

# IR CATALYTIC SYSTEMS FOR THERMAL TREATMENTS

[www.infragas.com](http://www.infragas.com)

 ***infragas*** CATALYTIC AND  
RADIANT SYSTEMS

# WHO WE ARE

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Since 1971 INFRAGAS® has designed and produced infrared catalytic gas systems specific for surface thermal treatments.

The fuel supply is either Natural Gas (NG) or Propane (LPG). The IR catalytic gas panels are used for the following industrial applications:

- Solvent-based and water-based paint drying (complete treatment)
- Powder coating melting
- Powder coating curing (complete treatment)
- Insulation paint drying on electrical cables
- Thermoforming
- Glass paint drying (decoration, mirroring process)
- Pre-heating of products for further treatments
- Textile treatment (silk screen printing, thermosetting, woven-no-woven fabrics finish)
- Drying after surface treatments (e.g. sandblasting, cleaning...)
- Ink drying
- Vulcanisation
- Thermoplastic treatment
- Wood industry (paint curing on MDF and HDF)
- Food industry
- Oil & Gas applications.



## CERTIFICATION

Safety and Quality are basic principles in all Infragas activities. The production of infrared catalytic gas panels is carried out with continuous checking in line with International Quality Standard ISO 9001 procedures. Infragas quality system has also been approved in conformity with the requirements of the European Directive 94/9/EC, known as ATEX Directive, specific for production of equipments usable in potentially explosive environments.

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**INFRAGAS IS SUPPLIER OF RADIANT  
SYSTEMS FOR OVEN MANUFACTURERS  
AT INTERNATIONAL LEVEL**



# PRODUCTS

Infracas panels are available in the following types:  
INFRACAT®, infrared catalytic heaters;  
BOOSTERCAT®, boosted infrared catalytic heaters.

## MAIN CHARACTERISTICS:

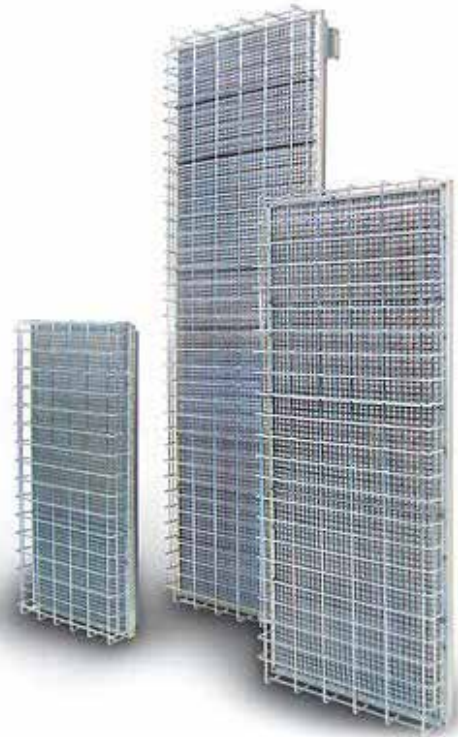
- Many sizes to suit different applications
- Working with Natural Gas or Propane
- Made in stainless steel - hard wearing for long life and reliability
- Compact: high power density, taking up little space
- They can be installed in horizontal, vertical or inclined position to suit application
- Equipped with a highly efficient catalyst (quick start-up: 10 minutes!) with reduced electrical power for the pre-heating phase
- Surface temperature capable of being modulated from 180°C (356°F) to 650°C (1202°F)
- FLAMELESS: usable in potentially explosive atmospheres (ATEX and FM certification)
- Designed, made and tested according to International Quality Standard ISO 9001
- INFRACAT available with K type thermocouple, shut-off valve or thermostatic safety Maxitrol valve
- BOOSTERCAT available with built-in motor fans or with rear flanges for directional air feed.



High technology combined with **LOW WORKING COSTS, TREATMENT SPEED**  
and **COMPACT OVENS** with Infracas IR catalytic panels



# INFRARED ENERGY AND CATALYTIC TECHNOLOGY



INFRARED CATALYTIC PANELS NAMED INFRACAT®, WHOSE TRADE-NAME IS THE COMBINATION OF INFRARED ENERGY AND CATALYTIC TECHNOLOGY, ARE CHARACTERISED BY SURFACE TEMPERATURE CAPABLE OF BEING MODULATED FROM 180°C (365°F) TO 550°C (1022°F).

INFRACAT panels are available in the following versions:

- Standard with "K" type thermocouple for modular applications in ovens;
- Integrated "shut-off" manual valve or thermostatic manual valve in case of panels used as independent units for heating or for industrial thermal treatments.

According to the size, power ranges from 1,5 kW (1290 kcal/h) up to 17 kW (14617 kcal/h), as they have been designed to develop a specific power of 20kW/m<sup>2</sup>.

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## INFRACAT PANELS CERTIFICATIONS:

### CSA CERTIFICATION

Canadian Standard Association - Class 1, Division 1&2, Group D - Explosion Proof products;

### FM CERTIFICATION

Factory Mutual Approvals for use in classified areas Class 1, Division 2, Group D - Explosion Proof products;

### ATEX CERTIFICATION

CE marking in conformity with the Directive 94/9/EC for use in potentially explosive atmospheres, Group II, Category 2 G - Explosion Proof products;

### GOST CERTIFICATION

for Russian Federation;

### UKR-SEPRO CERTIFICATION

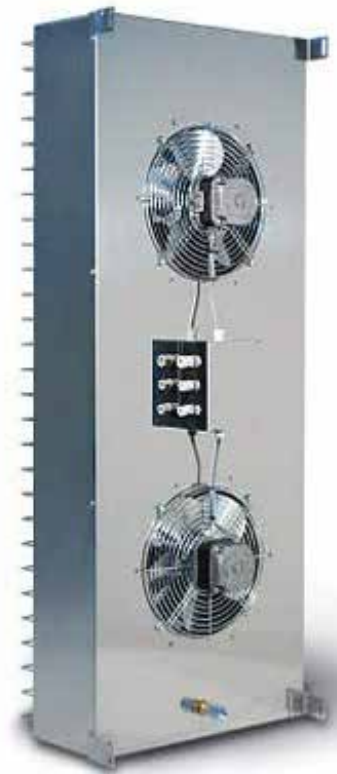
for Ukraine.



MODEL	SIZES mm/inches			VOLTAGE (FOR PRE-HEATING PHASE)		ELECTRICAL POWER ABSORBED IN PRE-HEATING PHASE	PRE- HEATING TIME (minutes)	GAS ENTRY NPT		POWER kW		POWER Btu / hr		GAS CONSUMPTION			
	height	length	thickness	120V	240V			without valve	with	max	min	max	min	LPG g/h max	LPG g/h min	NG m³/h max	NG m³/h min
6.24	150/6"	610/24"	60/2,36"	x	x	400W	10'	1/2"	3/8"	1,5	1,0	5000	3500	113	75	0,15	0,10
8.40	205/8"	1020/40"	45/1,75"	x	x	500W	10'	1/2"	3/8"	4,0	2,4	13500	8000	300	180	0,40	0,24
8.51	205/8"	1305/51"	45/1,75"	x	x	800W	10'	1/2"	3/8"	5,5	3,3	19000	11500	413	248	0,55	0,33
12.12	305/12"	305/12"	60/2,36"	x	x	230W	10'	1/2"	3/8"	1,5	1,0	5000	3500	113	75	0,15	0,10
12.24	305/12"	610/24"	60/2,36"	x	x	460W	10'	1/2"	3/8"	3,0	1,8	10000	6000	225	135	0,3	0,18
12.60	305/12"	1530/60"	60/2,36"	x	x	970W	10'	1/2"	3/8"	8,0	4,8	27500	16500	600	360	0,80	0,48
12.72	305/12"	1830/72"	60/2,36"	x	x	1040W	10'	1/2"	3/8"	10,0	6,0	34000	20500	750	450	1,00	0,60
15.30	380/15"	760/30"	45/1,75"	x	x	580W	10'	1/2"	3/8"	5,0	3,0	17000	10200	375	225	0,50	0,30
16.40	410/16"	1020/40"	45/1,75"	x	x	760W	10'	1/2"	3/8"	8,0	4,8	27000	16500	600	360	0,80	0,48
16.51	410/16"	1305/51"	45/1,75"	x	x	855W	10'	1/2"	3/8"	10,5	6,3	36000	21500	788	473	1,05	0,63
18.48	460/18"	1220/48"	60/2,36"	x	x	825W	10'	1/2"	3/8"	10,0	6,0	34000	20500	750	450	1,00	0,60
18.60	460/18"	1530/60"	60/2,36"	x	x	1015W	10'	1/2"	3/8"	12,0	7,2	41000	24500	900	540	1,20	0,72
18.72	460/18"	1830/72"	60/2,36"	x	x	1210W	10'	1/2"	3/8"	15,0	9,0	51000	3100	1125	675	1,50	0,90
24.24	610/24"	610/24"	60/2,36"	x	x	760W	10'	1/2"	3/8"	6,0	3,6	20500	12300	450	270	0,60	0,36
24.48	610/24"	1220/48"	60/2,36"	x	x	1200W	10'	1/2"	3/8"	13,5	8,1	46000	28000	1013	608	1,35	0,84
24.60	610/24"	1530/60"	60/2,36"	x	x	2400W	10'	1/2"	3/8"	17,0	10,2	58000	35000	1275	765	1,70	1,00



# CATALYTIC TECHNOLOGY COMBINED WITH AN INTEGRATED VENTILATION SYSTEM



INFRAGAS MANUFACTURES INFRARED VENTED CATALYTIC PANELS NAMED BOOSTERCAT®, WHOSE REGISTERED TRADE-MARK SYNTHETIZES CATALYTIC TECHNOLOGY COMBINED WITH THE ACTION OF AN INTEGRATED VENTILATION SYSTEM OR A FORCED AIR SYSTEM THROUGH FLANGES POSITIONED ON THE REAR SIDE OF THE HEATER.

**BOOSTERCAT** surface temperature is capable of being modulated in a range from 180°C (365°F) to 650°C (1202°F) and, according to the specific size, power ranges from 6kW (5159 kcal/h) up to 25kW (21496 kcal/h).

BoosterCat panels have been designed to develop a specific power of 30 kW/m<sup>2</sup>.

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## **BOOSTERCAT PANELS CERTIFICATIONS:**

### **ATEX CERTIFICATION**

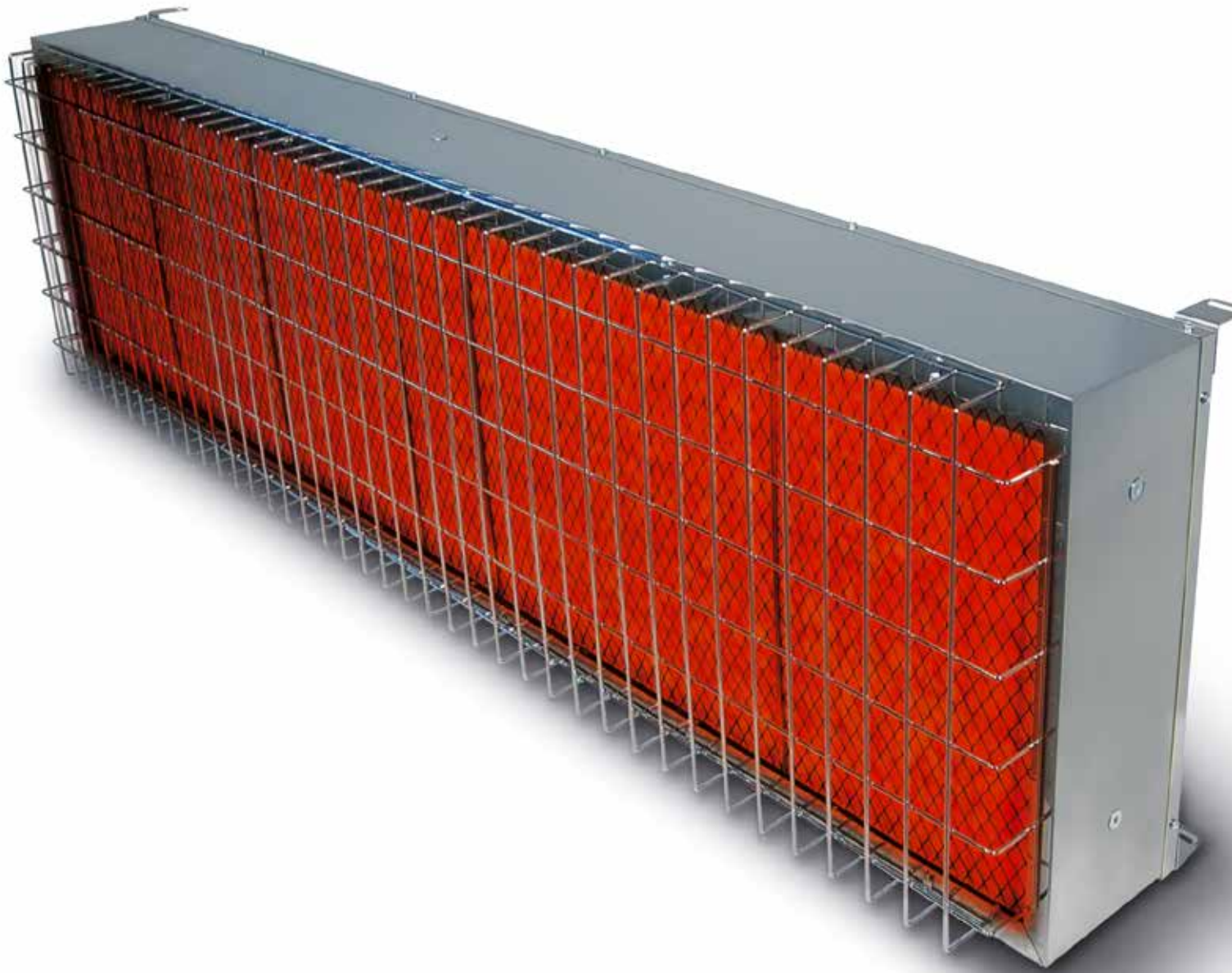
CE marking in conformity with the Directive 94/9/EC for use in potentially explosive atmospheres, Group II, Category 2/-G rear part of the heater in safe zone - Explosion Proof products:

### **GOST CERTIFICATION**

for Russian Federation;

### **UKR-SEPRO CERTIFICATION**

for Ukraine.



MODEL	SIZES mm/inches			VOLTAGE (FOR PRE-HEATING PHASE)		ELECTRICAL POWER ABSORBED IN PRE-HEATING PHASE	PRE- HEATING TIME (minutes)	GAS ENTRY NPT	POWER kW		POWER Btu / hr		GAS CONSUMPTION			
	height	length	thickness	120V	240V				max	min	max	min	LPG g/hr max	LPG g/hr min	NG m³/hr max	NG m³/hr min
5K	489/19"	522/21"	311/13"	x	x	560W	10'	1/2"	6	4	20500	12000	450	263	0,60	0,35
10K	644/25"	630/25"	311/13"	x	x	760W	10'	1/2"	10	6	34000	205000	750	450	1,00	0,60
12K	442/17"	1033/41"	311/13"	x	x	760W	10'	1/2"	12	7	41000	24000	900	525	1,20	0,70
15K	492/19"	1231/49"	311/13"	x	x	825W	10'	1/2"	15	9	51000	30500	1125	675	1,50	0,90
20K	492/19"	1541/61"	311/13"	x	x	1015W	10'	1/2"	20	12	68000	41000	1500	900	2,00	1,20
25K	492/19"	1841/73"	311/13"	x	x	1210W	10'	1/2"	25	15	85500	51000	1875	1125	2,50	1,50



# TECHNOLOGY

## CATALYTIC OXIDATION

INFRAGAS manufactures IR radiant panels that operate on the basis of a GAS CATALYTIC OXIDATION and emit heat through INFRARED ENERGY.

The catalytic oxidation is a chemical reaction activated by means of a catalyst whose characteristics are not altered in time.

The gas (fuel) flows inside the heater and reacts with the oxygen of the surrounding atmosphere (supporter of combustion): the contact of the feeding combustible (Natural Gas or LPG) with the oxygen, through the catalyst duly pre-heated, generates a gas oxidation with production of THERMAL ENERGY.

The reaction is exothermic and develops heat through INFRARED RADIATION (IR).

The catalytic technology enables a complete gas oxidation in total ABSENCE OF FLAME, as the temperature at which the catalytic reaction takes place is lower than the spark starting temperature of the feeding combustible. As a consequence, the TOTAL SAFETY of the catalytic systems leads to applications in potentially explosive atmospheres (ATEX and Factory Mutual certifications - explosion proof appliances).

The catalytic gas oxidation generates carbon dioxide (CO<sub>2</sub>) and water vapour (H<sub>2</sub>O) without emission of carbon monoxide (CO), NO<sub>x</sub> (NO or NO<sub>2</sub>) and unburnt hydrocarbons (HC). It follows that the Catalytic Technology can also be used to reduce VOC emissions to atmosphere in ENVIRONMENT RESPECT (VOCs abatement).

## INFRAGAS INFRARED ENERGY

INFRAGAS infrared catalytic heaters emit thermal energy through infrared rays (IR). INFRARED RADIATION is a form of energy transmission with electromagnetic waves (infrared rays). Electromagnetic waves travel in straight lines and are not absorbed by the air, therefore they do not heat the volumes and they transform themselves in heat only when they are absorbed by an object exposed to them. This working principle enables to obtain notable energy savings and high quality treatments in a short time.

The temperature of a heat source determines the wavelength of that source: if the temperature increases, the wavelength shortens.

Infrared energy is divided in three wavelengths categories, measured in micron (µm):

SHORT WAVES:	from 0,8µm to 2µm
MEDIUM WAVES:	from 2µm to 4µm
LONG WAVES:	from 4µm to 10µm

The radiation of INFRAGAS systems has different wavelengths obtained by modulating the catalytic surface temperature. Therefore, infrared heaters are suitable for different applications considering that they have medium-long wavelengths, between 2 and 10 µm.

The electromagnetic waves emitted by the Infragas panels are greatly absorbed from the most part of organic products. In powder coating sector, for example, infrared energy is perfectly absorbed in polymerization phase, while in treatments with traditional paints, Infragas wavelength enables the rapid evaporation of water and solvents and an homogeneous finishing of high quality without generating thermal stress in the treated substrate.





# CUSTOMER SUPPORT

Customer satisfaction is for Infragas the primary goal and impulse to improvement.

## CUSTOMIZED SOLUTIONS

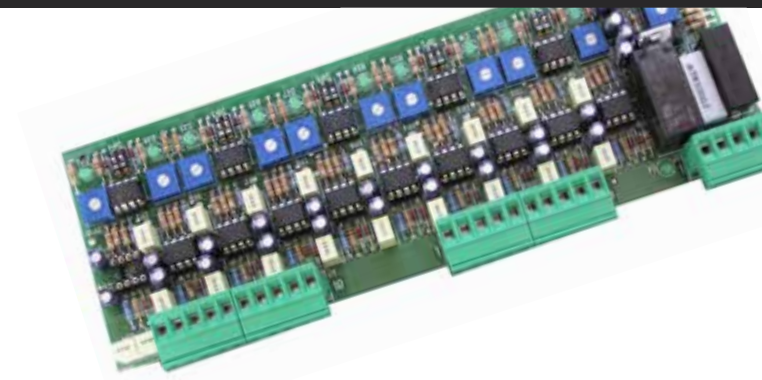
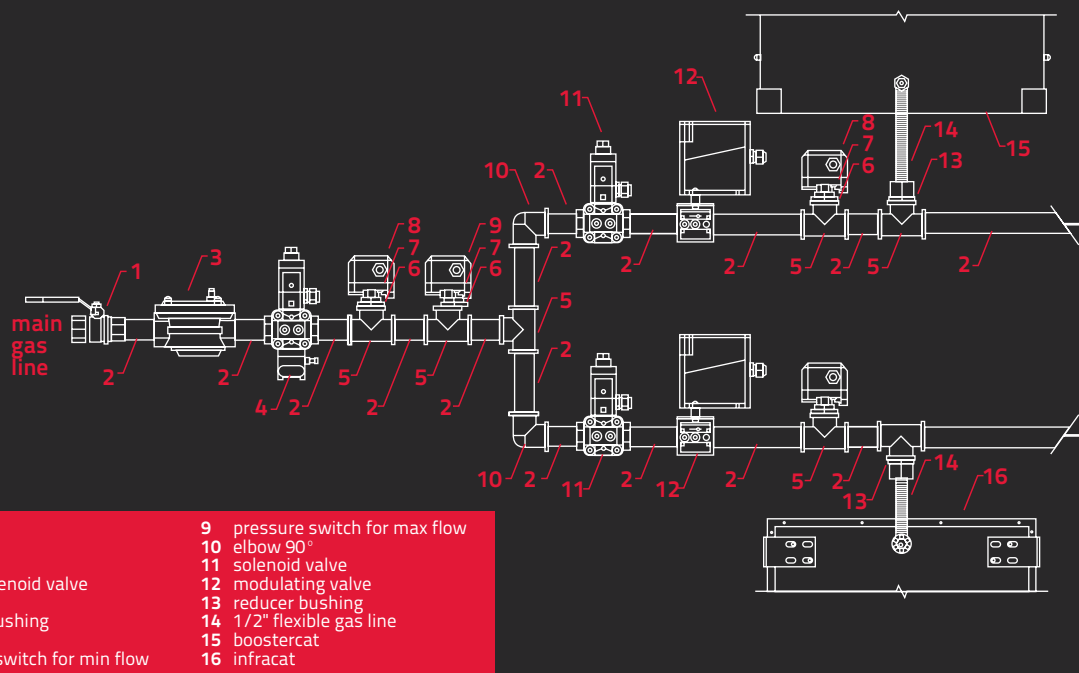
Infragas Research Department enables the development of innovative solutions with the infrared panels in order to satisfy customers both standards and special requirements.

## TEST CENTRE

Infragas has a laboratory and a Test Centre in its plant at Caselle Torinese both to perform tests in collaboration with customers and to acquaint those who do not have previous experience or knowledge of Catalytic Technology.

## PROJECTS

We develop, in cooperation with the customer, complete projects that include also gas connections.



SAFETY AND QUALITY ARE VERY IMPORTANT FACTORS THAT INVOLVE ALL INFRAGAS ACTIVITIES. THE DEVELOPMENT OF A NEW PRODUCT FOLLOWS THE INTERNATIONAL QUALITY STANDARD ISO 9001 PROCEDURES, FROM FIRST DESIGN PHASES TO FINAL MANUFACTURE.



Innovation with Infragas catalytic technology:

- QUICK START-UP
- LOW CONSUMPTION OF FEED GAS
- TEMPERATURE MODULATION
- RAPID CURING TIMES
- FAST COOLING
- SPACE SAVING (compact ovens)
- VOCs ABATEMENT
- ENVIRONMENT RESPECT
- HIGH QUALITY RESULTS
- SAFETY
- USE IN POTENTIALLY EXPLOSIVE ATMOSPHERES (Explosion-Proof)
- ENERGY SAVINGS
- WORKING WITH NATURAL GAS OR PROPANE
- DESIGNED, MADE AND TESTED ACCORDING TO ISO9001 INTERNATIONAL QUALITY STANDARD







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