DATASHEET

Gas Quencher

Vertical down-flow liquid film Quencher

GAS CLEANING SYSTEMS DIVISION

Hamworthy Combustion Gas Quenchers, thanks to their expressly developed dual feed technology, ensure the effective and complete adiabatic saturation of gases even at very high temperature.

Quencher design has been developed for severe, dirty application with sticky dusts typically generated by wastewater incineration and is suitable also for acid and corrosive gases such as those coming from off-gas or vent-gas incineration units.

Hot gases enter the Quencher from the top through an anti-acid bricks refractory-lined nozzle and flow down the quenching zone where the quenching liquids are fed to the pool and to the spray tips. Liquids fed to the pool overflow down the inner surfaces and create a continuous liquid film that protects the shell. Liquids fed to the spray tips are atomized inside the gas stream thus capitalizing on the gas turbulence for optimal heat and mass transfer.

Hamworthy Combustion Gas Quenchers can be installed immediately above a Hamworthy Combustion Venturi Scrubber, thus becoming part of an integrated system that puts together in a single stage gas quenching and high efficiency dust collection capabilities.

Design Characteristics

Hamworthy Combustion Gas Quenchers can be operated both under pressure, when the gas stream is moved by a forced draft fan or by the combustion air blowers of the Thermal Oxidizer, and under vacuum, when the need of reducing the Waste Heat Boiler design pressure requires the installation of an induced draft fan for exhaust gas extraction.

The anti-acid refractory bricks lining of the inlet gas nozzle makes the equipment suitable also for modern thermal oxidizers exhaust gases typical outlet temperatures (1,100°C / 2,000°F).

Open-Pool and Sealed-Pool designs are available depending on the nature and pressure of the gas to be treated. The first configuration typically applies to near atmospheric systems while the second best suits pressurized and vacuum applications.

Spray tips are non-clogging type for higher reliability and their connections are expressly designed for easy maintenance.

Straight cylindrical design ensures minimum pressure drop and maximum resistance against scaling and/or plugging.

Performance Features

Complete adiabatic saturation is ensured even at turn-down ratios as low as 20% of design gas capacity with no need for automatic control loops on circulation rates. Gas temperature as high as 1,100°C (2,000°F) and quenched gas flow rates up to 170,000 m^3/h (100,000 acfm) can be processed in a single unit. Spray tips are operated with slight excess liquid (referred to evaporated water) and fairly low pressure drop so that head requirements of pumps are minimised. A recycle tank can be integrated in the downstream wet scrubbing system or dedicated to the quenching stage. Quenching liquid can be recycled slurry with suspended solids or dissolved salts, fresh water or a combination of the two. Single quenching units as well as complete packages including scrubber, piping, ductworks, rotating equipments etc. can be supplied. ASME Code or any other international pressure vessel design code can be applied.

Design Advantages

- Suitable for very high temperatures
- Low operation costs.
- Maintenance-free.
- Low pressure drop.
- Compact design.
- No risk of scaling or plugging.
- Suitable for severe and dirty services.
- Simple control system.
- Compatible with Hamworthy Combustion Venturi Scrubber.
- Compatible with ASME Code

Specification

Gas Flow:	1,700 m3/h (1,000 acfm) to 170,000 m^3/h (100,000 acfm)
Gas Temperature:	Up to 1100°C (2000°F) and higher
Gas connection:	Special flanges according to any code.
Nominal Diameter:	200 mm (8") diameter to 2000 mm (80") diameter
Overall Height:	1500 mm (5 ft) up to 2500 mm (8 ft)
Water Consumption:	Evaporated water plus blow-down.
Material of Construction:	Stainless Steel, Duplex SS, other alloys, Graphite
Lifting lugs:	Provided as standard

Notes:
The Hamworthy Combustion Gas Quencher is individually designed for each installation.
The Liquid Pumparound is related to the inlet gas properties

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COMBUSTION

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Flares/Quencher/August 2008/Rev. 1