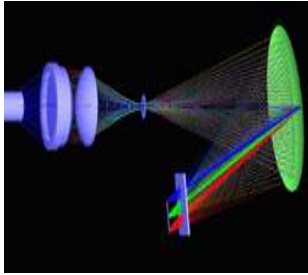


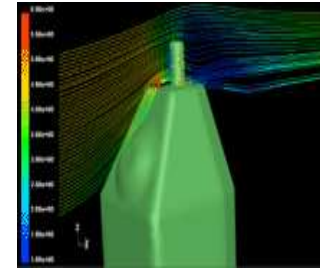
PROENGIN TECHNOLOGY PRESENTATION

FLAME SPECTRPHOTOMETRY



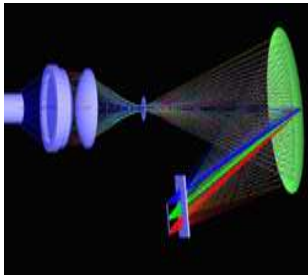


Principle of Operation

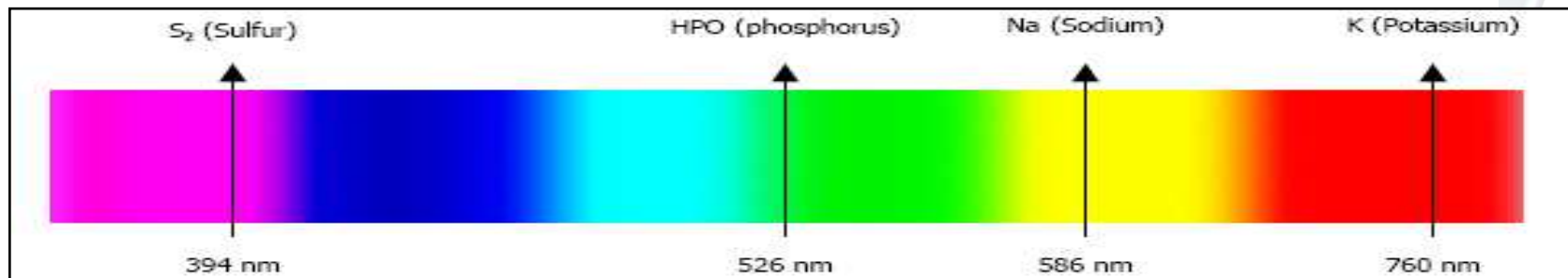
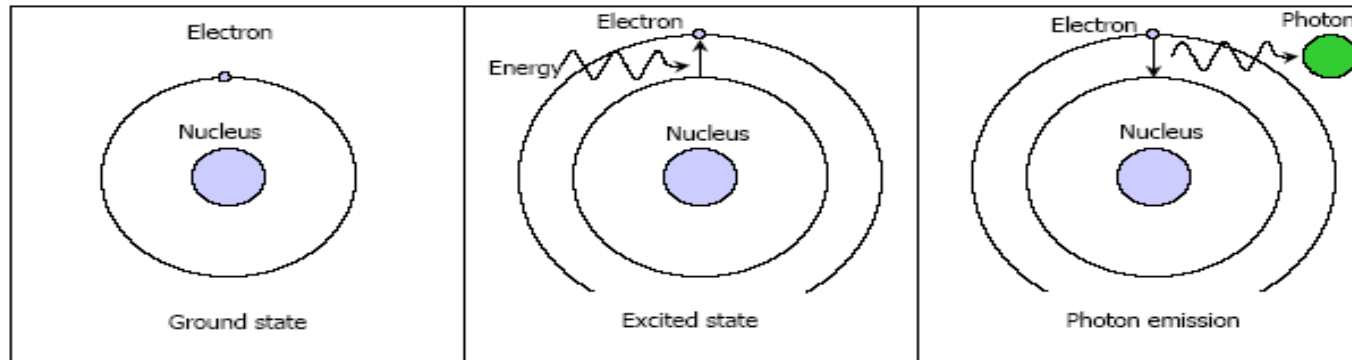
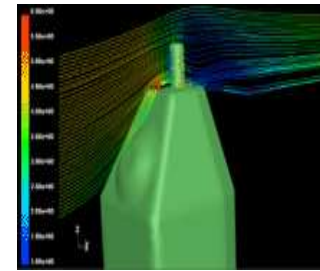


What is Flame Spectroscopy ?

- Each element when excited emits light at a specific point in the light spectrum that can be analyzed. A continuous stream of air flow through a hydrogen flame excites the elements. The elements light emission is then analyzed.
- Phosphorus, Sulfur Arsenic, HNO (bond), Potassium, Sodium, Calcium and many other elements can be detected from any complex gas, aerosol or dust particle through this method.



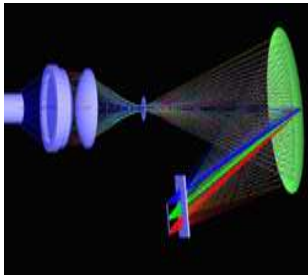
Principle of Operation



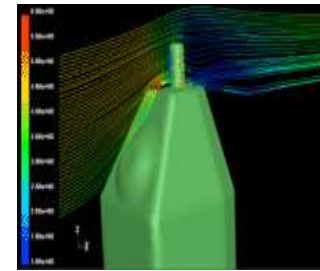
Example of main emission line (or band) from sulfur, phosphorus, sodium and potassium between 350 and 800 nm.

The color tells you the element

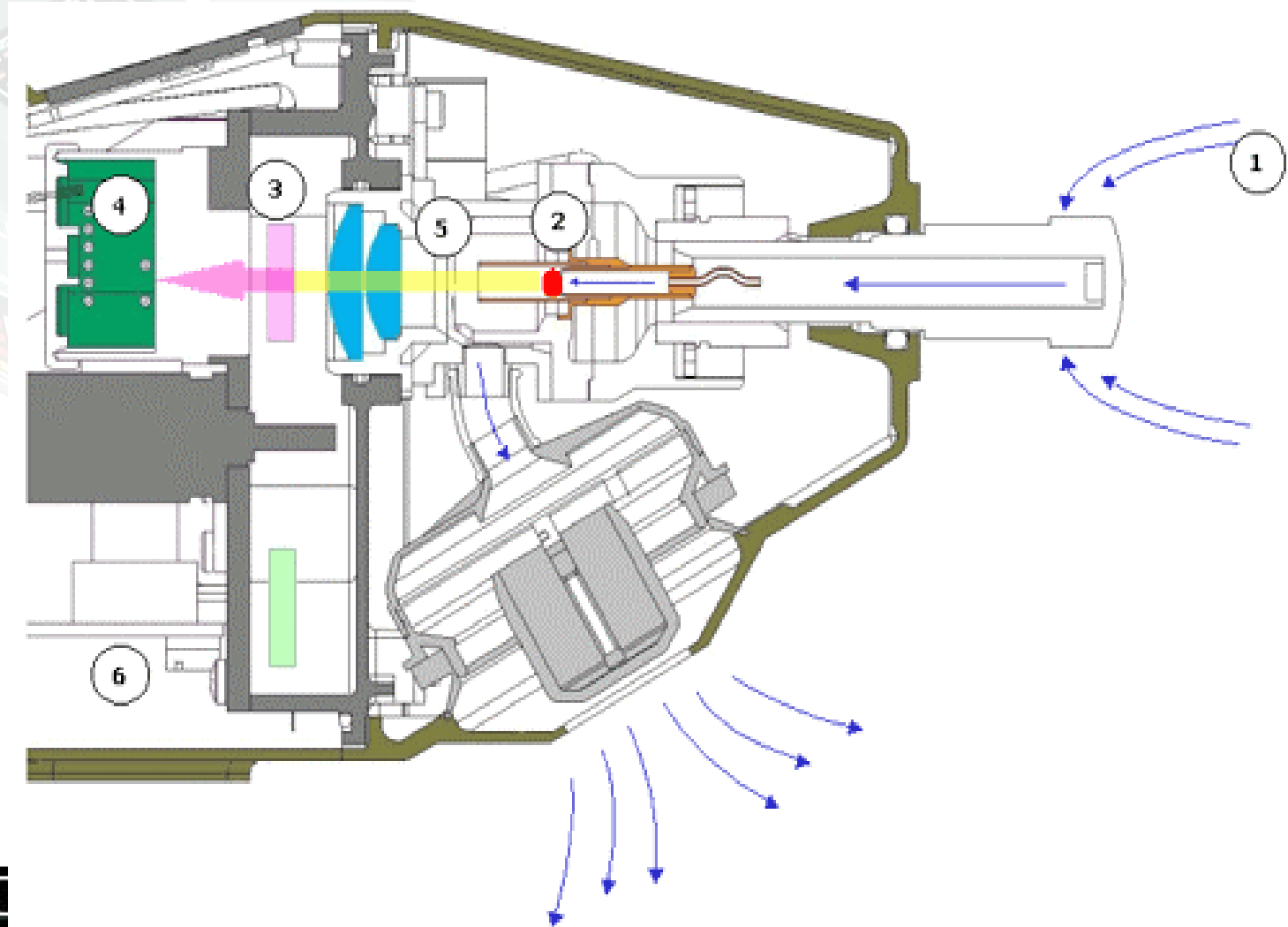
Different color = Different Element



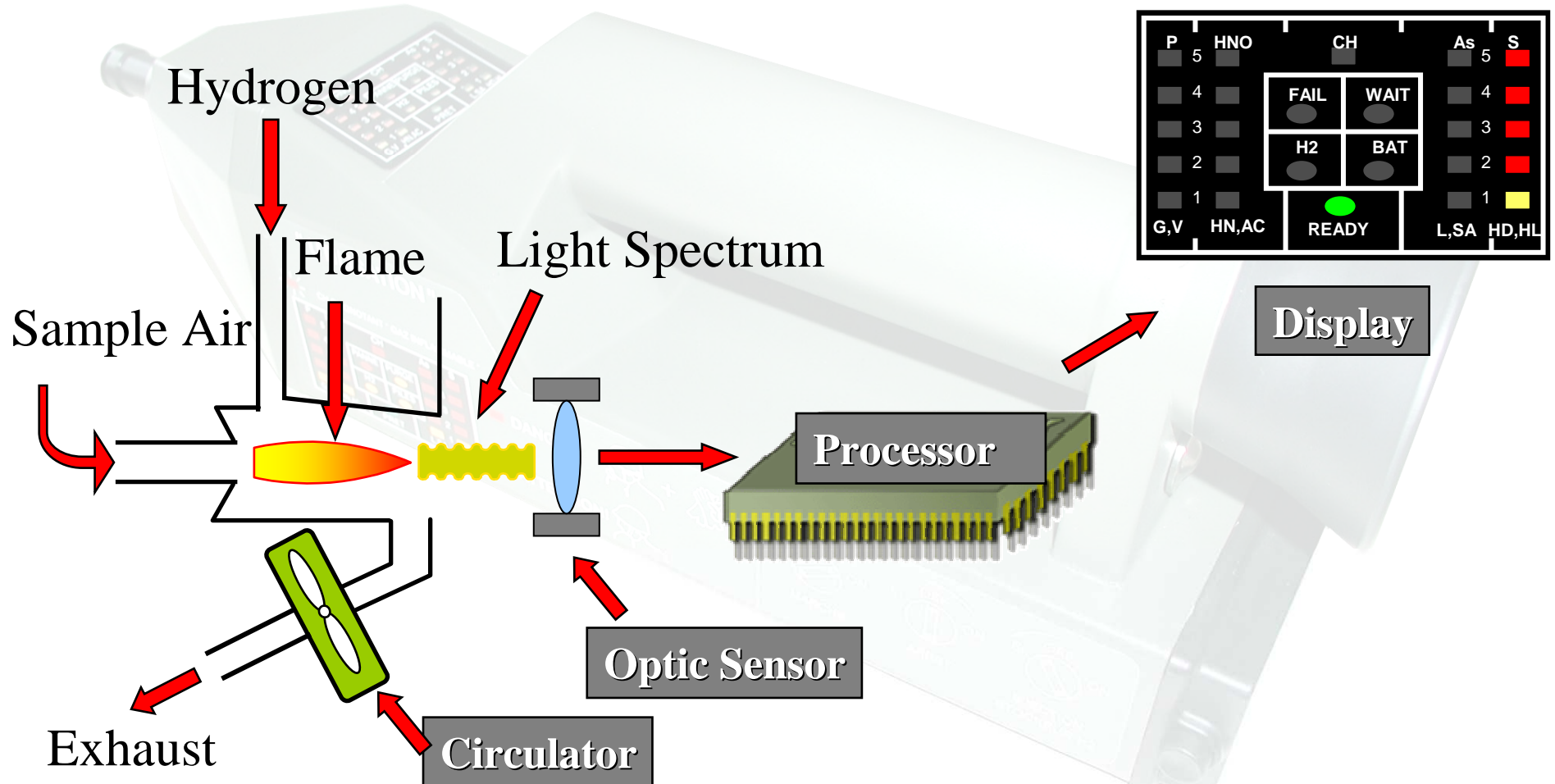
How Does it Work?



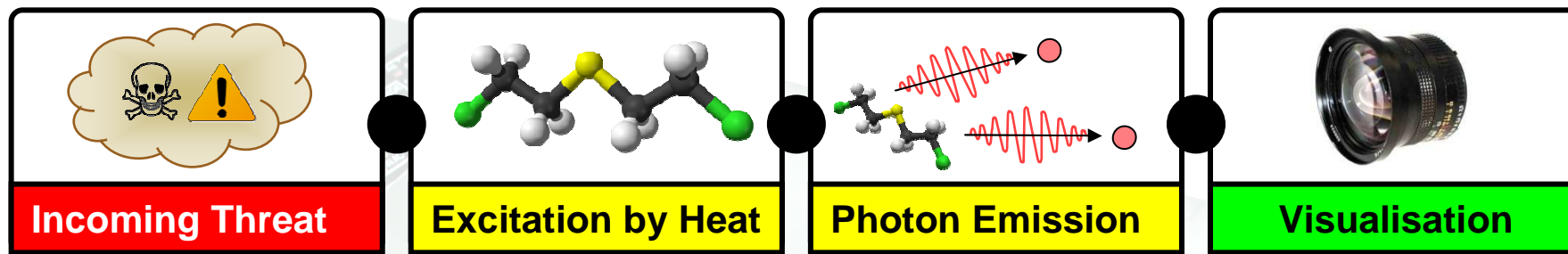
- 1 Air inlet
- 2 Burner
- 3 Light Filter
- 4 Sensor
- 5 Focus lens
- 6 Processor



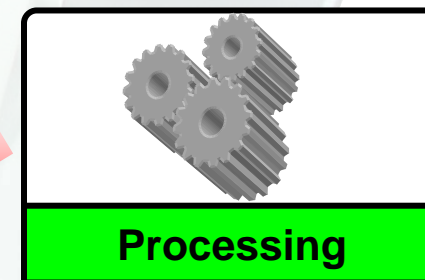
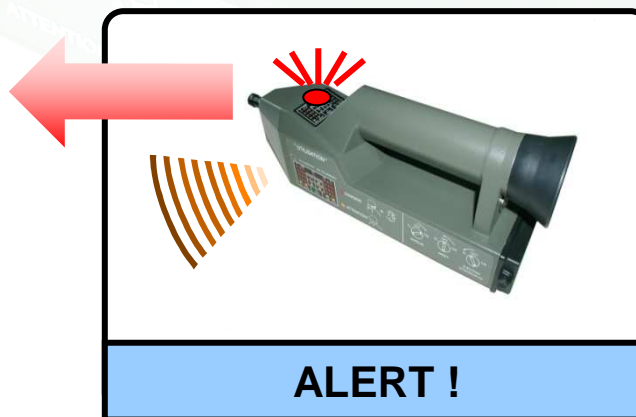
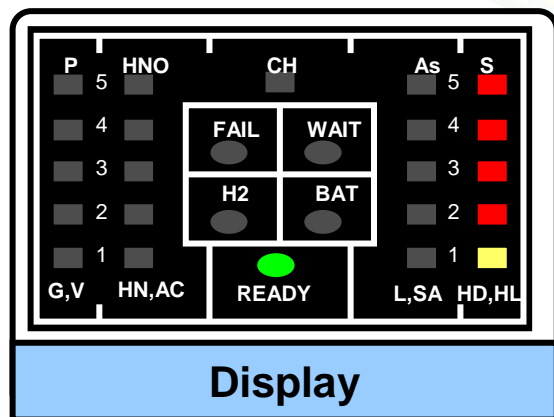
How does it work ?



How does it work ?

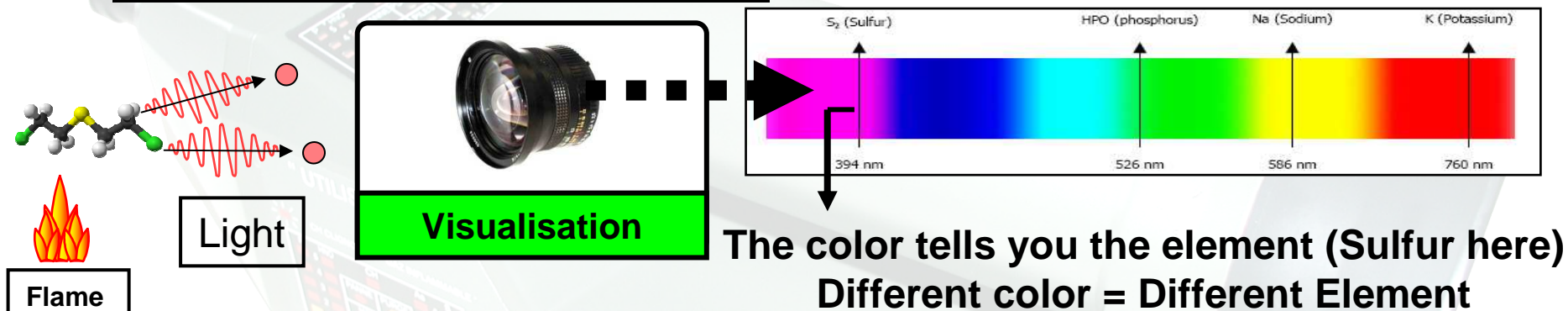


MUSTARD AGENT (HD)

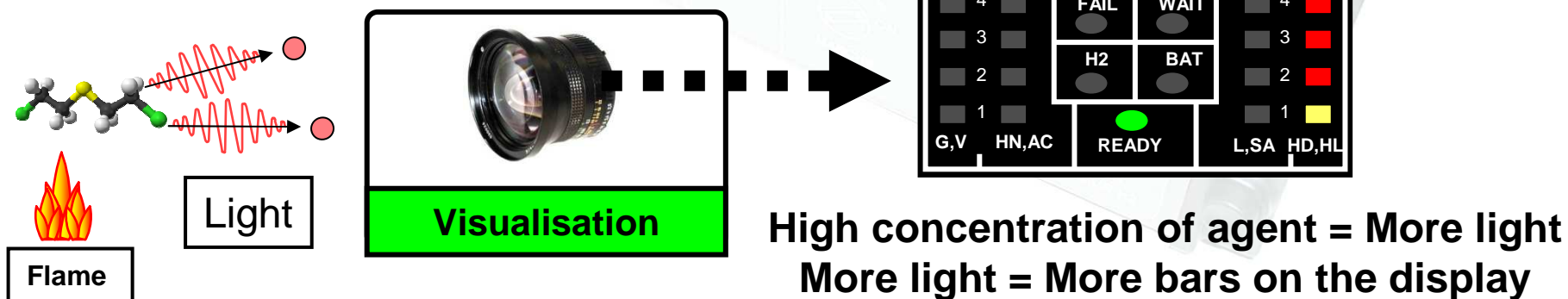


How does it work ?

• QUALITATIVE ANALYSIS



• QUANTITATIVE ANALYSIS



PROENGINE

Chemical and biological detection

Why do we use Flame Spectrometry?

- Detection is almost **instantaneous**: as each toxic molecule is sampled in the flame, it reacts immediately giving off light.
- The burner can be adjusted (Tuned) for **maximum sensitivity** for all detectable elements.
- There is **no memory effect**, even with high concentrations.
- All elements can be detected simultaneously because they emit different colors.
- Utilizes an open sensor (i.e. no membrane) which means **no retention** of toxic agents = fast response and decay time and **less maintenance**.
- The heat from the flame decontaminates the internal surfaces which also assists in a **fast return-to-zero-time**.
- **Unaffected** by heat, cold and humidity.
- Detects vapor, aerosols, **liquid** and **encapsulated** agents.

Characteristics



✓ **Fast Response Time**



2 sec

 **PROENGINE**

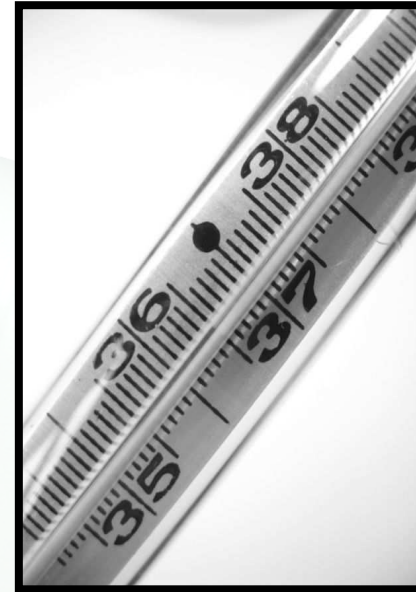
Chemical and biological detection

Characteristics



✓ **Operating Range**

-25°F to 131°F



Characteristics



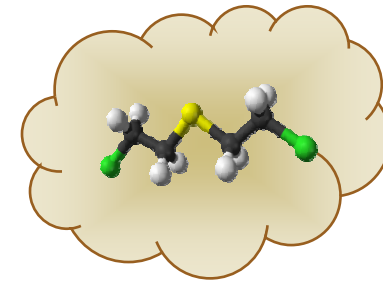
✓ **Multi-Agent Detection**

Detects multiple agents simultaneously
on four separate channels.

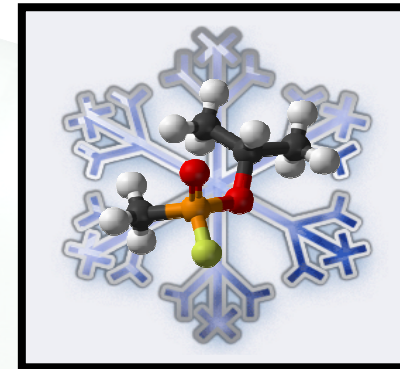
 **PROENGINE**

Chemical and biological detection

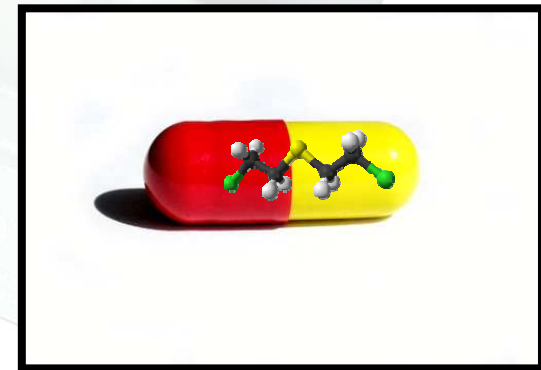
Characteristics



✓ **All forms detection**



Vapor, Aerosols, Droplets, Dust, Frozen,
and Encapsulated agents.



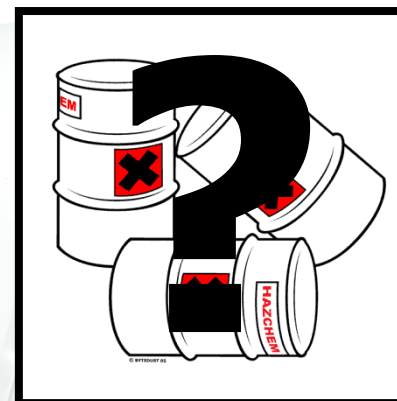
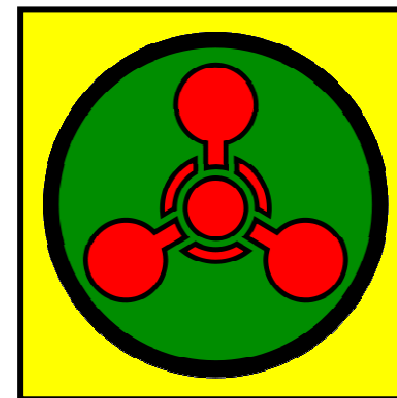
 **PROENGINE**

Chemical and biological detection

Characteristics

✓ **Unlimited Detection Range**

Capability to detect CWA and TIMs/TICs
Open Range - No library



Characteristics

✓ Unlimited Detection Range

Capable of detecting every type of agent:

- Homemade
- Terrorist mixture / New Agent
- Impure agents



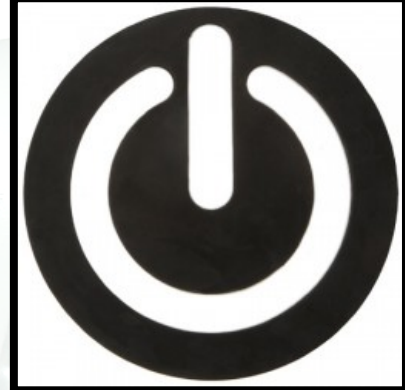
Characteristics

✓ **User Friendly**

- **Training** Time : 2 minutes (basic use)
- **No** Field Calibration required.
- **Fast return-to-zero** after detection even in high concentration.
- **Continuous Detection** no need to change filter after positive detection.
- **High Reliability** and minimal maintenance

ON

OFF

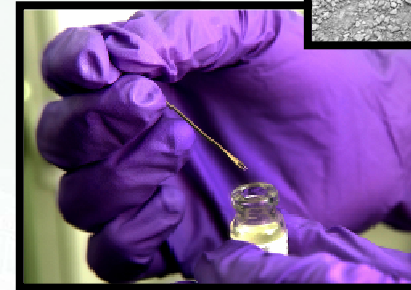
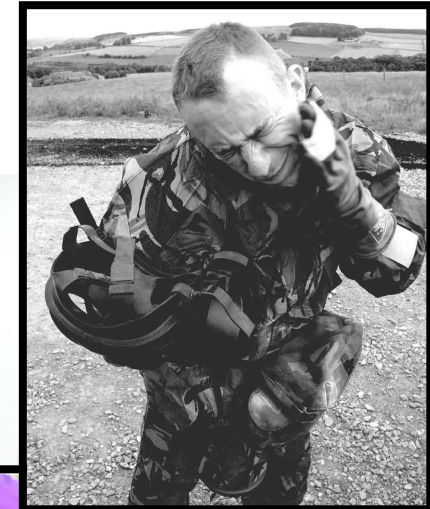


READY

Characteristics



✓ Liquid Detection



Detects liquid agents.
Detects agent in water, on the skin.



 **PROENGINE**

Chemical and biological detection

Characteristics



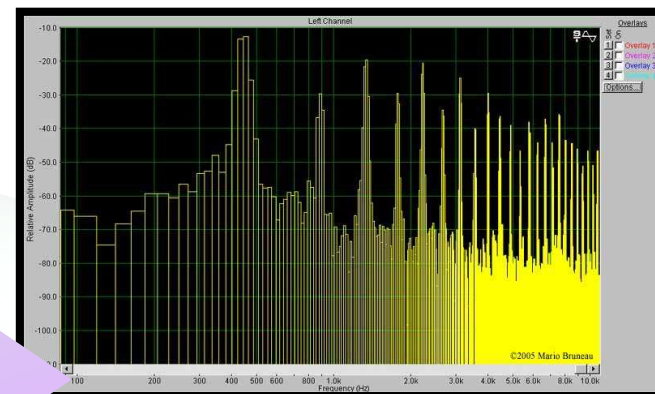
✓ **No False Alarms**

- Virtually **No False Negative** alarms.
- Virtually **No False Positive** alarms.



Characteristics

✓ **High Sensitivity**



P - .01 mg/m³ for all G, V agents (0.2 ppm)
S - 0.5 mg/m³ for H, HD and HL (0.15 ppm)
As - 1.5 mg/m³ for L, SA (1.5 ppm)
HNO - 10 mg/m³ for HN, HCN (5 ppm)

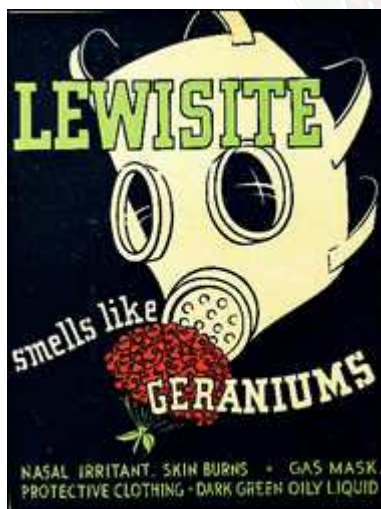
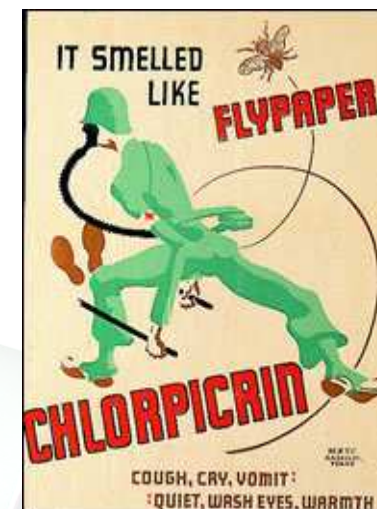
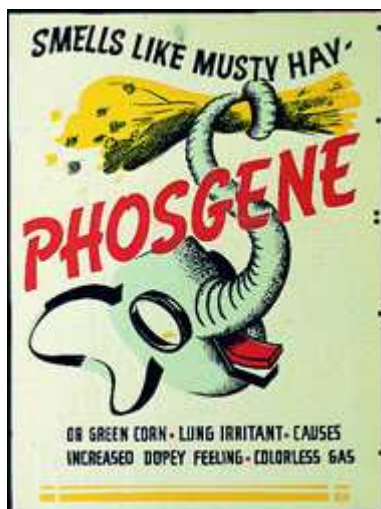


PROENGINE

Chemical and biological detection

CONTACT

PROENGIN Inc



140 South University Drive, Suite F
Plantation, Florida 33324
Tel. (954) 760-9990
Fax (954) 760-9955
mark@proenginusa.com

