

Tray scrubbers

Technology
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Tray scrubbers are used for cleaning gas flows which are contaminated with both particulate and soluble noxious gases. Their unique design enables them to capture particulate > 2 micron as well as soluble gases to high efficiencies of removal. They are widely used in the mining, mineral processing, fertiliser, chemical and petrochemical industries amongst others.

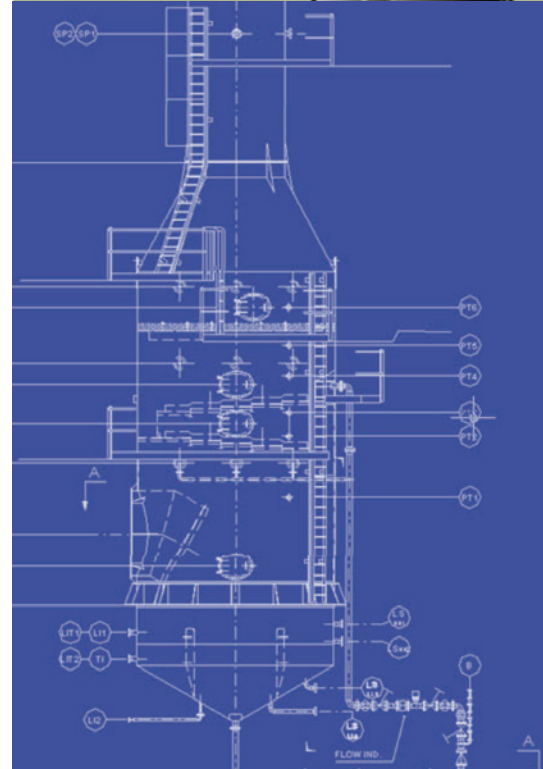
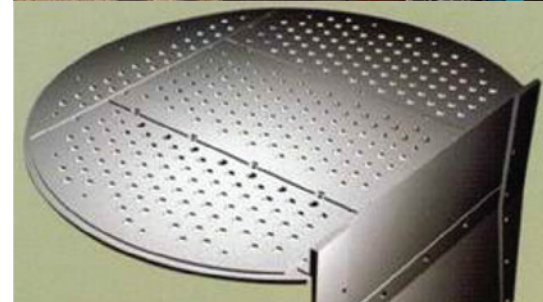
Bespoke designs are prepared by ERG's experienced process engineering team to meet your specific application and detailed requirements.

Key advantages of tray scrubbing are:

- Multiple tray stages of scrubbing give excellent efficiencies of removal
- Highly effective at treating large gas flows at comparatively low capital cost
- Running costs are relatively low due to the low gas side pressure drop and the low liquor rates required
- Trays are self-cleaning, reliable and robust
- Trays types such as fixed valve design can be matched to suit the application
- Tray weir height can be adjusted to give enhanced capture of contamination and greater turn down if this is required

Design parameters:

- Flowrates from 2,000 to 100,000 m³/hr per tower, multiple cylindrical towers in parallel or rectangular cross-section for higher flowrates
- Removal of any soluble gaseous contaminant and soluble or insoluble particulate >2 micron
- Gaseous contaminant loadings typically from 100 to 10,000 mg/m³; particulate loadings typically up to 5,000 mg/m³
- Removal efficiencies typically 90-95% and up to 99% as required
- Vessel diameters from 600 to 3,800mm; vessel heights up to 12m



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Key features

- Complete systems supplied including recirculation pumps, pipework, fans, ductwork, access platform, instrumentation and control system. They can also be integrated with other ERG mass/heat transfer equipment (e.g. quench, venturi, carbon filter, etc.) into a single air pollution control solution
- Trays used include simple perforated plates and impaction valve designs
- Adjustable weirs provide variable pressure drop and stage efficiency; under-tray sprays improve resistance to fouling
- Recirculated liquor flowrate selected to minimise pump flow and energy consumption at optimal scrubbing performance
- Droplet elimination using chevron, impaction blade or woven mesh design to suit application – clean-in-place sprays available to assist with on-line maintenance
- Scrubber sump tank integrated into the packed column vessel – cone and sloping base designs are available to improve maintainability in solid-laden applications
- Chemical dosing, water make-up and blowdown control matched to the performance requirements
- Instrumentation selection to give robust operation, high reliability and tight performance control
- System control by stand-alone MCC/C&I panel or integrated DCS, with HART or Profibus protocols available as standard
- Vessels designed as standard to PD5500 (metal) and BS4994 (GRP) with CE marking to PED as appropriate. Other design codes available as required
- Materials selection to suit contaminants and reaction chemistry: common materials include uPVC, PP, cPVC, derakane GRP, crystic GRP, 304SS, 316SS

Examples of typical scrubbing applications

- SO₂ scrubbing using NaOH solution, often in combination with fly ash removal from flue gases
- SiO₂ and soluble phosphate particulates from fertiliser (granulator) production
- Food industry particulate
- General industrial
- HCl scrubbing using NaOH solution to achieve extremely low discharge concentrations
- NH₃ scrubbing using dilute sulphuric acid solution

