UV LAMPS
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 has extensive experience in the manufacturing and production of Ultraviolet Lamps (UV) for low pressure, amalgam, medium pressure with mercury & black-light lamps.
UV LIGHT

Ultraviolet radiation (so-called UV or ultraviolet rays or ultraviolet light) is an electromagnetic radiation, belonging to the electromagnetic spectrum, which emits a shorter wavelength than that of visible light but longer than X-rays. The name means “beyond violet” [from Latin ultra, “beyond”] because the spectrum consists of electromagnetic waves with higher frequencies than those that humans identify as the colour violet, being the one with the shortest wavelength.

UV LAMPS

UV lamps produced by Helios are made of a quartz tube, sealed at both ends, containing a small quantity of mercury and an inert gas.
Ultraviolet light can be divided into two ranges: near UV spectral range (380-200 nm) and far-UV spectral range (200-10 nm). When considering the effect of UV radiation on human health, the range of UV wavelengths is typically divided UV-A (400-315 nm), UV-B (315-280 nm) and UV-C (280-100 nm).

The Sun emits ultraviolet light at all three bands UV-A, UV-B and UV-C but, due to the absorption by the first Ozone layer of the atmosphere, about 99% of ultraviolet rays that reach the earth’s surface is UV-A. Almost 100% of the UV-C rays and 95% of UV-B rays is filtered by Earth’s atmosphere.

Electromagnetic spectrum

Helios produces ultraviolet lamps made of quartz glass with wavelengths from 185 to 400 nm.

UV lamps produced by Helios Quartz are made of a quartz tube, sealed at both ends, containing a small quantity of mercury and an inert gas.
Helios uses different kinds of quartz tubes according to the type of ultraviolet lamp to be produced:

- Natural quartz
- Synthetic Quartz
- Doped Quartz [Ozone Free]

The choice of using a quartz tube to produce UV lamps is not random: this material, known for its high thermal and mechanical stability, has high transmission efficiency and it is highly transparent to UV radiation.
Helios produce:

- Medium pressure UV lamps
- Low pressure UV lamps
- Amalgam UV Lamps
- UV Black Light lamps (Wood’s light)
- Quartz glass plates
- Quartz glass disks
- Quartz glass tubes
- Quartz glass domed tubes
MERCURY MEDIUM PRESSURE UV LAMPS (mod.HMPL)

The mercury medium pressure UV lamps are appreciated mainly for two applications:

- For UV curing and drying
- For UV disinfection and oxidation

Thanks to its great experience in the production of UV lamps, Helios Quartz possesses the technology to offer its customers both “rolled sealed” lamps (A) and “pinched sealed” lamps (B); here below some explanatory drawings.

A - Rolled sealed lamps

The sealing process of the lamp occurs on a lathe under vacuum. While perfectly heated, the Quartz will collapse around the leaves of molybdenum.
The main features of the medium-pressure UV lamps manufactured by Helios are as follows:

**Quartz tubes:** • Natural Quartz (OF) • Natural Quartz (OG) • Synthetic Quartz (OG)

**Outer diameter (OD) of the quartz tubes** from 10 mm to 38 mm

**Arc length** from 50 mm to 2500 mm and **Power range** from 100 W to 60 kW

**Shape of the lamp body:** • Linear • U form • Spiral • Other forms available upon request

**Max nominal power density** per unit length (to be checked in the prototyping stage):
• from 80 W/cm to 300 W/cm* • from 80 W/cm to 120 W/cm** • from 80 W/cm to 250 W/cm***

**Useful life** (lab tested and according to the power of the lamp - one ignition per day):
• from 1000 h to 1500 h* • from 1500 h to 5000 h** • from 1500 h to 5000 h***

**Surface temperature** (lab tested and according to lamp power) from 600°C to 900°C

---

**B - Pinched sealed lamps**

The sealing process takes place using a spiker pinching machine; the quartz, suitably warmed, is pressed by two hammers.
For special applications, in addition to the usual mercury lamps, Helios has developed a series of UV Lamps (Metal Halide) adding doping elements (metal halide) that change the spectrum of ultraviolet radiation, thus optimizing it for different possible applications.

All lamps produced by Helios are available with different specifications/ configurations, both in not doped quartz and in Ozone-Free quartz.
The metal halide UV medium pressure iron doped lamps emit UV radiation with peak emission in the UVA range at 366 nm and 440 nm.

The metal halide UV medium pressure lead doped lamps emit UV radiation with peak emission in the UVA range at 357 nm and 420 nm.

Helios can produce medium pressure UV lamps suitable for almost all UV systems; the following is a list of the necessary information for spare parts:

- Electrical Data (Power [W], input tension [V0 - VL] or input current [A0 - AL])
- Total length of the lamp (inclusive of terminal ceramic) (1)
- Arc length (2)
- Diameter of the quartz tube (3)
- Cable length (4)
- Type of ceramic terminal (5)
- Type of electrical connection needed (6)
- Type of reflector (7)
- Lamp production of ozone Yes/No
- Code of the lamp to be replaced

![UV MEDIUM PRESSURE LAMPS IRON DOPED](image1)

![UV MEDIUM PRESSURE LAMPS LEAD DOPED](image2)
The low pressure UV lamps, also called “germicidal lamps”, exploit UVC light to get the rapid sterilization of bacteria, molds, fungi, viruses and microorganisms both in air and in water. In this category of lamps about 40% of electricity is converted directly into UVC radiation with monochromatic emission at 254 nm for germicidal applications and at 185 nm for the oxidation of surfaces.

The data in the table are only general information. For any specific requests or to receive more detailed information, please contact the Helios Technical Departement.
The main features of the low-pressure UV lamps manufactured by Helios are as follows:

**Quartz tube:** • Natural Quartz (OF) • Natural Quartz (OG) • Synthetic Quartz (OG)

**Outer diameter (OD) of the quartz tubes** from 10 mm to 38 mm

**Arc length** from L. 50 mm to L. 2000 mm and **Power range** from 5 W to 200 W

**Lamp Body shape:** • Linear • U form • Spiral • Other forms available upon request

**Max nominal power density** per unit length (to be checked in prototyping phase): 1W/cm

**UVC max power intensity** per unit length (to be checked in the prototyping stage): 0,4 W/cm

**Lifetime** (lab tested and according to lamp power) up to 16000 hours

**Working temperature** from 5°C to 40°C with stable UVC emission

**Maximum loss of efficiency** at the end of its useful life: 40%

Helios uses the best materials in the production of mercury UV low pressure lamps and is able to provide customers with all standard models available on the market, with all possible configurations of the terminals, also with the configuration “High Output” where UVC emission can be up to 60% higher than the basic model with the same wavelength.
Depending on the materials used, mercury low pressure UV lamps can be divided into two large families: “Ozone Generating” lamps and “Ozone Free” lamps.

Helios usually chooses quartz glass for the production of low-pressure UV lamps because it ensures very high levels of UV transmission (equal to or higher than 90%); moreover, it is very resistant to solarization phenomenon and little susceptible to mechanical failures or to thermal shocks. However, for less important applications or for smaller budgets, Helios provides the same lamps in Soft Glass.

**Lamps produced in undoped natural quartz glass (ozone generating)**

Ozone is the strongest oxidizing agent available: it reacts with a multitude of organic compounds and can oxidize and disinfect air and water. Ozone is a highly efficient deodorant and it is able to sterilize complete surfaces, mold in the air and bacteria. Helios provides two different types of Ozone generating lamps: “H” [high ozone generation] and “VH” [very high ozone generation].

**Lamps produced in synthetic quartz glass (ozone generating)**

By using synthetic quartz glass it is possible to obtain a higher efficiency of UV transmission at 185 nm; these lamps represent a good solution for the processes of oxidation.
Lamps produced in natural doped quartz glass (ozone free)
Helios, using suitably doped quartz glass (Ti), produces "L" (ozone free) germicidal lamps which can be used for ultraviolet disinfection with a UV emission peak (monochromatic) at 254 nm, a wavelength useful also for the destruction of the ozone.

Lamps produced in soft glass (ozone free)
Germicidal lamps, produced with Soft Glass (SG), have a peak wavelength at 254 nm where the germicidal efficiency is about 30%.
AMALGAM LOW PRESSURE UV LAMPS (mod. HAL)

UV low pressure amalgam lamps don’t contain only mercury: inside the lamp there is a solid amalgam, that is to say an alloy of mercury with other metals. The low-pressure amalgam lamps produced by Helios are the best solution for ultraviolet disinfection and oxidation of water, air and surfaces because they combine a very long working life (up to 20,000 hours) with an excellent UVC efficiency at 254 nm (up to 45%) and a much higher power density than traditional low pressure or mercury medium pressure lamps, as shown in the table below.

<table>
<thead>
<tr>
<th>LAMP TYPE</th>
<th>Low pressure high output</th>
<th>Amalgam low pressure</th>
<th>Medium pressure</th>
</tr>
</thead>
<tbody>
<tr>
<td>HELIOS MODEL</td>
<td>HOGL</td>
<td>HAL</td>
<td>HMPL</td>
</tr>
<tr>
<td>INPUT POWER</td>
<td>10-160 W</td>
<td>50-1500 W</td>
<td>1-30 KW</td>
</tr>
<tr>
<td>POWER DENSITY</td>
<td>0,8-1,3 W/cm</td>
<td>1-6 W/cm</td>
<td>80-300 W/cm</td>
</tr>
<tr>
<td>UVC RADIATION</td>
<td>&lt;350 μW/cm</td>
<td>&lt;1000 μW/cm</td>
<td>&lt;35000 μW/cm</td>
</tr>
<tr>
<td>WAVE LENGTH/EFFICIENCY</td>
<td>185 nm</td>
<td>254 nm</td>
<td>Broad band polychromatic</td>
</tr>
<tr>
<td></td>
<td>2%</td>
<td>25-35%</td>
<td>5-15%</td>
</tr>
<tr>
<td>SURFACE TEMPERATURE</td>
<td>&gt;50 °C</td>
<td>90-120 °C</td>
<td>500-950 °C</td>
</tr>
<tr>
<td>CURRENT</td>
<td>0,8-1,3 A</td>
<td>1,2-5 A</td>
<td>0,3-0,4 A</td>
</tr>
<tr>
<td>LIFETIME</td>
<td>12000 h</td>
<td>&gt;12000 h</td>
<td>9000 h</td>
</tr>
<tr>
<td>INFLUENCE OF ENVIRONMENT TEMP.</td>
<td>High</td>
<td>High</td>
<td>Low</td>
</tr>
</tbody>
</table>

The data in the table are only general information. For any specific requests or to receive more detailed information, please contact the Helios Technical Departement.
The main features of the low-pressure UV amalgam lamps manufactured by Helios are as follows:

**Quartz tubes:**
- Natural Quartz (OF) - efficiency at 254 nm
- Natural Quartz (OG)
- Synthetic Quartz (OG)

**Outer diameter (OD) of the quartz tubes** from 10 mm to 38 mm

**Arc length** from L. 100 mm up to L. 2600 mm and **Power range** from 50 W to 1500 W

**Lamp Body shape:**
- Linear
- U form
- Spiral
- Other forms available upon request

**Max nominal power density** per unit length (to be checked in prototyping phase): 6 W/cm

**UVC max power intensity** per unit length (to be checked in the prototyping stage): 4 W/cm

**Coefficient of electric power conversion** in UVC radiation at 254 nm up to 45%

**Lifetime** (lab tested and according to lamp power) up to 20000 hours

**Working temperature** from 1°C to 60°C with stable UVC emission

**Maximum loss of efficiency** at the end of its useful life from 5% to 20%

UV amalgam lamps produced by Helios, thanks to their high power and long-lasting quality, represent a convenient solution for UV disinfection systems, containing the operating and maintenance costs due to the decrease of the total number of the lamps and electronic components to be installed.

A special coating process of the glass quartz allows the amalgam and low pressure UV lamps to maintain a nearly constant germicidal action throughout the life cycle of the lamp, thus increasing its durability.
AMALGAM LOW PRESSURE UV LAMPS (mod. HAL)

Helios usually chooses the natural quartz glass for the production of low pressure amalgam UV because it provides very high levels of UV transmission (greater than or equal to 90%); moreover, it is very resistant to solarization and it is not susceptible to mechanical failure or thermal shocks. However, for special applications of disinfection and ultraviolet oxidation, Helios produces the same lamps in synthetic quartz glass with a UV emission at 185 nm for ozone generation or oxidation processes on surfaces.

Helios uses the finest materials for the production of low pressure amalgam mercury lamps and is able to offer all standardized models available on the market in different solutions and configurations as shown below, both in the "ozone-generating" and in the "Ozone Free" version.

Lamps produced in undoped natural quartz glass (ozone-generating)
Ozone is one of the strongest oxidizing agent available, that reacts with a multitude of polluting organic compounds to oxidize and disinfect air and water from molds, alga, bacteria and virus.

Lamps produced in synthetic quartz glass (ozone generating)
Using the synthetic quartz glass you have a greater efficiency of UV transmission at 185 nm; these lamps represent a good solution for oxidation processes.
Lamps produced with doped natural quartz glass (ozone free)

Made of doped quartz glass (Ti), the "Ozone Free" lamps are used for disinfection, when you need only one wavelength peak at 254 nm. It is important to note that lamps that emit at this wavelength can also be used for the destruction of ozone.

Helios can produce medium pressure UV lamps suitable for almost all UV systems; below a list of the necessary information for spare parts:

- Electrical Data [Power [W], input tension [V0 - VL] or input current [A0 - AL]]
- Total length of the lamp [inclusive of terminal ceramic] (1)
- Arc length (2)
- Diameter of the quartz tube (3)
- Cable length (4)
- Type of ceramic terminal (5)
- Type of electrical connection needed (6)
- Lamp production of ozone Yes/No
- Code of the lamp to be replaced

![Diagram of lamp connections]

Natural and Synthetic quartz glass

<table>
<thead>
<tr>
<th>Spectral radiation strength [relative units]</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
</tr>
<tr>
<td>0.8</td>
</tr>
<tr>
<td>0.6</td>
</tr>
<tr>
<td>0.4</td>
</tr>
<tr>
<td>0.2</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Wavelength (nm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>160</td>
</tr>
<tr>
<td>240</td>
</tr>
<tr>
<td>320</td>
</tr>
<tr>
<td>400</td>
</tr>
</tbody>
</table>
AMALGAM LOW PRESSURE UV LAMPS (mod. HCL-HSSL)

Thanks to more than ten years of experience both in the production of UV lamps and in the processing of quartz glass, Helios is able to produce traditional low-pressure UV mercury lamps and amalgam lamps with non-linear forms. In particular, in addition to the classic U-shaped lamps already widely available on the market, below there are some forms of lamps that we have created for special germicidal applications.

The Helios technical office is able to design and develop optimal HCL lamps according to the specifications provided by the customer.
Helios provides models (see above) in all the possible configurations of terminals with vertical working position. The forms 1-6 are available for tubes with maximum length of 1595 mm and with diameter of 10 - 12 - 15 - 19 - 28 and 32 mm.

Lamp data is based on measurements performed under laboratory conditions in air at room ambient temperature. Measurements were performed on a high-frequency, current limited electronic ballast and represent average values at 1 meter. HSSL lamps are designed for operation on a preheat ballast only, unless otherwise noted.

### UV amalgam lamp mod. HSSL (Helios Special Shape Lamps)

<table>
<thead>
<tr>
<th>Tube diameter</th>
<th>Quartz tube linear length</th>
<th>Dimensions and shape</th>
<th>Power</th>
<th>Current</th>
<th>UV emission at 254 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>HSSL155</td>
<td>10 mm</td>
<td>1595 mm</td>
<td>on request</td>
<td>155 W</td>
<td>0,8 A</td>
</tr>
<tr>
<td>HSSL175</td>
<td>12 mm</td>
<td>1595 mm</td>
<td>on request</td>
<td>175 W</td>
<td>1,0 A</td>
</tr>
<tr>
<td>HSSL200</td>
<td>15 mm</td>
<td>1595 mm</td>
<td>on request</td>
<td>200 W</td>
<td>1,2 A</td>
</tr>
<tr>
<td>HSSL310</td>
<td>19 mm</td>
<td>1595 mm</td>
<td>on request</td>
<td>310 W</td>
<td>2,0 A</td>
</tr>
<tr>
<td>HSSL325</td>
<td>28 mm</td>
<td>1595 mm</td>
<td>on request</td>
<td>325 W</td>
<td>3,2 A</td>
</tr>
<tr>
<td>HSSL610</td>
<td>32 mm</td>
<td>1595 mm</td>
<td>on request</td>
<td>610 W</td>
<td>5,0 A</td>
</tr>
</tbody>
</table>

Helios is also able to provide every type of germicidal amalgam lamp mod. HSSL (Helios Special Shape Lamps); the table below shows some models.
The name Wood lamp (named after the American scientist Robert Williams Wood), or black light, refers to a light source that emits electromagnetic radiation predominantly in the range of ultraviolet and in the visible light range.

Helios produces Wood lamps with ultraviolet emission peaks at 254 nm, 310 nm and 366 nm.

- **UV-C short-waves (180–280 nm)** emitted at 254 nm are suitable for chemical, photochemical and chromatographic applications; in microbiology they are useful for the identification of bacteria and fungi, for the analysis of fluorescent materials and for the analysis of minerals.
- **UV-B medium waves (280–320 nm)** emitted at 310 nm are suitable for the chromatographic analyses and GEL, for tests on thin layers, for searching tests of electrophoresis in DNA / RNA, and for the analysis of minerals.
- **UV-A long-waves (320–380 nm)** emitted at 366 nm are suitable for many organic applications, fluorescence tests, in the food processing industry, for the control of banknotes and documents, art restoration, in many microbiological tests or in the field of dermatology diseases and for the cure of favism or for geological inspections.
A Wood lamp produces light which is not directly visible to the human eye; however, it can be used to illuminate materials on which ultraviolet radiation causes fluorescent and phosphorescent effects. Possible applications of these properties can be found in the fight against the counterfeiting of banknotes, through the use of banknote verification, or in the search for cracks in metal structures which are coated with materials responsive to UV rays.
ELECTROMAGNETIC BALLAST WITH STARTER/IGNITORS
They represent the most widely used method to operate correctly the mercury low pressure UV lamps.

ELECTRONIC BALLASTS
Electronic power supplies (ballasts) are commonly used in UV mercury low pressure amalgam lamps disinfection systems.

SPECIAL CABLES FOR HIGH TENSION
Helios pays particular attention to the quality of all materials and components needed to produce its UV lamps; the choice of the cables is particularly important. The standard models have cables that can withstand temperatures up to 250 °C; moreover, special cables are designed for the specific use in UV applications in high temperature and high voltage.

The quality department of Helios tests periodically the level of light resistance of cables used in the production of the UV lamps through our device INVE 2000 for the control of the ageing level of materials.
**TRANSFORMERS, REACTORS AND LIGHTERS**

They are the method for a correct ignition, supply and operation of mercury medium pressure UV lamps. Each lamp has to work exclusively with the electric group with which it was designed.

**POWER CAPACITORS AND REGULATORS**

Capacitors work in order to re-establish the power factor after the transit through the electric group and the UV medium pressure lamp, thus optimizing the electrical consumption. Regulators work to optimize the UV radiation according to the different applications.

**SUPPORTS**

Among the accessories we recommend the use of special steel supports for the installation of the lamps inside the UV curing and disinfection system. These supports are specially made for Helios with a special steel which can resist to high temperatures (>1000°), with a controlled expansion that keeps shape memory. The Technical Department is able to assist the client in choosing the proper support for each lamp and to advise about the correct assembly. In the picture you can see an example of our codes 10200314 and 10200320.
TUBES

The function of quartz tubes, inside of which the UV lamp is placed, is to isolate the lamp from the flow of air and water, thus avoiding possible accidental breakages.

Helios has always at stock a full range of standard diameters commonly used on the market; in addition, the production department is able to satisfy in a short time any specific demand of customers by providing them with customized tubes with fired (a), flared (b) or flanged (c) edges.

DOMED TUBES

The function of the quartz domed tubes is to isolate the lamp electrically and thermally from the external fluid thus avoiding possible accidental breakages.

Helios has always available at stock a full range of standard diameters commonly used on the market; in addition, the production department of Helios is able to satisfy in a short time any specific request of the customers by providing them with customized sleeves with fired (a), flared (b) or flanged (c) edges and with round (d) or flat (e) bottom.

CUSTOMIZED SOLUTIONS

Helios can count on many years of experience in the field of water treatment and is able to support its customers by providing them with optimum solutions for UV systems for the disinfection of water, air and surfaces. Helios is able to develop solutions with a special plastic material that is resistant to UV radiation; solutions to house UV lamps, isolate and connect the UV lamps to the systems.

The quality department of Helios tests periodically the level of UV light resistance of materials through our device INVE 2000 for the control of the ageing level of materials. The pictures below show this device and we kindly invite our interested customers to contact our sale offices to receive all the technical information and documentations.
SPECIAL EYE PROTECTION
Helios remarks for the operators the need to use special glasses protection; in case of non-use of this protection, Helios declines all responsibility.
Moreover, we remind our customers to always handle the UV lamps with suitable gloves on, in order not to touch quartz glass with bare hands.

PHOTOCHEMICAL REACTORS
For special applications of oxidation and synthesis, Helios produces photochemical reactors to be used in labs for different applications: chlorination processes, production of vitamin D, photopolymerization. These products are widely appreciated by universities, research centres and private laboratories. Below, two of our equipment; we kindly invite our customer to contact our sales department.

COOLING TUBES
The function of the cooling quartz tubes is to filter the infrared rays emitted by the mercury medium pressure UV lamp and avoid, in this way, possible damages to the product.
Helios keeps always at stock a full range of standard diameters commonly used on the market; moreover, the production department Helios is able to satisfy in a short time any request of the customers, providing them with customized solutions, according to their specifications and drawings.

QUARTZ PLATES AND UV REFLECTORS
Helios produces quartz plates, up to a length of 2500 mm, selecting the best raw materials and the appropriate production process, in order to ensure the best grade for each application and optimize the ultraviolet transmittance.
Helios keeps always at stock a full range of standard thicknesses commonly used on the market; moreover, the production dept. of Helios is able to satisfy any request in a short time by providing both flat and round plates, also according to the design and specifications of the customers.
The UV quartz reflectors are plates in quartz with flat or curved form, which are processed in a particular way; this plates influence the emission of the lamp, optimizing it according to the different possible applications.
### MAIN APPLICATIONS

#### POLYMERIZATION

<table>
<thead>
<tr>
<th>Drying of UV paints and varnishes</th>
<th>Production of printed circuits</th>
<th>Production of CD’s and DVDs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wood industry</td>
<td>Ceramic industry</td>
<td>Plastic industry</td>
</tr>
<tr>
<td>Glas industry</td>
<td>Automotive – Serigraph lines</td>
<td>Serigraph lines for white glas</td>
</tr>
<tr>
<td>UV curing and printing industry</td>
<td>Offset printing</td>
<td>Flessographic printing</td>
</tr>
<tr>
<td>Ink printing</td>
<td>Packaging industry</td>
<td>Labels printing</td>
</tr>
<tr>
<td>UV curing for adhesives</td>
<td>Serigraph printing</td>
<td>Electronics industry</td>
</tr>
</tbody>
</table>

### RECOGNITION OF THE PRODUCT

Helios Quartz, being ISO 9001 certified, records any information of the production of every article; for this reason, each lamp is identified by a string written on the tube of the lamp as shown in the picture.
At Helios we believe that the monitoring and control of the quality of raw materials and finished products, the traceability of our products, the production system represent the pillars of our presence on the market and we intend to keep it this way also in the future, in order to continue operating on the market.

For this reason, since 2000 the company has been certified by ISO 9001 and TÜV: each commercial or manufacturing process complies with certain procedures and control standards, to ensure the availability and traceability of the product, in 2010 we adopted SAP Business One as ERP System.

Helios has been investing heavily on quality control and in this line we are creating and implementing a department, whose job is to constantly monitor both the incoming material from suppliers and the outgoing products. Thanks to this department we are able to perform all the dimensional measurement using traditional tools but also to perform reverse engineering through our FARO device, which can detect measurements with accuracies of 0.05mm. Moreover, we can also measure the transmission of quartz glass through our spectrophotometer VARIAN Cary 500.
Helios can provide each type of germicidal low pressure mercury lamp model HGL (HELIOS GERMICIDAL LAMPS); in the table below you can find some models we have always at stock.

### Lamps mod. HGL Table

<table>
<thead>
<tr>
<th>Lamps mod. HGL</th>
<th>Tube diameter</th>
<th>Total length</th>
<th>Arc length</th>
<th>Power</th>
<th>Current</th>
<th>Voltage</th>
<th>UV emission at 254 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGL4T5L</td>
<td>15,7 mm</td>
<td>134,7 mm</td>
<td>77 mm</td>
<td>4 W</td>
<td>180 mA</td>
<td>23 V</td>
<td>9 µW/cm²</td>
</tr>
<tr>
<td>HGL6T5L</td>
<td>15,7 mm</td>
<td>210,9 mm</td>
<td>154 mm</td>
<td>6 W</td>
<td>180 mA</td>
<td>34 V</td>
<td>16 µW/cm²</td>
</tr>
<tr>
<td>HGL8T5L</td>
<td>15,7 mm</td>
<td>287,1 mm</td>
<td>231 mm</td>
<td>8 W</td>
<td>180 mA</td>
<td>45 V</td>
<td>21 µW/cm²</td>
</tr>
<tr>
<td>HGL10T5L</td>
<td>15 mm</td>
<td>357 mm</td>
<td>277 mm</td>
<td>17 W</td>
<td>425 mA</td>
<td>42 V</td>
<td>57 µW/cm²</td>
</tr>
<tr>
<td>HGL15T8L</td>
<td>25,7 mm</td>
<td>438,2 mm</td>
<td>353 mm</td>
<td>15 W</td>
<td>350 mA</td>
<td>44 V</td>
<td>47 µW/cm²</td>
</tr>
<tr>
<td>HGL20T10L</td>
<td>32,5 mm</td>
<td>588,5 mm</td>
<td>505 mm</td>
<td>19 W</td>
<td>360 mA</td>
<td>58 V</td>
<td>76 µW/cm²</td>
</tr>
<tr>
<td>HGL24T5L</td>
<td>15 mm</td>
<td>692 mm</td>
<td>612 mm</td>
<td>32 W</td>
<td>425 mA</td>
<td>77 V</td>
<td>95 µW/cm²</td>
</tr>
<tr>
<td>HGL25T8L</td>
<td>25,7 mm</td>
<td>436,4 mm</td>
<td>353 mm</td>
<td>25 W</td>
<td>620 mA</td>
<td>41 V</td>
<td>71 µW/cm²</td>
</tr>
<tr>
<td>HGL30T8L</td>
<td>25,7 mm</td>
<td>893,4 mm</td>
<td>810 mm</td>
<td>30 W</td>
<td>380 mA</td>
<td>80 V</td>
<td>100 µW/cm²</td>
</tr>
<tr>
<td>HGL36T5L</td>
<td>15 mm</td>
<td>843 mm</td>
<td>762 mm</td>
<td>41 W</td>
<td>425 mA</td>
<td>98 V</td>
<td>150 µW/cm²</td>
</tr>
<tr>
<td>HGL40T5L</td>
<td>15,7 mm</td>
<td>842 mm</td>
<td>767 mm</td>
<td>41 W</td>
<td>425 mA</td>
<td>98 V</td>
<td>141 µW/cm²</td>
</tr>
<tr>
<td>HGL48T5L</td>
<td>15 mm</td>
<td>1148 mm</td>
<td>1047 mm</td>
<td>55 W</td>
<td>425 mA</td>
<td>135 V</td>
<td>180 µW/cm²</td>
</tr>
<tr>
<td>HGL64T5L</td>
<td>15 mm</td>
<td>1554 mm</td>
<td>1474 mm</td>
<td>75 W</td>
<td>425 mA</td>
<td>179 V</td>
<td>240 µW/cm²</td>
</tr>
<tr>
<td>HGL67T5L</td>
<td>15 mm</td>
<td>1630 mm</td>
<td>1550 mm</td>
<td>79 W</td>
<td>425 mA</td>
<td>189 V</td>
<td>252 µW/cm²</td>
</tr>
<tr>
<td>HGL135T5L</td>
<td>15 mm</td>
<td>135 mm</td>
<td>55 mm</td>
<td>5 W</td>
<td>425 mA</td>
<td>15 V</td>
<td>10 µW/cm²</td>
</tr>
<tr>
<td>HGL150T5L</td>
<td>15 mm</td>
<td>150 mm</td>
<td>70 mm</td>
<td>6 W</td>
<td>425 mA</td>
<td>18 V</td>
<td>14 µW/cm²</td>
</tr>
<tr>
<td>HGL212T5L</td>
<td>15 mm</td>
<td>212 mm</td>
<td>132 mm</td>
<td>10 W</td>
<td>425 mA</td>
<td>25 V</td>
<td>26 µW/cm²</td>
</tr>
<tr>
<td>HGL237T5L</td>
<td>15 mm</td>
<td>237 mm</td>
<td>157 mm</td>
<td>11 W</td>
<td>425 mA</td>
<td>30 V</td>
<td>30 µW/cm²</td>
</tr>
<tr>
<td>HGL265T5L</td>
<td>15 mm</td>
<td>265 mm</td>
<td>185 mm</td>
<td>12 W</td>
<td>425 mA</td>
<td>35 V</td>
<td>33 µW/cm²</td>
</tr>
<tr>
<td>HGL287T5L</td>
<td>15 mm</td>
<td>287 mm</td>
<td>207 mm</td>
<td>14 W</td>
<td>425 mA</td>
<td>34 V</td>
<td>40 µW/cm²</td>
</tr>
<tr>
<td>HGL303T5L</td>
<td>15 mm</td>
<td>303 mm</td>
<td>223 mm</td>
<td>15 W</td>
<td>425 mA</td>
<td>35 V</td>
<td>43 µW/cm²</td>
</tr>
<tr>
<td>HGL317T5L</td>
<td>15 mm</td>
<td>317 mm</td>
<td>237 mm</td>
<td>16 W</td>
<td>425 mA</td>
<td>46 V</td>
<td>48 µW/cm²</td>
</tr>
<tr>
<td>HGL357T5L</td>
<td>15 mm</td>
<td>357 mm</td>
<td>277 mm</td>
<td>17 W</td>
<td>425 mA</td>
<td>42 V</td>
<td>57 µW/cm²</td>
</tr>
<tr>
<td>HGL436T5L</td>
<td>15 mm</td>
<td>436 mm</td>
<td>356 mm</td>
<td>21 W</td>
<td>425 mA</td>
<td>51 V</td>
<td>72 µW/cm²</td>
</tr>
<tr>
<td>HGL793T5L</td>
<td>15 mm</td>
<td>793 mm</td>
<td>713 mm</td>
<td>38 W</td>
<td>425 mA</td>
<td>92 V</td>
<td>125 µW/cm²</td>
</tr>
<tr>
<td>HGL843T5L</td>
<td>15 mm</td>
<td>843 mm</td>
<td>762 mm</td>
<td>41 W</td>
<td>425 mA</td>
<td>98 V</td>
<td>150 µW/cm²</td>
</tr>
<tr>
<td>HGL1148T5L</td>
<td>15 mm</td>
<td>1148 mm</td>
<td>1067 mm</td>
<td>55 W</td>
<td>425 mA</td>
<td>135 V</td>
<td>180 µW/cm²</td>
</tr>
<tr>
<td>HGL1554T5L</td>
<td>15 mm</td>
<td>1554 mm</td>
<td>1474 mm</td>
<td>75 W</td>
<td>425 mA</td>
<td>179 V</td>
<td>240 µW/cm²</td>
</tr>
<tr>
<td>HGL1630T5L</td>
<td>15 mm</td>
<td>1630 mm</td>
<td>1550 mm</td>
<td>79 W</td>
<td>425 mA</td>
<td>189 V</td>
<td>252 µW/cm²</td>
</tr>
</tbody>
</table>

**High output lamps**

<table>
<thead>
<tr>
<th>Lamps mod. HGL</th>
<th>Tube diameter</th>
<th>Total length</th>
<th>Arc length</th>
<th>Power</th>
<th>Current</th>
<th>Voltage</th>
<th>UV emission at 254 nm</th>
</tr>
</thead>
<tbody>
<tr>
<td>HGL436T5L</td>
<td>15 mm</td>
<td>436 mm</td>
<td>356 mm</td>
<td>21 W</td>
<td>425 mA</td>
<td>51 V</td>
<td>72 µW/cm²</td>
</tr>
<tr>
<td>HGL793T5L</td>
<td>15 mm</td>
<td>793 mm</td>
<td>713 mm</td>
<td>38 W</td>
<td>425 mA</td>
<td>92 V</td>
<td>125 µW/cm²</td>
</tr>
<tr>
<td>HGL843T5L</td>
<td>15 mm</td>
<td>843 mm</td>
<td>762 mm</td>
<td>41 W</td>
<td>425 mA</td>
<td>98 V</td>
<td>150 µW/cm²</td>
</tr>
</tbody>
</table>

We produce the above models with all configurations of the caps also in mod. SGL and with configurations H and VH. Lamp data is based on measurements performed under laboratory conditions in air at room ambient temperature. Measurements were performed on a high-frequency, current limited electronic ballast and represent average values at 1 meter.
Helios can provide each type of germicidal low pressure mercury lamp model **HCL** (HELIOS COMPACT LAMPS); in the table below you can find some models we have always at stock.

We produce the above models with all configurations of the caps, also in Soft Glass and with configurations H and VH.

Lamp data is based on measurements performed under laboratory conditions in air at room ambient temperature. Measurements were performed on a high-frequency, current limited electronic ballast and represent average values at 1 meter.

Helios can provide each type of germicidal low pressure mercury lamp model **HAL** (HELIOS AMALGAM LAMPS); in the table below you can find some models we have always at stock.

We produce the above models with all configurations of the caps, also in Soft Glass and with configurations H and VH.

Lamp data is based on measurements performed under laboratory conditions in air at room ambient temperature. Measurements were performed on a high-frequency, current limited electronic ballast and represent average values at 1 meter. **HAL** lamps are designed for operation on a preheat balast only, unless otherwise noted.
Helios Quartz Group SA
Production Site / R&D and Technical Center
Via Roncaglia 20 6883
Novazzano - Svizzera
+41 (0) 91923355/6
+41 (0) 919233557
swiss@heliosquartz.com
www.heliosquartz.com

Helios Itatquartz S.r.l.
Production Site / R&D and Technical Center
Via delle Industrie 103/A 20040
Cambiago - Milano - Italia
+39 02 95 34 93 18
+39 02 95 34 50 85
italy@heliosquartz.com
www.heliosquartz.com

Helios Quartz America Inc.
Distributor – Logistic and Technical center for North America region
8444 W. Central Ave., # 2 Sylvania, OH 43560 USA
+1 (419) 882-3377
+1 (419) 787-8307
america@heliosquartz.com
www.heliosquartz.com

Shenyang Helios Tech. Co. Ltd
Distributor and Logistic center for China Mainland region
Building A,1506 Midland Tower. No.208 Changjiang S.St. Huanggu District,
Shenyang, China
+86 024-3163319
china@heliosquartz.com
www.heliosquartz.com

Helios Quartz Asia Ltd.
Distributor and Logistic center for Asia Pacific region
11 A, Yue on Commercial Building
335-387 Lockhart Road Wanchai,
HongKong
+86 (132) 38830625
asia@heliosquartz.com
www.heliosquartz.com

Helios Quartz Turkey
Commercial branch for Turkey region
Mimaroba Mh. Mustafa Kemal Bulvari.
Colorist A Blok. Kat 3 D 50
Mimaroba, Büyükçekmece - Istanbul
+90 8502281908
turkey@heliosquartz.com
www.heliosquartz.com