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TWT EXPERIENCE

Customer	**BRIANZACQUE - PURIFIER OF MONZA SAN ROCCO**
Sector	**LIQUID WASTE SECTOR - CIVIL AND INDUSTRIAL WASTE WATER TREATMENT PLANT**
Plant	**5-STAGE SCRUBBER AND DEODORISER**

BACKGROUND

Situated in the San Rocco district of Monza and built in 1966 on the left bank of the Lambro river, over an area of 12 hectares, the plant receives and purifies the sewage discharges of 26 municipalities in the Province of Monza and Brianza and 319 production facilities, placing it among the largest in the Lombardy region.

It has a capacity of 600,000AE, purifies about 56 million m3 of water annually, collected by a sewage network that extends over 2,954 km of pipelines, and produces about 7,000 tonnes of dried sludge for disposal.

It is a continuous cycle plant, operating 24 hours a day, 365 days a year, and equipped with technological remote control instruments that monitor the purification process and odour emissions in real time.

Of the 'biological activated sludge' type, it was among the first purifiers to complete the sludge treatment chain with a thermal drying plant that allows its subsequent reuse as a secondary fuel in cement kilns.

PROBLEM STATEMENT

Odour abatement of the thermal sludge hydrolysis plant was initially approached with the installation of a horizontal scrubber, a technology that proved to be ineffective in removing a high odour load, **resulting in discomfort for the neighbouring neighbourhood.**

APPROACH

Considering the particular problem to be addressed, **we devised an innovative solution based on our proprietary AMDS Advanced Multistage Deodorization System.**

We therefore opted for a process that involved backwashing between the recirculation liquid atomised through nozzles and the gas to be treated on special vertical towers with the same footprint as the demolished horizontal model.

PLANT

The plant consists of **5 washing and deodorisation stages realised in 2 wet towers (scrubbers)** operating in series for the abatement of the vapours carried by the mixture consisting of the gas currents coming from the sludge oxidation tanks (NO) and final activated carbon (GAC), the primary sludge collection tanks, the anaerobic stabilisation digested sludge collection tanks, the mechanically thickened sludge tanks, the post-combustion unit's sludge heat treatment tank and the hydrolysed sludge tanks.

TECHNOLOGY

The first abatement tower has 2 separate chemical washing stages inside, the second 3 (the first 2 like the first, plus a final neutral wash with water).

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The Contact Time and the definition of the design parameters comply with the Lombardy Region's guidelines for single towers even though the multi-stage technology is innovative and exceeds what is required for single scrubber towers.

The filling bodies of the above-mentioned scrubber stages are made up of **special random rings** that promote better contact with the sucked in aeriform, ensuring optimal management of the periodic fouling phases.

The structure of these rings forms a dense layer of mesh on which the atomised washing liquid and the polluted air, in upward motion, come into contact: at this moment, the chemical reaction develops, **resulting in the neutralisation of the substances in the air and the removal of the odour.**

Each tower is equipped with a droplet stop filter at the outlet. Before the treated air is emitted into the atmosphere, the flow can be conveyed to the activated carbon treatment unit as a refinement for the removal of any residual substances.

INSTALLATION

The turnkey project lasted approximately 6 months (design, construction and installation) and **included a dedicated facility to facilitate maintenance operations** on the scrubber towers.

MONITORING

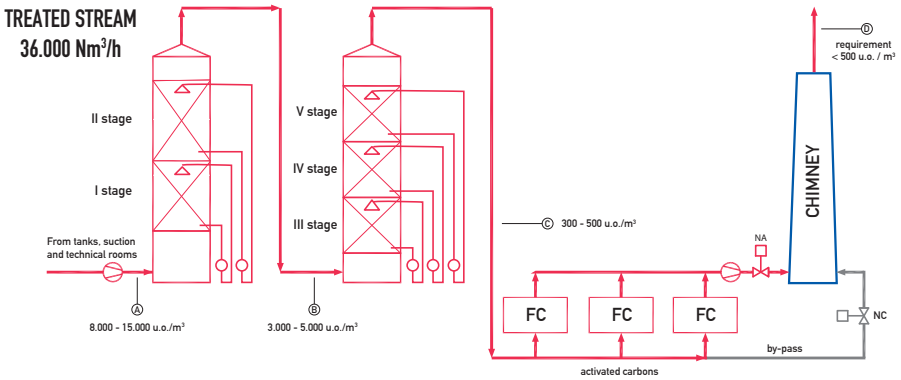
The system was monitored for the first few months of operation and the order of reagents was reversed to optimise efficiency. To date, the system is periodically monitored with olfactometric analysis and chemical analysis at the stack emission.

RESULT • YIELD

The system thus created and automatically controlled by a SCADA supervisor is able to reduce the odour from around 6,000/10,000 o.u./m3 to a value of less than 500 o.u./m3 after scrubbing. Downstream of activated carbon, on the other hand, values in the order of 250/300 o.u./m3 are obtained with annual replacement.

APPLICATIONS

All civil and industrial wastewater treatment plants with a high odour content, in particular screenings and sludge management.



SUBSTANCE	LIMIT	ENTRY POINT	SCRUBBER OUTPUT	GAC CHIMNEY OUTPUT	TOTAL YIELD
H_2S	1 mg/Nm³	< 40 mg/Nm³	< 0,5 mg/Nm³	< 0,1 mg/Nm³	99 %
Mercaptans	4 mg/Nm³	< 10 mg/Nm³	< 0,5 mg/Nm³	< 0,1 mg/Nm³	99 %
COV Nm	20 mg/Nm³	< 100 mg/Nm³	< 30 mg/Nm³	3,0 mg/Nm³	97 %
NH_3	5 mg/Nm³	< 100 mg/Nm³	< 0,5 mg/Nm³	< 0,5 mg/Nm³	99 %
ODOURS	500 o.u./m³	< 10.000 o.u./m³	360 – 500 o.u./m³	< 300 o.u./m³	99 %

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