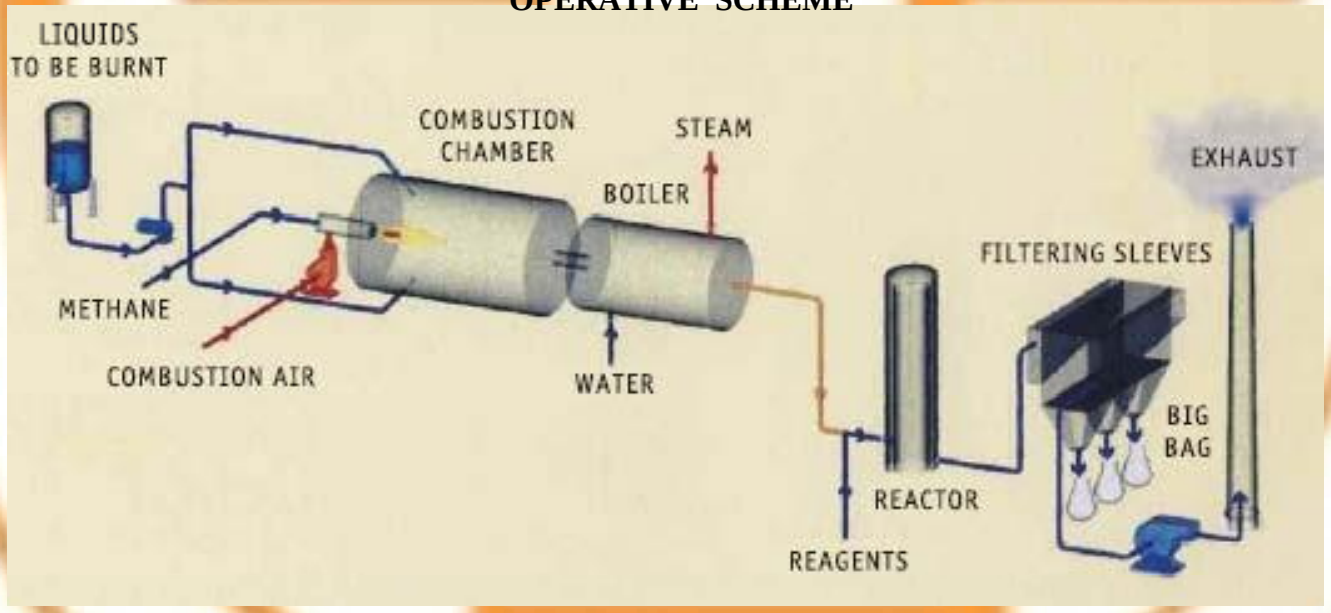
LIQUID WASTE THERMAL OXIDIZER WITH FUMES TREATMENT AND HEAT RECOVERY

Some industrial process produce highly pollutant liquids containing solvents or organic compounds, which can not be treated in conventional plants. Such liquids can be burned in special type of incenerators equipped with after burners.

TM.I.P. build incinerators working up to 1200° C completed with heat recovery system and flue gas cleaning section for dry or wet removal acids

OPERATIVE SCHEME



SPECIFICATION
500 kg/hr liquids
2.000 Nm^3/hr
p o l l u t e d gas

Dry fumes Treatment for chlorinates
Heat recovery: 3.000 kg/hr of steam

SPECIFICATION
200 kg/hr liquids
1.000 Nm^3/hr
solvent polluted air

SPECIFICATION
300 kg/hr liquids
1.000 Nm3/hr polluted gas

SPECIFICATION :
1000Kg /hr liquids
2.000 Nm^3/hr
solvent polluted air

Dry fumes Treatment for chlorinates
Heat recovery: 5.000 kg/hr of steam

PROBLEM OF ELEMENTS

Waste blends containing halogens, sulfur or phosphorus need special equipment to remove derivatives of these elements after combustion is complete. Halogens in the waste-stream will result in the formation of halogen acid gases in the incinerator.
Inorganic constituents of a waste stream will pass through the incinerator or collect within it upon cooling.
Salt-laden streams may require the use of special furnaces, in which the internal temperature is maintained above the fusion temperature. The molten salt are subsequently removed.
Light metals, such as sodium, potassium and calcium, can be easily captured in air-emission- control equipment. However, they can cause significant refractory deterioration if deposited within the incinerator itself.

PARTICULATE REMOVAL

Liquid waste containing high ash or particulate concentrations may require venture – or ejector- type scrubbers, and wet scrubbers. A bag fabric filter following the gas-conditioning system can be used.

EXAMPLE OF WASTES THAT CAN BE INCENERATED

- **The majority of the materials originated from solvent recycling facilities consisting of process still bottoms, distillation cuts, and other fractions or residues from solvent recovery work**
- **Solvents: aromatics, aliphatics, ketones, chlorinates, alcohols (propylene glycols), NMP, propylene carbonate, dibasic ester blends**
- **Amines (Nitrogen containing compounds)**
- **Residue from industrial of commercial painting operations from spent solvents to paint solids including all of the wash solvents, paint filters, thinners and pot cleaners, waste paint, paint**
- **Metal cleaning fluids: solvent-based mixtures and blends, metal working and machining lubrificants, coolants, cutting fluids, and the like**
- **Electronic industry solvents: higher value chlorinated/fluorocarbon solvents(the fuels program generally sees the residues from recovery processing of these high cost materials, rather than the spent solvent itself such as oils and resins)**
- **Adhesives, inks**
- **Byproducts of pharmaceutical industry**
- **Solvents and inks used to print newspaper and other publications**
- **Catalysts, absorbent, oil waste, organic contaminated solvents**
- **Cleaning solvents**
- **Sludge from the petroleum industry**

IMPORTANT PARAMETERS FOR LIQUID WASTES

Through the use of atomizers, the waste can be formed into tiny droplets with a large ratio of surface area to volume. These can then be more easily mixed with air and, thus, more easily vaporized and burned.

For atomization, the most important property to be examinated is viscosity.

It is also desirable to know, as accurately as possible, the composition of the liquid. The amounts of chlorine, sulfur and inorganic (as well as water) influence the design of the incinerator.

LOW-HEATING-VALUE LIQUIDS

For liquids having low heating value incineration may still be a logical destruction method, even though auxiliary fuel may be required. A cost comparison would have to be made between biological or other destruction methods and incineration.

In many situations, there will be a combination of high-and low heating valve wastes. These may be blended, to minimize the use of supplemental fuel, if they are completely miscible and totally compatible.

DESIGN CONFIGURATIONS

THE PLANT IS USUALLY COMPOSED BY:

- **Combustion chamber with auxiliary burner and wastes feeding device**
- **Post-combustion chamber with burner to guarantee 900-1200C at 2seconds residence time**
- **HEAT RECOVERY**

If a liquid waste has very low ash or inorganic content, and if no halogens, sulfur or phosphorus are present, then the quality of the flue gas from incinerator will be much the same as that from combustion of a fossil fuel.

Boiler for steam or oil production and combustion-air preheating, while an acceptable form of heat recuperation, are seldom economically justified.

- **Main fan**
- **Chimney with analysis instrumentation**
- **Electronic control system for automatic running of the plant.**

In case the company has also vents (from tanks – reactors) to be purified they can be fed directly to post-combustion chamber.