SMART FLUX SENSOR™

Real time accurate information about heat transfer between furnace gas and boiler wall

Sensors Determine Furnace Cleanliness

Having reliable and current knowledge of the cleanliness of each section of a boiler is absolutely necessary for getting any sootblowing system to operate efficiently, even while boiler conditions are changing. In the furnace area, this means having real time and accurate information about the heat transfer between the furnace gas and boiler wall. Our SMART Flux Sensors™ provide just that and thus help take the guesswork out of boiler cleaning.

As part of Clyde Industries's SMART Clean™, our intelligent boiler cleaning system, the SMART Flux Sensors™ accurately measure heat flux and tube temperature of a particular furnace wall area. The input from each sensor is forwarded to our SMART Controls™ system for processing which uses specially developed algorithms to determine whether an area is clean or dirty. Only when necessary SMART Controls™ activates the local cleaning device with exact location of cleaning. In addition, based on the sensor feedback, suitable cleaning parameters such as blowing pressures and operating speeds will be selected.

Integration in SMART Clean™ System

The heat flux data from each of the SMART Flux Sensors™ are collected in the Sensor Interface Module (SIM). This module in turn communicates via standard Ethernet protocol with the SMART Controls™, intelligent central command system.

SMART Clean™ Intelligent Feedback Module using SMART Flux Sensors™:

Clyde Industries has developed and optimized SMART Flux Sensors™. In tandem with specially developed algorithms the historical output from each sensor provides insight into the clean or dirty state of each zone. This determines which zone is to be cleaned at which time, regardless of the cleanliness state of other zones within the furnace.

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The benefits of this system addition are significant and twofold:

- **Cleaning performance enhancement**
  The cleaning device will only attempt to clean areas which are specifically in need of cleaning, no time will be wasted on already clean areas. This permits more immediate response and provides a better retention of optimal furnace heat absorption.
- **Thermal impact reduction in case of water cleaning**
  Since the thermal impact on a clean tube is twice as high as on a dirty tube, this magnifies tube life by a factor of eight (8).

The system consists of the allotted number of SMART Flux Sensors™ whose output is fed into the SMART Clean™ module. Each sensor has an expected life of over 10 years operationally. This module traces and records the progress of the SMART Flux Sensor™ within each area and determines individually which zone must be cleaned at what time, hence eliminating the need for sequence or time-based control entirely.

Clyde Industries SMART Flux Sensor™ can also directly replace competitor's heat flux sensors without modifying the existing system. Through many installations, it has been proven that SMART Flux Sensor™ is the most reliable heat flux sensor for power plant applications.

Options available:
- Inconel overlay
- Extended leadout
- Double tube and triple tube design

Benefits

- Guide the cleaning device to clean only when and where cleaning is needed
- Improve boiler efficiency and heat rate
- Mitigation of the potentially damaging effects of overcleaning, such as erosion or thermal cracking
- Minimize tube leakage
- Long sensor service life - typically over 10 years
- ASME certified fabrication process
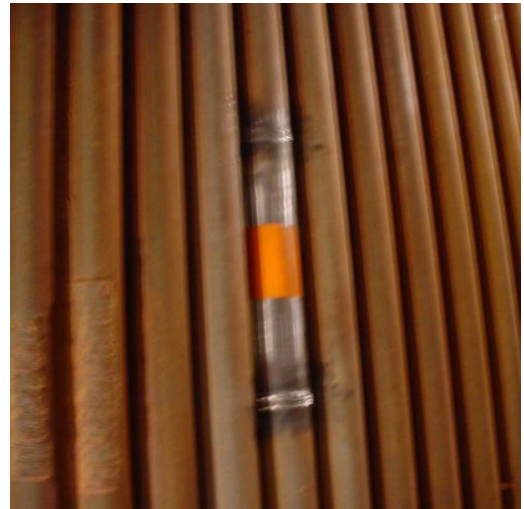
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