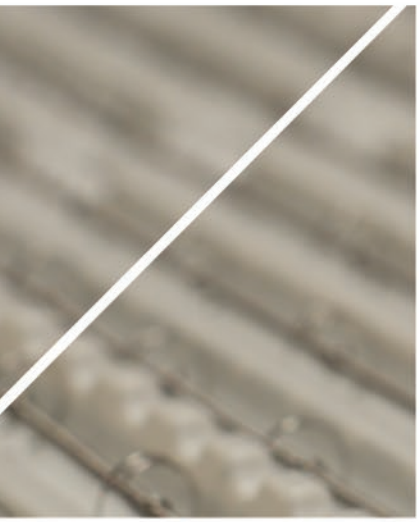
INFRARED HEATER

Technical & Product Guide



SOUTHEAST THERMAL SYSTEMS

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USHIO

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USHIO

Oregon FACTORY

USHIO traces its origins to the early years of lighting and has advanced lighting technology in all corners of business and industry. USHIO ensures that only the highest quality lighting products and the finest lighting professionals stand behind the USHIO name.

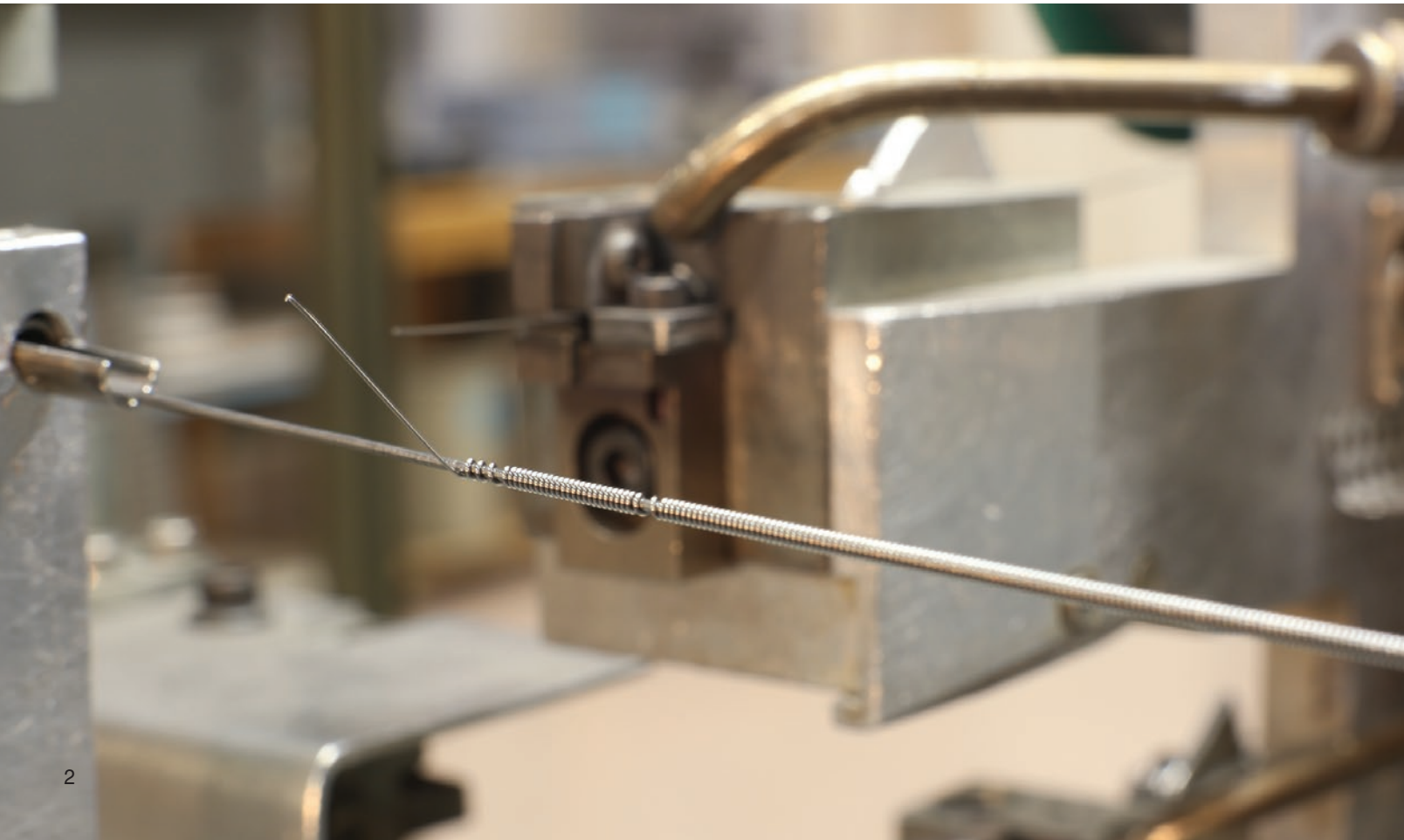
With over 3,000 employees on three continents, USHIO is a prominent force in the lighting industry. The company serves its customers from over twenty-five comprehensive sales and marketing divisions in over a dozen countries.

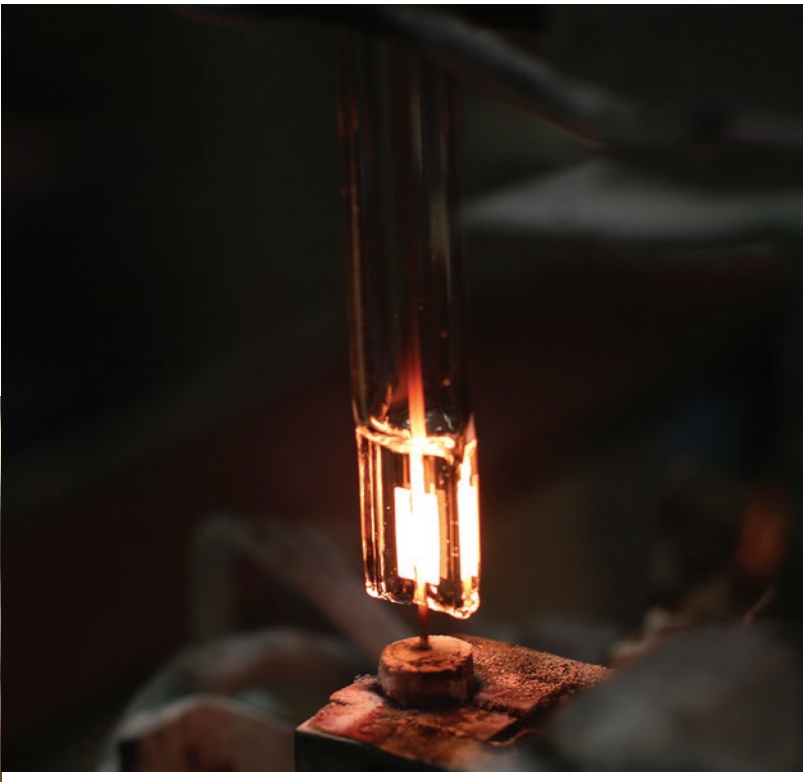
In 1987 USHIO's manufacturing facility for infrared (IR) quartz emitters was established in Newberg, Oregon. The Oregon factory is the largest IR emmitter manufacturer located here in the United States. With state-of-the-art technology and high standards for quality, USHIO Oregon has gained notoriety for producing the most reliable IR emitter products in the industry today.

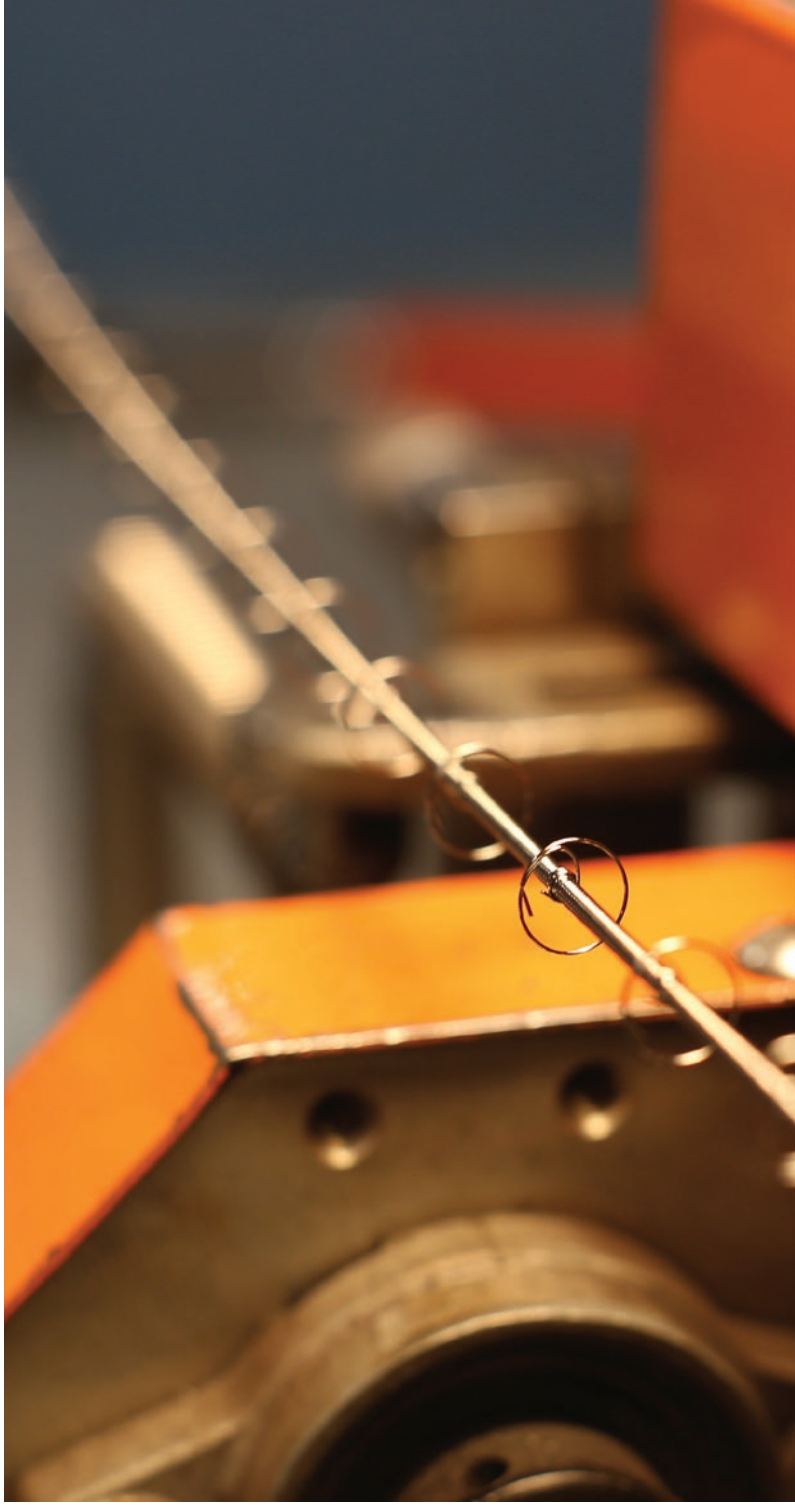
The primary focus at the Oregon facility is to provide custom designs and unique, specialized products. These products include halogen, amalgam and xenon lamps in addition to discharge and LED light box assemblies. Finished products are used in a variety of industries including the semiconductor, medical, dental, copier/printer, industrial heating and drying applications.

As an ISO-9001 and ISO-14001 certified facility, the USHIO Oregon factory is leading the way with innovative, quality lighting products manufactured in the U.S., while also upholding high standards to protect our environment.

By producing a variety of products unmatched in quality and performance, and by backing that up with an unshakeable commitment to customer service, USHIO is a driving force in lighting-edge technology, leading its customers beyond the farthest reaches of their imagination.







USHIO Oregon delivers Quality Control throughout every step of the manufacturing process, repeatedly producing superior, high-quality specialty IR products.

ISO 14001 CERTIFIED

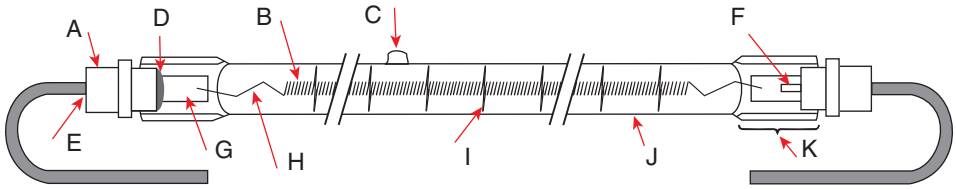
ISO 9001 CERTIFIED

Made in USA

QIH REFERENCE GUIDE

GENERAL PROPERTIES OF A QIH LAMP

A Base
B Filament
C Filling Tip
D Cement
E Lead Wire
F Outer Lead Rod
G Molybdenum Foil
H Inner Lead
I Support
J Bulb (Envelope)
K Seal



USHIO QIH PART NUMBER REFERENCE GUIDE

QIH240-1000 □ / □ □ □

Glass Type / Jacket Type
T = Translucent Quartz
C = Clear
R = Ruby
= No Indication; Clear Quartz

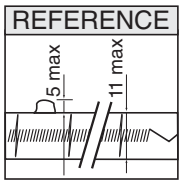
Burning Position
V = Vertical Burning
= No Indication; Horizontal Burning

Reflector
Z = White Coated Reflector
= No Indication; No Reflector

Base Type
B = Metal Clip Base
E = R7s (Contact Type)
S = Metal Sleeve w/Lead Wire
C = Lead Wire; No Metal Sleeve
L = Round Ceramic Base w/Lead Wire
D = Flat Ceramic Base w/Lead Wire
H = Flat Ceramic Base w/Lead Wire (no adhesive)

USHIO QIH REFERENCE NOTES

Dimensions
MOL = Maximum Overall Length
LL = Lighted Length (Filament Length) (Avg.)
L1 = Contact to Contact Length



Lamp Notes
F = Faston Terminal
FR = Faston Receptacle
FT = Faston Tab
IW = Insulated Wire
R = Ring Tongue Terminal
S = Spade Tongue Terminal / Standard Lead Wire Length: 145mm
SS = Silicon Sleeve

BASE TYPE OPTIONS

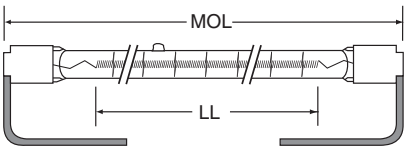


Fig. 1


Metal Sleeve with Lead Wire

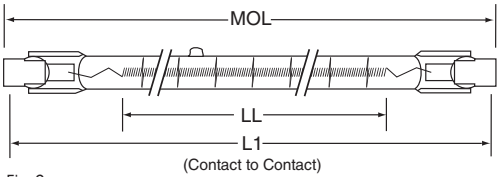


Fig. 2


R7s Contact Base

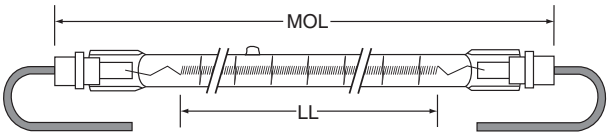


Fig. 3


Round Ceramic Base with Lead Wire

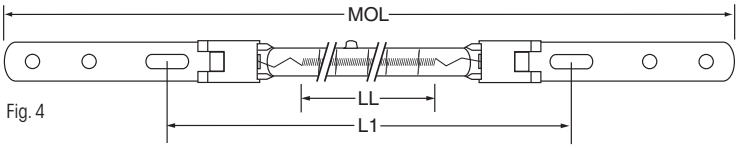


Fig. 4


Metal Clip Base

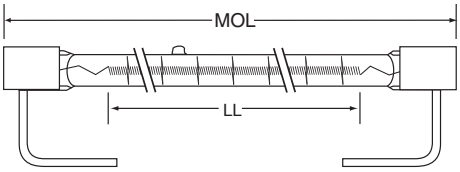


Fig. 5


Flat Ceramic Base with Lead Wire

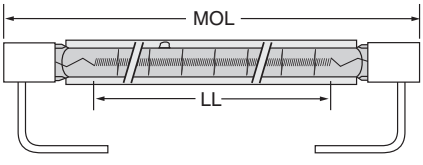


Fig. 6


Ruby/Clear Jacket

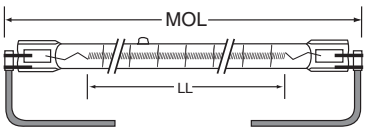
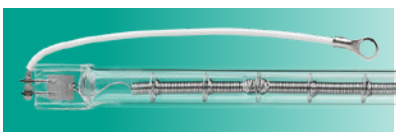


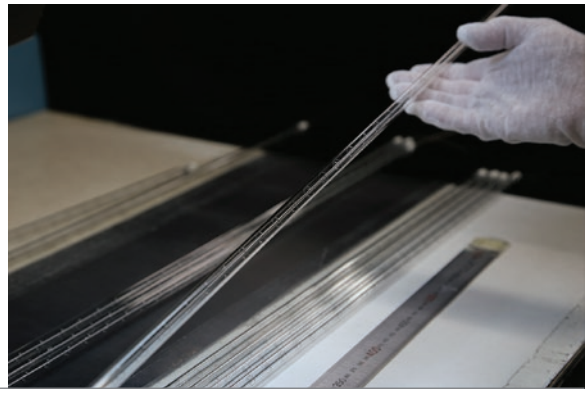
Fig. 7


Lead Wire without Metal Sleeve

INDUSTRIAL HEATER

INDUSTRIAL HEATER LAMP APPLICATIONS

With high-quality standards and possessing state-of-the-art equipment, USHIO Oregon provides clean, instantaneous and precision controlled quartz infrared heater lamps (QIH). These high-efficiency lamps are able to transfer large amounts of heat while maintaining absolute controllability. Quartz tubes are best used for radiant applications that need instant on, instant off, such as heat sensitive materials that may have to linger in a heat source. USHIO's quartz lamps are the best choice where precise high wattage density is necessary for high speed production processes while maintaining even heat controlled zones.



Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
300 Watts									
120	1001288	QIH120-300T/S	214.0	106	—	2450	6000	1	
375 Watts									
120	1001289	QIH120-375T/E	219.0	128	215	2500	6000	2	
120	1001290	QIH120-375T/S	223.0	128	—	2500	6000	1	
500 Watts									
120	1001293	QIH120-500/L	223.0	127	—	2500	5000	3	
120	1001294	QIH120-500/S	223.0	127	—	2500	5000	1	
120	1001297	QIH120-500T/E	220.0	127	216	2500	5000	2	
120	1001298	QIH120-500T/S	223.0	127	—	2500	5000	1	
240	1001352	QIH240-500/D	227.5	165	—	2600	4000	5	IW, S
240	1001353	QIH240-500/ZD	227.5	165	—	2600	4000	5	IW, S
240	1001409	QIH240-500C/D	227.0	162	—	2500	5000	6	
600 Watts									
104	1001285	QIH104-600/S	303.0	152	—	2500	6000	1	
800 Watts									
120	1001299	QIH120-800T/S	303.0	203	—	2500	6000	1	
850 Watts									
120	1003565	QIH120-850R/VD	198.0	115	—	—	5000	6	FT, IW, SS
1000 Watts									
240	1001317	QIH240-1000/S	351.0	254	—	2500	5000	1	
240	1001318	QIH240-1000/S2	303.0	254	—	2500	5000	1	
240	1001319	QIH240-1000/S3	351.0	272	—	2500	5000	1	
240	1001320	QIH240-1000/VB	485.0	272	370	2500	5000	4	
240	1001321	QIH240-1000/VD	357.5	272	—	2500	5000	5	IW, S
240	1001322	QIH240-1000/VZD	357.5	272	—	2500	5000	5	IW, S
240	1002250	QIH240-1000/VZH	357.5	272	—	2500	5000	5	IW, S
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
240	1001324	QIH240-1000/ZD	357.5	272	—	2500	5000	5	IW, S

INDUSTRIAL HEATER LAMP APPLICATIONS

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1000 Watts									
240	1003550	QIH240-1000R/VD4	531.0	440	—	—	5000	6	FT, IW, SS
240	1001325	QIH240-1000T/S	351.0	254	—	2500	5000	1	
1200 Watts									
144	1001300	QIH144-1200/S	224.0	155	—	2500	5000	1	
144	1001301	QIH144-1200/S2	228.0	155	—	2500	5000	1	IW, R
230	1003142	QIH230-1200/ZH	225.0	155	—	2700	3000	5	IW, S
1300 Watts									
230	1003236	QIH230-1300/ZL	453.0	358	—	2500	5000	3	IW, F
1350 Watts									
115	1001287	QIH115-1350/L	317.0	256	—	2750	3000	3	IW
220	1001311	QIH220-1350/L	317.0	256	—	2750	3000	3	IW
1500 Watts									
230	1003235	QIH230-1500/ZL	453.0	360	—	2500	5000	3	IW, FR
240	1001327	QIH240-1500/S	303.0	235	—	2500	5000	1	
1600 Watts									
144	1001302	QIH144-1600/S	229.0	150	—	2650	3000	1	IW, R
208	1001305	QIH208-1600/L	502.0	407	—	2500	5000	3	
208	1001306	QIH208-1600T/E	499.0	407	495	2400	6000	2	
208	1001307	QIH208-1600T/S	503.0	407	—	2400	6000	1	
240	1001328	QIH240-1600/E	499.0	407	495	2500	5000	2	
240	1001329	QIH240-1600/L2	502.0	407	—	2500	5000	3	
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
240	1002198	QIH240-1600/VS	503.0	407	—	2500	5000	1	
240	1001333	QIH240-1600T/E	499.0	407	495	2500	5000	2	
240	1001334	QIH240-1600T/L	502.0	407	—	2500	5000	3	
240	1001335	QIH240-1600T/S	503.0	407	—	2500	5000	1	
277	1001355	QIH277-1600/L	502.0	407	—	2500	5000	3	
277	1001356	QIH277-1600T/E	499.0	407	495	2500	5000	2	
277	1001357	QIH277-1600T/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001339	QIH240-2000/S	303.0	248	—	2500	5000	1	
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	
240	1001341	QIH240-2000/VB	485.0	280	370	2500	5000	4	
240	1001343	QIH240-2000/VS	303.0	248	—	2500	5000	1	
240	1001344	QIH240-2000/VZD	357.0	280	—	2500	5000	5	IW, S
240	1003405	QIH240-2000/ZD4	354.0	290	—	2500	5000	5	IW
240	1003404	QIH240-2000/ZH5	354.0	290	—	2400	5000	5	IW
240	1001350	QIH240-2000T/S	603.0	508	—	2500	5000	1	
400	1001345	QIH400-2000/VB	623.0	410	508	2500	5000	4	

INDUSTRIAL HEATER

INDUSTRIAL HEATER LAMP APPLICATIONS

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
2000 Watts									
400	1001362	QIH400-2000/ZB	623.0	410	508	2500	5000	4	
2500 Watts									
480	1001373	QIH480-2500/S	732.0	635	—	2500	5000	1	
480	1001376	QIH480-2500/VS	732.0	635	—	2500	5000	1	
480	1003164	QIH480-2500/ZH	737.0	635	—	2500	5000	5	IW
480	1001380	QIH480-2500T/L	729.0	635	—	2500	5000	3	
480	1001381	QIH480-2500T/S	732.0	635	—	2500	5000	1	
575	1001399	QIH575-2500/S	732.0	635	—	2500	5000	1	
2600 Watts									
240	1001408	QIH240-2600R/D	583.0	500	—	—	5000	6	IW, S, SS
3000 Watts									
240	1001351	QIH240-3000/S	503.0	410	—	2500	5000	1	
3200 Watts									
384	1001360	QIH384-3200/S	456.0	406	—	2500	3000	1	
3650 Watts									
480	1001385	QIH480-3650/L	1062.0	965	—	2500	5000	3	
480	1001386	QIH480-3650/S	1059.0	965	—	2500	5000	1	
480	1001387	QIH480-3650T/L	1060.0	965	—	2500	5000	3	
3800 Watts									
420	1003046	QIH420-3800/VS	1062.0	965	—	2500	5000	1	
570	1001392	QIH570-3800/L	1062.0	965	—	2500	5000	3	
570	1001393	QIH570-3800/S	1062.0	965	—	2450	5000	1	
570	1001395	QIH570-3800/VS	1062.0	965	—	2450	5000	1	
5000 Watts									
600	1001402	QIH600-5000/S	732.0	638	—	2500	5000	1	
6000 Watts									
480	—	QIH480-6000*	300.0	248	—	3150	—	7	

*Call to Inquire

CURING APPLICATIONS

The USHIO (QIH) IR technology for curing is targeted to provide heat to specific areas where and when it is needed on demand. With the increasing popularity of powder coating curing applications, IR lamps apply even distribution of heat, resulting in polished and smooth surfaces.

The heat tunnel photo shown on the right is used to cure the coatings on wood furniture.

Photo courtesy of Prime Heat.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
300 Watts									
120	1001288	QIH120-300T/S	214.0	106	—	2450	6000	1	
375 Watts									
120	1001290	QIH120-375T/S	223.0	128	—	2500	6000	1	
1000 Watts									
240	1001317	QIH240-1000/S	351.0	254	—	2500	5000	1	
240	1001319	QIH240-1000/S3	351.0	272	—	2500	5000	1	
240	1001321	QIH240-1000/VD	357.5	272	—	2500	5000	5	IW, S
240	1002250	QIH240-1000/VZH	357.5	272	—	2500	5000	5	IW, S
240	1001325	QIH240-1000T/S	351.0	254	—	2500	5000	1	
1600 Watts									
240	1001329	QIH240-1600/L2	502.0	407	—	2500	5000	3	
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
240	1001333	QIH240-1600T/E	499.0	407	495	2500	5000	2	
240	1001335	QIH240-1600T/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	
240	1001344	QIH240-2000/VZD	357.0	280	—	2500	5000	5	IW, S
240	1003404	QIH240-2000/ZH5	354.0	290	—	2400	5000	5	IW
240	1001350	QIH240-2000T/S	603.0	508	—	2500	5000	1	
400	1001362	QIH400-2000/ZB	623.0	410	508	2500	5000	4	
2500 Watts									
480	1001376	QIH480-2500/VS	732.0	635	—	2500	5000	1	
3000 Watts									
240	1001351	QIH240-3000/S	503.0	410	—	2500	5000	1	
3650 Watts									
480	1001387	QIH480-3650T/L	1060.0	965	—	2500	5000	3	
3800 Watts									
570	1001393	QIH570-3800/S	1062.0	965	—	2450	5000	1	
570	1001395	QIH570-3800/VS	1062.0	965	—	2450	5000	1	

PAINT & INK DRYING APPLICATIONS

The importance of using infrared lamps for paint and ink drying applications is the quick and even drying of the paint and ink. This minimizes air movement, streaking, and dust particles adhering to the paint and ink surfaces. Pretreatment and primer coatings can easily be dried to achieve a much faster production process time. Infrared heating for paint applications are most commonly used on aluminum, metal, steel, and wood surfaces. Infrared heating of ink is mostly used for paper, cardboard, and textiles; as well as maintaining a consistent temperature for the ink cartridges.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
375 Watts									
120	1001289	QIH120-375T/E	219.0	128	215	2500	6000	2	
120	1001290	QIH120-375T/S	223.0	128	—	2500	6000	1	
500 Watts									
120	1001294	QIH120-500/S	223.0	127	—	2500	5000	1	
120	1001298	QIH120-500T/S	223.0	127	—	2500	5000	1	
240	1001352	QIH240-500/D	227.5	165	—	2600	4000	5	IW, S
800 Watts									
120	1001299	QIH120-800T/S	303.0	203	—	2500	6000	1	
1000 Watts									
240	1001317	QIH240-1000/S	351.0	254	—	2500	5000	1	
240	1001318	QIH240-1000/S2	303.0	254	—	2500	5000	1	
240	1001320	QIH240-1000/VB	485.0	272	370	2500	5000	4	
240	1001321	QIH240-1000/VD	357.5	272	—	2500	5000	5	IW, S
240	1001322	QIH240-1000/VZD	357.5	272	—	2500	5000	5	IW, S
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
240	1001324	QIH240-1000/ZD	357.5	272	—	2500	5000	5	IW, S
1350 Watts									
115	1001287	QIH115-1350/L	317.0	256	—	2750	3000	3	IW
220	1001311	QIH220-1350/L	317.0	256	—	2750	3000	3	IW
1600 Watts									
144	1001302	QIH144-1600/S	229.0	150	—	2650	3000	1	IW, R
208	1001306	QIH208-1600T/E	499.0	407	495	2400	6000	2	
208	1001307	QIH208-1600T/S	503.0	407	—	2400	6000	1	
240	1001328	QIH240-1600/E	499.0	407	495	2500	5000	2	
240	1001329	QIH240-1600/L2	502.0	407	—	2500	5000	3	
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
240	1001331	QIH240-1600/S2	455.5	407	—	2500	3000	1	
240	1001333	QIH240-1600T/E	499.0	407	495	2500	5000	2	

PAINT & INK DRYING APPLICATIONS

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1600 Watts									
240	1001334	QIH240-1600T/L	502.0	407	—	2500	5000	3	
277	1001357	QIH277-1600T/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001339	QIH240-2000/S	303.0	248	—	2500	5000	1	
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	
240	1001343	QIH240-2000/VS	303.0	248	—	2500	5000	1	
240	1001344	QIH240-2000/VZD	357.0	280	—	2500	5000	5	IW, S
240	1001350	QIH240-2000T/S	603.0	508	—	2500	5000	1	
400	1001345	QIH400-2000/VB	623.0	410	508	2500	5000	4	
400	1001362	QIH400-2000/ZB	623.0	410	508	2500	5000	4	
2500 Watts									
480	1001373	QIH480-2500/S	732.0	635	—	2500	5000	1	
480	1001376	QIH480-2500/VS	732.0	635	—	2500	5000	1	
480	1001381	QIH480-2500T/S	732.0	635	—	2500	5000	1	
3000 Watts									
240	1001351	QIH240-3000/S	503.0	410	—	2500	5000	1	
3650 Watts									
480	1001386	QIH480-3650/S	1059.0	965	—	2500	5000	1	

PAPER & TEXTILE DRYING

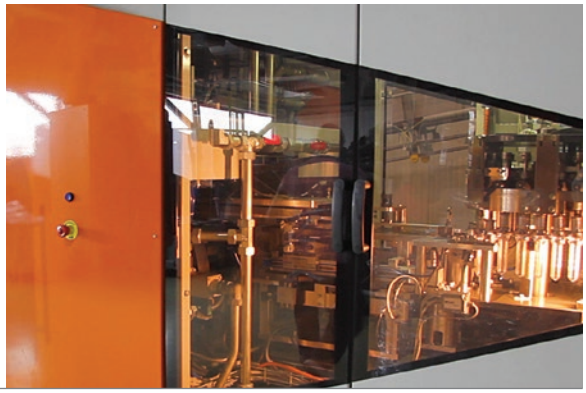
PAPER & TEXTILE DRYING APPLICATIONS

USHIO manufactures a wide array of infrared heater lamps with the ability to customize lamps to meet your specific needs. For paper and textile drying infrared heater lamps are well-suited for this application. Infrared heater lamps are used to dry the outer top surfaces of the material and penetrate deep into the material. This speeds up production time and saves on energy costs.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1000 Watts									
240	1001319	QIH240-1000/S3	351.0	272	—	2500	5000	1	
240	1001322	QIH240-1000/VZD	357.5	272	—	2500	5000	5	IW, S
240	1001324	QIH240-1000/ZD	357.5	272	—	2500	5000	5	IW, S
1600 Watts									
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
3650 Watts									
480	1001386	QIH480-3650/S	1059.0	965	—	2500	5000	1	

BLOW MOLDING APPLICATIONS

The bottle blow molding industry extensively uses infrared heater lamps for plastic bottle molding. Being able to precisely control the temperature of the plastics allows a consistent plastic bottle to be formed.



Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1000 Watts									
240	1001322	QIH240-1000/VZD	357.5	272	—	2500	5000	5	IW, S
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
240	1001324	QIH240-1000/ZD	357.5	272	—	2500	5000	5	IW, S
1200 Watts									
144	1001301	QIH144-1200/S2	228.0	155	—	2500	5000	1	IW, R
230	1003142	QIH230-1200/ZH	225.0	155	—	2700	3000	5	IW, S
1300 Watts									
230	1003236	QIH230-1300/ZL	453.0	358	—	2500	5000	3	IW, F
1500 Watts									
230	1003235	QIH230-1500/ZL	453.0	360	—	2500	5000	3	IW, FR
1600 Watts									
144	1001302	QIH144-1600/S	229.0	150	—	2650	3000	1	IW, R
230	1003143	QIH230-1600/ZH	225.0	155	—	2700	3000	5	IW, S
240	1001333	QIH240-1600T/E	499.0	407	495	2500	5000	2	
240	1001335	QIH240-1600T/S	503.0	407	—	2500	5000	1	
277	1001357	QIH277-1600T/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001344	QIH240-2000/VZD	357.0	280	—	2500	5000	5	IW, S
240	1003405	QIH240-2000/ZD4	354.0	290	—	2500	5000	5	IW
240	1003404	QIH240-2000/ZH5	354.0	290	—	2400	5000	5	IW
2500 Watts									
400	1003570	QIH400-2500/ZD	381.0	310	—	2500	5000	5	IW
480	1001381	QIH480-2500T/S	732.0	635	—	2500	5000	1	
3000 Watts									
400	1003571	QIH400-3000/ZD	381.0	310	—	2500	5000	5	IW
3800 Watts									
570	1001393	QIH570-3800/S	1062.0	965	—	2450	5000	1	

GRAPHIC ARTS

GRAPHIC ARTS APPLICATIONS

The USHIO graphic art lamps are ideal for drying ink for graphic arts and silkscreen presses when printing on surfaces such as paper or textiles. With short and medium wavelengths, with wattages ranging from 375W to 6000W and the flexibility to customize lamps, USHIO's graphic art lamps are repeatedly chosen for their quality.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
375 Watts									
120	1001289	QIH120-375T/E	219.0	128	215	2500	6000	2	
120	1001290	QIH120-375T/S	223.0	128	—	2500	6000	1	
500 Watts									
120	1001294	QIH120-500/S	223.0	127	—	2500	5000	1	
120	1001297	QIH120-500T/E	220.0	127	216	2500	5000	2	
120	1001298	QIH120-500T/S	223.0	127	—	2500	5000	1	
800 Watts									
120	1001299	QIH120-800T/S	303.0	203	—	2500	6000	1	
1000 Watts									
240	1001317	QIH240-1000/S	351.0	254	—	2500	5000	1	
240	1001318	QIH240-1000/S2	303.0	254	—	2500	5000	1	
240	1001319	QIH240-1000/S3	351.0	272	—	2500	5000	1	
240	1001320	QIH240-1000/VB	485.0	272	370	2500	5000	4	
240	1001322	QIH240-1000/VZD	357.5	272	—	2500	5000	5	IW, S
240	1002250	QIH240-1000/VZH	357.5	272	—	2500	5000	5	IW, S
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
240	1001325	QIH240-1000T/S	351.0	254	—	2500	5000	1	
1200 Watts									
144	1001300	QIH144-1200/S	224.0	155	—	2500	5000	1	
144	1001301	QIH144-1200/S2	228.0	155	—	2500	5000	1	IW, R
230	1003142	QIH230-1200/ZH	225.0	155	—	2700	3000	5	IW, S
1350 Watts									
115	1001287	QIH115-1350/L	317.0	256	—	2750	3000	3	IW
220	1001311	QIH220-1350/L	317.0	256	—	2750	3000	3	IW
1500 Watts									
230	1003235	QIH230-1500/ZL	453.0	360	—	2500	5000	3	IW, FR

GRAPHIC ARTS APPLICATIONS

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1600 Watts									
208	1001305	QIH208-1600/L	502.0	407	—	2500	5000	3	
208	1001306	QIH208-1600T/E	499.0	407	495	2400	6000	2	
208	1001307	QIH208-1600T/S	503.0	407	—	2400	6000	1	
240	1001328	QIH240-1600/E	499.0	407	495	2500	5000	2	
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
240	1001333	QIH240-1600T/E	499.0	407	495	2500	5000	2	
240	1001335	QIH240-1600T/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001339	QIH240-2000/S	303.0	248	—	2500	5000	1	
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	
240	1001343	QIH240-2000/VS	303.0	248	—	2500	5000	1	
240	1001344	QIH240-2000/VZD	357.0	280	—	2500	5000	5	IW, S
400	1001362	QIH400-2000/ZB	623.0	410	508	2500	5000	4	
2500 Watts									
480	1001373	QIH480-2500/S	732.0	635	—	2500	5000	1	
480	1001381	QIH480-2500T/S	732.0	635	—	2500	5000	1	
3650 Watts									
480	1001385	QIH480-3650/L	1062.0	965	—	2500	5000	3	
480	1001387	QIH480-3650T/L	1060.0	965	—	2500	5000	3	
3800 Watts									
570	1001393	QIH570-3800/S	1062.0	965	—	2450	5000	1	
6000 Watts									
480	—	QIH480-6000*	300.0	248	—	3150	—	7	

*Call to Inquire

SEMICONDUCTOR APPLICATIONS

Precise temperature and heating zones are required in the semiconductor industry. The USHIO (QIH) IR lamps provide a precisely controlled IR source that can meet the stringent needs of the semiconductor industry.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
300 Watts									
120	1001288	QIH120-300T/S	214.0	106	—	2450	6000	1	
500 Watts									
120	1001294	QIH120-500/S	223.0	127	—	2500	5000	1	
120	1001298	QIH120-500T/S	223.0	127	—	2500	5000	1	
120	1003201	QIH120-500T/S3	223.0	127	—	2500	5000	1	R
240	1001353	QIH240-500/ZD	227.5	165	—	2600	4000	5	IW, S
600 Watts									
104	1001285	QIH104-600/S	303.0	152	—	2500	6000	1	
800 Watts									
120	1001299	QIH120-800T/S	303.0	203	—	2500	6000	1	
1000 Watts									
240	1001318	QIH240-1000/S2	303.0	254	—	2500	5000	1	
240	1001319	QIH240-1000/S3	351.0	272	—	2500	5000	1	
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
1200 Watts									
144	1001300	QIH144-1200/S	224.0	155	—	2500	5000	1	
144	1001301	QIH144-1200/S2	228.0	155	—	2500	5000	1	IW, R
230	1003142	QIH230-1200/ZH	225.0	155	—	2700	3000	5	IW, S
1300 Watts									
230	1003236	QIH230-1300/ZL	453.0	358	—	2500	5000	3	IW, F
1350 Watts									
115	1001287	QIH115-1350/L	317.0	256	—	2750	3000	3	IW
220	1001311	QIH220-1350/L	317.0	256	—	2750	3000	3	IW
1500 Watts									
230	1003235	QIH230-1500/ZL	453.0	360	—	2500	5000	3	IW, FR
240	1001327	QIH240-1500/S	303.0	235	—	2500	5000	1	

SEMICONDUCTOR APPLICATIONS

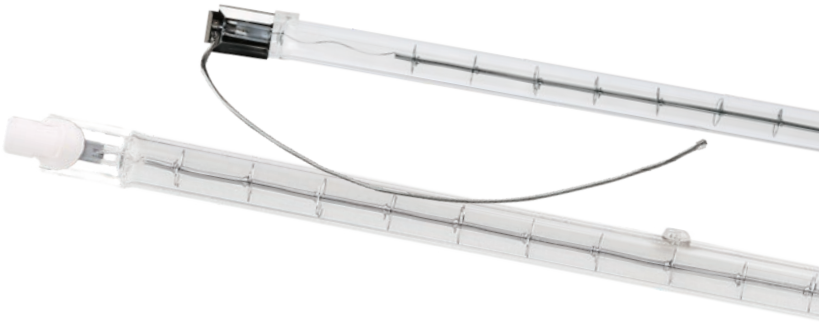
Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1600 Watts									
230	1003143	QIH230-1600/ZH	225.0	155	—	2700	3000	5	IW, S
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
240	1001331	QIH240-1600/S2	455.5	407	—	2500	3000	1	
240	1002198	QIH240-1600/VS	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001336	QIH240--2000/B	480.0	280	370	2500	5000	4	
240	1001339	QIH240-2000/S	303.0	248	—	2500	5000	1	
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	
240	1001343	QIH240-2000/VS	303.0	248	—	2500	5000	1	
240	1003405	QIH240-2000/ZD4	354.0	290	—	2500	5000	5	IW
240	1003404	QIH240-2000/ZH5	354.0	290	—	2400	5000	5	IW
240	1001350	QIH240-2000T/S	603.0	508	—	2500	5000	1	
2500 Watts									
400	1003570	QIH400-2500/ZD	381.0	310	—	2500	5000	5	IW
480	1001373	QIH480-2500/S	732.0	635	—	2500	5000	1	
480	1001376	QIH480-2500/VS	732.0	635	—	2500	5000	1	
575	1001399	QIH575-2500/S	732.0	635	—	2500	5000	1	
3000 Watts									
240	1001351	QIH240-3000/S	503.0	410	—	2500	5000	1	
3200 Watts									
384	1001360	QIH384-3200/S	456.0	406	—	2500	3000	1	
3650 Watts									
480	1001385	QIH480-3650/L	1062.0	965	—	2500	5000	3	

SCIENTIFIC & MEDICAL APPLICATIONS

(QIH) IR lamps are an important component used in the Scientific and Medical industries. The controlled heating available with the IR heater lamps allow these lamps to be used to accurately and instantaneously control the temperature of the surrounding environment. USHIO provides an array of different power levels, different geometries and a wide range of color temperatures to fit your specific heating needs. The IR lamps are used in applications such as infant environment warming, heat therapy for aching muscles, spa and sauna heating and environmental control for laboratory experiments.

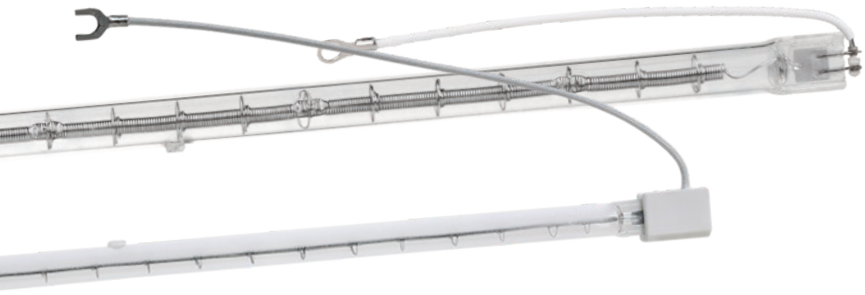
Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
300 Watts									
120	1001288	QIH120-300T/S	214.0	106	—	2450	6000	1	
375 Watts									
120	1001289	QIH120-375T/E	219.0	128	215	2500	6000	2	
120	1001290	QIH120-375T/S	223.0	128	—	2500	6000	1	
500 Watts									
120	1001293	QIH120-500/L	223.0	127	—	2500	5000	3	
120	1001294	QIH120-500/S	223.0	127	—	2500	5000	1	
120	1001297	QIH120-500T/E	220.0	127	216	2500	5000	2	
120	1001298	QIH120-500T/S	223.0	127	—	2500	5000	1	
120	1003201	QIH120-500T/S3	223.0	127	—	2500	5000	1	R
240	1001352	QIH240-500/D	227.5	165	—	2600	4000	5	IW, S
240	1001353	QIH240-500/ZD	227.5	165	—	2600	4000	5	IW, S
600 Watts									
104	1001285	QIH104-600/S	303.0	152	—	2500	6000	1	
800 Watts									
120	1001299	QIH120-800T/S	303.0	203	—	2500	6000	1	
1000 Watts									
240	1001317	QIH240-1000/S	351.0	254	—	2500	5000	1	
240	1001318	QIH240-1000/S2	303.0	254	—	2500	5000	1	
240	1001320	QIH240-1000/VB	485.0	272	370	2500	5000	4	
240	1001321	QIH240-1000/VD	357.5	272	—	2500	5000	5	IW, S
240	1001322	QIH240-1000/VZD	357.5	272	—	2500	5000	5	IW, S
240	1002250	QIH240-1000/VZH	357.5	272	—	2500	5000	5	IW, S
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
240	1001324	QIH240-1000/ZD	357.5	272	—	2500	5000	5	IW, S
240	1003550	QIH240-1000R/VD4	531.0	440	—	—	5000	6	FT, IW, SS
240	1001325	QIH240-1000T/S	351.0	254	—	2500	5000	1	

SCIENTIFIC & MEDICAL APPLICATIONS



Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1200 Watts									
144	1001300	QIH144-1200/S	224.0	155	—	2500	5000	1	
144	1001301	QIH144-1200/S2	228.0	155	—	2500	5000	1	IW, R
1300 Watts									
230	1003236	QIH230-1300/ZL	453.0	358	—	2500	5000	3	IW, F
1350 Watts									
115	1001287	QIH115-1350/L	317.0	256	—	2750	3000	3	IW
220	1001311	QIH220-1350/L	317.0	256	—	2750	3000	3	IW
1500 Watts									
230	1003235	QIH230-1500/ZL	453.0	360	—	2500	5000	3	IW, FR
240	1001327	QIH240-1500/S	303.0	235	—	2500	5000	1	
1600 Watts									
144	1001302	QIH144-1600/S	229.0	150	—	2650	3000	1	IW, R
208	1001305	QIH208-1600/L	502.0	407	—	2500	5000	3	
208	1001306	QIH208-1600T/E	499.0	407	495	2400	6000	2	
208	1001307	QIH208-1600T/S	503.0	407	—	2400	6000	1	
240	1001328	QIH240-1600/E	499.0	407	495	2500	5000	2	
240	1001329	QIH240-1600/L2	502.0	407	—	2500	5000	3	
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
240	1001331	QIH240-1600/S2	455.5	407	—	2500	3000	1	
240	1001333	QIH240-1600T/E	499.0	407	495	2500	5000	2	
240	1001334	QIH240-1600T/L	502.0	407	—	2500	5000	3	
240	1001335	QIH240-1600T/S	503.0	407	—	2500	5000	1	
277	1001356	QIH277-1600T/E	499.0	407	495	2500	5000	2	
277	1001357	QIH277-1600T/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001339	QIH240-2000/S	303.0	248	—	2500	5000	1	
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	

SCIENTIFIC & MEDICAL APPLICATIONS

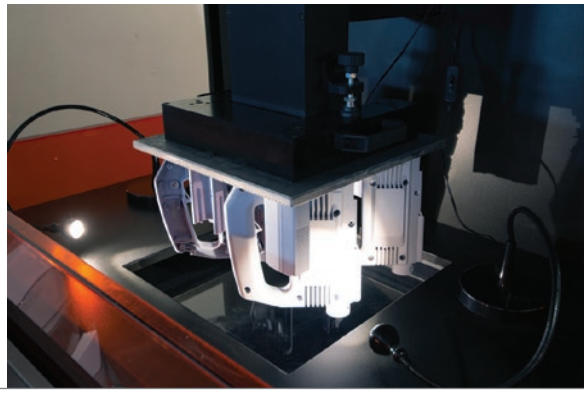


Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
2000 Watts									
240	1001341	QIH240-2000/VB	485.0	280	370	2500	5000	4	
240	1001343	QIH240-2000/VS	303.0	248	—	2500	5000	1	
240	1001344	QIH240-2000/VZD	357.0	280	—	2500	5000	5	IW, S
240	1003405	QIH240-2000/ZD4	354.0	290	—	2500	5000	5	IW
240	1003404	QIH240-2000/ZH5	354.0	290	—	2400	5000	5	IW
400	1001362	QIH400-2000/ZB	623.0	410	508	2500	5000	4	
2200 Watts									
250	1001354	QIH250-2200/C	303.0	248	—	2500	3000	7	R
2500 Watts									
480	1001373	QIH480-2500/S	732.0	635	—	2500	5000	1	
480	1001376	QIH480-2500/VS	732.0	635	—	2500	5000	1	
480	1003164	QIH480-2500/ZH	737.0	635	—	2500	5000	5	IW
480	1001381	QIH480-2500T/S	732.0	635	—	2500	5000	1	
575	1001399	QIH575-2500/S	732.0	635	—	2500	5000	1	
3000 Watts									
240	1001351	QIH240-3000/S	503.0	410	—	2500	5000	1	
3200 Watts									
384	1001360	QIH384-3200/S	456.0	406	—	2500	3000	1	
3650 Watts									
480	1001385	QIH480-3650/L	1062.0	965	—	2500	5000	3	
480	1001386	QIH480-3650/S	1059.0	965	—	2500	5000	1	
480	1001387	QIH480-3650T/L	1060.0	965	—	2500	5000	3	
3800 Watts									
570	1001393	QIH570-3800/S	1062.0	965	—	2450	5000	1	
5000 Watts									
600	1001402	QIH600-5000/S	732.0	638	—	2500	5000	1	
6000 Watts									
480	—	QIH480-6000*	300.0	248	—	3150	—	7	

*Call to Inquire

3D PRINTING APPLICATIONS

3D printing is an up and coming industry that requires precise substrate and environmental temperatures to obtain the best 3D print results. USHIO offers a wide array of custom design capabilities to fit your specific needs.



Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1300 Watts									
230	1003236	QIH230-1300/ZL	453.0	358	—	2500	5000	3	IW, F
3650 Watts									
480	1001385	QIH480-3650/L	1062.0	965	—	2500	5000	3	

SOLAR SIMULATION APPLICATIONS

The USHIO (QIH) IR lamps are used in the solar simulation industry to mimic the sun's spectral output in the IR region. The combination of visible light and IR light allows research of the complete affect of the sun on materials and testing of solar panel efficiencies.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	LL (mm)	L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
1200 Watts									
144	1001300	QIH144-1200/S	224.0	155	—	2500	5000	1	
144	1001301	QIH144-1200/S2	228.0	155	—	2500	5000	1	IW, R
1350 Watts									
115	1001287	QIH115-1350/L	317.0	256	—	2750	3000	3	IW
1600 Watts									
240	1001330	QIH240-1600/S	503.0	407	—	2500	5000	1	
2000 Watts									
240	1001340	QIH240-2000/S2	351.0	254	—	2500	5000	1	
2500 Watts									
480	1001376	QIH480-2500/VS	732.0	635	—	2500	5000	1	
3000 Watts									
240	1001351	QIH240-3000/S	503.0	410	—	2500	5000	1	
3650 Watts									
480	1001385	QIH480-3650/L	1062.0	965	—	2500	5000	3	
480	1001386	QIH480-3650/S	1059.0	965	—	2500	5000	1	

FOOD INDUSTRY APPLICATIONS

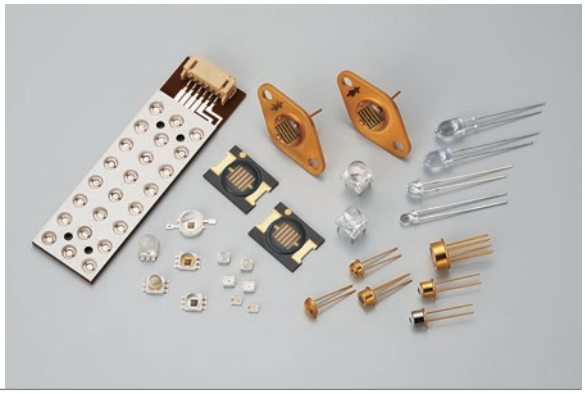
Food warming is a large industry that utilizes a variety of (QIH) IR heater lamps to warm food efficiently and effectively. The addition of a reflector on the lamp allows the IR energy to be directed at the food minimizing the energy required to keep food warm.

Volts (V)	Ordering Code	Lamp Description	Dimensions MOL (mm)	Dimensions LL (mm)	Dimensions L1 (mm)	Color Temp (K)	Avg Life (h)	Fig No	Lamp Notes
300 Watts									
120	1001288	QIH120-300T/S	214.0	106	—	2450	6000	1	
375 Watts									
120	1001289	QIH120-375T/E	219.0	128	215	2500	6000	2	
120	1001290	QIH120-375T/S	223.0	128	—	2500	6000	1	
500 Watts									
120	1001297	QIH120-500T/E	220.0	127	216	2500	5000	2	
120	1001298	QIH120-500T/S	223.0	127	—	2500	5000	1	
1000 Watts									
240	1002250	QIH240-1000/VZH	357.5	272	—	2500	5000	5	IW, S
240	1001323	QIH240-1000/ZB	485.0	272	370	2500	5000	4	
240	1001325	QIH240-1000T/S	351.0	254	—	2500	5000	1	

UV/IR LEDs CUSTOM DEVICES

USHIO is a high quality solutions provider in the field of industrial LED's and photo sensors. As a solutions provider, USHIO offers all wavelengths from UVC to visible and even into the infrared spectrum with available wavelengths between 270 and 1550nm.

An extensive range of package styles are also available including SMD, high power TOP, super beam, ultra high power arrays, stem, SMBB and photodiodes and phototransistors. With this wide array of available LED wavelengths and package styles, USHIO products are able to meet the needs of many market segments. These markets include UV curing, lithographic exposure, automotive ITS, visual imaging, bio-medical applications, night vision, sorting and material curing. Speed, agility and flexibility define USHIO's LED solutions.



IR Illumination:

IR LED arrays are available between 780 and 1550nm. Their customizable sizes and wavelengths allow for IR security monitoring as well as specific material and area heating and curing. Other custom wavelengths are available upon request.

Multi Wavelength:

With a multi wavelength, the user is given the option to use a combination of a variety of available wavelengths in a single package. These combination wavelengths are available between 270 and 1550nm and can also combine UV and IR wavelengths. Standard multi wavelength packages available.

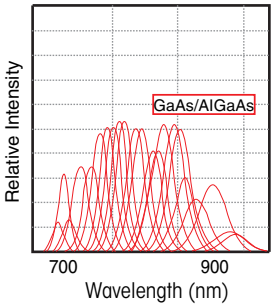
High Density Array:

In a high density array, up to 60 chips can be used in less than an 8mm square array. These arrays are available for most wavelengths between 270 and 1550nm.

High Power Array:

High power output arrays feature uniform light emission using water cooling systems. These UV wavelengths are available between 365 and 405nm. Other custom wavelengths are available upon request.

Simulated spectral radiation power traces indicate the typical spectral performance of each part number. This is not an actual measurement data.



700	760	870	1050
720	780	890	1070
735	810	910	1200
740	830	940	1450
750	850	970	1550

Near-Infrared Light

Wavelength (nm)

Package Lineup

LED Plastic Mold

Surface Mount Package

Stem Type LED

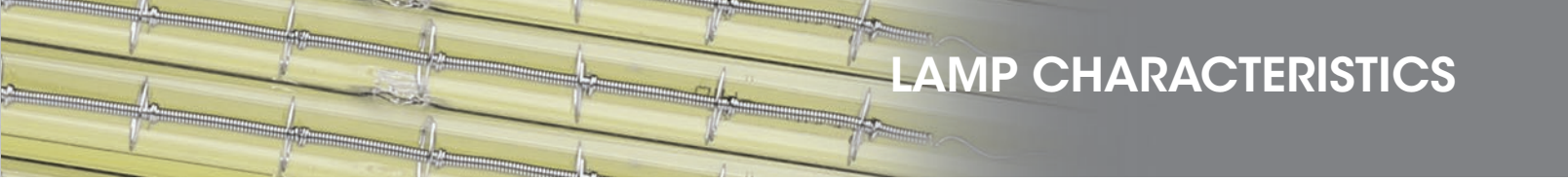
Super Beam Type LED

High Power SMB

High Power Illuminator

SMB with Outer Lens

For Horticulture Lighting



LAMP CHARACTERISTICS

USHIO (QIH) IR LAMP ADVANTAGES

- High Efficiency: Up to 95% of Energy Converted to IR Radiation
- Long Life: Typically Greater Than 5,000 Hours
- Fast Response: Typically < 1 Sec. to Reach 90% Output
- Output Maintenance: Typically <10% Drop in Output Over Life
- Variable Power Control
- Reliability: High Quality Parts and Stringent Processes Used to Produce a Superior Product
- Custom Lamp Designs Available
- Small Production Runs Possible
- Short Lead Times for Samples
- Exceptional Technical Support

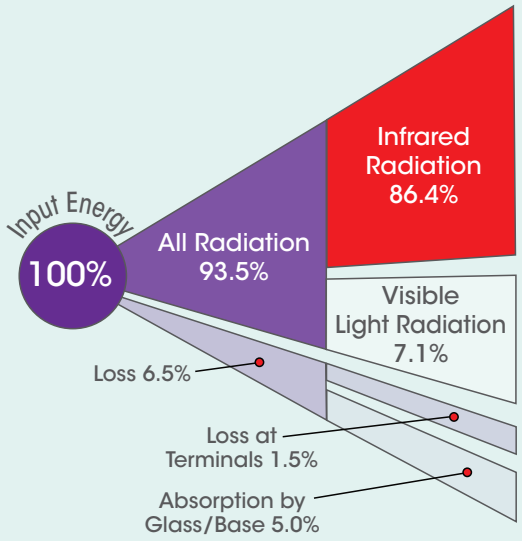
QUARTZ INFRARED HEATER - DESCRIPTION

- **Economy**
  Compact and lightweight, halogen lamps have made it possible to design very compact lighting or heating fixtures and equipment, allowing for a reduction in the cost of production facilities. Additionally, the long life of halogen lamps permits a further reduction in maintenance and related expenses.
- **Heat Impact Resistance**
  With their quartz glass envelope, halogen lamps are much more resistant to heat impact than ordinary incandescent lamps. It is very unlikely that a halogen lamp will break should it come into contact with cold water.
- **High Efficiency**
  The lamp envelope is of quartz glass. The compact bulb supplies a high luminous output per watt. The "Halogen Cycle" minimizes evaporation of the tungsten filament.
- **Long Life**
  The "Halogen Cycle" guarantees extremely long lamp life. Service life is about twice that of an ordinary incandescent lamp.
- **Stable Color Temperature**
  Thanks to the "Halogen Cycle" – a chemical reaction whereby evaporated tungsten particles are returned to the filament – blackening of the bulb wall and thinning of the tungsten filament are kept to a minimum. Light intensity and color temperature remain stable throughout the life of the lamp.
- **Warm Up and Cool Down**
  When a Quartz Infrared Heater lamp is turned on, it will be able to achieve its maximum radiation (heat energy) in the shortest time when compared with other heaters. The length of time it takes to achieve the maximum radiation output is 40-50 seconds; it also has a rapid cool down when the lamp is switched off.

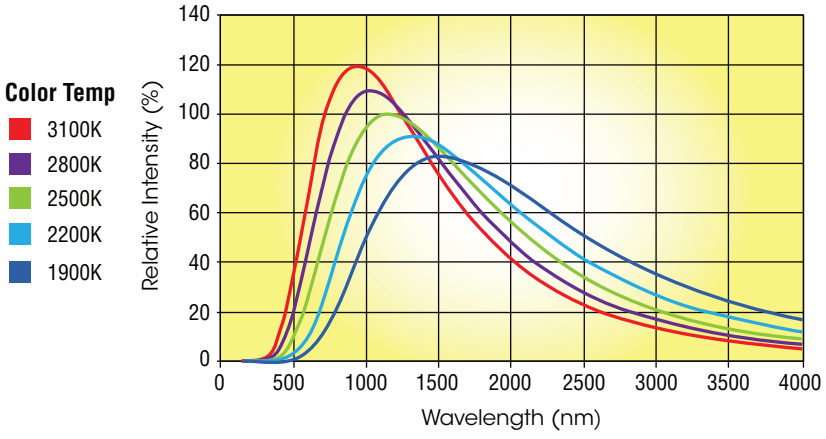
COLOR TEMPERATURE & SPECTRAL DISTRIBUTION

Typical Ratio of Radiated Energy and Heat Loss

A lamp converts 75%~95% of electric energy into heat and light emitted from the lamp. Visible light accounts for up to 12% of the converted energy. The remainder is emitted in the form of infrared radiation.



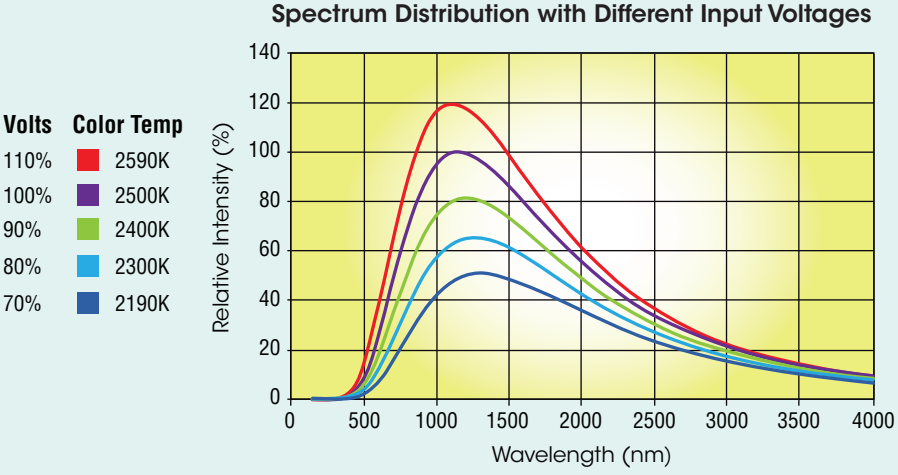
Spectrum Distribution with Fixed Input of Electrical Energy



The relative intensity increases as the temperature increases with the resulting peak being shifted towards the shorter wavelength range.

This chart shows the spectral distribution of a QIH lamp with different voltages applied.

Spectrum Distribution with Different Input Voltages



VOLTAGE VARIATIONS AND VARIATIONS OF OTHER FACTORS

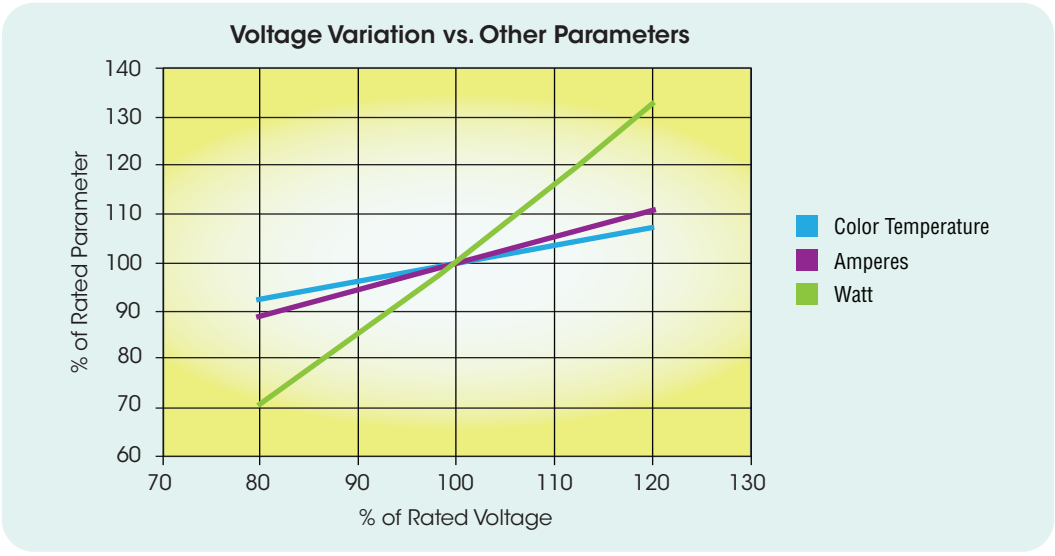
There are several factors (F), as shown in the below table, which are inherent to the characteristics of QIH lamps. The change ratio (F/F_0; F is the actual value and F_0 is the rated value), for these factors is approximate and expressed as:

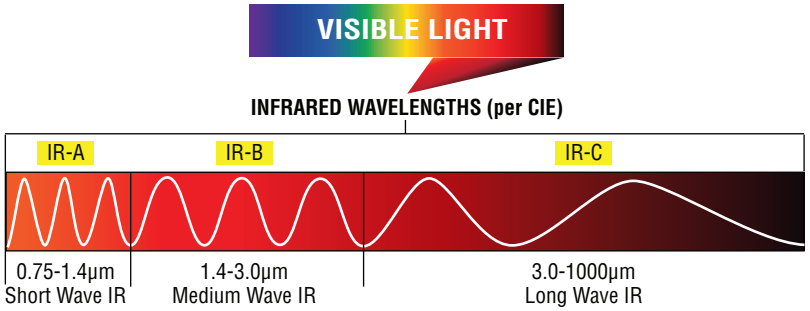
$F = F_0 * (V/V_0)^K$ where V is the actual voltage value and V_0 is the rated voltage value. The chart also shows the values of K for each of the factors (values for K may vary slightly according to the configuration of each lamp). The voltage variation chart displays the graphs for each factor.

	F	Current (A)	Wattage (W)	Color Temp. (K)
K	Halogen Lamps	0.54	1.54	0.37

VOLTAGE VARIATION AND LIFE VARIATION

The life of a lamp is greatly affected by the voltage applied to the lamp. If the voltage were increased by 10% over the rated voltage, the life expectancy would be cut by 1/3 of the rated life. Inversely and theoretically, if the voltage applied were limited to 90%, the life would be expected to increase by 3.5 times the rated life. In practice however, there are other factors involved which prevent such a large increase. Nonetheless, it should be noted that life can be influenced significantly by relatively small changes in voltage.





LAMP LIFE

USHIO's QIH series of IR lamps are manufactured to high quality standards and are designed to provide reliable performance over life. Reliable performance however, is contingent on several parameters which are dependent on operating conditions. Key information is provided below on a few of these parameters.

- **SEAL TEMPERATURE**
  The temperature of the seal at the point where the metal foil meets the outer pin of the lamp must be kept under 350ºC. If this junction exceeds 350ºC, there are several detrimental effects that will be encountered.

  - Accelerated oxidation will occur resulting in increased expansion and seal fracture.
  - Higher thermal expansion will induce stress between the metal and the quartz, resulting in possible fracture.
  - The integrity of the hermetic seal could be compromised.

  It is recommended that thermocouple testing be performed to ensure proper operating temperatures. Ushio can provide lamps equipped with thermocouples upon request.

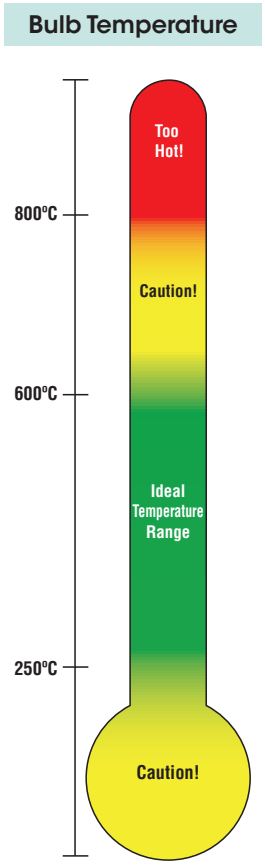
- **BULB TEMPERATURE AND HALOGEN CYCLE**
  The bulb temperature should be maintained between 250ºC and 800ºC. This is to ensure the Halogen Cycle is operating effectively and to maintain the integrity of the quartz bulb and seals.

  The Halogen cycle refers to the Halogen gas that is often filled into the lamp which reacts and combines with the evaporated tungsten from the filament thus preventing tungsten from being deposited on the bulb wall causing wall blackening.

  At temperatures below 250ºC, the halogen gas will not be very effective and any evaporating tungsten from the filament will be deposited on the bulb wall. The amount of deposit may be small, considering the evaporation of tungsten is lower at low temperatures versus when hot, but over time these tungsten deposits can accumulate and result in bulb wall darkening. (If encountered, this effect can often be overcome by once again operating the lamp within the prescribed temperature range, which should clean up most of this blackening).

  At temperatures greater than 600ºC, the halogen gas again becomes less effective at preventing wall blackening. Beginning at this temperature, the process of dissociation of the halogen/tungsten compound starts to play a role, with some of the free tungsten becoming deposited on the bulb wall.

  At temperatures greater than 800ºC, not only does blackening increase, but also stresses in the quartz due to increased temperature gradients will begin to affect the lamp, both at localized areas of the bulb as well as at the transition from the bulb to the seals. In addition, any slight impurities within the lamp will no longer have negligible effects due to increased mobility and reaction rates.



- **VOLTAGE VARIATION**
  It has already been explained that slight changes in nominal operating voltage can have significant impacts on the life of the lamp.

INRUSH CURRENT

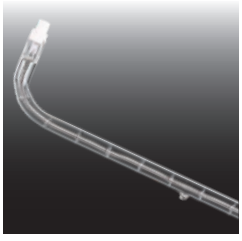
The resistivity of tungsten changes significantly with temperature. When an IR lamp is started from a cold state, the lamp will draw a current (amperes) that is about 7-10 times the normal operating current. The magnitude and duration of this current is highly dependant on the particular lamp being used. This Inrush current should be taken into account when designing systems using many lamps as it may impact the service requirements at the electrical mains supporting the system. There are methods to alleviate this such as soft starting, or idling the lamps at low power in between uses. For more information contact Ushio America, Inc. - Application Engineering.

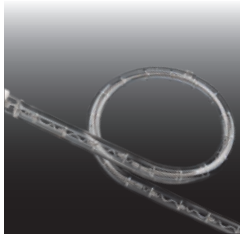
SPECIALTY LAMPS

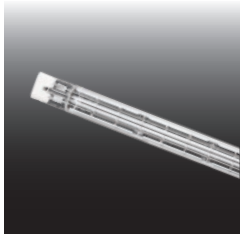
USHIO has engineering expertise to meet specialized requirements for custom products. We regularly produce specialized lamps in small quantities with short lead times to meet customer specific goals.

USHIO OREGON GENERAL CAPABILITIES	
Quartz Length	180 - 1600mm
Quartz Tube Diameter (O.D.)	6 - 14mm
Quartz Bending Radius	20 -250mm
Color Temperature	1600 - 3200K
Voltage	Any
Wattage	12,000W Max*
Amperes	25A Max*
Filament Structure	Standard Coil, Segmented Coil, Wave Coil
Reflective Coatings	White
Operating Position	Any

*(Dependent on other parameters)


U-Shaped Lamps


Circular-Shaped Lamps


Twin Tube Lamps


Omega-Shaped Lamps


Bend-Shaped Lamps


Curved-Shaped Lamps


Reflective White Coatings Lamps


Ruby Tube Lamps


Wave Coil Lamps


Segment Filament Lamps

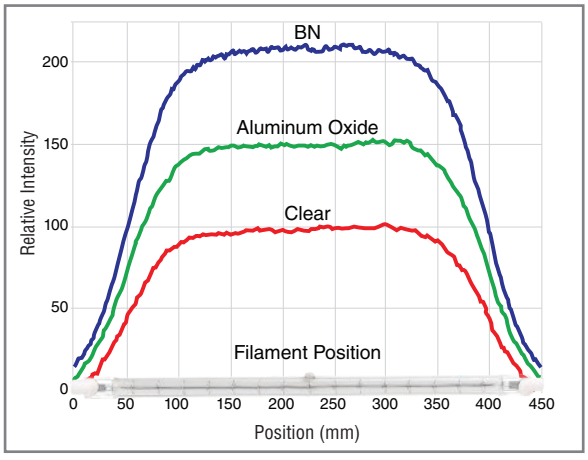
REFLECTIVE WHITE COATING LAMPS

For many years, USHIO has provided lamps with a reflective white coating applied to the lamp. This aluminum-oxide coating increases the efficiency of the (QIH) IR radiation in the direction of the target by approximately 50%.

USHIO has recently developed a new white coating which we call our BN coating. It increases the efficiency of the lamp by another 30% over our standard aluminum-oxide coating.

Please inquire with USHIO to learn if either of these coatings can be applied to your lamp of interest.

Reflective White Coating Chart



RUBY TUBE / GLARE REDUCTION LAMPS

In those applications where the intensity of the lamp is too bright and is exposed to the naked eye, a reduced glare version is often available.

These are available in:

- Translucent (a soft satin looking quartz)
- Frosted (sand blasted quartz)
- Ruby Tube (red pigmented quartz)
- Ruby Jacket (red tube sleeve placed over existing lamp)

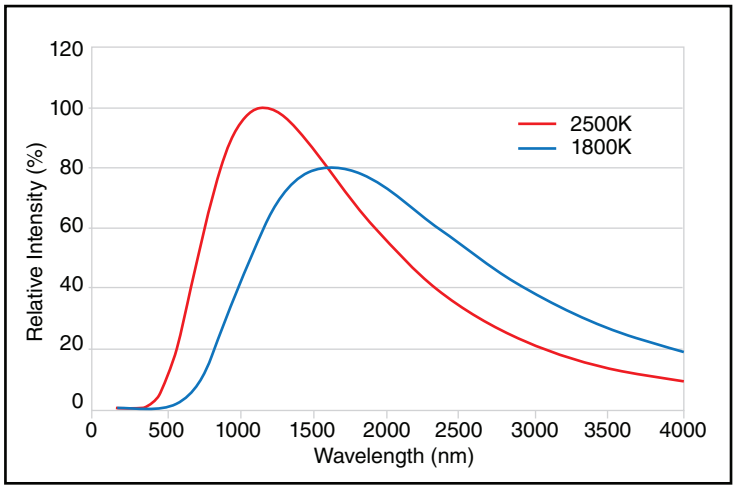
WAVE COIL LAMPS

Short Wave (2500K) and Fast Response Medium Wave (1800K)

Ushio's QIH lamps can be tailored to provide outputs varying from Short Wave radiation to the beginning of Medium Wave radiation to suit the needs of the application. The output of a QIH lamp is a broadband IR radiation which means slight changes to the operational controls will have little effect on the spectral response of the lamp.

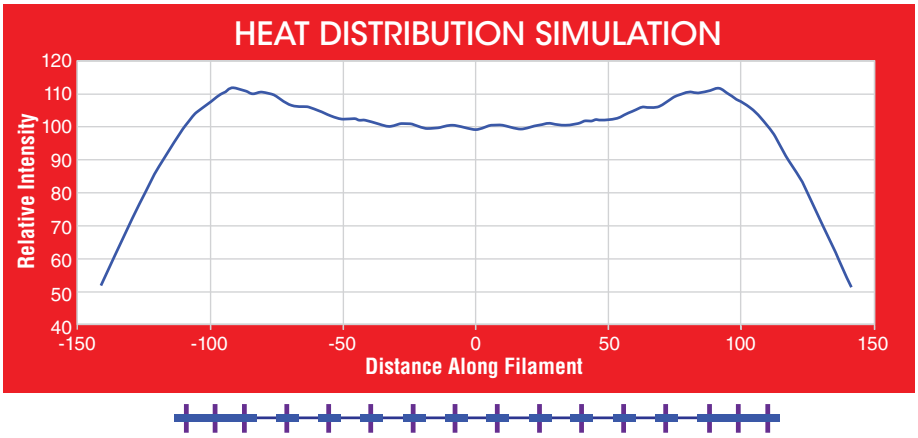
The choice of using a Short Wave lamp or Fast Response Medium Wave (FRMW) lamp depends on the target material. For example, if water were to be heated, wavelengths higher than about 2 or 3 microns would be the most efficient as this is where water has a strong absorption band. This would mean a FRMW lamp would be a better choice for this application. This principle is not always straightforward, for in some cases multiple target materials are involved and one material may absorb the IR radiation which may then transfer it to the other material through conduction. The FRMW lamp comes in two configurations depending on the design constraints: Standard Coil Filament or Wave Coil Filament (pictured below).

Calculated Spectral Distribution with Equal Input Electrical Energy

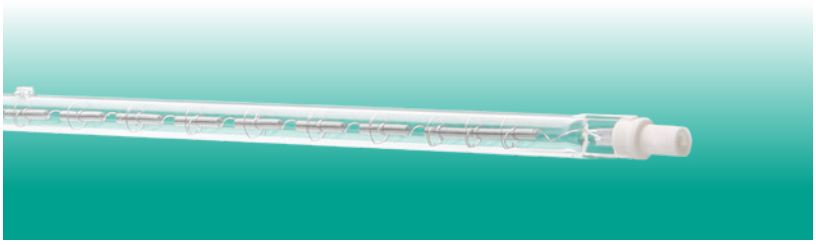


SEGMENTED FILAMENT LAMPS

Where uniform distribution is required, USHIO has the capability to divide the filament into discrete segments. This segmented design tailors the radiation pattern to provide uniform radiation intensity on the target.



Segmented Filament



SAFETY & HANDLING

FIRST-AID MEASURES

- **Glass cuts:** Perform normal first aid procedures. Seek medical attention as required.
- **Inhalation:** If discomfort, irritation or symptoms of pulmonary involvement develop, remove from exposures and seek medical attention.
- **Ingestion:** Seek medical attention.
- **Contact, Skin:** Thoroughly wash affected area with mild soap or detergent and water and prevent further contact. Seek medical attention if irritation occurs.
- **Contact, Eye:** Wash eyes immediately with water for 15 minutes. Seek medical attention.

FIRE-FIGHTING MEASURES

The lamps themselves do not pose any significant fire risk. These lamps are typically part of, or installed in a system. It is recommended to use the appropriate fire extinguisher class (e.g. Class C for electrical fires), as applicable, based on equipment or environment. Under extreme high temperature conditions a lamp may burst, shattering the quartz and resulting in the discharge of extremely hot fragments (up to 1000°C). In this case there is risk of personal injury, property damage, burns and fires.

HANDLING & STORAGE

- Halogen lamps operate at extremely high temperatures that can cause serious physical injuries and property damage.
- Only use halogen lamps in halogen approved fixtures.
- Do not use halogen lamps in close proximity of paper, cloth or other combustible materials that can cause a fire hazard.
- Lamps are very fragile. Do not drop, crush, bend or shake the lamps. Vibration or impact will cause filament breakage and short lamp life.
- Never touch the lamp when it is on, or soon after it has been turned off, as it is hot and may cause serious burns.
- Do not look directly at the operating lamp for any period of time; this may cause serious eye injury.
- Always turn off the electrical power before inserting, removing or cleaning the lamp.
- Make sure lamps of specified wattage and voltage are only used in appropriately rated fixtures. Unspecified use will lead to short lamp life, breakage and overheating of the fixture.
- Lamps should not be operated beyond the total rated voltage. Avoid the use of dimmers that may drive the lamp over its rated voltage.
- Use an external fuse when required.
- Do not allow one lamp to directly expose another unless the system was carefully designed for this. This may lead to overheating and shortened lamps life.
- Do not touch the halogen bulb surface or inside reflectors with your bare hands. Oils from skin can lead to breakage or shorten the life of the lamp. Use clean gloves or a lint-free cloth for installation and removal.

SAFETY & HANDLING

HANDLING & STORAGE (continued)

- Clean any dirt, oil or lint away from the lamp with alcohol and a lint-free cloth or tissue. Any foreign particles or materials on the bulb surface can cause hot spots on the bulb and result in lamp failure.
- Operate the lamp only in the indicated burn position. Failure to do so will lead to overheating and shortened lamp life.
- Electrical connections should be in good condition. Affix the lamp securely in the socket. Improper installations will cause electrical arcing, overheating, and shortened lamp and socket life. Replace lamps and sockets when needed.