

GAS INFRARED METAL FIBRE BURNER



1. Design

Metal Fibre Burner consists of:

- the steel housing
- the inlet of the air/gas mix
- gas/air distribution system to provide a homogeneous combustion on the whole burner surface area
- the metal fibre

The special features of the burner are:

- shape versatility
- thermal expansion control
- low weight
- compact and solid design

A complete unit consists of the radiator and the auxiliary parts, like:

- gas train
- gas-air mixing device
- fan for the combustion air
- ignition system
- flame control
- modulation electronics

The Metal Fibre Burner mainly consists of a steel/ceramic housing with the metal fibre medium mounted on top. Distribution plates are used inside the housing to provide for the homogeneity of the combustion.

Due to the flexibility of the metal fibre media and the procedures for securing it to the housing we are able to offer a wide range of burner powers and sizes:

Type MF 7	150 mm x 200 mm
Type AK4/MF 10	140 mm x 375 mm
Type MF 25	300 mm x 400 mm

2. Combustion Process

Surface combustion is a technique in which premixed gas and air burns on the surface of a permeable medium. With the Metal Fibre Burner, the permeable medium is made of very thin metal fibres. The permeable medium then heats to incandescence and releases most of the energy input as thermal radiation. At all operation conditions the Metal Fibre Burner achieves a homogenous combustion.

The Metal Fibre Burner is operated at a surface temperature of about 1000°C, which corresponds to a thermal surface load of approx. 200 kW/m².

The sophisticated steel used to manufacture the Metal Fibre Burners is extremely resistant to oxidation and corrosion. This provides the burner with exceptional durability. When the burner is operated in a confined environment, the surface temperature will be higher and the radiated power will increase. The maximum long-term operating temperature for the Metal Fibre Burner is 1050° C.

Radiation from surface combustion burners originates from two sources: emissions from the heated surface and emissions from the hot combustion gases leaving the surface. The high radiant flux from the Metal Fibre Burner can be expressed as a portion of the total energy output of the burner.

Because of the highly porous nature of the mat as well as the thin combustion layer, the Metal Fibre Burner is fully radiant a few seconds after ignition. This is a major benefit for quick modulation and accurate temperature control.



IR-dryer part with Metal Fibre Burners
for powder-gelling applied to motor
blocks

3. Characteristics

Resistance to Thermal Shocks

As the Metal Fibre Burner is 100% metal, it resists thermal shocks, even of extreme levels. Thus water splashed on the burner surface whilst firing evaporates without leaving any trace of damage to the burner.

Resistance to Mechanical Shocks

The Metal Fibre Burner is extremely robust. No special precautions are needed for handling or mounting.

Flashback Safety

Even in tough confined conditions with burner surface heated up to 1150 °C, insulation properties of the Metal Fibre Burner assure that no self-ignition will occur.

Fast Cooldown

This is a crucial point in fire prevention. If the burner is shut off with the air fan switched on, the cooling down of the Metal Fibre Burner is so fast that a few seconds after shutdown the burner surface can be touched with bare hands.

Low Emissions of NO_x and CO

Surface combustion with the Metal Fibre Burner leads to extremely low emissions of NO_x, CO and unburned fuel components. As a result of the intimate contact between the gases and the fibres, the flame temperature is significantly reduced leading to far lower NO_x levels than with other burner technologies.

Low Noise Generation

Noise-free and resonance-free combustion. Because of the textile structure of the Metal Fibre Burner the probability of flame front resonance is extremely low.