

"Adapting the the New Design Challenges for Large Tower Construction for Carbon Capture and Flue Gas"

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Keywords Flue Gas, Absorbers, Large Vessels, Mass Transfer Internals

Abstract Text (500-1000 words - maximum 2 pages, font 12)

Cansolv and others participating in CCS and environmental projects are specifying large flue gas absorbers, often with new geometry, new material of construction (MOC) and mass transfer internals. Large mass transfer packed towers have been deployed before, but typically in low flow rate applications in steel vessels. Therefore, the need to design packed vessels in very large scale, low pressure, high flowrate environments – considering new geometry and MOC represents significant new mechanical and process design challenges:

- ◇ High gas flow rates and low liquid flows add to the challenge of proper distribution
- ◇ Absorber Challenges: contact large quantities of flue gas with aqueous solvents over multiple sections of packing, while minimizing pressure drop.
- ◇ Strippers Challenges: introduce significant quantities of steam and turbulence to regenerate the solvent, while needing to accommodate dual phase and proper distribution.
- ◇ Both units involve oxidative and corrosive fluids, which introduces the need for the sealing of collector trays to minimize leakage of solvents between adjacent sections.
- ◇ Mechanical considerations such as special vessel surfaces and support arrangements, and the need for securing major support beams.

Decisions on how to address the needs and minimize the risk requires the involvement of designers with the internals supplier, the technology supplier and the End-User. This paper presents the various equipment and vessel MOC issues expected and explored by Sulzer and Cansolv in developing offerings for large scale packed vessels for SO₂ and CO₂ capture.