

### OFS measurement not Dependant upon:

- Differential Pressure
- Design DP
- Beta Ratio
- Temperature
- Gas Composition
- Humidity
- Speed of Sound

### Environmental Compliance

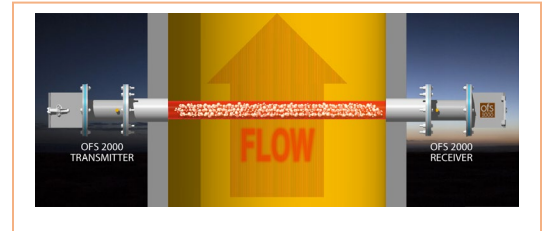
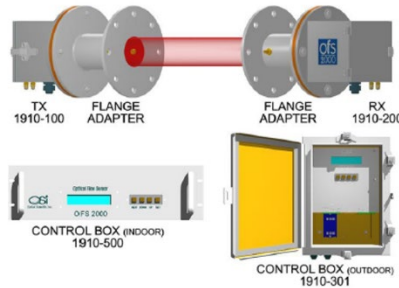
All OFS sensors meet or exceed requiremnts set by the US EPA and Californias SCAQMD.

- EPA method 14
- EPA MACT RSR 40 CFR 63.670
- EPA 40 CFR parrt 60 & 75

- EPA 40 CFR part 60 subpart Ja
- SCAQMD rile 1118

### Flexible communications

- 4-20mA - 2 out 2 in
- Digital Relays
- RS 232/485
- Modvus RTU
- Modbus RTU Ethernet
- Serial port
- Limited Distance
- Modems
- WAN or LAN



### Flow Measurement

A terminal loading facility in southern califina had a permit that used a fixed NOx limit to predict the total NOx that could be emitted from the combustor on a daily basis.

When the NOx limit was being approached the loading operations were suspended until 12:01 AM the following day to avoid a violation.

The NOx limit and flow were based on the combustor design specifics, not a real time flow measurement.

### The Solution:

In a permit modification the terminal agreed to the presumed NOx limit and agreed to measure the real time mass flow rate to provide mass emssions, pounds of NOX, in exchange for being able to load more tanker trucks up to a new maximum number of pounds of NOx per day.

### OFS-2000 Optical Flow Sensor

The terminal purchased the OFS 2000, a thermal well and temperature measurement and PLC modifications and software to calculate and report mass emissions. Atmospheric pressure was provided from the local airport and the variations were so small as to not require an an atmospheric pressure

### Flexible installation

OFS has been designed to meet a broad range of industrial applications.

NO Repiping Required Avoid costly shut downs. OFS can be installed on a live processes using a hot tap procedudres along with Gate valves and additional sight glasses for plant and personnel saftey. OFS can be installed in tight spaces with minimum space rquirements of 2 upsteam / 1 downsteam diameters. Installation based on standard ANSI pattern 4" pipe flange.

### COST Benefit

The cost of the measurements, programming and reporting software was justified based on the increased loading capacity and efficiency of the terminal loading process. More trucks could be loaded per day without shutting down the loading process as before.

### OFS How It Works

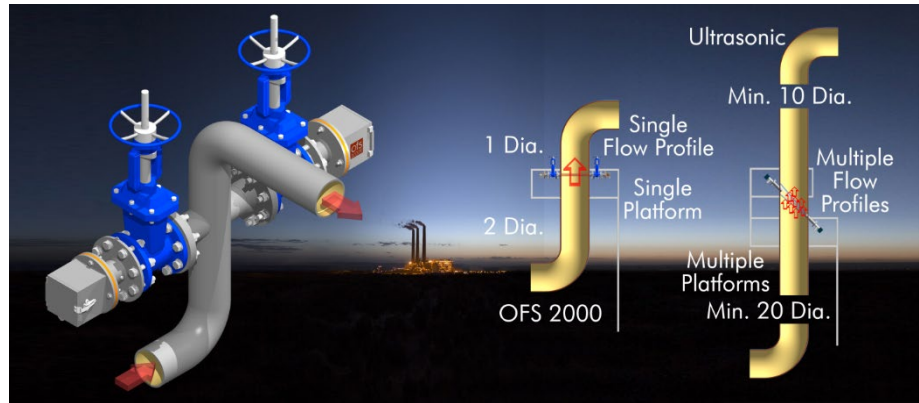
OSI's patented OFS series flow meters use our optical scintillation measurement algorithm and advanced Digital Signal Processing (DSP) to measure the movement of turbulence found in a gaseous flow streams, providing highly accurate

OFS  
measurements  
unaffected by

Temperature  
Pressure  
Distance  
Gas Density  
Moisture  
Opacity

OFS can measure velocities from 0.03 - 170 M/Sec

Processes with entrained / liquid droplets, High Temperature, High and variable opacity and dust concentrations are not a problem



#### OFS Unique Advantages:

Non-Intrusive- With no direct contact with flow, measurement does not cause any pressure drop, or affect the flow characteristics in any way.

No Moving Parts - OFS 2000 is essentially maintenance-free, save for window cleaning. OFS internal monitoring alerts the user if window cleaning is required. (Typically only semi-annually (if then) on the dirtiest stack and duct high purge spools are available.)

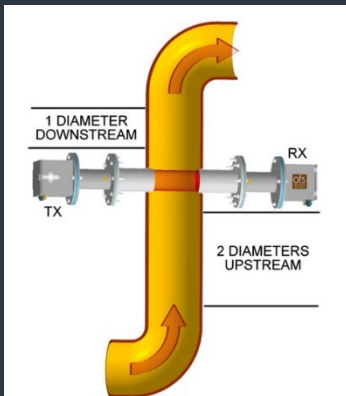
If OFS can detect the turbulence-induced light fluctuations with even a fraction of the light, it can accurately measure the flow velocity.

So in this sense, OFS is a “pure” measurement.

#### Built in Calibration

By its very nature OFS scintillation measurement does not drift. This means OFS sensors require no calibration – ever.

OFS technology uses a proprietary patented algorithm developed by OSI and certified by NIST (National Institute of Standards and Technology) and is supported with over 20 million hours of observation data. Automatic calibration check and continuous self-test diagnostics are built-in for user security. Drift >3% from norm will cause a fault alarm. Since 1999 there have been no instances of calibration fault in any OFS system. only semi-annually



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