATION: LWIR radiation penetrates under the surface to a greater depth than the other types of infrared emissions.



LOWER SPECIFIC POWER: thanks to the specific wavelength range used, it is also possible to successfully treat delicate materials which do not tolerate excessive exposure to heat.



MAXIMUM EFFICIENCY: LWIR emission takes place in the wavelength range in which the treated materials reveal the highest absorption capacity. The result is that the maximum energy is transferred to the product.



LWIR PANEL

TECHNICAL SPECIFICATIONS

Emission **temperature range** 100°C–450°C.

Specific **radiated power** adjustable up to 6 kW/m².

Emission **wavelengths** between 3 and 9 μm.

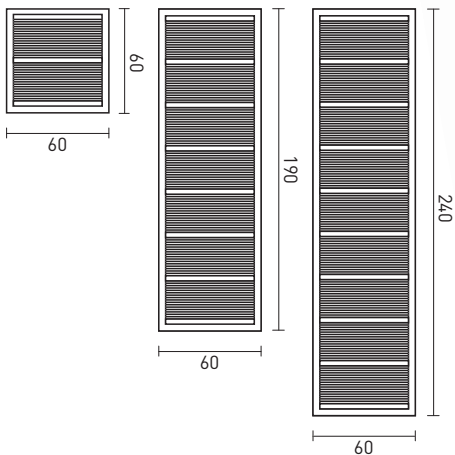
Variable **radiant surfaces** with modular system from 0.36 m² to 2.1 m².

The panels are provided with an **automatic temperature adjustment system**.

DIMENSIONS

Standard models
60 cm x 60 cm
60 cm x 190 cm
60 cm x 240 cm

The panels can be customized to meet specific needs.



Stalam technology revolutionizes the philosophy hitherto behind the use of traditional infrared sources.

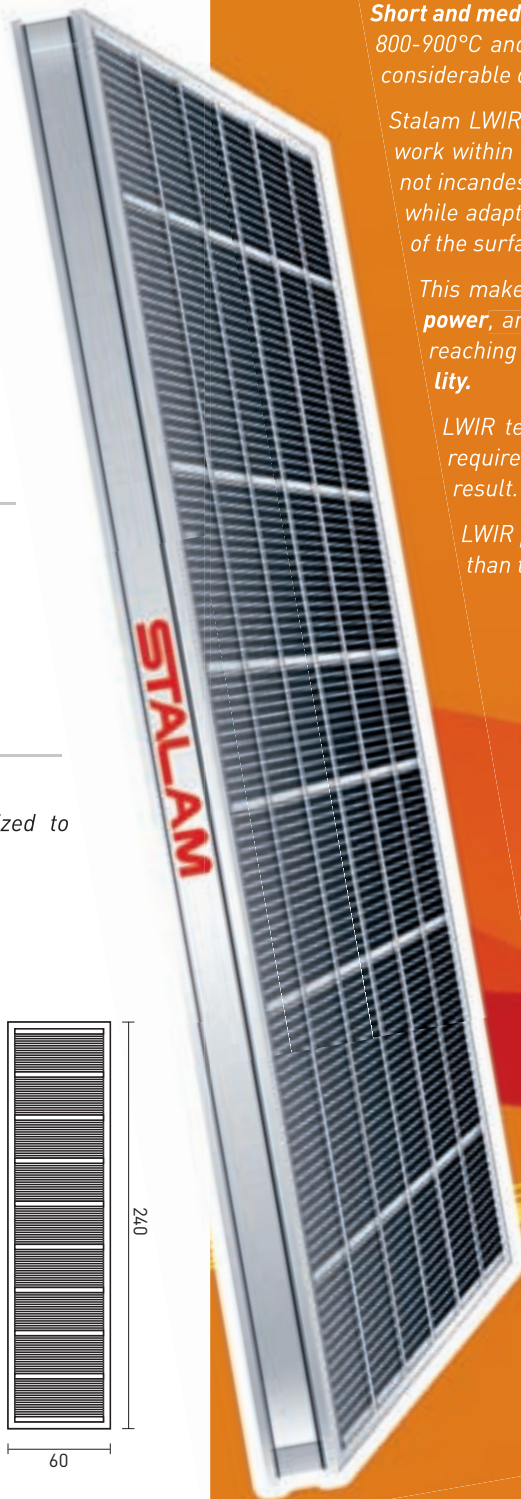
Short and medium-wave emitters work at temperatures above 800-900°C and therefore must necessarily be positioned at a considerable distance from the product to treat.

*Stalam LWIR panels, on the other hand, make it possible to work within a **temperature range from 100°C to 450°C**, are not incandescent and can be positioned close to the product, while adapting the emission temperature to the real needs of the surface to treat.*

*This makes it possible to **eliminate pointless wastage of power**, and prevent an excessive quantity of energy from reaching the product, thereby improving **treatment quality**.*

*LWIR technology can replace all those processes that require the use of hot-air ovens and **save power** as a result.*

*LWIR panels guarantee a **very long life**, much greater than that of short and medium-wave emitters.*



PAINT DRYING

POLYBOX DRYER

FAST PAINT DRYING BOOTH

*POLYBOX DRYER is an **innovative and revolutionary fast drying booth** equipped with exclusive STALAM LWIR technology.*

*The POLYBOX DRYER integrates the LWIR technology with an appropriate air circulation and with control of the relative humidity, **thereby maximizing drying effectiveness.***

*Arranged in appropriate positions in the POLYBOX DRYER, the LWIR panels make it possible to dry paint applied to any support **very quickly and in an absolutely uniform manner**, with the prevention of surface anomalies so that the products are ready immediately for the next operations.*

*The **complete automation of the cycle** makes it possible to set the parameters of the various work stages, thereby allowing the POLYBOX DRYER to be used for a multiplicity of painted articles, from wood to leather, from glass to metal, and from paper to plastic.*

*The POLYBOX DRYER can be built with **different configurations** as it has been designed to be modular and therefore adapt to all the customer's specific needs.*



MAIN ADVANTAGES:

- Deep penetration** of the radiation into the treated products.
- Specific radiated power adjustable** up to 6 kW/m².
- Uniform and simultaneous drying/heat treatment** even of products with complex shapes.
- Rapid drying/heat treatment** with considerable reduction of overall production cycle times.
- Elimination of the irregular treatment problems.**
- Assured repeatability of the drying/heat treatment process** even in different environmental conditions.



STALAM

DRYING CERAMICS

POLYLINE DRYER

FAST DRYING LINE FOR CERAMIC PRODUCTS

The problems that occur in the delicate **ceramic product drying phase** after press-moulding or casting are well known, especially when their shape is complex.

These problems can be overcome using the **innovative POLYLINE DRYER line** equipped with **exclusive STALAM LWIR** technology.

Arranged in appropriate positions in the drying line, **STALAM LWIR** panels make it possible to dry ceramic or other products that are permeable to LWIR radiation **very quickly and in an absolutely uniform manner**, with the prevention of surface defects or deep fissures, while rendering the products ready immediately for the next operations.

It is possible to adjust the radiated LWIR power, and therefore the drying effect, by varying the temperature of the radiant elements (generally between 200°C and 300°C).

Thanks to its **practical and versatile management system**, the **POLYLINE DRYER** is suitable for applications in a wide range of processes that require surface or in-depth treatments, depending on the characteristics of the product.

The **POLYLINE DRYER** is a modular line (tunnel) that **STALAM** can configure according to customers' different needs.



MAIN ADVANTAGES:

Uniform and simultaneous drying even of products with complex shapes.

Fast drying / heat treatment.

Elimination of problems of fissuring and surface anomalies.

Assured repeatability of the drying process even in different environmental conditions.

Continuous operation with instantaneous activation and fast changing of the temperature profiles.

Straightforward management of the different temperatures during the process.

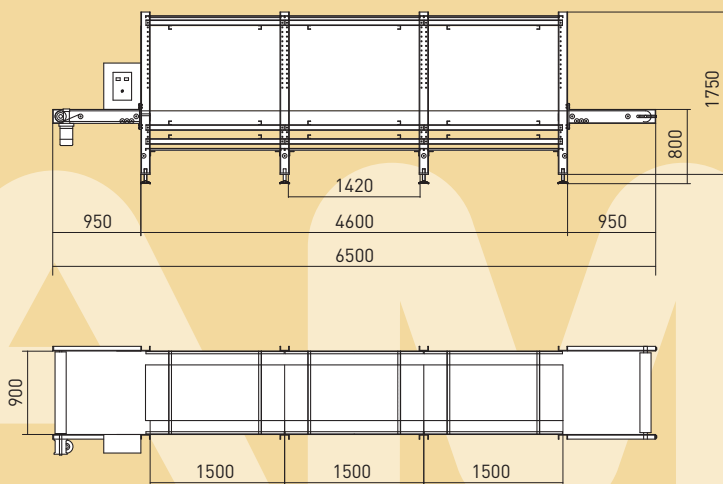
Maintenance-free.

Very fast installation and simple connection to the electricity supply line.

Customizable dimensions thanks to the modularity of the line.

Reduction of warehouse space for products being dried.

Reduction of the overall production cycle times.



EXAMPLE OF A "POLYLINE DRYER" PLANT

Treatment length	4500 mm
Conveyor belt width	600 mm
Max radiating temp.	450°C
Installed power	12 kW
Output	about 100 pieces/h (for 130 g of water/piece)

INDUSTRIAL APPLICATIONS



PLASTICS

Thermoforming
 Vacuum thermoforming
 Heat treatment of extruded parts
 Drying
 Laminating



WOOD/FURNITURE

Heating plastic-coated, painted or bonded components
 Drying the same products
 Drying of water-based paints



PAPER

Fast drying of coated paper
 Adhesive activation



TEXTILES

Drying of dyed/printed/impregnated fabrics
 Latex coating polymerization



ELECTRONICS

Preheating PCB
 IR ovens for SMT



THIN FILM DEPOSITING

Vacuum application of substrates



PRINTING

Drying inks



FOODSTUFFS

Heating
 Cooking



CERAMICS

Drying glaze/pigments
 Pre-drying of ceramics



PACKAGING

Heat-shrinking
 Forming



PAINTING

Drying
 Heat treatment



LEATHER

Drying
 Drying of dyed leather

photo 2 and 3
 Glass-fibre fabric impregnation line with vertical drying tunnel



photo 1
 Modular drying tunnel for dyed leather



photo 4
 Paint drying booth for vehicles and industrial machinery



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