How to implement radiant heaters

Heating a whole building when you only need to warm a small area is a sure way of wasting energy and money. With radiant heaters you can get fast, efficient heat and recoup your costs in less than a year.

The business case

Take the example of a 6m high warehouse with an area of 800m^2, operating five days a week on a single shift. Only a 5m^2 space where staff work at a despatch desk actually needs heat.

A conventional warm air heating system might use around 56,000kWh/year of gas.

Installing spot radiant heating could save at least 80% of the energy – at a gas price of 2.5 p/kWh, you'd save £1,120 a year.

The technology

There's a wide choice of radiant heaters, but the most common are gas-fired U- tube or straight-line fan driven heaters, and radiant plaque or cone heaters. If you don't have a gas supply, electric radiant heaters are an alternative.

Heat radiates directly down onto people at ground level, so your staff are kept warm without your having to heat large volumes of air in the building.

Radiant heating is virtually instant too, so works well with time controls or movement sensors. You can control the temperature control with special 'black bulb' thermostats that measure the heat received directly by the person in line with the heat radiated, rather than the surrounding air temperature.

Figure 1 *radiant electric heater, U shaped unitary radiant tube heater and radiant plaque heater*

Source: Ambirad, Unitary radiant tube heater (right)

Source: BSRIA

***Table 1** Applications*

	Radiant U tube heater	Radiant plaque heater	Radiant cone heater
Heat intensity	Compact medium intensity heater	High intensity	Medium intensity
Advantages	Separate flue, suitable for dusty environment	Very concentrated heat output, compact	Compact, lightweight
Disadvantages	More difficult to install	High maintenance in dusty environment, no flue	High maintenance in dusty environment, no flue
Typical clearance distance below heater to combustible material	1.6-2.3m	2.2-2.6m	1.0-1.3m
Application	General area heating	General spot heating	General spot heating

***Table 2** Specification checklist*

Considerations	Ultrasonic/microwave
Fuel type	Natural gas, propane or electricity.
Pattern of work in the building	Where people usually work in the building. Heaters need to be in line of sight of the area to be heated.
Design heat load	Decide which parts of the building need heating and the minimum temperature.
Number of heaters	The mounting height dictates the maximum burner size and the number of burners you'll need.
Distance from heater to combustible material	It's important to maintain minimum clearance distance to combustible materials to ensure there's no fire risk above or below the heater.
Noise level	Some heaters are louder than others because of their fans and combustion noise. You can position fans outside the building or inside an acoustic box.
Fresh air input to burners	Where there's dust in the atmosphere, you need to use gas-fired radiant tube heaters with ducted fresh air.
Flue arrangements	Where can the flue duct pass through the roof if required?
Corrosive chemicals	If the air contains corrosive chemicals, you may need an alternative method of heating. Get advice from your supplier.

Applications

Radiant heaters are ideal for spot heating a small area in a larger building.

Larger areas in buildings higher than 5m can be heated very efficiently by radiant heat if installed as part of a refurbishment package.

The *Table 1* summarises the most common types of radiant heater.

Specification checklist

Table 2 above lists the main points to discuss with your supplier when considering a radiant heating system.

Commissioning procedure

Gas-fired radiant systems should be commissioned by the manufacturer, who will test the heater time and temperature controls and train users.

Make sure that:

- you get a copy of the warranty, commissioning certificate and the combustion efficiency test results
- the flue gas extraction system complies with regulations
- there is enough clearance above and below the heater for any combustible materials.

Common problems

You can avoid any problems by choosing and installing your heaters carefully. Factors to pay attention to include:

- mounting height – if the radiant surface is positioned too low, people can get uncomfortably hot heads
- clearance – staff need to take responsibility for keeping combustible material away from the heaters; not stacking cardboard too close, for example
- corrosive atmosphere – talk this through with your supplier at specification stage
- noise levels – make sure your suppliers know what noise level you expect and can cope with
- plaque heaters shouldn't be used in dusty atmospheres because of the high maintenance cost.

Finding a supplier

High-efficiency radiant heaters come under the Government's Enhanced Capital Allowances scheme. You can see a list of ECA approved gas-fired radiant heaters at www.eca.gov.uk

Radiant heaters should always be fitted by a reputable heating contractor. You may already know of a good contractor; if not, contact a trade association.

The Heating and Ventilating Contractors' Association (HVCA)
020 7313 4900
www.hvca.org.uk