

**FLSMIDTH  
CEMENT**



# **GAS COOLING TOWER**

# RELIABLE, LOW-MAINTENANCE GAS COOLING

Our cooling tower can be used for any cooling of gases – such as preheater exhaust, cooler excess air and kiln bypass systems – before they are conveyed to mills and filters. The hot exhaust gases enter the top section of the vertical, cylindrically shaped and insulated tower, and are drawn through the cooling tower by a fan. Some of the dust from the gases is precipitated and collected in the bottom hopper of the conditioning tower and extracted by a conveyor.

## 2-PHASE WATER/COMPRESSED AIR ATOMISATION SYSTEM

- Superior cooling effect
- Continuous droplet quality
- Less frequent maintenance
- Unique fast reacting FLSmidth Cement control system
- Highly reliable

## KEY BENEFITS

Low initial cost

Low power consumption

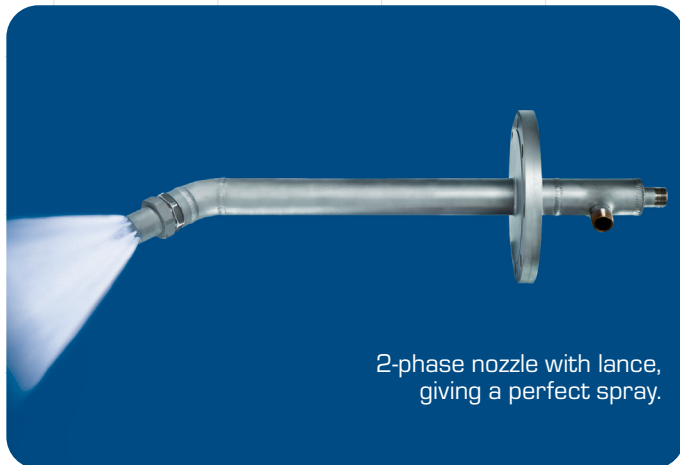
Highly reliable

### Two nozzle systems

We have years of experience with this technology, and offer towers with two different principles for water atomisation:

1. The original FLSmidth® nozzle system that operates at high water pressure
2. The newer 2-phase nozzle system that operates with water and compressed air at low pressure

As an alternative to the complete cooling tower, the 2-phase nozzle system can also be used for cooling gases entirely in the vertical down duct. In this configuration, a small bottom outlet should be installed, but there will be no transport system for dust removal.



2-phase nozzle with lance, giving a perfect spray.

### Optimised performance

In both systems, design of the tower and gas inlet in particular, is optimised for top performance based on CFD (Computational Fluid Dynamics) analysis and our in-depth experience with cooling tower technology. Also, both systems use FLSmidth's proprietary thermodynamic control system, which is self-adjusting and reacts very quickly to changes in operating conditions.

### High-pressure system

Each of our two systems has certain advantages. The high-pressure system is simpler, has a lower initial cost and consumes less power. However, it needs more frequent maintenance of the nozzles than the dual system, or else its spraying becomes less efficient over time. The high-pressure system also requires clean water, as specified in the FLSmidth Water Quality Specifications.

### 2-phase system

The 2-phase system's compressed air equipment makes it more complex, but the atomisation of water is more efficient and forms smaller droplets. Therefore, it offers a better cooling effect, requiring a smaller, space-saving tower. The nozzles are easier to maintain and last longer because of lower pressure applied.

The 2-phase system provides continuous droplet quality, with small droplets that are easier to control. It can handle more water impurities than the high-pressure and offers less risk of unplanned production shutdowns for maintenance.

### Upgrades

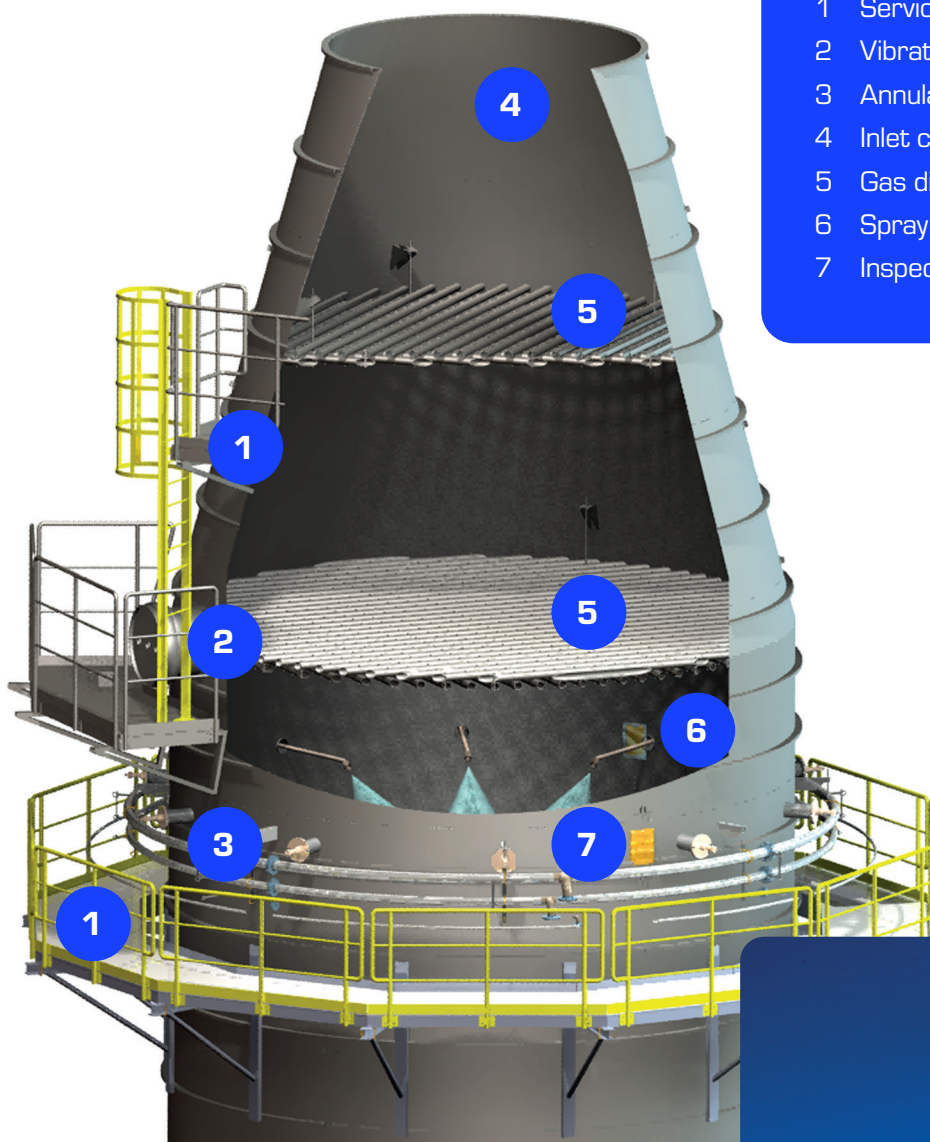
Most of our cooling tower systems are sold into complete new plants. However, they are also available for upgrades and modernisation of existing plants. 2-phase system technology installed in an existing tower with high-pressure nozzles will result in much higher capacity. After initial preparation, upgrades can be completed within approximately two weeks of downtime.



### Operating parameters (both systems)

- Operating temperature: from inlet up to 600°C down to 150°C
- Inlet air flow: up to 700,000 Nm<sup>3</sup>/hr.
- Water consumption: up to approx. 80 m<sup>3</sup>/hr.





- 1 Service platform
- 2 Vibrator for screen
- 3 Annular pipes
- 4 Inlet cone
- 5 Gas distribution screens
- 6 Spray lance
- 7 Inspection hatch



[www.flsmidth-cement.com](http://www.flsmidth-cement.com)

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