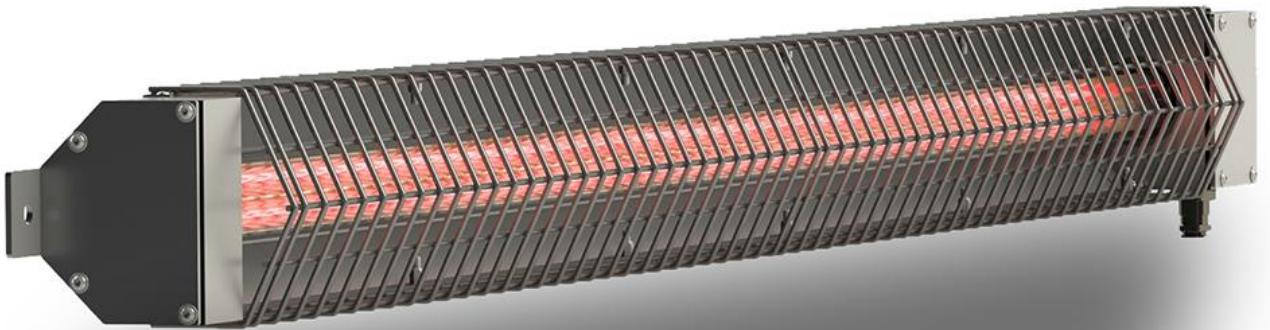


SAI - Société d'Acoustique Industrielle

# Infra-red Anti-icing



sai

the science  
of silence



## SAI EXPERTISE

SAI designs, manufactures and installs air intake systems for any type of installation and environment : polluted areas, deserts, sea side, offshore, industrial areas, arctic regions... Our scope of supply includes acoustic treatment, air filtration, heating and cooling solutions. Since about 15 years, SAI is a world leading company in the supply of anti-icing nozzles qualified by some of the main gas turbine OEM.

Lately, SAI also developed a range of infra-red anti-icing emitters suitable for compressors & gas turbine air intake systems.

## AIR INTAKE ANTI-ICING

For continuous gas turbine operation, it is essential that the air intake systems do not get clogged causing an increase in pressure drop, reducing efficiency, and ultimately causing the gas turbine / compressor to trip leading to shutdown. One cause of blocked filters in European climate operation is the air intake filters icing.

Conventional methods of anti-icing systems used on the combustion air intake systems for gas turbines operate by increasing the temperature and reducing the moisture content of the incoming air to a point where ice formation on the filter elements does not occur.



Infra-red anti-icing operate by heating the moisture within the air stream and on the filter surface. This method benefits the end-user by not raising the incoming air temperature as currently employed with conventional anti-icing, thus maintaining the gas turbine efficiency during the operating times of the anti icing system.



## TECHNOLOGY

Infra-red anti-icing has to be arranged in banks of emitters equally spaced to give complete coverage upstream the filter surface. In standard operation, anti-icing will be used when temperature ranges from  $-5^{\circ}\text{C}$  to  $+5^{\circ}\text{C}$  and when relative humidity is above 70 %. Infra-red anti-icing works with the radiation principle. It doesn't heat directly the inlet air. The main part of the heating power is transferred directly to the filter, and a part also heats the small drops of water present in the airflow. The distance between the emitters and the filters is essential for the efficiency of the IR emitters. The use of gold reflectors enhances the proven efficiency of infrared for this application and further improvements in efficiency are provided by the rapid response of the emitters. Emitters length can range from 500 mm up to 2 500 mm. Electrical consumption is about 2,5 kW/m.

## CUSTOMIZED SOLUTION

Upon request, SAI can supply a wide range of accessories including control-command panels and instrumentation: relative humidity & ambient temperature sensors. The whole supply can be customized depending on the customers' needs: IP65 protection, CE marking, ATEX / TRCU / EAC certification ...



## CONSTRUCTION

IR anti-icing are located upstream the filter banks. Inside the filter casings, airflow velocities are ranging from 2 up to 4 m/s. To ensure the emitters protection against water and dust, they need to be protected with an airtight housing. SAI emitters consist of insensitive and shock-resisting quartz glass and are, therefore, very well suitable for use inside the combustion air intake filter casings. Electrical connection of our IR emitters is routed into a terminal box via a special sealing. Our design is being tested and qualified to be dust-tight and splash-proof. Despite the provided housing protection, installation, maintenance and exchange of the emitters is easily possible thanks to the terminal and maintenance boxes.

### MEDIUM WAVE EMITTERS

The medium wave emitters are made of a quartz glass twin tube with gold reflector.

### PROTECTIVE TUBE

The emitters are protected thanks to a shock-resisting quartz glass all along the infra-red length. gaskets are used to keep the system dust-tight and splash-proof.

### PROTECTIVE GRID & ENCLOSURE

The Stainless Steel protective cover is screwed on the casing and easily dismantable. The housing is made of 316L Stainless Steel with picking & passivation.

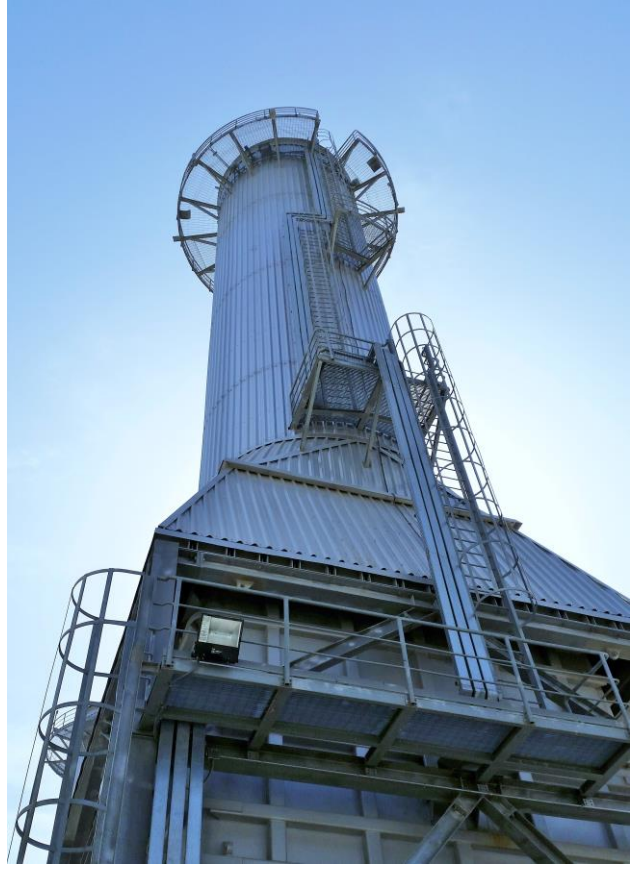


### TERMINAL BOX

The terminal box contains the ceramic terminal block used for the power supply. This electrical part is dust-tight and splash-proof thanks to the gaskets installed on the dismantable hatch and the glass tube. This box is equipped with a metallic cable gland and an earth connection.

### MAINTENANCE BOX

The infra-red emitters can be easily installed and dismantled for change-out purpose from the stainless steel enclosure thanks to a maintenance hatch. This hatch is screwed on the housing and equipped with a specific gasket.



sai

the science  
of silence

Société d'Acoustique Industrielle

Immeuble Le Phénix 1  
24, Rue Emile Baudot  
91120 PALAISEAU - France

Tél.: +33 (0)1 69 30 90 10

commercial@saifrance.com



www.saifrance.com