

AHT Product Scope - Wet Gas Conditioning



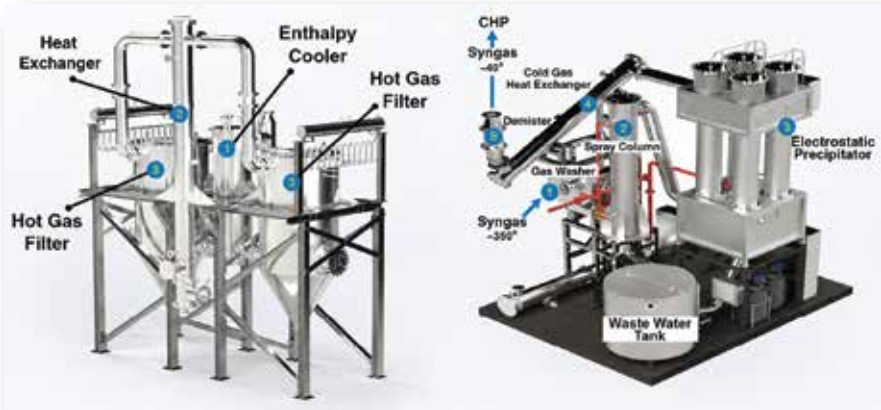
Overview

Within AHT's Gas Conditioning portfolio, our Wet Gas Conditioning is designed for applications requiring higher-purity synthesis gas. By extending the Dry Gas Conditioning process with additional cooling and water-contact cleaning stages, the system removes residual tar, aerosols, and water-soluble contaminants to produce high-quality syngas. This conditioned syngas is ideal for demanding applications such as Combined Heat and Power (CHP) systems, where consistent gas quality is essential. The process also protects downstream equipment, reduces maintenance, and improves overall plant efficiency by delivering a stable fuel gas.



Products

For applications requiring higher-purity syngas (e.g. utilization in a CHP), AHT CleanTec provides a Wet Gas Conditioning solution. Through this multi-stage process that combines with the Dry Gas Conditioning process, the syngas undergoes additional water-contact cleaning stages, to remove residual tar, aerosols, and water-soluble contaminants. The result is a high-quality syngas suitable for a wide range of demanding downstream applications.



Wet Gas Conditioning

Technical Data

	EcoFilter-Wet Compact	EcoFilter-Wet Performance	EcoFilter-Wet Industrial
Wet Gas Conditioning			
Dust Removal	<10 mg/Nm ³		
Tar Removal	<50 mg/Nm ³		
Outlet Pressure	70 mbar		
Outlet Temperature of Syngas	40-50 °C		
Total Extracted Heat from Syngas	~135 kW (at ~70°C) ~15 kW (at ~20°C)	~295 kW (at ~70°C) ~30 kW (at ~20°C)	~590 kW (at ~70°C) ~60 kW (at ~20°C)
Water Consumption	Wash Water: < 17500 kg/h Fresh Water: ~125 kg/h	Foul Water: 35000 kg/h Fresh Water: ~250 kg/h	Foul Water: 70000 kg/h Fresh Water: ~ kg/h

Process Breakdown

- 1** Firstly, high-temperature raw syngas from the gasifier enters the enthalpy cooler, where it is cooled using the enthalpy of water vaporization, reducing the temperature to approximately 500°C for safe downstream handling.
- 2** Next, the syngas then passes through the hot gas filter, where solid particulate matter larger than 2 μm is captured on filter candles at high temperatures, ensuring a clean gas stream and preventing it from contaminating the downstream equipment.
- 3** Thermal energy is then recovered in the hot gas heat exchanger, while the gas is further cooled to enable the removal of heavy tars in liquid form. Following this, the water then enters the spray column where it is introduced in counterflow over a packed bed.
- 4** This increases its contact surface area, removes residual fine dust particles and water-soluble components, while reducing the gas temperature to approximately 40°C. The syngas is then sent to a gas scrubber to remove all dust and particles while also generating pressure, and creating an aerosol that will be further processed.
- 5** Afterwards, the remaining aerosols are removed in an electrostatic precipitator, followed by further cooling in the cold gas heat exchanger using a chilled water circuit to reduce moisture content, and to prepare the gas for downstream use.
- 6** Finally, a demister removes the residual water mist, and the cooled and purified gas is conveyed via the gas blower to its end-use application, such as a CHP gas engine.

Benefits

Through our syngas generation technology, a wide range of benefits can be achieved, including:

01

Flexible Gas Utilization

Through our Wet Gas Conditioning process, dust, tar, contaminants, and aerosols are removed, reducing wear, maintenance, and operating costs. The resulting high-purity syngas is suitable for CHP systems and other industrial applications.

02

Efficient Heat Integration

Heat removed from the syngas inside the gas conditioning unit can be used efficiently for other processes (e.g., drying, space heating, or steam generation), thereby improving overall system efficiency.

03

Part-Load Capability

The gas conditioning system accommodates variations in syngas production, ensuring stable and efficient gas cleaning over a wide operating range. This enables seamless integration with changing process conditions while maintaining consistent gas quality.

04

Emission Control

Our Wet Gas Conditioning process removes dust, tar, aerosols, and water-soluble contaminants, helping downstream processes meet emission limits while ensuring stable, compliant operation.