Termomeccanica Industrial Process

Termomeccanica Group

Adsorption

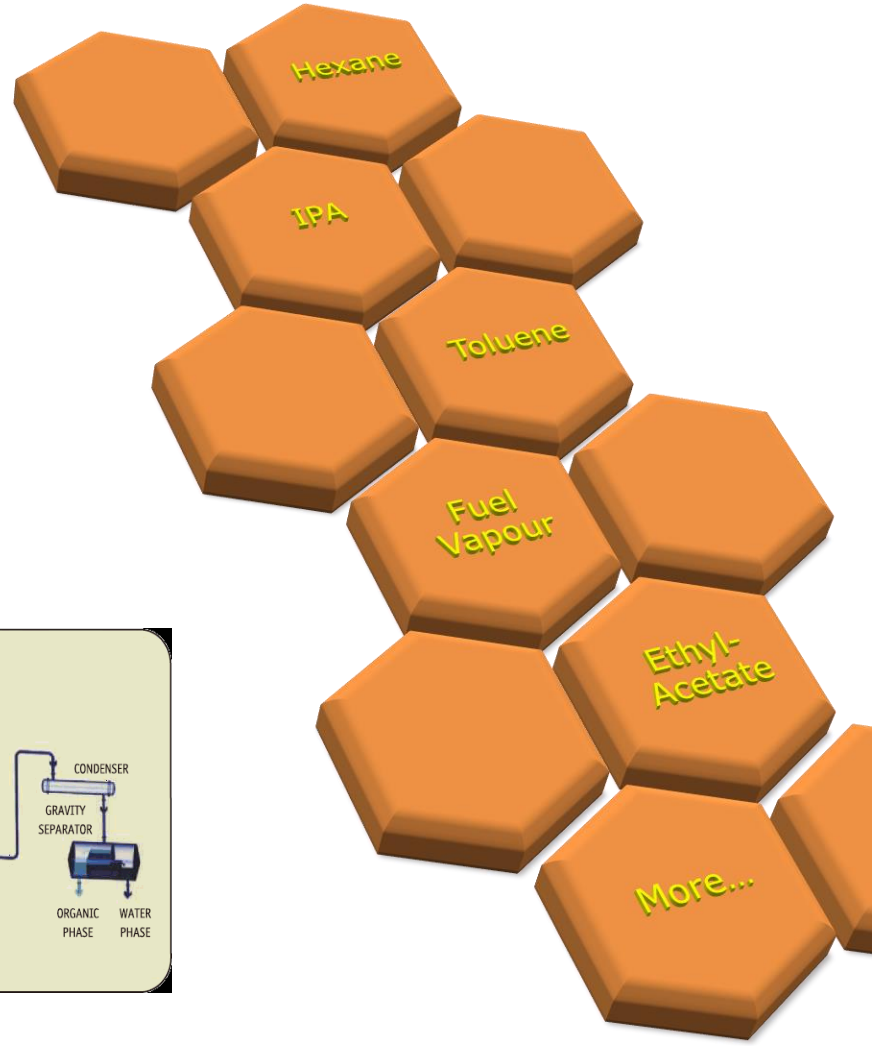
June 2020

Adsorption

It’s adopted for treating exhaust gas recovering pollutants with the possibility of recycling them in a new process.

Adsorbing materials are micro porous substances with a huge surface/height (up to 1700 m^2/gr) such as activated carbons, synthetic zeolite, silica gel and activated alumina.

TMIP designs & manufactures adsorption plants with pollutant removal levels of 97% and with a particularly fast investment payback.

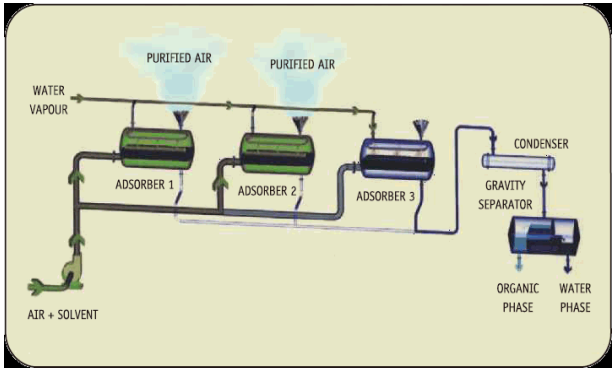



ADHESIVE TAPES PRODUCTION

ADHESIVE PAPER PRODUCTION


PAINTS PRODUCTION

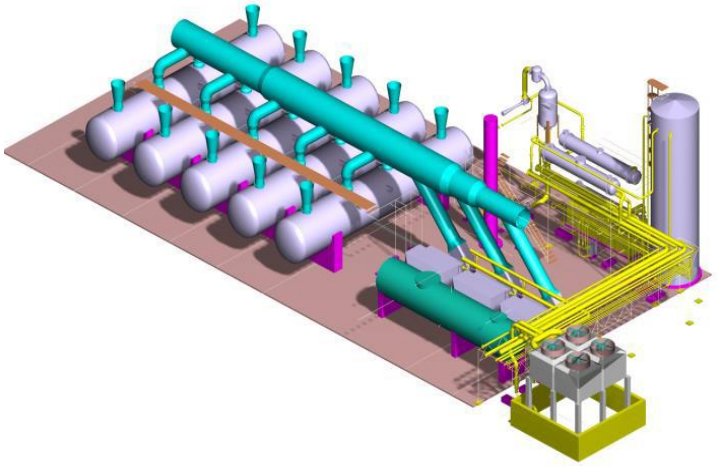

ROTOGRAVURE PRINTING



Adsorption

Process Solution:

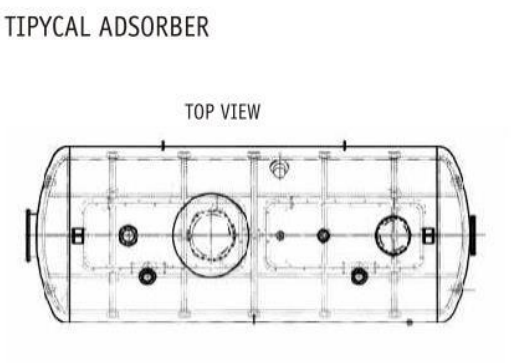
- Activated Carbon regeneration by steam
- Activated Carbon regeneration by hot nitrogen
- with Thermocompression for steam saving
- With Distillation Units

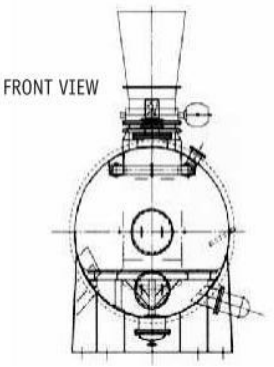


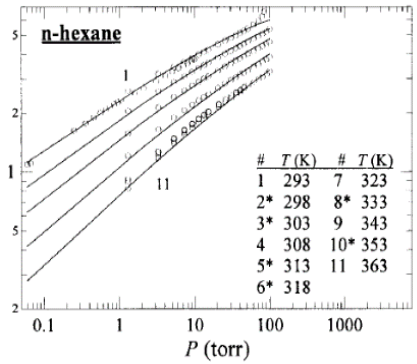
Hexane recovery

Process Data

- **Operation**: Continuous
- **Type**: Steam regeneration
- **Capacity**: 200.000 Nm^3/h
- **Number of adsorbers**: 5
- **Solvent inlet concentration**: 5 g/Nm^3
- **Recovery percentage**: >96%
- **Steam specific consumption**: 3.5 $kg_{steam}/kg_{solvent}$



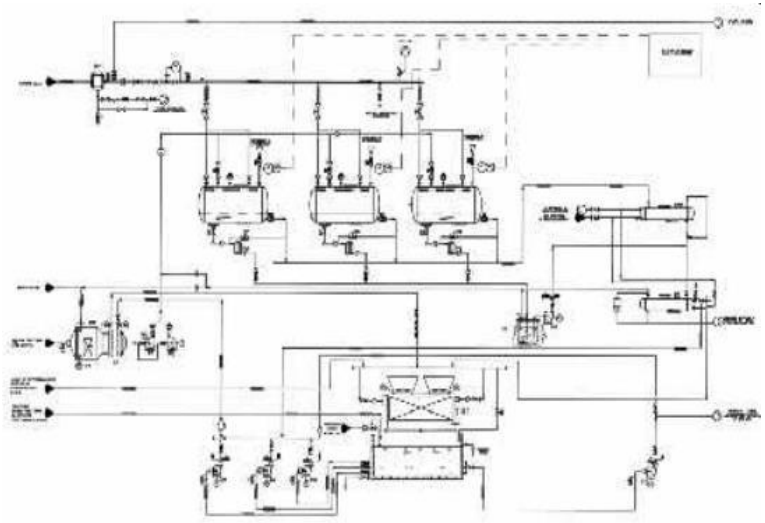




Toluene recovery

Process Data

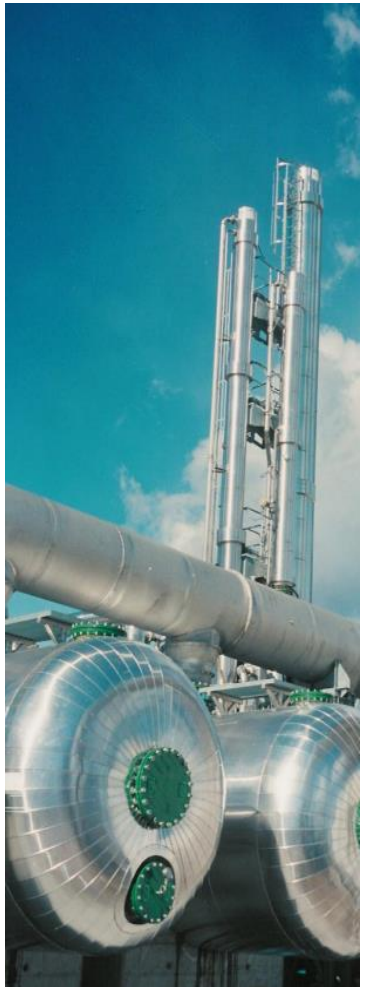
- **Operation**: Continuous
- **Type**: Steam regeneration
- **Capacity**: 200.000 Nm^3/h
- **Number of adsorbers**: 5
- **Solvent inlet concentration**: 5 g/Nm^3
- **Recovery percentage**: >96%
- **Steam specific consumption**: 3.5 $kg_{steam}/kg_{solvent}$



Ethyl acetate recovery

Process Data

- **Operation**: Continuous
- **Type**: Steam regeneration and Ethyl acetate water mixer distillation
- **Capacity**: 80.000 Nm^3/h
- **Number of adsorbers**: 3
- **Solvent inlet concentration**: 8 g/Nm^3
- **Recovery percentage**: >96%
- **Steam specific consumption**: 3 $kg_{steam}/kg_{solvent}$



Vapour Recovery Unit

The main advantages for recovering vapours are:

- Reduce emission of environmentally hazardous compounds;
- Increase safety and reduce health risks linked with the distribution net of gasoline or crude oil;
- Recovery of valuable energy resources;
- VRU capacity: from 150 to 3500 m^3/h of vapours.

Main application of VRU:

- Storage terminals;
- Truck and rail car loading;
- Marine loading system;
- Vapour balance systems.

Vapour Recovery Unit

All emission regulations can be achieved:

TA-Luft: 150 mg/m^3
EU Directive: 35 g/m^3
US EPA: 5 mg/l loaded

Our VRU may even coupled with a second stage plant, reducing emissions to as low as 50 mg/m^3.

Process consists of three main steps:

- Adsorption of the VOC on activated carbon bed;
- Regeneration of the carbon by means of vacuum;
- Re-absorption and recovery of VOC by absorbent liquid.

Vapour Recovery Unit

VRU Safety

Safety features of our VRUs include the following:

- Use of activated carbon capable to withstand high degrees of mechanical and thermal stresses;
- Higher pressure resistant vessels and piping;
- Control system monitoring all important operating parameters, with ESD;
- Flame arrestors, limit switches , level switches etc.

VRU Control system

- Our plants are equipped with an advanced Programmable Logic Controller (PLC), a bus communication between I/O station and PLC as well as a PC-based, user-friendly Human Machine Interface (HMI). Control system continuously keeps track of process parameters and the operation of the unit;
- The system enables operational adjustments, accurate diagnostics and remote supervision.

thank you

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