

COMBUSTION APPARATUS WICKBOLD METHOD

Standards:

- ASTM D 2784
- ASTM D 2747
- ASTM D 2384
- ISO 4260
- IP 243



ANALYSIS OF SULFUR, CHLORINE AND FLUORINE (Wickbold Method):

The WICKBOLD Method consists of burning a sample with a stainless steel burner with an oxyhydrogen blowpipe, to then measure the Sulfur, Chlorine and Fluor contained in the product resulting from this combustion.

It is used to measure **Total Sulfur** in LPG, as well as in liquid petroleum products. With the use of solvent it also allows to dose Total Sulfur in viscous samples, aromatic compounds, and high-grade samples. After combustion, sulfur is measured by **turbidimetry** or any other appropriate technique.

This method is also used for the determination **of chlorine** (from 0.5 ppm) in lubricants, butane-butene mixtures, ethylene, propylene.....
By combustion, the organically bound chlorine is completely converted to free chlorine, which will be measured by **conductimetry** or any other technique.

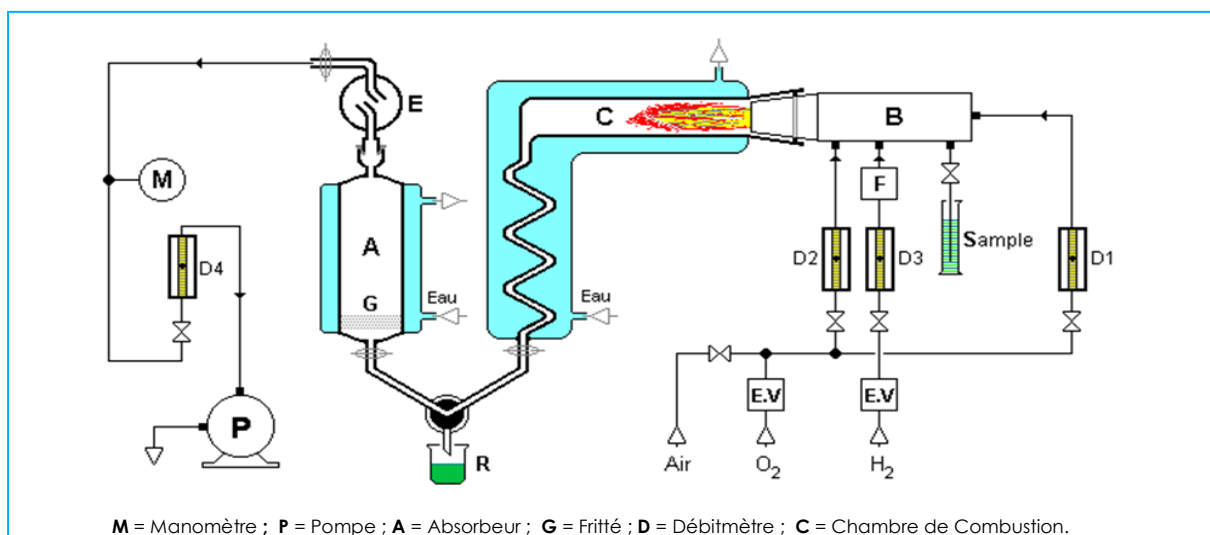
HIGHLY SECURED EQUIPMENT:

The use of hydrogen to make combustions requires a rigorous approach to safety. Concerned about complying with the safety standards, our device is the most secure of the market.

- by using a stainless steel burner / Sintered Flame arrester (F) / Glassware covered by protection caps, to protect the user from any possible explosion.
- by "Safety" functions that automatically shuts off the Hydrogen by closing solenoid valves (EV) in case of:
 - a) Opening of the protective cover during combustion,
 - b) Reduced cooling water pressure,
 - c) Decrease of the Depression of the vacuum in the fluid circuit,
 - d) Decrease of oxygen pressure.

PRINCIPLE OF OPERATION :

The sample (S) is aspirated and burnt in the flame of an oxyhydrogen blowpipe (B). The products of combustion are absorbed in the reagent suitable for the desired analysis. They are then recovered (R) for a separate titration



ADVANTAGES OF THE WICKBOLD METHOD:

A very high combustion temperature in very large excess of oxygen, guaranteeing a perfect combustion,
Possibility of large sample quantity (several tens of ml), allowing very low measurement thresholds (≈ 1 ppm Sulfur),
A device for measuring Sulfur, Chlorine and Fluorine at a low price.

ACCESSORIES :

- **Burner:** made of stainless steel to reach a temperature of about $2,000^{\circ}\text{C}$. A quartz burner can be supplied on request.
- **Combustion Chamber:** quartz refrigerated by circulation of water.
- **Pyrex Absorber:** also refrigerated, with a sintered as well a 3-way faucet at the base (vigreux tip absorber, available on request).
- **Glass Ball:** intended to retain the vapors of the absorbent.
- **Vacuum Pump:** with a flow rate of approximately $3,000\text{ l/h}$ integrated into the device (graphite pallet pump).
- **Glassware:** Beaker, vial, and flasks for liquid samples.
- **Sampling Reservoir:** For LPG samples and natural gas as well as refining gas.

TECHNICAL CHARACTERISTICS:

Dimensions: Height 65 + (20 glassware) x Width 68 x Depth 48 cm / weight $\approx 40\text{ kg}$

Électrical: The device requires connection to the 230 V - 50 Hz single-phase mains 110 V - 60 Hz, Power consumption 500 W.

Gas: The apparatus requires 2 gas supplies which must be:

- ☞ Oxygen – technical grade sulfur-free
- ☞ Hydrogen – technical grade sulfur-free

Consumption : Oxygen $\approx 1500\text{ l/h}$
 Hydrogen $\approx 200\text{ l/h}$

Supply pressures must be between 1 bar minimum and 3 bar maximum.

Water: For cooling glassware
Inlet pressure between 1 and 2 bar with tap for flow adjustment.
Free evacuation.