



AMBOSO®

Air Depuration & Combustion Plants

SOLVENTS RECOVERY FROM CONTAMINATED GAS FLOWS

- The way to transform pollutants to resources -



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Many industrial productions for their development use various chemical compounds, which are at the end are emitted into the atmosphere like polluting gas emissions. In order to protect the environment and health, depuration systems are installed that are designed to purify these emissions.

To date, the most commonly used technologies to purify solvents are:

- adsorption on activated carbon;
- thermal combustion.

In both these applications the pollutant is destroyed, thus leaving the work cycle definitively.

In some cases there is a third way of purification, this way consists in removing of the polluting substance from the gaseous emission and in its reuse as a raw material within the production cycle.





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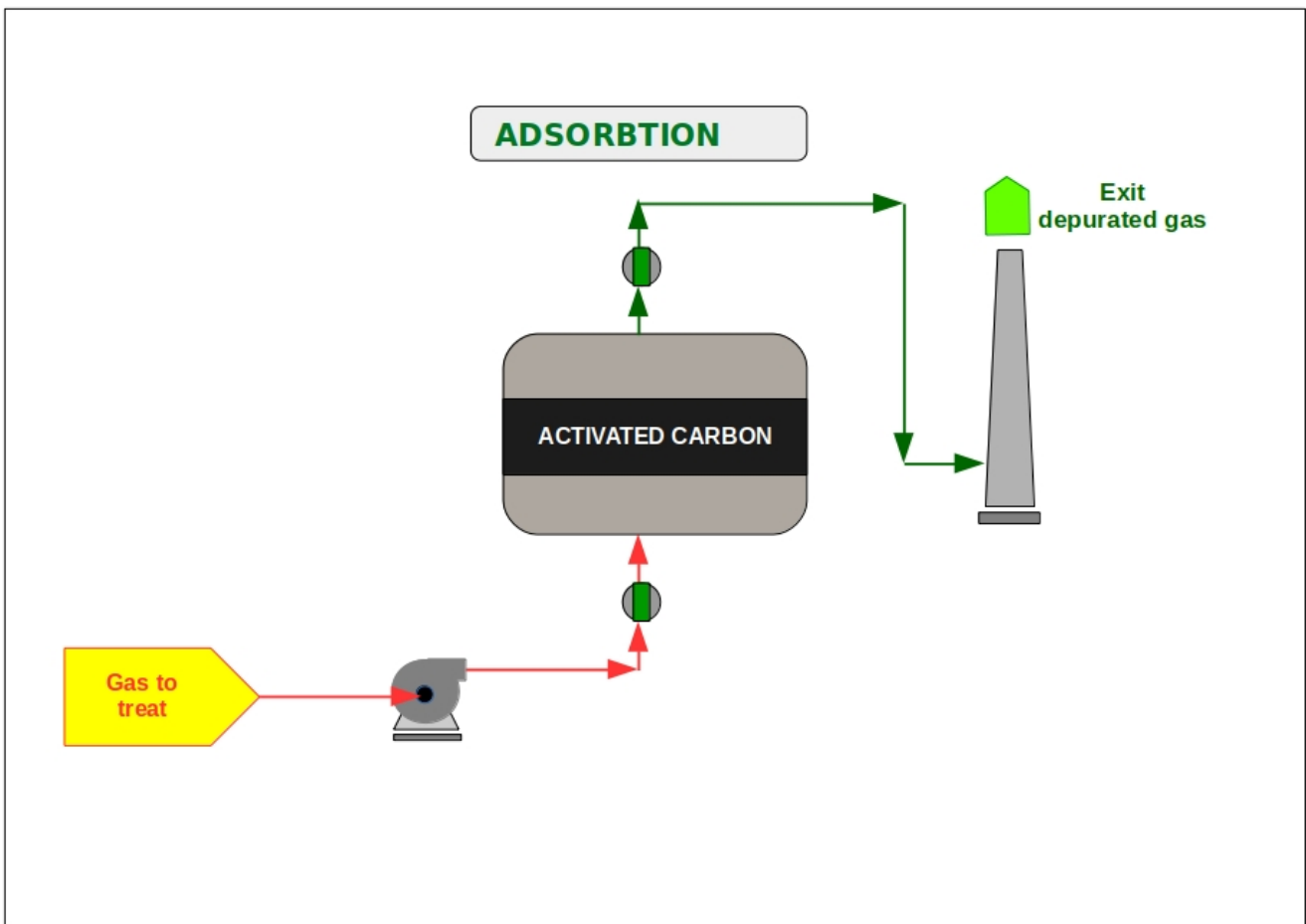
SOLVENT RECOVERY SYSTEM

The purification system with solvent recovery allows purifying the gaseous emissions and recovering the solvent for its reuse in the production cycle.

The functioning of this system is divided into three phases.

1- Adsorption

The gaseous stream to be purified passes through a bed of activated carbon which adsorbs the pollutant releasing purified gas.



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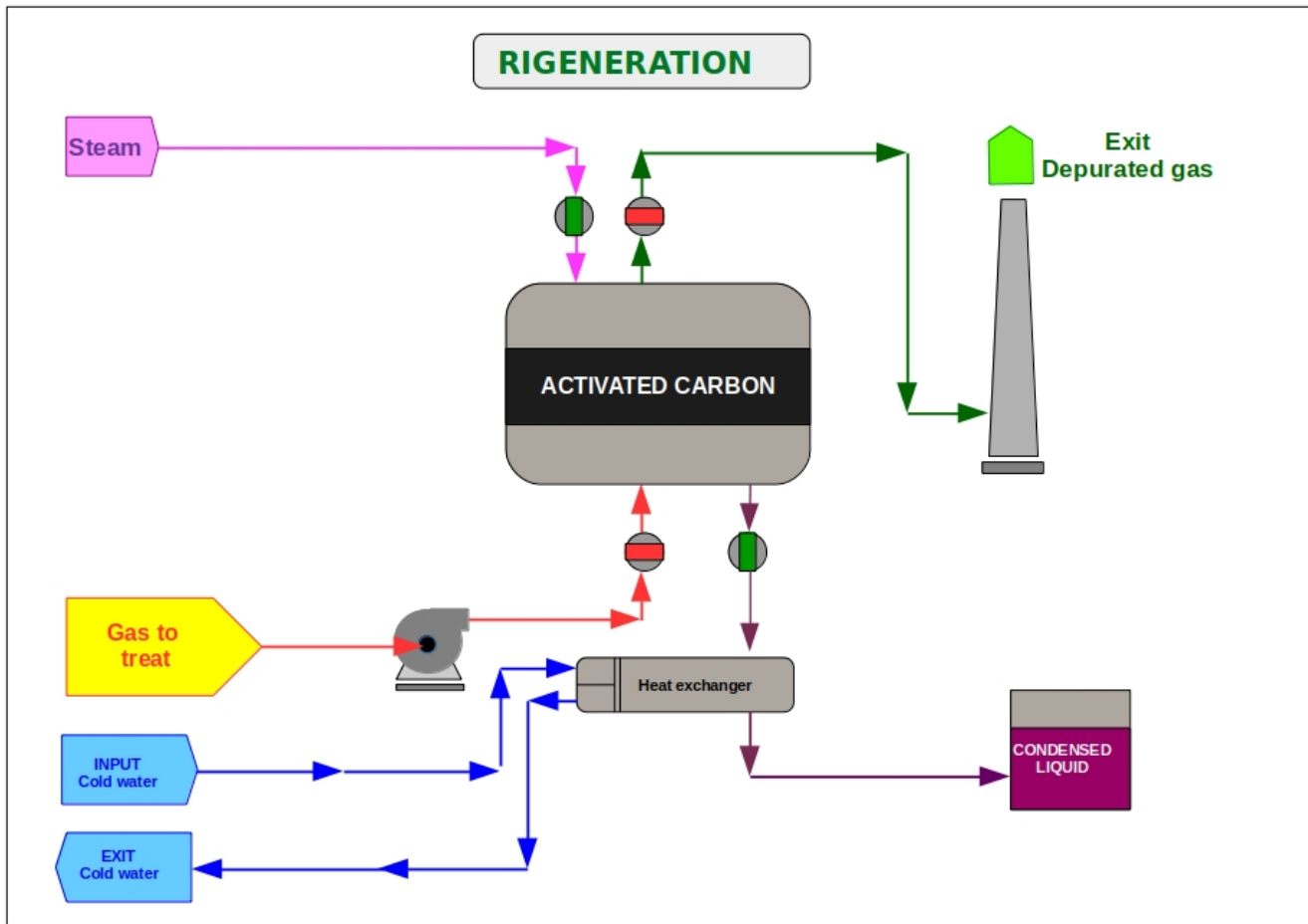
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2- Regeneration

When the activated carbon has been saturated by the pollutant it is regenerated using a flow of water vapor.

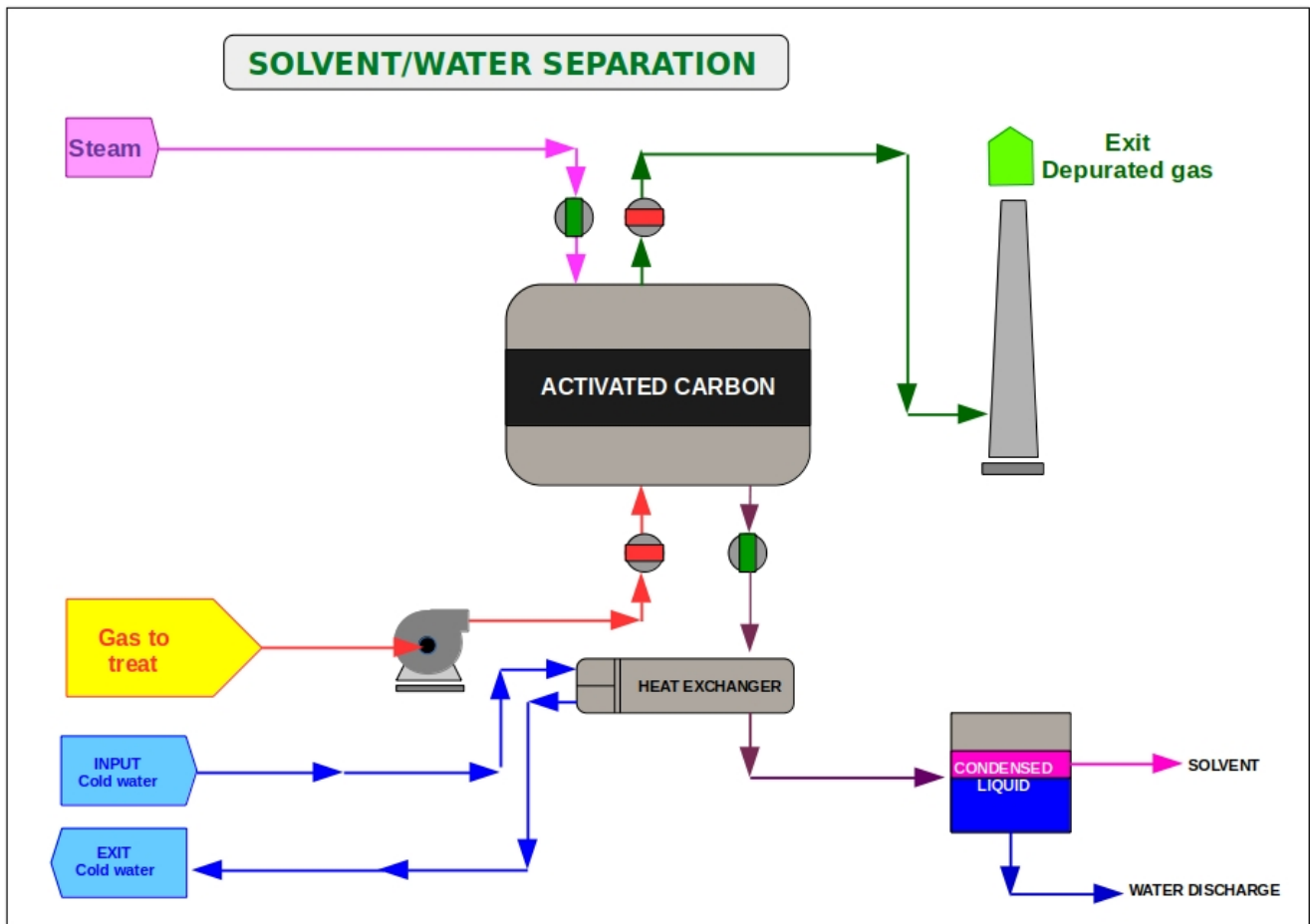
The steam leaving the carbon filter is mixed with the solvent that was retained in the activated carbon.

The steam and solvent mixture is condensed and collected like liquid in a tank.



3- Solvent/water separation

The mixture of water and solvent deriving from the regeneration of activated carbon is collected in a tank, within which, as a result of the specific weight difference, the water separates from the solvent.



The solvent back again in the work cycle and the water is disposed of.

WHEN IS IT POSSIBLE TO APPLY THE "SOLVENT RECOVERY SYSTEM"?

The solvent purification and recovery system is not always applicable, in order to recover solvent the following conditions must be present:

- 1) The pollutant to be removed / recovered is only one, in practice the process must be defined as "unique solvent".
This condition is necessary because after regeneration it is simpler to separate just one solvent from the water instead than a mixture of solvents.
- 2) The solvent to be recovered is NOT water-soluble. This condition is essential to separate the solvent from the water and reuse it in the production cycle.
- 3) That the minimum quantity of solvent is "economically" interesting. Usually the applicability of this system is positively evaluated when there is a concentration of solvent in the air to be treated higher than 1500/2000 mg / Nm³ of air to treat.





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SOLVENT RECOVERY SYSTEM, UTILITIES REQUIRED

In order to function, a solvent recovery system needs the following utilities:

- Electricity: necessary for the operation of fans and control panel
- Compressed air: necessary for the operation of the various process valves
- Water vapor: necessary in the regeneration phase of activated carbon.
If there is no steam flow in the company it will be possible to install a generator specifically designed for this purpose.
- Cold water: necessary to condense the vapor / solvent mixture.
If this fluid is not present in the company, it will be possible to install machines (evaporative tower and / or chiller) for this purpose.

CONSUMPTION

The consumption of this kind of system always depends on the size of the machine, proportionately, small machines, consume more than large machines.
Just to give an idea of consumption, we can say that for each kilogram of solvent recovered, 0.8 / 1.5 kW of electricity and 4/6 kg of steam will be used.



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CONCLUSIONS

Today the sustainability of industrial production is a central topic of our life and of the life of our planet, more and more often and in more fields the most important argument is the circular economy.

Solvent recovery systems fit perfectly into this new industrial setting, enhancing the economic results by bringing the following advantages:

- Return of the investment allocated for the purifier in reduced times;
- Lower production costs;
- Reduction and simplification of raw material movements.

