



Proper Selection of Infrared Wave Lengths

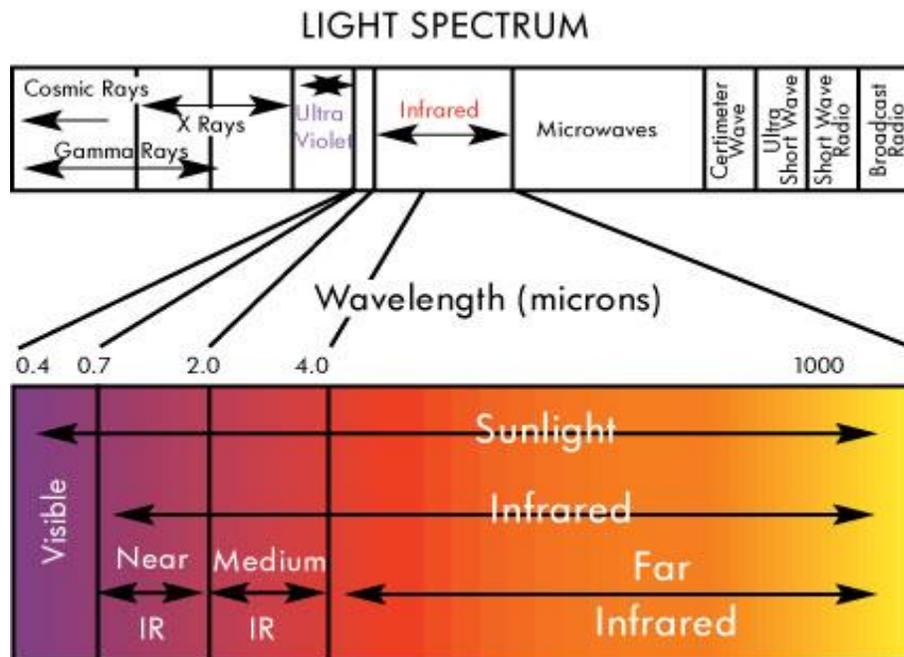
Infrared energy is thermal radiation consisting of wave lengths longer than those of visible light. It is part of the electromagnetic spectrum with wave lengths between 0.7 and 400 microns. Infrared energy travels at the speed of light, is totally pure radiation, and can be transferred without physical contact with the heat source or heating the intervening air. The energy is harmless and is transferred via invisible waves. When these waves strike the object to be heated, the radiation is absorbed and converted into heat energy.

The most widely used industrial infrared equipment uses a bulb, tube or rod as its emitting source and depends upon a reflector to collect and beam its energy. Usually, the emitter must be spaced 14 inches or more from the object receiving the heat to insure uniformity, but increased spacing decreases efficiency.

Another type of infrared equipment is the flat-panel emitter, which can be used very near the work surface with great uniformity and efficiency. However, when the space is increased, the radiation is dissipated. Infrared energy is emitted in straight lines, but not necessarily in lines that are perpendicular to the emitting surface.

The key to productive performance is not merely the use of infrared energy, but the selection of proper infrared wave lengths. Only when infrared energy of the proper peak wave length is selected for a given material are the waves absorbed and the molecules within the material excited. This raises the temperature to accomplish the desired process.

The absorption spectrum of most products is much higher in the longer, 'far infrared' wave lengths – from 2.5 to 15 microns.





Black Body Patented Emitter

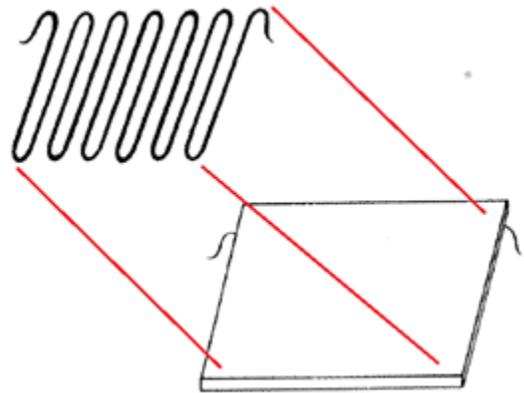
In 1967 Black Body corporation developed a flat-panel emitter that has an excellent emissivity factor and is efficient and uniform in the temperature range of 500F to 900F when used very near the work to be processed. (Black Body is a physics term that represents the most efficient emitter and absorber of radiant energy.)

The patented Black Body emitter consists of a serpentine configuration of NiChrome wire (figure 1): embedded in a refractory pad that is approximately 3/8" inches thick, available in a variety of sizes (figure 2): and coated with a high-emissivity black coating.

A lightweight black-coated steel-mesh grid 1"x1"x 1/2" deep (figure 3) used on the face of the Black Body emitter triples its radiating surface.

The energy is emitted vertically or almost vertically from the flat panel emitter passes through the grid to the work surface. The energy that is divergent or close to parallel with the emitting surface is absorbed by the grid and re-emitted in lines closer to perpendicular. Therefore, the panel concentrates more of its energy toward the work to be processed. (figure 4)

(figure 1)



(figure 2)

(figure 3)



(figure 4)

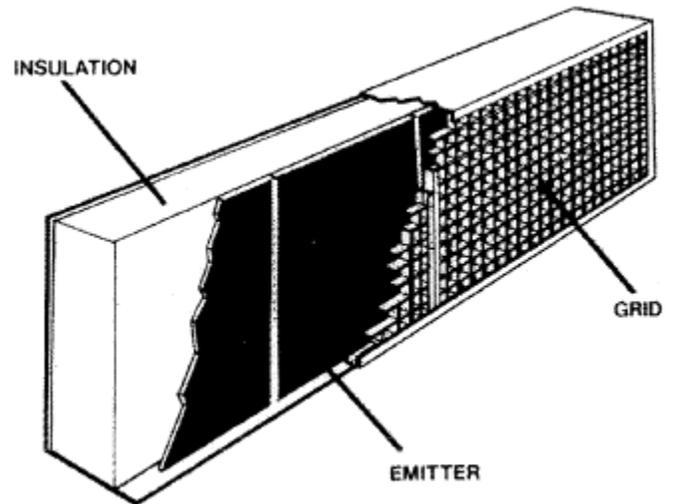
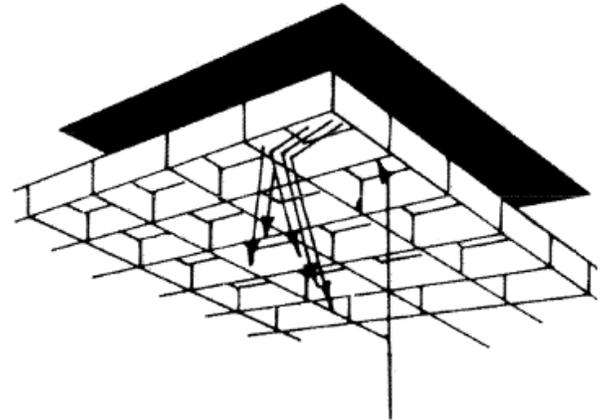




Heat Conservation

Air is transparent to infrared energy and acts as an insulator against heat losses. This principle produces increased efficiencies when Black Body emitters are arranged overhead or horizontally. The patented grid creates dead-air pockets on the surface of the emitter and prevents convection heat losses.

Black Body ovens can be built any length or any width by bolting the heater sections to a structural framework. This building block concept allows a great deal of flexibility in oven designs, such as horizontal ovens, vertical ovens, tunnel ovens, bell ovens with or without conveyors.





COMFORT HEATERS

Compare the Thermazone Infrared Advantages

Low Initial cost and simple, inexpensive installation make Thermazone Infrared Heaters the easy, economical solution to heating. Thermazone Heaters are always on the job, too - no moving parts to breakdown or bulbs or reflectors to clean or replace.

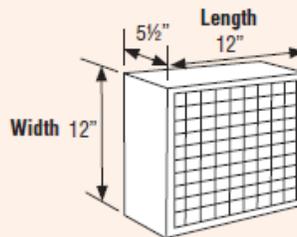
Since no combustion products are discharged and no flames or noxious gases are produced, the UL-Approved Thermazone Heaters provide safe, clean heat.

Thermazone Heaters are efficient. Ninety percent of all energy is converted to useful heat.

In addition, Thermazone Heaters can be arranged and controlled in zones. They are easy to install (much like light fixtures) and may be moved to meet future requirements.

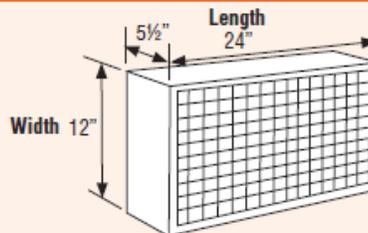
HEATER SPECIFICATIONS

MODEL	BTU'S	WATTS	SINGLE PHASE AMPS		
			115V	230V	460V
11-450U	1,535	450	3.91		
11-600U	2,047	600	5.22		
11-800U	2,729	800	6.96		
11-1000U	3,412	1000	8.7		
11-1200U	4,094	1200	10.44		
11-1500U	5,118	1500	13.1		



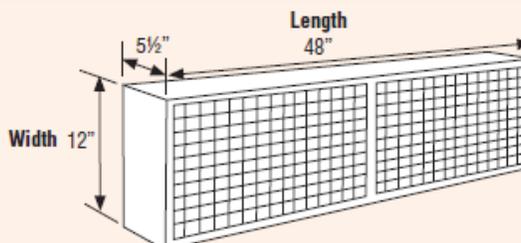
Shipping Weight
10 lbs.

21-900U	3,070	900	7.83	3.91	
21-1200U	4,094	1200	10.5	5.22	
21-1600U	5,459	1600	13.92	6.96	
21-2000U	6,824	2000	14.40	8.7	
21-2400U	8,188	2400	20.87	10.44	
21-3000U	10,236	3000	26.09	13.1	



Shipping Weight
20 lbs.

41-1800U	6,141	1800		7.83	3.91
41-2400U	8,188	2400		10.5	5.22
41-3200U	10,918	3200		13.92	6.96
41-4000U	13,648	4000		14.40	8.7
41-4800U	16,377	4800		20.87	10.44
41-6000U	20,472	6000		26.09	13.05



Shipping Weight
38 lbs.

*Three phase models available - consult factory.