

Drying Ovens **Infrared** Halogen Lamps



PHOTO ELECTRONICS
U. V. CURING EQUIPMENTS

INFRARED HALOGEN LAMPS

Photo Electronics produces a vast range of **ovens for industrial heating and drying processes** using the latest technology and solutions.

Medium wavebands (quartz lamps, gas radiators) or long wavebands (ceramic heating elements, gas burners) are usually used in industrial heating processes.

Photo Electronics uses **Infrared Halogen lamps** in its ovens, emitting **medium-shortwave Infrared radiation** meaning notable advantages in terms of practical use and energy savings.

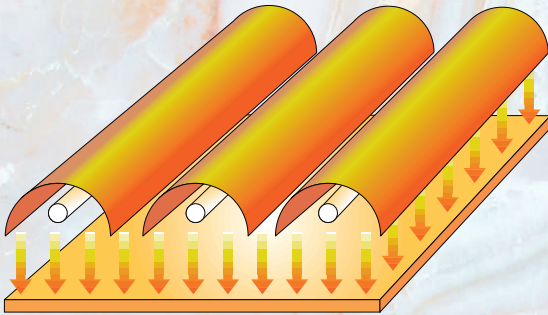
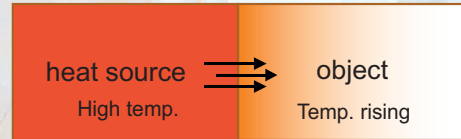


Photo Electronics Infrared Halogen lamps guarantee higher productivity; they are very versatile, safe and mean notable energy savings!

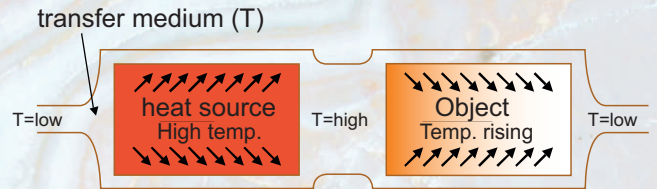
TYPES OF HEATING

(In general) there are three main types of heating:

- by **Conduction**.
- by **Convection**.
- by **Irradiation**.



CONDUCTION: The heating is by contact between the heat source and the object to heat.



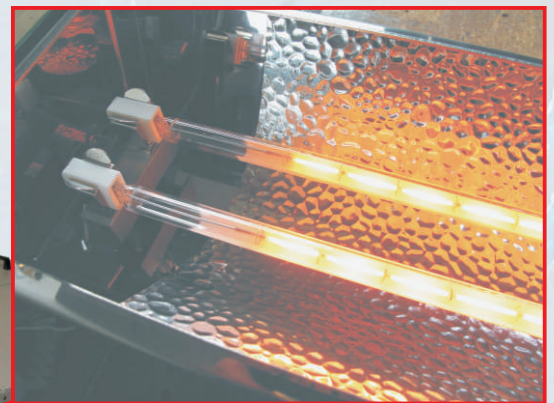
CONVECTION: The heating is through a transfer medium (ex. fluid, Gas, air), which carries the heat from the source to the object to heat.



IRRADIATION: The heating is through infrared radiation emitted by the source. The object receiving the radiation absorbs the same and is heated. In this case there is no transfer medium.

Photo Electronics halogen lamps work on the principle of irradiation. **The lamps heat the object directly without heating the surrounding air.**

This makes the Halogen lamp a high efficiency heat source.



COMPOSITION OF THE OVEN SYSTEM

The Oven consists of a steel Tunnel containing: the IR Halogen lamps complete with reflectors, the fumes extraction system, various screens and sheet steel covers reaching the ground.

An electrical board lets the user turn the lamps on/off and vary the power using a potentiometer.

The Oven is independent of the conveyor system and is designed to be able to adapt to any kind of existing roller conveyor or rack.

PURPOSE OF THE SYSTEM

To accelerate the hardening of two-component mastics and polyester fillers used on natural marble or agglomerates before polishing.

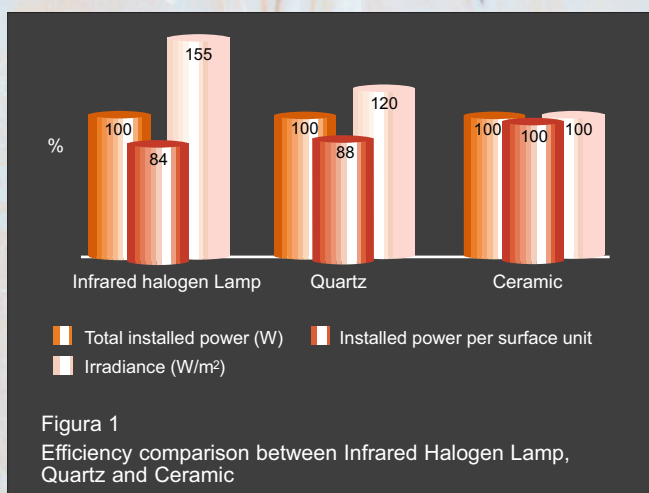
To heat marble slabs before filling:

- increasing the temperature of the material
- helps eliminate surface humidity
- improving the penetration and adhesion of the filler.

ENERGY SAVINGS

The Photo Electronics IR Halogen lamps **reduce energy consumption during the production cycle**. In fact, when the production line stops, the oven is turned off (zero energy consumption) and can be turned on again in just one/two seconds to immediately produce 100% of the energy (Figure 2).

Due to the high efficiency of the Infrared Halogen lamps, to obtain the same heating effect on the material being processed, **less power is required than with traditional lamps** (considerable energy savings).



EFFICIENCY/PRODUCTIVITY

The **Photo Electronics Halogen lamps convert 90% of the electrical energy into Infrared radiation**.

Today, they represent the **heat source with the highest energy efficiency**, which means energy savings compared to quartz or ceramic Infrared lamps (Figure 1).

VERSATILITY/ADVANTAGES

The **power of the oven can be adjusted to meet the requirements** and suit the temperature of the material being processed (the material isn't overheated but heated just enough to reach the optimal temperature).

The **lamps are instantaneous**, and just take 2 seconds to reach max power (Figure 2).

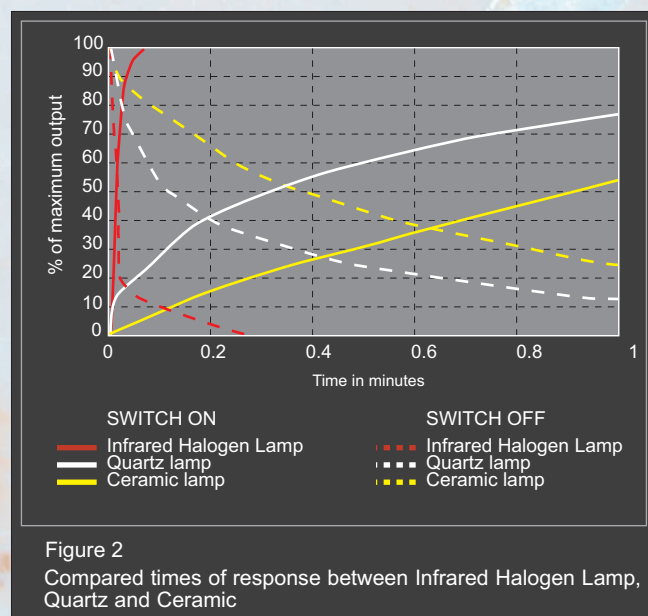
The short waves produced by the Halogen Lamps **have greater penetrating power** than quartz or ceramic lamps.

The **short waves heat the surfaces of the material directly without heating the surrounding air**, while quartz/ceramic lamps heat the air first, which then transmits the heat to the material.

When the line is stopped, the material in the oven isn't overheated because the lamps are turned off and the **temperature drops in a few seconds** (Figure 2).

The homogeneous heating of the surface is guaranteed by the **aluminium reflectors that optimize and diffuse the infrared rays** over the material.

The **compact design** of the IR Halogen lamps makes it possible to keep the overall dimensions of the ovens to a minimum, and install them in restricted spaces.



SAFETY

The **low thermal inertia** of the Infrared Halogen lamps makes it safe to turn them off when necessary.

They cool down very quickly compared to quartz or ceramic IR lamps (Figure 2). This means greater safety during maintenance.

Using ovens with Photo Electronics Halogen lamps drastically reduces energy consumption, helping protect the environment and the future of our planet.



Infrared wave	Short wave	Medium wave	Long wave
Emitter	Infrared Halogen lamp	Quartz emitter	Resistance (Ceramic)
Material	Tungsten coil in sealed quartz tube	Fe-Cr-Al alloy in quartz tube	Fe-Cr-Al alloy in closed steel tube
Radiant efficiency	92%	60%	40%
Switch ON/OFF time	1 sec	30 sec	5 min
Emission peak	1,2 µm	2,2 µm	4,0 µm
Visible	6%	0,50%	0,05%
IR-A	34%	3,50%	1%
IR-B	50%	50%	14%
IR-C	10%	46%	85%
Color temperature	2500°K	1300°K	800°K
Heating principle	Radiation	Radiation and convection	Convection
Air draught sensitivity	No	High	Very high
Focusing with reflectors	Good focusing recommended	Possible focusing	Hardly not relevant

IR OVENS FOR STONE INDUSTRY - LIST OF MODELS						
Lamps installed: Halide Infrared Emitters 2200W						
OVEN MODEL	Max. Conveyor Speed (mt/min.)	Oven Length (mm)	Working Width (mm)	Lamp Units Installed	Total Lamps Power (Kw)	3-phase Power Required (Kw)
IR65M20	2	2590	Tiles 650	9	19,8 Kw	12
IR65M30	3	3100	Tiles 650	12	26,4 Kw	16
IR65M40	4	4580	Tiles 650	15	33 Kw	20
IR65M60	6	5580	Tiles 650	24	52,8 Kw	31
IR22M10	1	1400	Slabs 2200	12	26,4 Kw	16
IR22M20	2	2200	Slabs 2200	24	52,8 Kw	31
IR22M30	3	3000	Slabs 2200	36	79,2 Kw	47
IR22M40	4	3600	Slabs 2200	48	105,6 Kw	62
LIST OF COMBINED IR + UV OVENS FOR STONE INDUSTRY						
Lamps installed: Halide IR Emitters 2200W + UV 5000W MH High Pressure						
OVEN MODEL	Max. Conveyor Speed (mt/min.)	Oven Length (mm)	Working Width (mm)	Lamp Units Installed	Total Lamps Power (Kw)	3-phase Power Required (Kw)
COM22M10	1,2	2400	Slabs 2200	12xIR2200w + 4xUV5000w	20(UV) 26,4(IR)	15(UV) 15,5(IR)
COM22M20	2,2	3800	Slabs 2200	21xIR2200w + 8xUV5000w	40(UV) 52,8(IR)	28(UV) 30,8(IR)
COM22M30	3,6	5400	Slabs 2200	36xIR2200w + 12xUV5000w	60(UV) 79,2(IR)	35(UV) 46,3(IR)
COM22M40	4,8	7000	Slabs 2200	48xIR2200w + 16xUV5000w	80(UV) 105,6(IR)	52(UV) 61,8(IR)

Both technologies (UV and IR) in a reduced space !