



Termomeccanica Industrial Process

Termomeccanica Group



Oil & Gas Solutions

April 2016

Solution for Oil & Gas

Oxidation	<p>Oxidation of organic liquid waste or gas polluted by organic compounds, H₂S, mercaptans etc.;</p> <p>Oxidation of solids (sludge, packaging, petrochemical wastes etc.) Oxidation;</p> <p>Thermal oxidation;</p> <p>CATOX units;</p> <p>RTO (Regenerative Thermal Oxidizers);</p>
Hydrocarbon recovery and Waste Gas Treatment	<p>Distillation plants (continuous, batch, multiple effects, etc.);</p> <p>Adsorption plants (VRU, hydrocarbon adsorption on carbon, odour abatement unit, iron scavenger, chloride removal);</p> <p>Absorption plant (CO₂, H₂S, NH₃, SO₂, etc.. Removal);</p>
Liquid treatment	<p>Stripping plants (BTEX , H₂S, NH₃ removal);</p> <p>Water contaminated by organic compounds;</p> <p>Evaporation and concentration plants.</p>



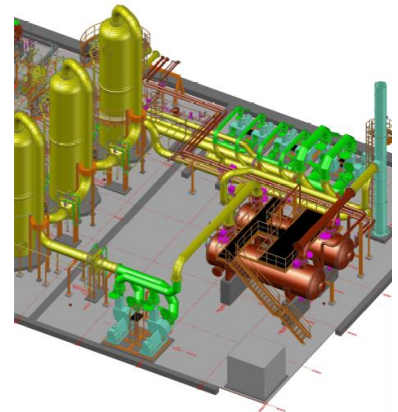
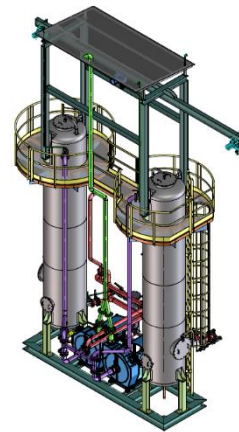
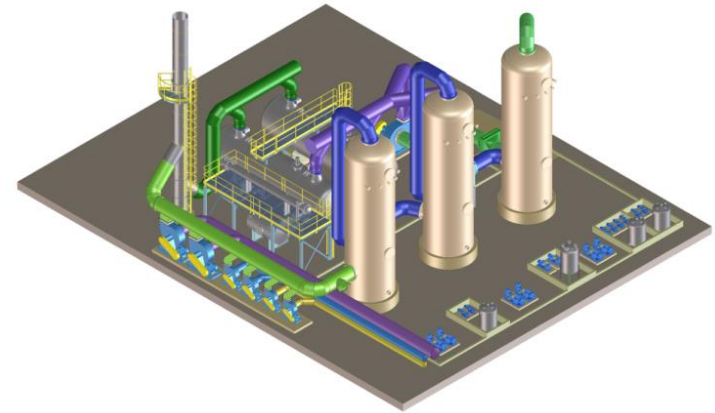
Odour abatement units

Typical processed stream:

- Waste air containing H_2S , NH_3 and VOCs coming from refinery WWTP (DAF, API, Oily sludge tank, etc..)
- Oily water sump, pits emission
- Spent caustic, slops tank out breathing emissions

Process solution:

- Waste air collection system from WWTP roofs/covers
- Scrubbing of NH_3 by sulphuric acid solution
- Scrubbing of H_2S by caustic soda and oxidation by $NaClO$
- VOCs adsorption by activated carbon filters (with steam regeneration for recovery)
- Skid mounted activated carbon filters for emissions from tank, pits and sumps



Odour abatement units

Odour mitigation project at Sohar Refinery, Oman

For mitigating odours from Sohar Refinery, the primary area for odour source has been the refinery Waste Water Treatment Plant. However Hydrocarbon emissions in other parts of Refinery could also contribute to odour.

TM.I.P. controls and minimize odour emissions from these identified sources by providing Activated Carbon Filter facilities at these locations.



Those units remove H_2S , VOCs and ammonia from waste air coming from tanks, pits and sumps by a special type of activated carbon.



Odour abatement units



Incinerators

Typical processed stream:

- Waste liquid
- Stream containing Chlorinated compounds
- Water containing Organics compounds
- H₂s, mercaptans waste gas
- Stream containing Nitrogen compounds

Process solution:

- Static Chamber with injection nozzles for waste liquid and toroidal distributor for vents streams
- Afterburner
- Heat recovery
- Flue gases treatment



Thermal oxidizers

Typical processed stream:

- Contaminated air by hydrocarbons
- Tail gas
- Vent stream
- Vents containing chlorinated compounds
- Vents containing nitrogen compounds

Process solution:

- Thermal Oxidizer
- Recuperative Thermal Oxidizer
- Regenerative Thermal Oxidizer RTO
- Catalytic Thermal Oxidizer CATOX



Distillation plants

Typical recovered compounds:

- Ethanol
- Methanol
- Acetone
- Dymethylformamide (DMF)
- N-methyl-2 pyrrolidone (NMP)
- Acetic acid
- Isopropyl alcohol (IPA)
- Ethyl acetate (EtAc)
- Methylene chloride (MC)
- Hexane
- TEA
- DEA
- MDEA Ammonia
- DMAc
- DNP
- Acetonitrile
- Toluene

And more...

Process solution:

- Continuous Distillation
- Batch Distillation
- Azeotropic Distillation
- Extractive Distillation
- Vacuum Distillation
- High pressure Distillation
- With Mechanical Compression
- With Thermocompression
- Multiple effects



Adsorption plants

Typical processed compounds:

- Toluene
- Hexane
- Ethyl-acetate
- Gasoline, Naphtha, etc..
- Odours from refinery tanks/pits

Process solution:

- Activated Carbon regeneration by steam
- Activated Carbon regeneration by hot nitrogen
- Chlorine Guard Bed
- Molecular Sieve for Gas purification
- Activated carbon filters for odours mitigation
- Iron scavenger for H₂S removal



Gas treatment

Typical processed stream:

- Air or gaseous stream containing solvents
- Air or gaseous stream containing dust
- Stream containing HCl, SO₂, HF, Ammonia, NO_x, H₂S, etc..
- CO₂ removal
- Odours abatement by acidic/alkaline scrubbers

Process solution:

- Chemical and physical absorption (alkaline or acid scrubber)
- Dry abatement with chemical injection
- Adsorption on activated carbon, molecular sieve, iron scavenger
- NO_x thermal and catalytic reduction



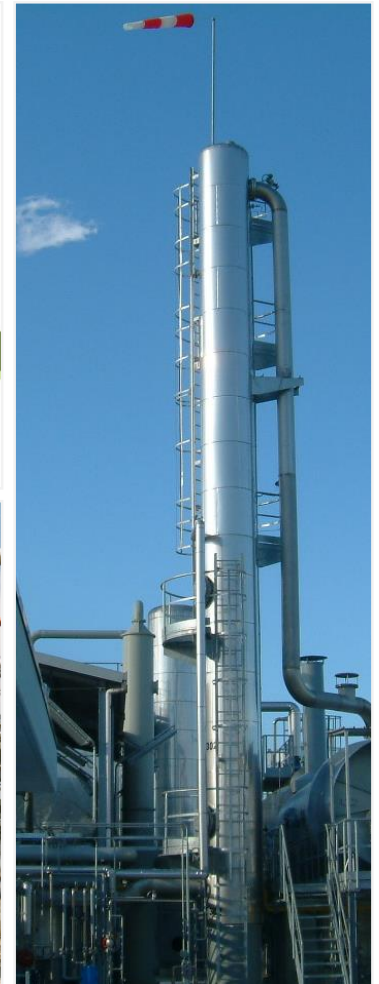
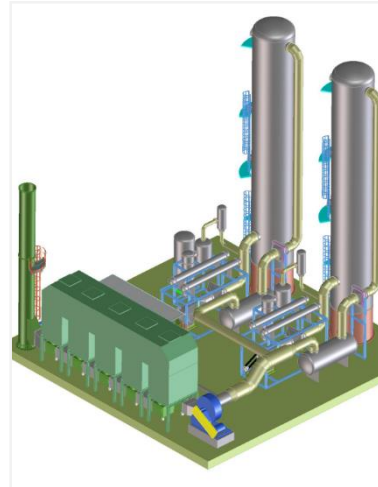
Liquid treatment

Typical processed stream:

- Water containing
 - Solvents
 - Hydrocarbons
 - Ammonia
 - H₂S
 - BTEX
 - CO₂

Process solution:

- Stripping by Air or Nitrogen
- Stripping by Fuel Gas
- Wet oxidation by chemical injection
- Concentration and Crystallization



thank you



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