

## Primary Concerns

Gas Monitoring systems must address these key concerns:

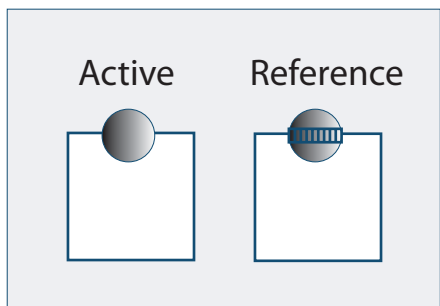
1. Proper selection of sensor technology
2. Accuracy of readings
3. Speed of Response
4. Maintenance
5. Price

## Proper Selection of a Flammable Gas Sensor

The following instruments are capable of detecting flammable gases and vapors. Of these four, only catalytic and flame temperature sensors are recommended for LFL monitoring.

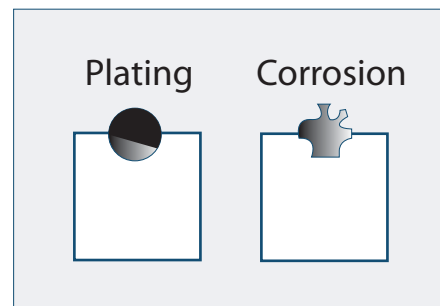
### 1. Catalytic Sensors

- Catalytic sensors have a long history of use in industrial applications, and are relatively inexpensive and reliable for area monitoring applications. They are not generally recommended for use in processes, or in applications where flammable gases/vapors are continuously present or where temperatures are high.



*Catalytic Sensor Element*

*A catalytic sensor element consists of two electrical coils. The Active coil is coated with catalyst, while the other is coated with glass and acts as a Reference. Flammable gas/vapor is burned when it contacts the catalyst on the Active coil: this changes the resistance of the Active coil, and upsets a Wheatstone Bridge circuit in the control monitor. The signal change is proportional to the amount of flammable gas present.*



*Catalytic Poisons*

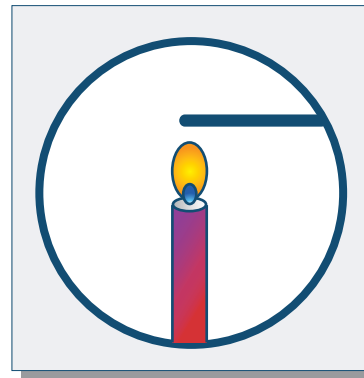
*Certain compounds leave behind a plating or corrosive on the catalyst. These "catalytic poisons" destroy the sensor. Catalytic poisons include: silicone, plasticizers, sulfur-based compounds, organo-metallic compounds, and acids.*

## 2. Flame Temperature sensors

- Flame temperature sensors have a proven record in process applications as the best means of monitoring solvent vapors. They offer universal calibration response to a wide range of common solvents, and work under conditions where catalytic sensors fail.

### *Flame Temperature Sensor*

*The sample is incinerated in a carefully metered pilot flame. A temperature detector measures the resulting change in the flame and produces a signal that forms part of a Wheatstone Bridge. The change in temperature is proportional to the flammability of the sample. Flame Temperature sensors provide a direct readout of the flammability of a sample, and have a close-to-linear response to a wide range of common solvents. Also, because the sample is incinerated, this sensor is not subject to catalytic poisons.*



## 3. Photo-ionization sensors

## 4. Flame Ionization sensors

- Photo-ionization and Flame Ionization are best suited to monitoring PPM levels of hydrocarbons (Photo-ionization sensors can also read certain compounds that are not hydrocarbons). These sensors do not provide a direct indication of flammability, and have a wide calibration error reading different solvents.

### *Flame Ionization Sensor*

*The sample is incinerated in a carefully metered hydrogen pilot flame, producing ionized carbon. The ionized carbon passes through an electrical field to an ion collector. The signal from the collector is amplified by an electrometer. The signal is proportional to the amount of carbon present in the sample.*

