Adsorptive and chemisorptive exhaust air purification
Eliminating odors in a waste water treatment plant

Client: Manufacturer of chemical active substances and biotechnological derived active ingredients.

In spring of 2014 a multi-stage exhaust air purification plant for hydrogen sulfides and organic hydrocarbons designed and manufactured by SÜLZLE KOPF was installed at the R&D facility and production site. Following the successful commissioning the plant started operation as scheduled and has been running with highest availability ever since.

Our scope of delivery for this turn-key plant included:
- Complete process layout and dimensioning
- Design and construction of the condensation and dehumidification stage, air conveyance, and of the chemisorption and adsorption
- Entire pipework including an automatic flap valve control for online adsorbent exchange
- Ex-protection concept
- Definition of the ex-protection zones
- Control concept with FMEA

Minimum use of resources
energetic and thermodynamic optimized dimensioning

Optimized odor elimination
for a wide range of odor-causing substances

Ex-protected plant
Plant description:
The exhaust air of the primary sedimentation basin of this industrial sewage treatment plant caused foul odor nuisance in the surrounding company buildings. These unpleasant odors are eliminated by chemically reacting with the adsorbent material. The 35°C warm and vapor water saturated air over the clarifier is drawn off and cooled down to 15°C with the condensation stage. Using the compression heat the crude air is pre-dehumidified followed by the final dehumidification by a re-heating phase. The multi-stage adsorption plant first eliminates the hydrogen sulfides and mercaptanes and then other odor-causing organic substances in the crude air. The completely odor-free purified air is then released into the atmosphere.

This adsorptive and chemisorptive exhaust air purification plant was designed and constructed in accordance to:
- VDI 3928: Waste gas cleaning by chemisorption
- VDI 3674: Waste gas cleaning by adsorption - Process gas and waste gas cleaning Betriebssicherheitsverordnung
- Machinery Directive 2006/42/EC
- Explosionsschutztechnischen Richtlinien BGR 104: Explosion Prevention Rules (EX-RL) BGR 132 and TRBS 2153: Avoidance of danger of ignition due to electrostatic loadings
- German Recycling and Waste Act §25 KrW-/AbfG resp. §26 KrWG

The picture shows the tube bundle heat exchanger as condensation stage with an 1.4571 insulation.

Technical specifications:
Plant capacity: 2.000 Nm³/h
Pollutants: hydrogen sulfide, mercaptanes and other odor-causing organic substances

Limit value of purified air: odor threshold

Our range of services:
- Complete engineering and 3D design
- Complete implementation
- Own manufacturing
- Complete assembly
- Engineering, installation and commissioning
- Complete documentation
- Step sequence planning and Electrical/I&C engineering
- Activated charcoal exchange service

SÜLZLE KOPF is your partner for adsorptive exhaust air purification with or without conditioners, and also for solutions applying:
- thermal technology
- regenerative technology
- catalytic technology
- absorptive technology
- and for ozone destruction

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