HYBEC

HALOGEN HEATER

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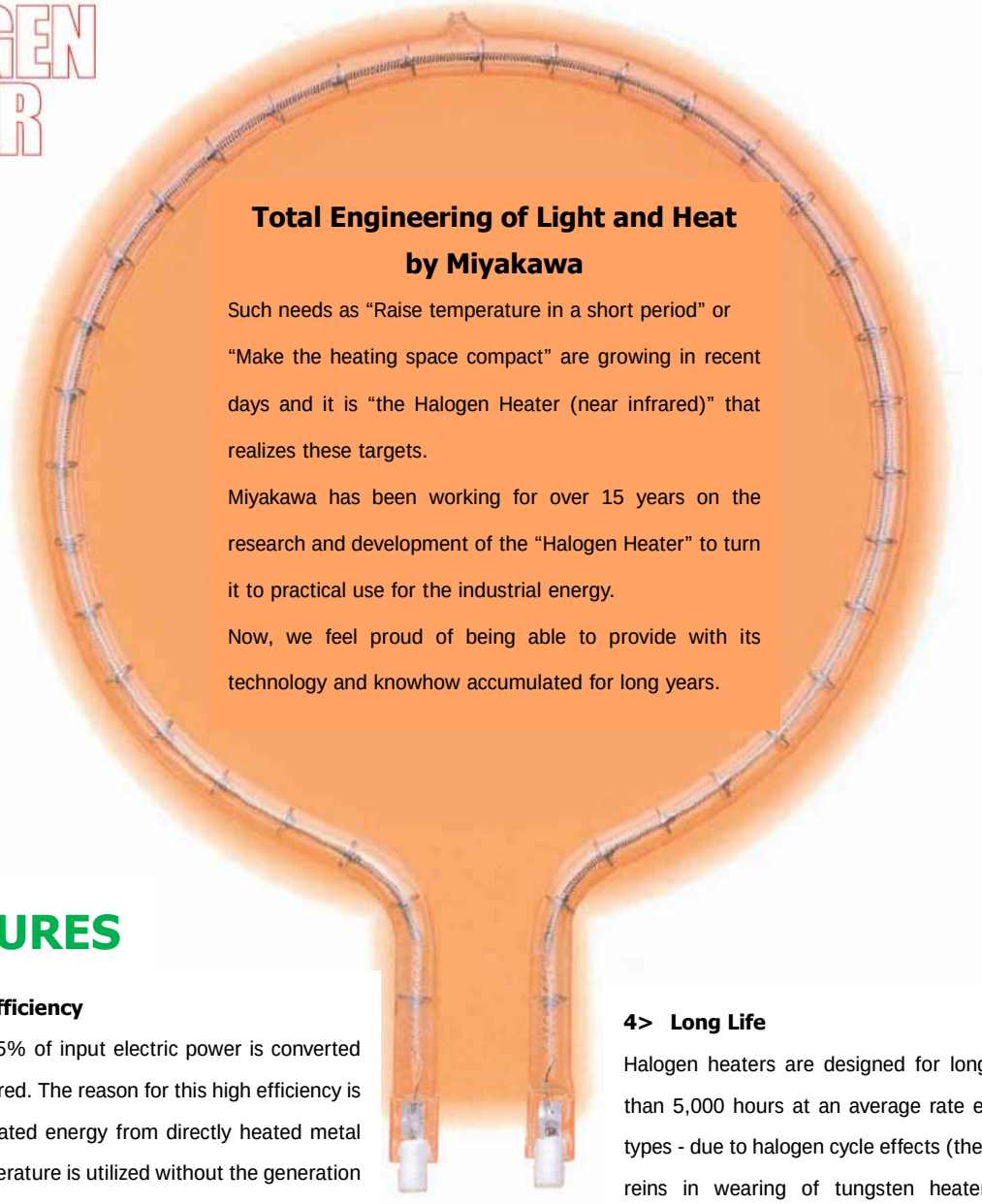
HALOGEN HEATER



Total Engineering of Light and Heat by Miyakawa

Such needs as “Raise temperature in a short period” or “Make the heating space compact” are growing in recent days and it is “the Halogen Heater (near infrared)” that realizes these targets.

Miyakawa has been working for over 15 years on the research and development of the “Halogen Heater” to turn it to practical use for the industrial energy.

Now, we feel proud of being able to provide with its technology and knowhow accumulated for long years.

FEATURES

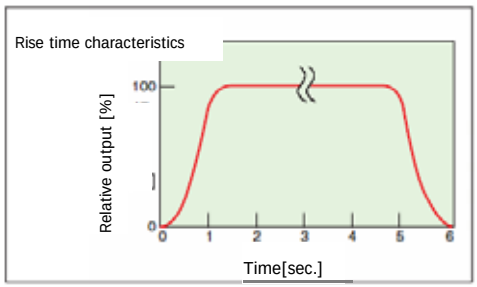
1> High Efficiency

More than 85% of input electric power is converted into the infrared. The reason for this high efficiency is that the radiated energy from directly heated metal at high temperature is utilized without the generation of useless energy.

2> **Concentration of Energy**

The energy can be concentrated by optical methods such as reflectors. It is possible to concentrate to 15 joules per square cm.

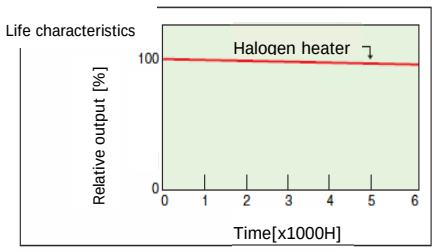
3> High Controllability



As tungsten heater with low heat capacity is used, heat-up and cool-down are almost instantaneous and output control is done electrically with perfect freedom. And as concentration and diffusion of energy are possible by optical methods such as mirror and lens, this is highly controllable heat source.

4> Long Life

Halogen heaters are designed for long life – more than 5,000 hours at an average rate except certain types - due to halogen cycle effects (the function that reins in wearing of tungsten heater by sealing halogen gas in). Reduction of output to the life end point is as low as several percent. Thus, handling is easy and economical.



5> **Heating in vacuum**

There are types which can be installed in vacuum. When using the out-of-vacuum types, if the container is infrared ray-transmissive, the object in the vacuum container can be heated.

6> Downsizing

Big feature of Halogen heater is light weight and possible downsizing. In narrow places or places where other heat sources are hard to bring in, the installation is possible. And handling is very easy, because structure and function are simple.

Base Configuration

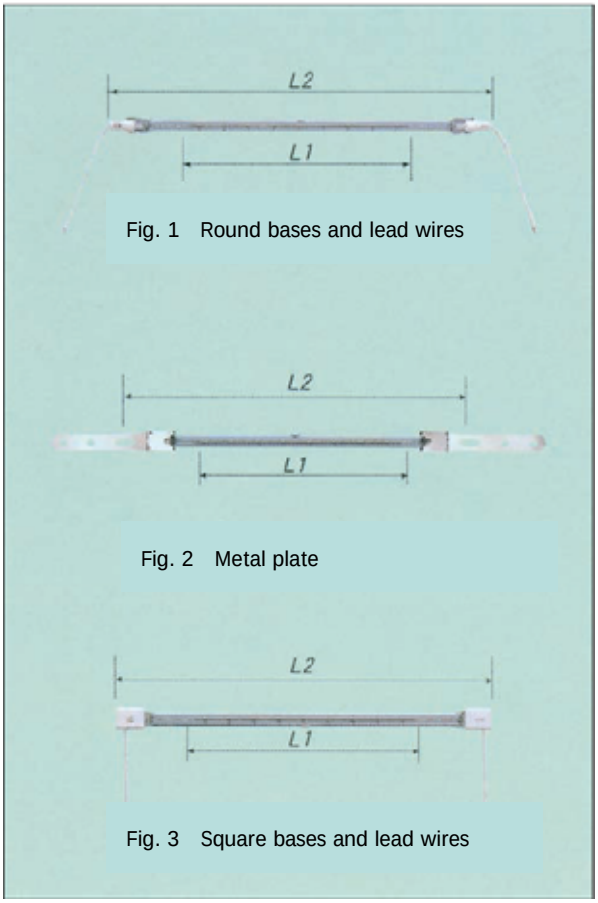
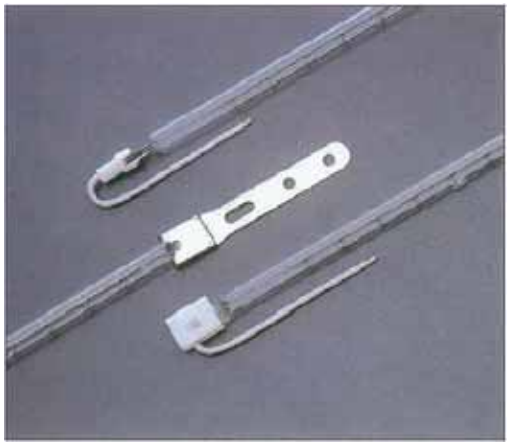


Fig. 1 Round bases and lead wires

Fig. 2 Metal plate

Fig. 3 Square bases and lead wires



Base Holder

Base holders to match base configurations shown below are assorted.

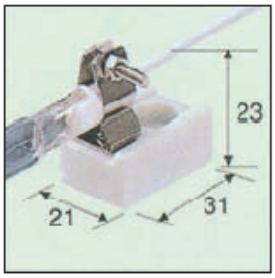


Fig. 4 For round bases and lead wires

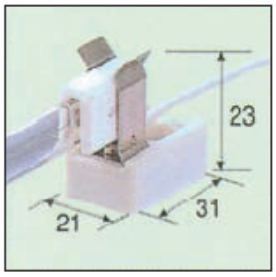


Fig. 5 For square bases and lead wires

Standard Specification

Near-infrared heater (clear type)

TYPE	RATED VOLTAGE (V)	WATTAGE (W)	HEAT GENERTION LENGTH L1 (mm)	LAMP LENGTH L2 (mm)	COLOR TEMP. (K)	AVE. LIFE (H)	FIG. #	DIRECTION OF MOUNTING
QIR-C100V 500WA	100	500	130±5	214±3	2450	5000	1	Within ±4°against horizontal plane
QIR-C100V 500WB		500	130±5	226±3	2450	5000	2	
QIR-C100V 500WC		500	130±5	205±3	2450	5000	3	
QIR-C100V 1000WA		1000	220±5	304±3	2450	5000	1	
QIR-C100V 1000WB		1000	220±5	316±3	2450	5000	2	
QIR-C100V 1000WC		1000	220±5	295±3	2450	5000	3	
QIR-C200V 1000WA	200	1000	240±5	324±3	2450	5000	1	
QIR-C200V 1000WB		1000	240±5	336±3	2450	5000	2	
QIR-C200V 1000WC		1000	240±5	315±3	2450	5000	3	
QIR-C200V 2000WA		2000	300±5	404±3	2450	5000	1	
QIR-C200V 2000WB		2000	300±5	416±3	2450	5000	2	
QIR-C200V 2000WC		2000	300±5	395±3	2450	5000	3	

Attention) Maximum operating temperature at molybdenum foil seal is 350℃

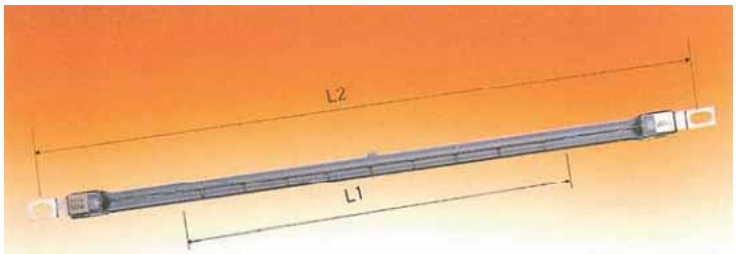
Option

Black coating type (far-infrared ray heater)

Coated by special ceramic coating on the surface of heating element, this type converts almost 100% of visible radiation output and 70～80% of near and middle infrared output to far-infrared ray. Compared with the amount of far-infrared ray generated by regular halogen heaters (clear type), the amount is 2～3 times and peak output wave length becomes 3μm～4μm.

Vacuum specification QIR heater

As ceramics or cement are used on the base portion of normal QIR heater, gas and fine particles are discharged when used in vacuum, causing certain troubles. Vacuum specification QIR heater is constructed without using these materials. As a result, the heater can be used in vacuum without fail. However, as service conditions vary depending upon degree of vacuum and temperature of QIR heater's sealed part, if the heater is used under specific condition, please consult with the Manufacturer.

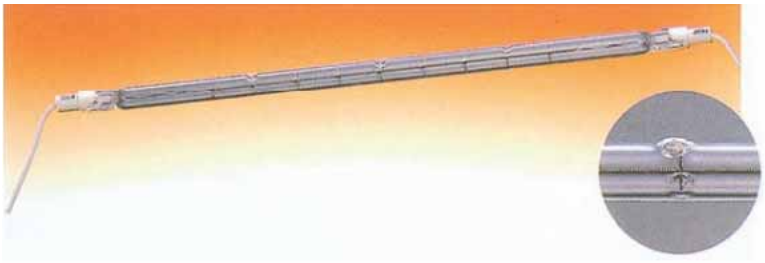


White coating type (equipped with reflection coating)

By white-coating outside surface of heating element, infrared is emitted effectively in a single direction. By doing this, reflector and other attachment can be omitted, then downsizing and space-cutting of system can be realized.

Vertical type

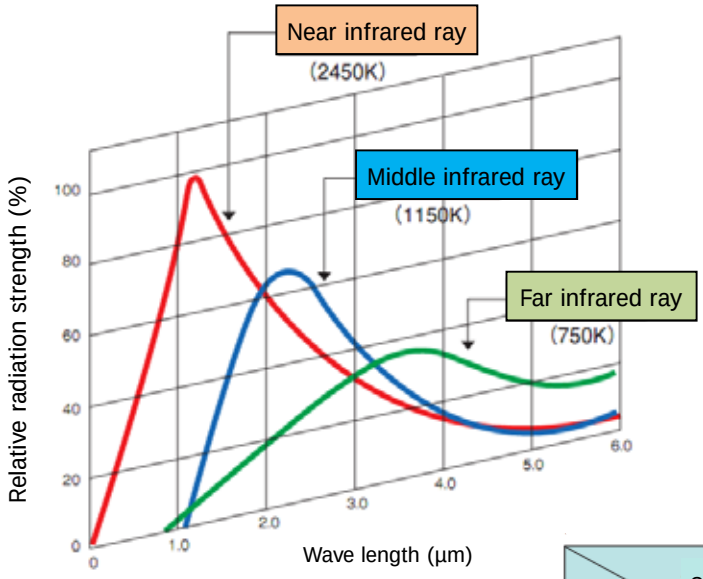
Allowable using angle of Halogen heater is ±4°against horizontal plane. If used over this limit, extreme short-life or other faults occur. This vertical type is recommended for use over allowable angle. If there are any unclear points with regard to use conditions, please contact with the Manufacturer.



The Manufacturer will comply with the customers' demands with regard to dimensions and ratings etc of all products regardless the quantity..

Comparison of energy distribution and efficiency, etc.

Energy distribution of the infrared rays



Electromagnetic waves with wavelength of 0.8μm to 1mm (1,000μm) are collectively called infrared ray. As shown in the left figure and the following table, they are divided into three categories. These three, that is, near, middle and far infrared rays have major characteristic respectively.

Near infrared ray (i.e. halogen heater) is the highest in energy efficiency and its big characteristic is that its energy is concentrated to around 15J/cm2. Therefore, high temperature heating is possible and the compact system can be composed.

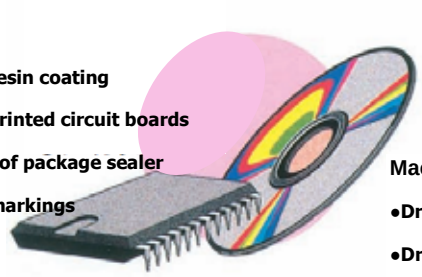
Black-coating tube, an option of halogen heater, radiates far infrared ray effectively and its buildup time is very quick, several tens of seconds, compared with general far infrared rays. That is a big advantage in use.

Group / Term	Near infrared ray	Middle infrared ray	Far infrared ray
Energy efficiency	Approx. 85%	80 – 85%	60 – 65%
Power density	Approx. 15W/cm2	Approx. 5W/cm2	Approx. 2W/m2
Build-up time	<1 sec.	30 - 60 sec.	5 – 10 min.
Color	2450K	1100 – 1200K	700 - 800K
Center	1.2μm	2.5μm	4.0μm
Life time	5000H	—	—

Applications of halogen heaters

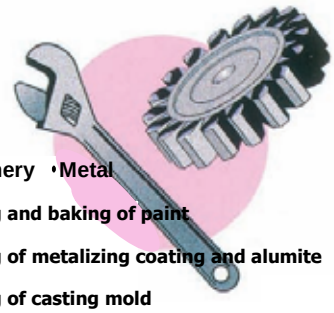
Electricity・Electronics

- **Soldering**
- **Drying of resin coating**
- **Drying of printed circuit boards**
- **Hardening of package sealer**
- **Drying of markings**



Machinery・Metal

- **Drying and baking of paint**
- **Drying of metalizing coating and alumite**
- **Drying of casting mold**
- **Quick water drip drying**
- **Downsizing of dry air furnace**

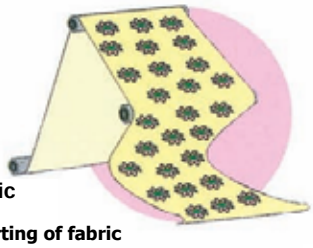


Plastics

- **Drying of material and power pellet**
- **Preheating prior to shape forming**
- **Hardening forming**
- **Gelling and heated foam formation**
- **Bond hardening**

Paper・Printing

- **Drying of watered paper**
- **Offset and gravure printing**
- **Burning treatment of printing matrix**
- **Drying moisture after coating**
- **Drying after vanish/vinyl coating**



Fabric

- **Starting of fabric**
- **Drying of dyeing/printing**
- **Waterproofing/shrink-proofing of wool**
- **Backing of carpet**
- **Drying of fabric**

Painting

- **Drying of paint**
- **Baking of paint**
- **Electrostatic hardening of fine particles**

CAUTION about safety of the halogen heater

WARNING

Do not cover halogen heater in use with flammable object (paper, cloth or plastic for example) or move them closer to halogen heater. It may cause a fire.

Do not drop, scratch or direct unreasonable power to halogen heater. Broken pieces of glass may fly apart, causing physical injury because inside pressure of halogen heater is high.

Use confirmable appliances such as socket, electric source and others. In case of nonconforming, it may cause overheating or short life.

If lighting direction of heater is designated, never fail to use the heater in designated direction. Otherwise the appliance may overheat or be transformed, causing extreme short life.

Never fail to turn the power off when installing, uninstalling, checking or cleaning the heater. Otherwise. it causes breakage of the heater or electrical shock.

CAUTION

As halogen heater is at high temperature while it is lighting or immediately after switched off, never tough it with bare hands. It causes burn injury.

Do not touch halogen heater directly with bare hands even in cold condition. If lighting it up with hand grease on its surface, glass deteriorates and the heater life becomes short. If the heater becomes tainted, wipe it out cleanly with alcohol etc. and use it (When handling halogen heater, use clean gloves.)

In order to prevent contact failure, dropout from fixture or fall-down, install halogen heater surely to socket or mounting terminals.

Do not use halogen heater at more than specified voltage. Using at more than specified voltage will result in extreme short life or heater may be broken depending on conditions.

Check if socket and contact portion are not damaged and confirm there is no deformation, rust or taint. They may cause faulty lighting or cause of overheating.

Do not use where water drop or rain falls. Do not use in high temperature, high humidity and dusty surroundings. They may cause overheating and breakage.

Rush current

Resistance at room temperature of tungsten used in halogen heater is around 1/10 of that of operating time. Therefore, at the moment voltage is applied to halogen heater, large rush current flows in. To answer to it, it is necessary to take into consideration for current circuit design such as heightening the impedance of heater circuit.

Temperature of sealing portion and life time

Sealing portion is made of molybdenum foil and quartz glass. As when temperature of sealing portion rises over 350℃, life time becomes short quickly, so keep temperature of sealing portion below 300℃ in use.

★ Specifications and appearance may be revised for improvement without prior notice.