INFRARED RADIANT GAS SYSTEMS FOR THERMAL TREATMENTS
INFRAGAS IR CATALYTIC GAS HEATERS

WHO WE ARE

Since 1971 INFRAGAS® designs and produces 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.

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

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 2014/34/UE, known as ATEX Directive, specific for production of equipments usable in potentially explosive environments.

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.

PRODUCTS

Infragas catalytic infrared heaters are available in the following typologies: INFRACAT®, infrared catalytic heaters; BOOSTERCAT®, boosted infrared catalytic heaters.

INFRAGAS IR CATALYTIC GAS HEATERS
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 heaters 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 ambient heating or for industrial standing-alone 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/m².

INFRACAT HEATERS CERTIFICATIONS:

- FM CERTIFICATION: Factory Mutual Approvals for use in classified areas Class 1, Division 2, Group D - Explosion Proof products.
- EAC CERTIFICATION: for EurAsian Economic Union.
- UKR-SEPRO CERTIFICATION: for Ukraine.

### MODEL SIZES

<table>
<thead>
<tr>
<th>MODEL</th>
<th>HEIGHT x LENGTH x THICKNESS</th>
<th>VOLTAGE FOR PRE-HEATING PHASE</th>
<th>ELECTRICAL POWER ABSORBED</th>
<th>GAS ENTRY</th>
<th>POWER</th>
<th>POWER BSU/hr</th>
<th>GAS CONSUMPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>mm/inches</td>
<td>120V 240V</td>
<td>kW</td>
<td>NPT</td>
<td>kW</td>
<td>Btu/hr</td>
<td>LPS  G25 Max</td>
</tr>
<tr>
<td>6.24</td>
<td>150/6&quot; 610/24&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>400W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>5000 3500</td>
</tr>
<tr>
<td>8.40</td>
<td>205/8&quot; 1020/40&quot; 45/1.75&quot;</td>
<td>x x</td>
<td>500W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>3000 6000</td>
</tr>
<tr>
<td>8.51</td>
<td>250/8&quot; 1305/51&quot; 45/1.75&quot;</td>
<td>x x</td>
<td>800W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>9500 11500</td>
</tr>
<tr>
<td>12.12</td>
<td>305/12&quot; 305/12&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>2200W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>3000 3500</td>
</tr>
<tr>
<td>12.24</td>
<td>305/12&quot; 610/24&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>460W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>13500 6000</td>
</tr>
<tr>
<td>12.60</td>
<td>305/12&quot; 1530/60&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>800W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>19000 11500</td>
</tr>
<tr>
<td>12.72</td>
<td>305/12&quot; 1830/72&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>970W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>24000 20500</td>
</tr>
<tr>
<td>15.30</td>
<td>380/15&quot; 760/30&quot; 45/1.75&quot;</td>
<td>x x</td>
<td>580W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>17000 10200</td>
</tr>
<tr>
<td>16.40</td>
<td>410/16&quot; 1020/40&quot; 45/1.75&quot;</td>
<td>x x</td>
<td>760W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>27000 10500</td>
</tr>
<tr>
<td>16.51</td>
<td>410/16&quot; 1305/51&quot; 45/1.75&quot;</td>
<td>x x</td>
<td>860W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>36000 21000</td>
</tr>
<tr>
<td>18.48</td>
<td>460/18&quot; 1200/40&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>825W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>34000 20500</td>
</tr>
<tr>
<td>18.60</td>
<td>460/18&quot; 1530/60&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>1015W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>41000 24000</td>
</tr>
<tr>
<td>18.72</td>
<td>460/18&quot; 1830/72&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>1210W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>51000 3100</td>
</tr>
<tr>
<td>24.24</td>
<td>610/24&quot; 610/24&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>760W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>20500 12000</td>
</tr>
<tr>
<td>24.48</td>
<td>610/24&quot; 1220/48&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>1300W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>46000 28000</td>
</tr>
<tr>
<td>24.60</td>
<td>610/24&quot; 1530/60&quot; 60/2.36&quot;</td>
<td>x x</td>
<td>2405W</td>
<td>10&quot;</td>
<td>1/2&quot;</td>
<td>3/8&quot;</td>
<td>58000 35000</td>
</tr>
</tbody>
</table>
INFRAGAS MANUFACTURES INFRARED VENTED CATALYTIC GAS HEATERS 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 EMITTER.

BOOSTERCAT surface temperature is capable of being modulated in a range from 180°C (365°F) to 660°C (1202°F) and, according to the specific size, power ranges from 6kW (5159 kcal/h) up to 25kW (21496 kcal/h).

Boostercat heaters have been designed to develop a specific power of 30 kW/m².

BOOSTERCAT CERTIFICATIONS:

ATEX CERTIFICATION

EAC CERTIFICATION
for EurAsian Economic Union.

UKR-SEPRO CERTIFICATION
for Ukraine.

| MODEL | SIZES mm/Inches | VOLTAGE FOR PRE-HEATING PHASE | ELECTRICAL POWER ABSORBED IN PRE-HEATING PHASE kW | PRE-HEATING TIME (minutes) | GAS ENTRY NPT | POWER kW | POWER Btu/hr | GAS CONSUMPTION
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>5K</td>
<td>489/19&quot; 522/21&quot;</td>
<td>311/13&quot;</td>
<td>x x</td>
<td>960V 10' 1/2&quot;</td>
<td>6 4</td>
<td>20500</td>
<td>20500</td>
<td>450 263 0,60 0,25</td>
</tr>
<tr>
<td>10K</td>
<td>644/25&quot; 630/25&quot;</td>
<td>311/13&quot;</td>
<td>x x</td>
<td>760V 10' 1/2&quot;</td>
<td>10 6</td>
<td>24000</td>
<td>20500</td>
<td>750 450 1,00 0,60</td>
</tr>
<tr>
<td>12K</td>
<td>442/17&quot; 1033/41&quot;</td>
<td>311/13&quot;</td>
<td>x x</td>
<td>760V 10' 1/2&quot;</td>
<td>12 7</td>
<td>41000</td>
<td>24000</td>
<td>900 525 1,20 0,70</td>
</tr>
<tr>
<td>15K</td>
<td>482/19&quot; 1231/49&quot;</td>
<td>311/13&quot;</td>
<td>x x</td>
<td>825W 10' 1/2&quot;</td>
<td>15 9</td>
<td>51000</td>
<td>30500</td>
<td>1125 675 1,20 0,60</td>
</tr>
<tr>
<td>20K</td>
<td>482/19&quot; 1541/61&quot;</td>
<td>311/13&quot;</td>
<td>x x</td>
<td>1075W 10' 1/2&quot;</td>
<td>20 12</td>
<td>68000</td>
<td>41000</td>
<td>1500 900 2,00 1,20</td>
</tr>
<tr>
<td>25K</td>
<td>482/19&quot; 1841/73&quot;</td>
<td>311/13&quot;</td>
<td>x x</td>
<td>1210W 10' 1/2&quot;</td>
<td>25 15</td>
<td>85000</td>
<td>51000</td>
<td>1875 1125 2,50 1,50</td>
</tr>
</tbody>
</table>
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 thorough 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 (CO₂) and water vapour (H₂O) without emission of carbon monoxide (CO), NOx (NO or NO₂) 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).

SAFE 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.

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 both to perform tests in collaboration with customers and to acquaint those who do not have previous experience or knowledge of Catalytic Technology.

SERVICE

Our commitment is to give availability and technical support all over the world. Customers can always rely on a high performance and safe Infragas thermal process.

PROJECTS

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

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 catalytic 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 a homogeneous finishing of high quality without generating thermal stress in the treated substrate.
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

Infragas welcomes you in the Infragas test centre for trials with infrared catalytic technology.
RHT burners are a safe and reliable source of heat generated by a gas combustion (Natural Gas or Propane) and transmitted through infrared rays in short wavelength. The infrared energy emitted by the RHT radiant surface is absorbed by the exposed materials fast and uniformly. They are specific for thermal processes that require high temperatures or rapid curing time (for example thermal increase on metal parts, moulds, powder melting, etc.).

Frame and body of the RHT are totally made with specific stainless steel for high temperature working conditions. Each burner is equipped with a control and pre-mix system with a calibrated mixture of air/gas.

The RHT operate in a range of power from 100% to 50% and are ready to be installed.

Infragas manufactures two RHT versions: STANDING-ALONE for each independent unit; REMOTIZED for connection to a main PLC (Programmable Logic Controller).

With reference to the environment respect, it is important to take into consideration that the surface microflame combustion with the metal fibre burner emits extremely low levels of NOx, CO and unburned.

RHT burners are available in different sizes and configurations for specific thermal treatments:

<table>
<thead>
<tr>
<th>MODEL</th>
<th>SIZE mm</th>
<th>POWER max-min</th>
<th>CONSUMPTION Natural Gas max-min</th>
<th>CONSUMPTION Propane max-min</th>
</tr>
</thead>
<tbody>
<tr>
<td>RHT-2c</td>
<td>136x765</td>
<td>20-10 kW</td>
<td>2.0 – 1.0 m³/h</td>
<td>1.5 – 0.7 kg/h</td>
</tr>
<tr>
<td>RHT-3c</td>
<td>136x1129</td>
<td>30-15 kW</td>
<td>3.0 – 1.5 m³/h</td>
<td>2.2 – 1.1 kg/h</td>
</tr>
<tr>
<td>RHT-4c</td>
<td>136x1506</td>
<td>40-20 kW</td>
<td>4.0 – 2.0 m³/h</td>
<td>3.0 – 1.5 kg/h</td>
</tr>
<tr>
<td>RHT-5c</td>
<td>136x1883</td>
<td>50-25 kW</td>
<td>5.0 – 2.5 m³/h</td>
<td>3.7 – 1.8 kg/h</td>
</tr>
<tr>
<td>RHT-6c</td>
<td>136x2260</td>
<td>60-30 kW</td>
<td>6.0 – 3.0 m³/h</td>
<td>4.5 – 2.2 kg/h</td>
</tr>
<tr>
<td>RHT-7c</td>
<td>136x2637</td>
<td>70-35 kW</td>
<td>7.0 – 3.5 m³/h</td>
<td>5.3 – 2.6 kg/h</td>
</tr>
<tr>
<td>RHT-8c</td>
<td>136x3014</td>
<td>80-40 kW</td>
<td>8.0 – 4.0 m³/h</td>
<td>6.0 – 3.0 kg/h</td>
</tr>
<tr>
<td>RHT-2l</td>
<td>375x274</td>
<td>20-10 kW</td>
<td>2.0 – 1.0 m³/h</td>
<td>1.5 – 0.7 kg/h</td>
</tr>
<tr>
<td>RHT-3l</td>
<td>375x412</td>
<td>30-15 kW</td>
<td>3.0 – 1.5 m³/h</td>
<td>2.2 – 1.1 kg/h</td>
</tr>
<tr>
<td>RHT-4l</td>
<td>375x550</td>
<td>40-20 kW</td>
<td>4.0 – 2.0 m³/h</td>
<td>3.0 – 1.5 kg/h</td>
</tr>
<tr>
<td>RHT-5l</td>
<td>375x688</td>
<td>50-25 kW</td>
<td>5.0 – 2.5 m³/h</td>
<td>3.7 – 1.8 kg/h</td>
</tr>
<tr>
<td>RHT-6l</td>
<td>375x826</td>
<td>60-30 kW</td>
<td>6.0 – 3.0 m³/h</td>
<td>4.5 – 2.2 kg/h</td>
</tr>
<tr>
<td>RHT-7l</td>
<td>375x964</td>
<td>70-35 kW</td>
<td>7.0 – 3.5 m³/h</td>
<td>5.3 – 2.6 kg/h</td>
</tr>
<tr>
<td>RHT-8l</td>
<td>375x1102</td>
<td>80-40 kW</td>
<td>8.0 – 4.0 m³/h</td>
<td>6.0 – 3.0 kg/h</td>
</tr>
</tbody>
</table>

RHT are made by Infragas in conformity with the requirements of the International Standard ISO 9001 and are checked individually before any dispatch.
FEED GAS
Natural Gas or Propane

GAS PRESSURE
20 mbar (2 kPa; 200 mm H2O)

VOLTAGE
230V 50-60 Hz  (24V – 12V upon request)

PRE-MIX SYSTEM
Control system for each RHT burner equipped with the following components:
- PRE-MIX AIR/GAS
- ELECTRONIC CARD
- STABILIZER
- FLAME CONTROL AND IGNITION
- POWER MODULATION
- CONTROL SIGNALS
- AIR FILTER
- CABLES between control cabinet and burner
- INLET GAS CONNECTION ½”.

Each system is equipped with connection hose to the radiant burner, length 700 mm.

The Infragas RHT heaters are certified

**RHT: INFRAGAS TECHNOLOGY FOR HIGH TEMPERATURES**

**INFRA GAS: INFRARED THERMAL SOLUTIONS**