

SELF REGENERATING RECOVERY PLANT

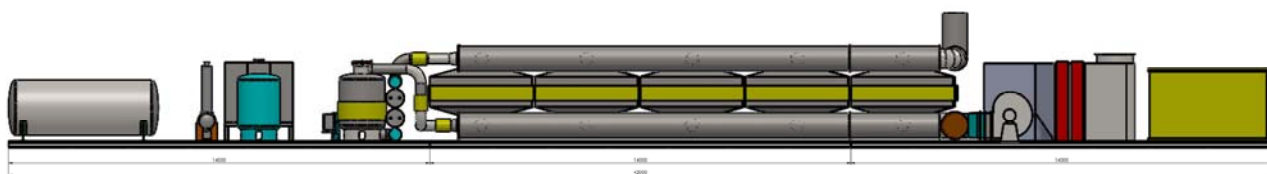
SITES srl is operating from many years in the field of solvent recovery from gaseous effluents.



The long experience has allowed us to develop an innovative technology for the regeneration of activated carbon used to adsorb volatile organic compounds in solvent recovery plants.



This new technology is called SRRP - Self Regenerating Recovery Plant



PREAMBLE

In the solvent recovery plants of first generation, the regeneration of activated carbon beds was carried out by means the use of a steam stream.

The steam is very suitable for this service because it combines the chemical-physical action to the thermal action, which facilitates the desorption of organic solvents from activated carbon.

The liquid mixture obtained downstream of the condensation of the vapor / solvent current is separated by gravity but the process is not complete and about 2% of the solvent is discharged with the waste water.

This incomplete separation, in addition to the cost for the loss of solvent, origins significant environmental problems requiring the installation of expensive and complex water treatment plants.

A second generation of recovery plants uses a nitrogen stream instead of steam for the regeneration of the carbon beds. The resulting plants are more complex with higher safety risks.

Our new SRRP technology foresees the use of a steam current for the regeneration of the beds but in a closed cycle: the condensed steam is re-evaporated and re-fed to the carbon beds in order to eliminate the effluents disposal.

ADVANTEGES OF SRRP TECHNOLOGY

The advantages of our new SRRP technology proposal are multiple, in particular regarding the safety aspects:

1 - In the recovery plants with Nitrogen the regeneration temperature is very high, about 220 ° C. This condition can generate an explosive mixture in case of leakage or infiltration of air into the system.

Considering the quantities of combustible and volatile species, the risk of explosion with catastrophic consequences is realistic.

With the use of steam the regeneration temperatures are extremely lower, about 110 ° C, minimizing the possibility of getting the risk conditions.

2 - Nitrogen Recovery plants are always associated with auxiliary facilities like cryogenic storage tanks in case of supply from nitrogen production companies or in-situ generation unit.

3 - As previously mentioned, the regeneration temperature of the carbons with nitrogen is about 220 ° C compared to the 110 ° C of the steam used in the SRRP plants. The advantages in terms of energy consumption of the SRRP system compared to traditional nitrogen plants are evident both in the heating and cooling phases.

4 - A further optimization in the energy balance of the SRRP technology foresees the recovery of the heat released by the system during the cooling phase in order to re-evaporate the condensate inside the closed loop of the regeneration steam.

5 - Traditional systems need of auxiliary units like boilers, high performance refrigeration units and evaporative towers that require continuous and costly interventions during ordinary and extraordinary maintenance.

ADVANTEGES OF SRRP TECHNOLOGY

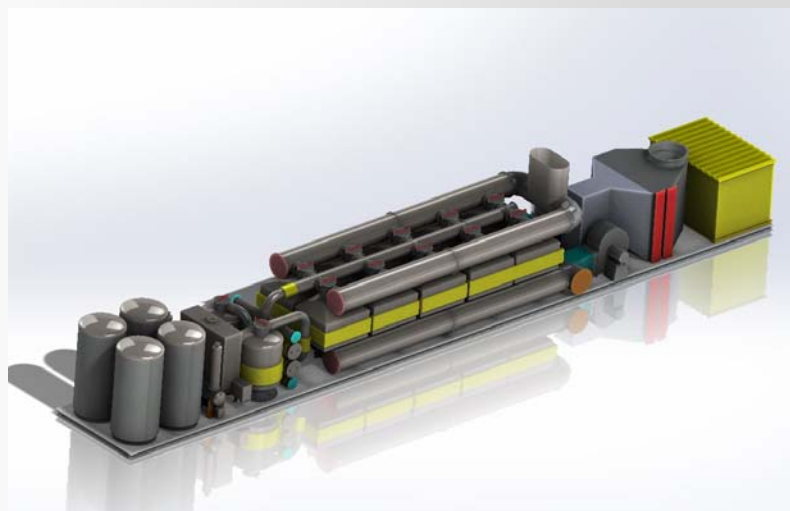
6 - Traditional systems require large installation surfaces with heavy civil works and area preparation.

SRRP systems are pre-assembled modules, ready for installation on a simple concrete basement or possibly on the roof of buildings.

7 - The workshop manufacturing and assembly time of the modular SRRP system is very concentrated such as the field installation activities. In few days is possible carry out the modules positioning on the basement and the mechanical and electrical connection of the entire recovery unit, including commissioning activities.

8 - In order to meet the various operational needs of customers, a wide range of sizes is available from 5000 Nm³ / h to 150000Nm³ / h of laden air to be treated.

9 - The investment cost of SRRP systems is extremely competitive compared to traditional nitrogen plants and comparable to incineration systems using regenerative furnaces.



CERTIFICATE OF APPROVAL

This is to certify that the Quality Management System of:

SITES S.r.l.
Via Trento, 82
22070 Fenegrò (Como) – Italia

has been approved by Lloyd's Register Quality Assurance to the following Quality Management System Standards:

ISO 9001:2008

The Quality Management System is applicable to:

Engineering, manufacturing, assembly and assistance of gas, air, oil and gas treatment plants for petrochemical and energy companies.

This certificate is valid only in association with the certificate schedule bearing the same number on which the locations applicable to this approval are listed.

Approval Certificate
No: LRC 6009580/QMS/IT/EN

Original Approval: 2nd June 2010

Current Certificate: 14th June 2016

Certificate Expiry: 14th September 2018


Issued by: Lloyd's Register Quality Assurance Italy Srl
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CERTIFICATE SCHEDULE

SITES S.r.l.
Via Trento, 82
22070 Fenegrò (Como) – Italia

Locations

Via Trento, 82
22070 Fenegrò (Como) – Italia

Via Milano, 74 b
22070 Bregnano (Como) - Italia

Activities

Engineering, project management, manufacturing and assembly and assistance of electrical panels, control and power panels for petrochemical and energy companies. Prefabrication of steel structures.

Engineering, project management, manufacturing and assembly of gas, air, oil and gas equipment for petrochemical and energy companies. Technical assistance activities.

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