Understanding Infrared Heaters

Infrared heaters provide an excellent means of efficient heating and are used for a wide variety of purposes, including agriculture, commercial, industrial, and leisure applications. Infrared heaters are normally used in areas where high temperatures are required. They are also in demand at places where a faster response time is needed and the heat needs to be distributed without physical contact, unlike convective or conductive heating methods.

How Infrared Heaters Work

Infrared heaters heat objects just like the Sun. Infrared light emitted from the sun strikes the surface of any object they come in contact with, warming it.

Similarly, infrared heaters work on the same principle. Infrared is a type of electromagnetic radiation at the end of the visible light range on electromagnetic spectrum. This infrared radiation is discharged from infrared heaters which then travels through the air and strikes any object that it comes in contact with, making its molecules vibrate; thereby, generating heat.

This method is contrary to that used by convection heaters, which heat the air in contact with them, causing it to rise, which in turn causes cooler air to sink and be heated by the heater.

Advantages of Infrared Heaters

Infrared heaters provide a number of benefits over other forms of heating, including convection and conduction:

Faster Response

Infrared heaters can start functioning to their full capacity at a moment's notice. Heating times are normally one-third of that of convection heaters. This is mainly because of the working mechanism of these heaters, which involve no intermediary medium, such as air in convection heaters.

Non-Contact Heating

Infrared heaters can heat any object without requiring any physical contact whatsoever, just like the Sun uses electromagnetic waves to heat up anything that comes in their way. Radiant heat energy is absorbed through the surface of an object, and is then conducted through the depth of the object.

High Efficiency

Due to the very nature of infrared heaters, the electromagnetic waves generated by them are converted into heat as soon as they are absorbed by an object. This energy can also be focused, concentrated, reflected, or directed, as needed by a certain application.

Types of Infrared Heaters

There are three basic classifications of these heaters:

1. **Near Infrared** – Operate between 780 nm and 1400 nm wavelength; emit temperatures greater than 1300 degrees C along with certain amount of visible light. Common applications include food preparation heat lamps, large volume space heating such as aircraft hangers, gymnasiums, etc, and certain medical applications.
2. **Medium Infrared** – Operate between 1400 nm and 3000 nm wavelength; emit temperatures between 500 and 800 degrees C. Common applications include autoclaves & plastic welding.
3. **Far Infrared** – Operate at greater than 3000 nm wavelength; emit temperatures around 100 degrees C. Common applications include domestic, public, and commercial heating for 'comfort'; also used in saunas.

All the types of infrared heaters are based upon the classification described above. The applications of the heaters, therefore, vary from light domestic to heavy industrial use with each type of infrared heater being designed for a specific purpose.