



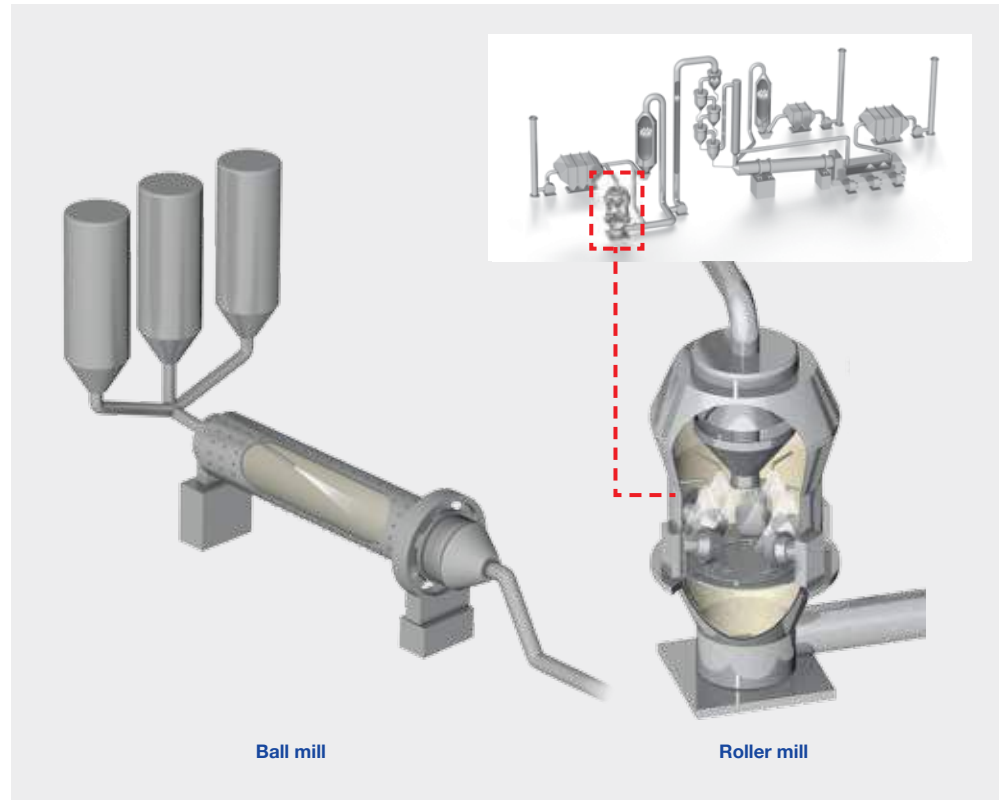
GAS COOLING APPLICATIONS BALL AND ROLLER MILL

Application

Heating during the grinding process can decrease the quality of the ground material. Through the injection of water into the ball mill, excess heat is dissipated and the outlet temperature is kept at the desired level.

Only if overtemperatures can be reliably avoided can the ground raw material or the ground cement be safely and efficiently conveyed and stored.

In the case of roller mills, the grinding bed is stabilized by the injection of liquid, thus optimizing the grinding process.



Our solution

We usually recommend single or twin-fluid systems for injection, optionally fitted with rotary feedthroughs for the lances.

Spillback nozzles

Atomization without compressed air



Lechler spillback nozzles atomize liquids as a fine hollow cone.

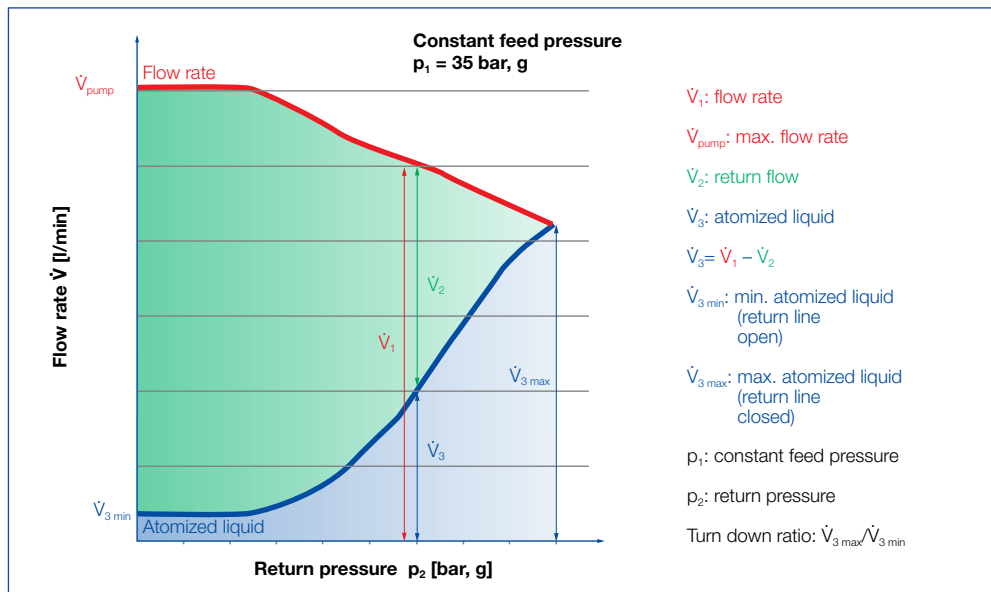
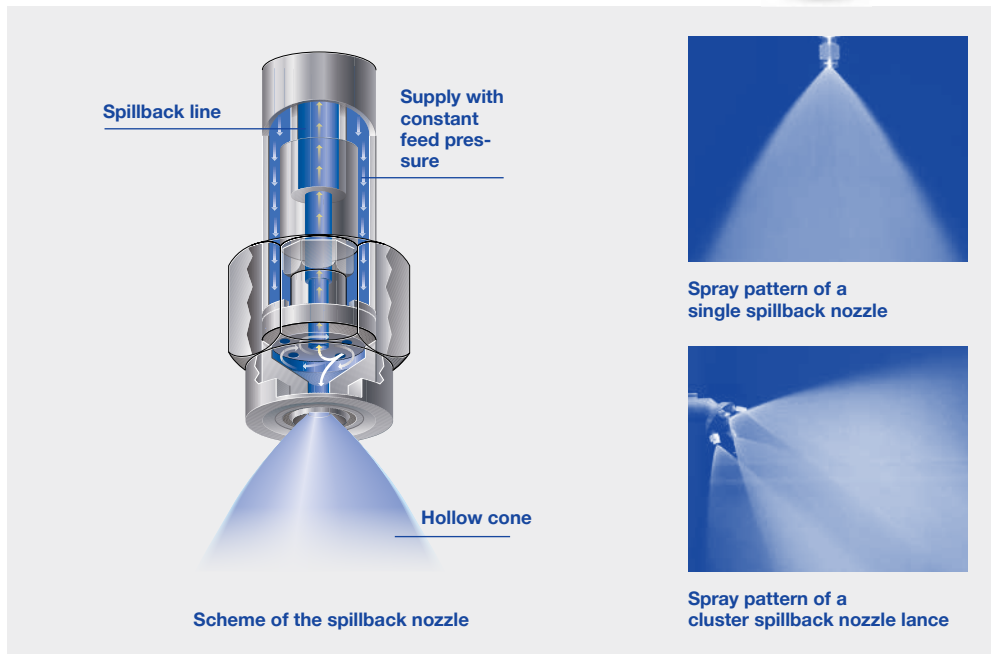
This special single-fluid nozzle works according to the pressure atomization principle. The water is sent to the nozzle with a relatively constant feed pressure, independent of the atomized flow rate.

The amount of liquid injected is adjusted via a control valve in the spillback line, whereby part of the flow is taken from the inlet flow rate and returned to the tank. The maximum atomized flow rate is achieved with the control valve closed.

Uniform and fine liquid atomization is achieved across the entire control range.

The atomized flow rate can be distributed over cluster heads with up to six small nozzles. This results in a total spray angle of approximately 120°.

This wide distribution of liquid over the entire duct is advantageous for reducing the number of lances.



Use:

- Gas cooling in medium-sized and large gas cooling towers

Properties



Spray angle of the individual nozzles
90° or 60°
as hollow cone



Low operating costs as no atomizing air required



Execution
as single or cluster nozzle lances possible



High turn-down ratio
of up to 12:1



Even and fine liquid atomization
over the entire control range



Typical pressure range
of 35 bar, g in the supply line at the nozzle

VarioJet® nozzles

Twin-fluid nozzles with low air consumption despite large outlet angle



Lechler VarioJet® nozzles

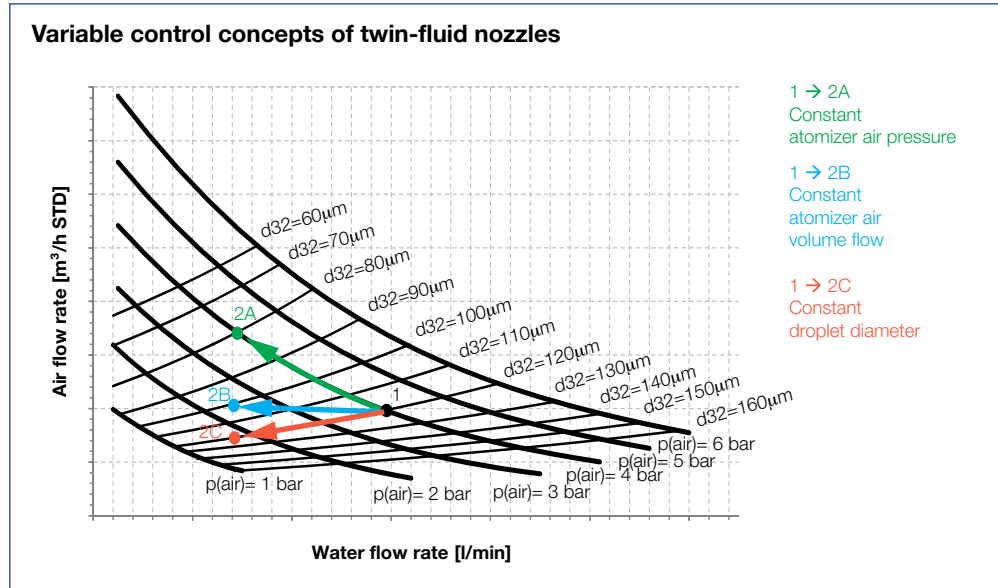
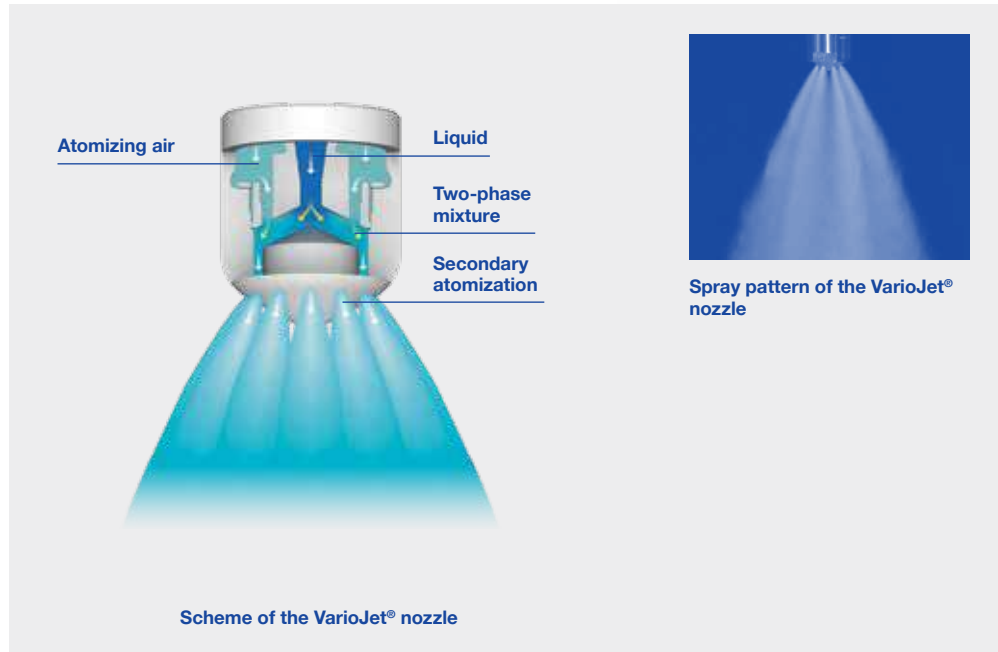
atomize according to the principle of internal mixing. With this twin-fluid nozzle, the water is fed in axially via a bore hole.

After arriving at the cone tip, the liquid is split up into a thin liquid film. This thin liquid film is split into finest droplets by the atomizing air in the mixing chamber. The resulting two-phase mixture is then atomized a second time when exiting via several bore holes arranged in a circular fashion.

Thanks to the innovative design of the nozzle, a spray with a large outlet angle is achieved. This is characterized by an even liquid distribution as well as a fine droplet spectrum with a low specific air consumption.

The fineness of the droplet spectrum is decisively influenced by the air/liquid ratio and by the pressure level of the two flow rates. As a general rule: the higher the air/liquid ratio and the higher the pressure level of atomizing air and liquid is, the finer the droplet spectrum.

The large free cross-sections in the nozzle keep the risk of clogging and the maintenance effort to a minimum.



Use:

- Gas cooling in gas cooling towers as well as gas-bearing pipes (ducts)

Properties



Large spray angle (60°, 90°) for good coverage of the cross-section of the duct



Adjustment of the droplet spectrum by changing the air/fluid ratio



Clog-resistant thanks to large free cross-sections without internal fittings



High turn-down ratio up to 20:1



Low air consumption



Typical pressure range
Liquid 1-9 bar, g
Atomizing air 1-6 bar, g

Laval nozzles

Twin-fluid nozzles for a wide droplet spectrum in special applications



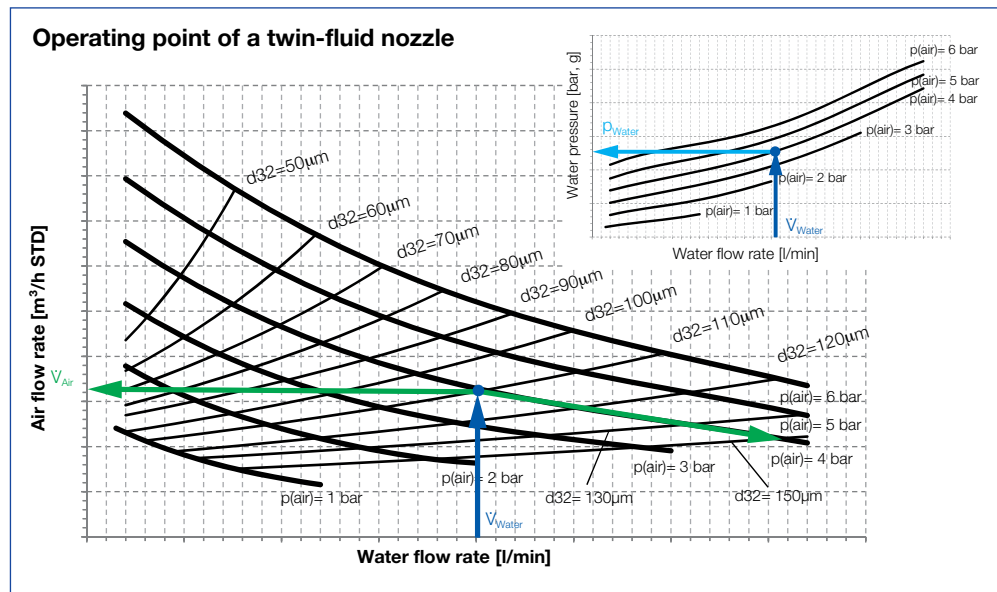
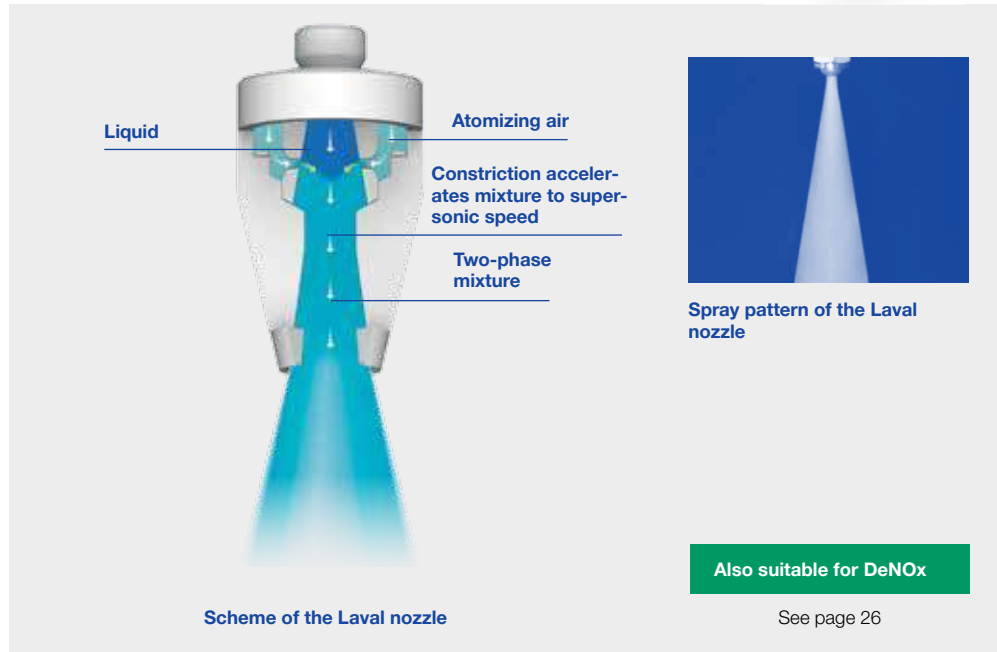
Lechler Laval nozzles

atomize liquids as a fine full cone. These twin-fluid nozzles work according to the supersonic principle.

A dual-phase mixture is created from atomizing air and liquid in the mixing chamber inside the nozzle. The shape of the nozzle causes this mixture to be accelerated to supersonic speed, resulting in an extremely fine atomization of the droplets.

By changing the air/liquid ratio, the droplet size and the droplet spectrum can be adapted within a wide range. The large free cross sections of the nozzle also allow atomization of viscous or solids-laden liquids.

Choosing the right material prevents wear even where abrasive media are present, and enables use at high temperatures.



Use:

- Gas cooling in gas-bearing pipes (ducts) and medium-sized and small gas cooling towers
- Injection of solids-laden water
- Introduction of lime water in the desulfurisation process
- Injection of aqueous ammonia or urea solution for the DeNOx process (SNCR/SCR)
- Chemical process engineering (spray dryers etc.).

Properties



Small spray angle (15°), suitable for small cross-sections and horizontal ducts



Adjustment of the droplet spectrum by changing the air/ fluid ratio



Clog-resistant thanks to large free cross-sections without internal fittings



Very large turn down ratio of 20:1 (in some cases up to 40:1)

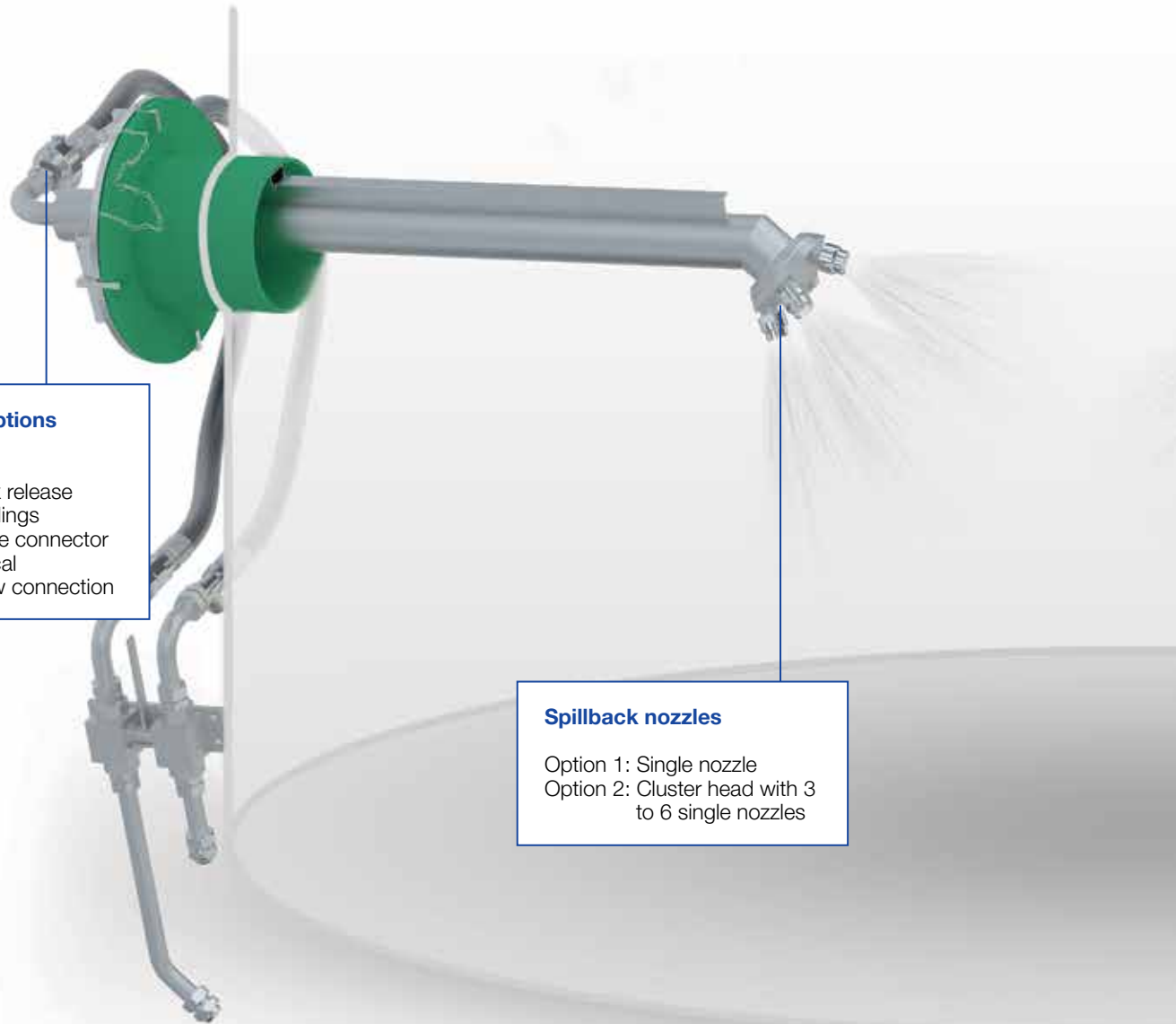


Very fine droplet spectrum



Typical pressure range
Liquid 1-6 bar, g
Atomizing air 1-6 bar, g

Lechler nozzle lances - Highest spraying accuracy in the flue gas duct



Connection options Accessories

- Option 1: Quick release couplings
- Option 2: Flange connector
- Option 3: Conical screw connection

Spillback nozzles

- Option 1: Single nozzle
- Option 2: Cluster head with 3 to 6 single nozzles

Lechler nozzle lances ensure optimal spray placement and alignment in flue gas ducts. The choice of nozzles and the consideration of local conditions and process-related matters means they can be individually adapted to the respective requirements.

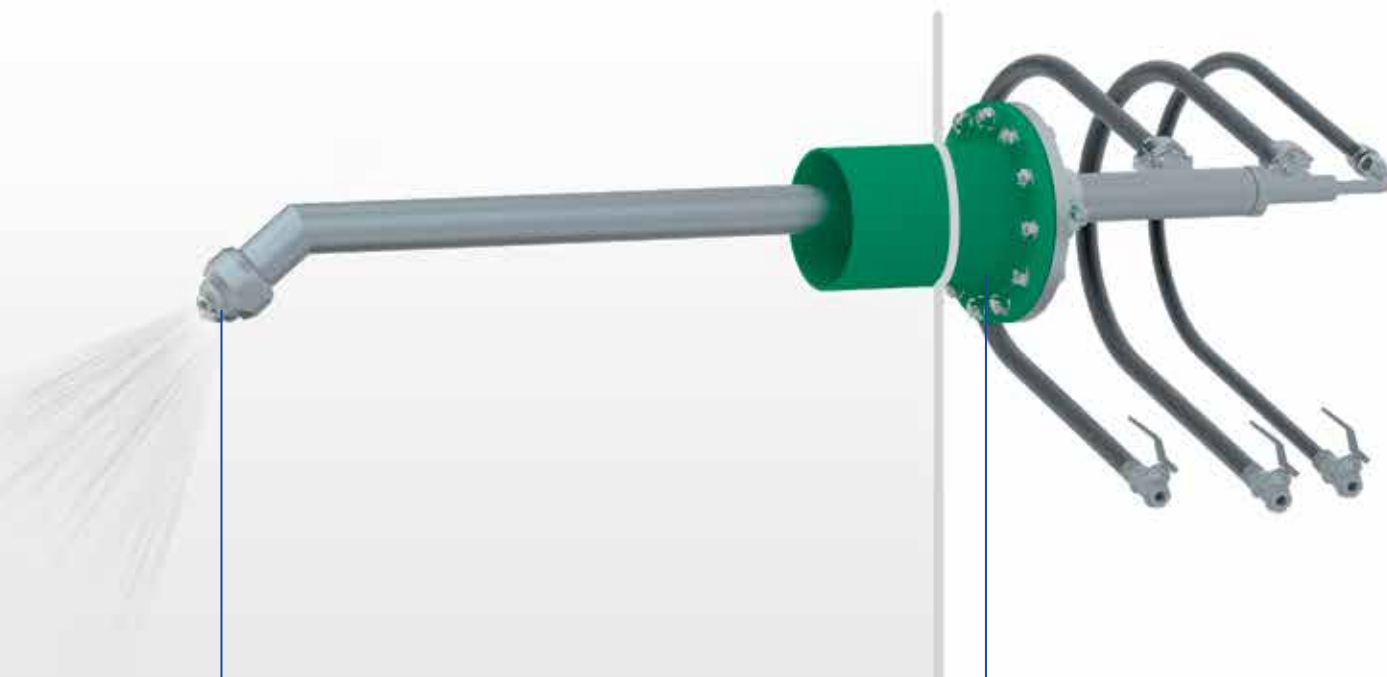
The nozzles themselves have a low-maintenance design and can be quickly cleaned or exchanged with minimal effort.

The robust, high-quality stainless steel construction ensures a high degree of functional reliability. Lances are available in a variety of material to suit specific process requirements.

Lechler nozzle lances are available with many options, including but not limited to:

- Protection tube to increase the service life in case of higher temperatures, high dust loads and aggressive gases, with barrier air as an option.
- Wedge flange, standard flange and special flange in accordance with customer requirements
- Guide rail to facilitate lance installation
- Shifting device to change the insertion length – with or without gastight sealing
- Expansion joint or stuffing box for expansion compensation at high temperatures
- Assembly connecting piece with flange connector for welding onto flue gas duct
- Further special customizations including wear protection, insulation, water cooling or coating
- Pre-assembled accessory kits for process media connections (e.g. quick release couplings, shut-off ball valves, strainers)

Lechler nozzle lances are manufactured in line with ultramodern production processes and according to the state of the art.



VarioJet nozzle

Option 1: without protection tube and without protection cap
 Option 2: with protection tube and with protection cap

Flange connections

Option 1: Wedge
 Option 2: Standard flange e.g. DIN, ANSI etc.
 Option 3: Special flange according to customer specification

Material

Lances are manufactured from stainless steel (316/316L) as standard, but depending on requirements can also be made of chemical and high-temperature resistant materials.

Accessories are available in galvanized steel or stainless steel and the hoses are available in rubber or stainless steel.



Talk to us

Each gas cooling tower and flue gas duct is different. Which is why standard solutions do not always make sense. Speak with us and let us work together to find the best solution for your purposes.

