

APPLICATIONS



helios quartz®





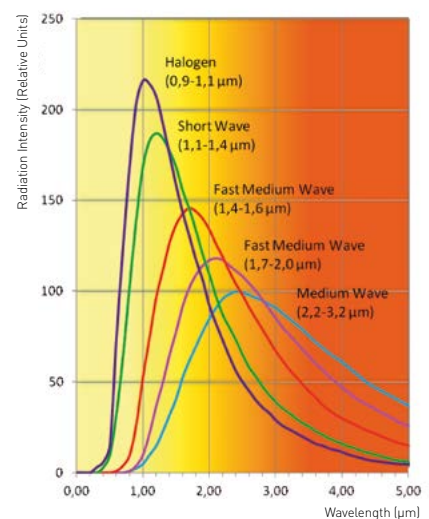
Founded in 1940, Helios Quartz Group has been a family-owned company with two production plants in Italy and Switzerland combined with offices in the USA, South America, and Asia to become a major international supplier for quartz glass processing and the manufacturing of IR & UV lamps. Helios Quartz also produces specialized equipment for industrial, scientific, and medical applications.

Helios Quartz is one of the leading companies worldwide in the printing industry for the supplying of IR quartz emitters in short, medium and fast medium wavelength, UV lamps and apparatus for the polymerization (curing) of glues, inks, varnishes, enamels and resins that react with the UV light and quartz glass plates.

INFRARED QUARTZ EMITTERS

Infrared emitters heat up the material through radiation, therefore the process happens in a direct way and with high efficacy; according to the material to be heated it is possible to choose different IR wavelengths in order to reach the maximum energy propagation and obtain the heating in a faster and more efficient way, furthermore thanks to their short on/off response time they allow very precise regulations that can be adjusted according to the different needs of the materials involved in the process. The picture shows all the radiation intensity curves for halogen, short wave, medium and fast medium wave emitters.

To better convey and focus on the material all the energy emitted by the lamp, it is possible to apply a special reflector directly on the quartz tube; Helios Quartz offers the possibility to apply a gold, white or ruby reflector.





IR **HALOGEN** QUARTZ EMITTERS

The IR Halogen radiation is positioned in the range of 0,9 e 1,1 μm . The Halogen radiation has a very high heating power and very fast on/off response time.

IR **SHORT WAVE** QUARTZ EMITTERS

The IR Short Wave radiation is positioned in the range of 1,1 e 1,4 μm . This emitter is characterized by high heating power and it is particularly recommended in those cases where is important to have a fast response switching on/off time. It is available in twin tube up to 6,5 meters long.

IR **FAST MEDIUM WAVE** QUARTZ EMITTERS

The IR Fast Medium Wave radiation is positioned in the range of 1,4 e 1,6 μm . This emitter is the optimal compromise when one specific application requires at the same time the IR radiation of the Medium Wave emitters and the fast response time in the switching on/off proper of the Short Wave emitters. It is available in twin tube up to 6,5 meters long.

IR **MEDIUM WAVE** QUARTZ EMITTERS

The IR Medium Wave radiation is positioned in the range of 2,2 e 3,2 μm . This emitter is particularly suitable for the fast heating of surface parts or thin thickness materials. It is available in twin tube up to 6,5 meters long.



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UV HIGH PRESSURE LAMPS

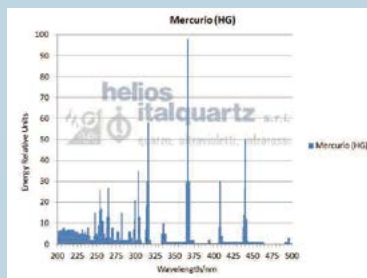
UV technology represents one of the major innovations in the development of polymers; in the UV process high-intensity ultraviolet light is used to cross-link the resins inside varnishes or inks. During conventional cross-linking hot air fosters the aggregation of polymers in the solvent, which evaporates due to the high temperature. The cross-linking process occurs thanks to a beam of ultraviolet light that activates some substances (called photoinitiators) present in the product; these photoinitiators trigger off a reaction of polymerization, which occurs in a very short span of time (1-2 seconds).

Helios Quartz manufactures UV curing lamps up to 2,5 meter long with power ratings range from 80 Watt/cm up to 300 Watt/cm.

For the Printing industry Helios Quartz produces:

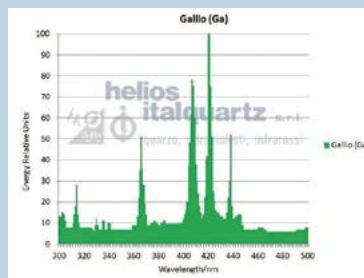
UV HIGH PRESSURE MERCURY LAMPS

The emission of UV High Pressure Mercury lamps covers all ultraviolet range (UVA, UVB and UVC) with the emission peak in UVA region at 366 nm.



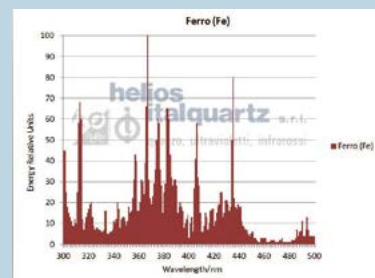
METAL HALIDE UV HIGH PRESSURE LAMPS GALLIUM DOPED

The Metal Halide Lamps, which emit high-power UV radiation specific for the Printing Industry applications, are Gallium (Ga) doped lamps with the emission peak in UVA region at 420 nm.



METAL HALIDE UV HIGH PRESSURE LAMPS FERRUM DOPED

The Metal Halide Lamps, which emit high-power UV radiation specific for the Printing Industry applications are Fe doped lamps with the emission peak in UVA region at 366 nm and 440 nm.



All the lamps produced by Helios Quartz are available with different specifications/configurations in normal or Ozone-Free quartz glass.

Helios Quartz can produce UV high pressure lamps suitable for almost all of existing UV curing equipment; in the following lines there is a list of information needed for the spare parts service:

- Electrical data (Power [W], input tension [V_0 - V_L] or input current [A_0 - A_L])
- Arc length
- Total length of the lamp (with caps)
- Tube diameter
- Length of the wires and kind of electrical connection you needed
- Ozone producing lamp Yes/No
- Type of caps (sketch)
- Reference Nr of the lamp to substitute





QUARTZ GLASS

Fused Quartz Glass SiO_2 is a unique material because of its high level of purity and its extraordinary mechanical, electrical, thermal, chemical and optical properties. These characteristics are valued in many industries such as semiconductors, optical fiber, chemical, metallurgic, electric heating, lighting and laboratories. The choice of quartz glass is not casual, in fact this extraordinary material is nearly perfectly transparent at IR and UV radiation, it can stand constant working temperature of more than 1000°C , it is chemical agents resistant and it is not subject to the thermal shock phenomenon.

For the printing Industry Helios Quartz produces quartz glass plates up to 2500 mm long

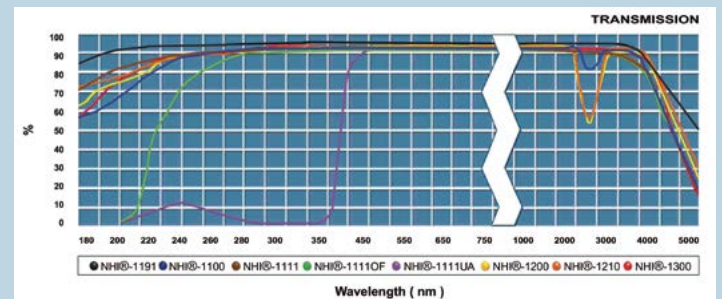
and quartz glass cooling tubes on customer's drawings or specifications. In accordance to the different applications, Helios Quartz recommends the appropriate type of quartz glass in order to optimize the IR or the UV quartz glass permeability. For special applications it is possible to supply also synthetic quartz glass.

Helios Quartz produces any kind of quartz plate with customized surface finishing such as optical polishing, mechanical polishing, flame polishing.

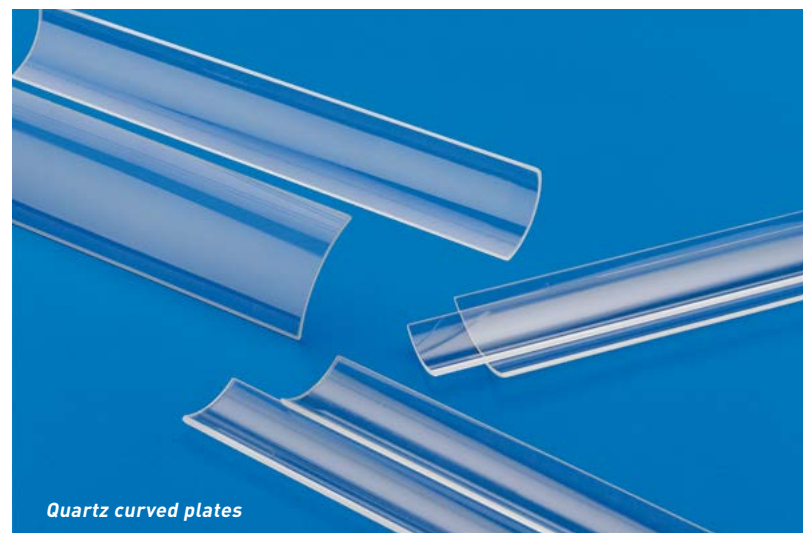
The following graph shows the transmission curve of the different qualities of quartz glass available for the printing industry.



Quartz plates



Clear quartz tubes



Quartz curved plates



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MODULES AND SYSTEMS

Helios Quartz in according to costumers specific requests produces IR modules and UV kits.

IR MODULES



The stainless steel panels are completely cabled, equipped with thermal sensor for high temperature and already prepared to accommodate infrared lamps made by Helios Quartz.

Characteristics:

- Predisposed for ventilation fan
- Predisposed for mechanical hooks for installation
- Predisposed for housing temperature sensors (optional)
- Equipped with a power controller (optional)



UV KITS

Characteristics:

- Reflectors with or without shutter
- Power supply choke or transformer
- Choke
- Starter / Ignitor
- Capacitor
- Constant Wattage Transformers
- High Temperature Cable
- UV lamp Electronic Power control

Helios Quartz Technical Department can also design, on customer specific request, complete UV systems with different wavelengths up to 2,5 meter long for UV polymerization.





APPLICATIONS

Helios Quartz products portfolio covers almost all the printing industry needs in terms of drying solutions, in the following lines we remarks some typical applications.

PAPER INDUSTRY

In the production of paper a mixture of fibers and water is sprayed uniformly on a net mesh conveyor belt. The usage of IR emitters combined with traditional vapor heated rollers is suggested in order to optimize the process by facilitating the uniformity of the moisture level required thus avoiding large variations in the humidity of the product.

Systems equipped with IR lamps require the necessary security measures such as protective quartz plates and controls that take into account the combustion temperature of paper.

The IR lamps are widely used also in almost all the following steps of the various types of paper processing.

PRINTING INDUSTRY

The heating by the Infrared Quartz emitters allows the ink to penetrate into the paper more quickly; the optimization of the absorption level depends on the type of paper used.

The choice of IR Medium Wave emitters is based on the principle of correlation between the wavelength emitted by the Infrared source with the infrared absorption curve properties of the water-based or solvent-based inks; the use of IR Short Wave emitters require the presence of a good cooling system and it is recommended when it is necessary to heat up the paper without significantly removing the residual moisture present in the paper and avoiding the occurrence of shrinkage problems.

Infrared technology can be used with almost

all conventional printing inks (water based and solvent base), since the infrared radiations reduces significantly the viscosity of the inks and facilitates a quick fixing on the paper.

The usage of IR emitters takes great quality advantages in printing processes and it is mainly valued for almost all multi-color machines/applications, except those designed for UV curing, for which, of course, it is required the UV technology.

Ultraviolet rays cures UV paints, UV varnishes and UV adhesives within seconds. The UV compounds, in contrast with the conventional coatings, are almost solvent-free, therefore the use of this technology eliminates the problem of formation of gas sacks and consequently it eliminates the danger of explosion during the drying process.

The choice of the correct emission spectrum of the UV radiation combined with a good quality of the UV compounds is very important in the printing process, since it must be ensured that a sufficient number of photons should react correctly in order to obtain a proper drying of all the coating material.

The printing machines equipped with ultraviolet rays, usually smaller than those which adopt the Infrared technology, have a great production speed and consequently some energy saving advantages.

In any case, both for IR and UV technology, a good printing process has to ensure the complete drying of the inks before printing sheets are overlapped, cut, folded or glued.





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