

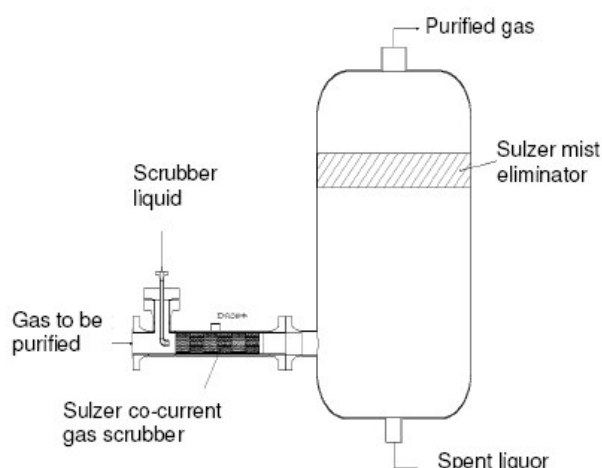
Sulzer Co-Current Gas Scrubber

An attractive opportunity to improve gas scrubbing operations

The Sulzer co-current gas scrubber is an efficient in-line contacting device used for contaminant removal. This in-line co-current contactor provides the surface area, turbulence and residence time required to maximize mass transfer.

Principal application for the Sulzer co-current gas scrubber is gas absorption followed by a fast chemical reaction in the liquid phase (chemisorption).

The scrubber liquid is sprayed into a pipe containing in-built Sulzer Static Mixing Elements – the heart of the Sulzer co-current gas scrubber. Due to the high number of plates the static mixing elements induce intense turbulence and intimate contact between the gas containing the substance to be removed and the scrubbing liquid as the two streams travel co-currently through the pipe. The enhanced interfacial surface area between the phases is sustained along the entire length of the contactor. The operational efficiency remains constant over a wide range of flow rates and viscosities.



Other co-current scrubber designs such as simple spray nozzle and venturi contactors are also available. While most operate satisfactorily at design rates, the efficiency is greatly affected when flow conditions vary. The Sulzer co-current system operates efficiently over a wide range of gas velocities - even at high gas velocities or liquid loads since there will be no flooding. This is extremely important in hydrocarbon processing, process gas treatment and exhaust gas treatment applications where flow rates can change considerably over time. The final result is an efficient removal of sour components, salts or other impurities from the process gas.

Subsequent liquid separation occurs in a downstream, often multifunctional vessel, such as a collecting tank. The spent liquor is circulated with a pump and must be renewed either continuously or batchwise.

Many years of experience and continuous development efforts have enabled Sulzer to offer optimum and economic solutions to a wide range of gas scrubbing problems.

Here are a few examples of applications:

Hydrocarbon Processing

- Scrubbing acidic gases (HCl, Cl₂, H₂S, SO₂) from exhaust regeneration gas in catalytic reforming plants
- Scrubbing HF or H₂S from product gas prior to an air cooler tube bank in hydrogenative cracking process (HCU / HDS)
- Selective H₂S absorption in the presence of CO₂ for the processing of natural or petroleum gas
- CO₂ removal with DEA, MDEA or other amines
- Absorption of H₂S from coking processes
- Drying of natural gas with glycols for dewpoint reduction of 35° C and more

Process Gas Treatment in chemical and petrochemical industries

- HCl removal in ethylene dichloride plants
- Scrubbing impurities from organics with water
- Absorbing ammonia with brine from gas also containing CO₂, H₂O and air

Exhaust Gas Treatment

- Scrubbing H₂S from spent air with caustic
- Scrubbing HCl from reactor exhaust gas with water e.g. in incineration plants
- Scrubbing alkaline components, such as NH₃ from reactor exhaust gas with sulfuric acid
- Exhaust gas scrubbing of chlorinated hydrocarbons after furnaces
- Removal of dust, e.g. after dryers from exhaust air of industrial plants

Sulzer co-current gas scrubbers provide significant advantages. Considerable savings in investment and servicing costs by comparison with other installations are possible. Hence significant operating advantages are achieved:

- Small overall dimensions due to high gas velocities up to 25 m/s
- Low energy demand thanks to low pressure drop (0.5 kWh/1000 m³ gas)
- Small amounts of scrubbing liquid are required due to the large interfacial surface area generated between the two phases
- Minimal influence of gas load variations on efficiency
- Vertical or horizontal installation possible resulting in flexibility to fit most existing or new systems
- Easy and predictable scale-up of pilot data
- No moving parts and insusceptibility to clogging thus eliminating routine maintenance expenses
- Low operating costs.

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