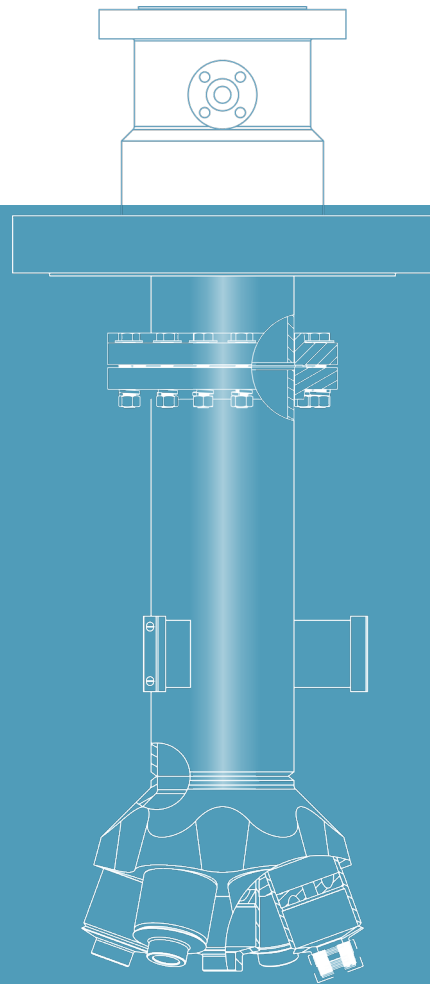


ENGINEERING AND  
FABRICATION



# THE HIGHEST STANDARDS IN SPRAY TECHNOLOGY



We keep the highest standards when it comes to designing and engineering spray solutions for our customers. It is important to know what our customers' expectations and requirements are before we even start the design. Lechler uses 4D methodology and in this, our engineers will Define, Design, Develop, and Deliver the optimal spray solution. We work closely with you from start to finish which is one of the many reasons why Lechler is a leader in spray technology.

## 1. Define

The initial step of our approach begins with evaluating your current process so that our engineers understand your requirements and expectations.



## 2. Design

All projects are different but our engineers make sure that the necessary software is used along with precise calculations and measurements:

- Proprietary software for layout
- Calculations (flow rates, pressures and nozzle placement, pipe sizing, thermal expansion, and preliminary pump and component selection)
- Computational Fluid Dynamics (CFD) when required
- Finite Element Analysis (FEA), fatigue analysis on high pressure
- Approval drawings
- Detailed drawings

## 3. Develop

Lechler has testing laboratories, state-of-the-art production facilities, and certifications to develop your ideal solution. There is no need to go outside when we already have all the resources right here.

### Production

- Machining (milling, lathing)
- Injection molding (MIM technology)
- Welding & fabrication
- Assembly
- Refurbishment

### Testing

- Hydro testing
- Positive material identification
- Nondestructive examination
- Material test reports

### Certifications

- ASME - Section IX (Qualified welder performance)
- ASME B & PV Code (Boiler & pressure vessel)
- ASME B31.1 & B31.3 (Power & piping process)
- ANSI & ASTM

## 4. Deliver

Our ultimate goal is delivering a robust quality solution that meets all of your expectations:

- Quality
- Design
- Price
- Delivery
- And more...



# THE INTELLIGENT WAY TO OPTIMALLY USE NOZZLES



When considering flows, turbulence and highly complex spray processes, nobody knows the possibilities better than we do. Just as no one knows your requirements better than you. Together we can find out how to use all your potential.

For simple calculations such as a straight piece of pipe, the flow state is still relatively easy to calculate using paper, pencil, and calculator.

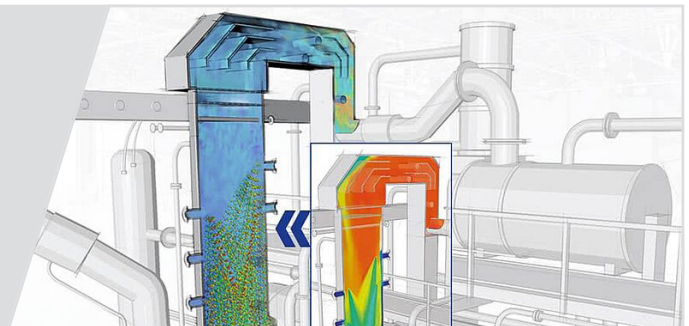


If there is just a slight curve, then this is not so easy. Here, **Computational Fluid Dynamics (CFD)** is required.



## Your benefits

- Identifying targeted areas
- Improving nozzle design
- Optimizing in a tight space
- Customer specific process optimization
- Reliable flow conditions
- Precise calculations
- Preventative measures
- And more...



# CUSTOM FABRICATION SPRAY SYSTEM SOLUTIONS

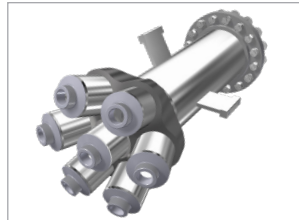


## Headers, lances, and quills

When it comes to spray system mechanisms, there are hundreds of pieces to consider. From the materials that make the mechanism, to the particular nozzles used to disperse the fluid – there are plenty of opportunities for customization.

While finding the right nozzle for your application is important, it is equally important that the equipment supplying fluid to the nozzle is designed properly to achieve the desired results for a safe and cost-effective installation. Whether your process requires fine atomization, coarse droplets, even coverage, high impact, low impact, or another characteristic, we are happy to guide you with our knowledge in fluid flow simulation, calculations, equipment selection, sizing, and fabrication.

Lechler engineers and welders are highly skilled in the design and fabrication of products such as ASME B31.1 and ASME B31.3. Our facility and welders maintain a comprehensive portfolio of certifications per ASME Code Section IX. Finally, our first class project management, material sourcing, and in-house state-of-the-art PMI equipment, amongst other NDE processes, ensure a successful project with all the required quality measures and documentation.



Lance injector type	Material and test requirements and standards	Connection type and features
Hydraulic	<p><b>Material selection</b></p> <ul style="list-style-type: none"> <li>Stainless Steel 316L</li> <li>Hastelloy</li> <li>PP, PVC</li> <li>And many more</li> </ul> <p><b>Code compliance</b></p> <ul style="list-style-type: none"> <li>ASME B31.1 Power Piping code</li> <li>Metallic industrial piping: DIN EN 13480</li> <li>Unfired pressure vessels: DIN EN 13445</li> <li>ASME B31.3 Process Piping code</li> <li>Welder Performance Qualification Records per ASME BPVC section IX</li> <li>Qualification test of welders: DIN EN 287</li> </ul> <p><b>Testing</b></p> <ul style="list-style-type: none"> <li>ANSI and ASTM testing</li> <li>Non-destructive testing – Penetrant testing: DIN EN ISO 3452</li> <li>Hardness</li> <li>Hydrostatic pressure test: Pressure Equipment Directive 2014/68/EU, DIN EN 13480-5 and DIN EN 13445-5</li> <li>Spray and flow testing</li> <li>Phase Doppler Anemometry (PDA) measurement system</li> <li>Magnetic particle inspection: DIN EN ISO 17638</li> <li>Positive Material Identification</li> </ul>	<p><b>Flange connections</b></p> <ul style="list-style-type: none"> <li>Wedge</li> <li>Standard flange e.g. DIN, ANSI etc.</li> <li>Special flange according to customer specification</li> </ul> <p><b>Additional features</b></p> <ul style="list-style-type: none"> <li>Shifting device to change the insertion length – with or without gastight sealing</li> <li>Expansion joint or stuffing box for expansion compensation at high temperatures</li> <li>Pre-assembled accessory kits for process media connections (e.g. quick release couplings, shut-off ball valves, strainers)</li> <li>Further special customizations including wear protection, insulation, water cooling or coating</li> <li>Assembly connecting piece with flange connector for welding onto flue gas duct</li> <li>Guide rail to facilitate lance installation</li> </ul>
Twin-fluid air/liquid		
Steam		

# ➤ PUMP AND CONTROL SKIDS REGULATE WATER FLOW



Our pump and control skids for regulating the flow rates of water and atomizing air are individual customer-specific solutions. Based on the requirements in each case, our first step is to design an overall concept and select the best components in order to create a perfectly tailored solution.

## First-class engineering

To perform our engineering, we determine all relevant parameters and define the plant's design. This includes determining the nominal widths and pressure levels as well as designing the pumps and control valves. We draw up the P&I diagram and make detailed equipment and signal lists as an option. Of course, the project is fully documented to ensure that technology and processes can be quickly traced even after years of use.

## High-quality components

A precise knowledge of the characteristic properties of our nozzles is essential. For only a complete system that is coordinated to how the nozzles function and operate will ensure smooth and economical operation of the gas cooling system. We fit our pump and control skids with high-quality components from well-known manufacturers as standard and the most important functional components are even realized in redundant design.

## Tested quality

The design (e.g. dimensioning of nominal widths) and production are in line with the latest state of the art and comply with all relevant standards. They are equally subject to the Lechler quality management system certified to DIN EN ISO 9001:2015, as is the final acceptance. Before delivery, the pump and control skid undergoes a pressure and tightness test and is checked by our experienced engineers. This will avoid any problems during commissioning.

## Control concept

Numerous installations, years of commissioning experience, plus expertise in nozzle technology all contribute to the constant improvement and optimization of Lechler control systems. By installing a control solution from Lechler you will benefit considerably from this wealth of experience. The flexible and fully automatic concept can be perfectly adapted to your process.



### Junction Box

All components except the pump motors are wired to a junction box within the pump and control skid unit.

This assures that the customer has a central connection point for all electrical components and measuring devices for further processing in the higher-level control.



### Control cabinet with complete PLC

All components including the pumps are wired to a control cabinet. The control cabinet is integrated into the base frame of the pump and control skid unit.

The complete injection control is tested in accordance with valid electrical standards and regulations and allows all relevant process parameters to be visualized over a control panel on the control cabinet.

Specific configuration and extensive testing make commissioning much faster. Communication and the exchange of signals (setpoint, plant status, error messages) with the customer's logic system is carried out via PROFIBUS or PROFINET.

The control has several modes of operation such as automatic mode and manual mode for tests during plant downtimes. In the event of faults, our engineers can quickly perform a remote diagnoses via the installed modem without the need for an on-site visit.



# MIST ELIMINATOR SYSTEMS OVERVIEW



Lechler offers a large selection of different separation profiles that can also be combined with each other. This gives us the opportunity to find the optimal solution for your task. We will find the right mist eliminator system for your requirements in terms of efficiency and space.

		<h3>LTH 100</h3>	<ul style="list-style-type: none"> <li>• Horizontal flow</li> <li>• Multi-stage configuration possible</li> <li>• High separation performance</li> <li>• Low pressure loss</li> <li>• Easy to clean</li> </ul>	<ul style="list-style-type: none"> <li>• Variable baffle vane spacing to optimize pressure loss and limit droplets</li> <li>• PPTV, PVDF, PE, stainless steel, and special</li> </ul>
		<h3>LTH 500</h3>	<ul style="list-style-type: none"> <li>• Horizontal flow</li> <li>• Reduced installation depths</li> <li>• High separation performance</li> <li>• Available in four variants for optimum adaptation to process requirements</li> </ul>	<ul style="list-style-type: none"> <li>• High hydraulic separation capacity</li> <li>• Variable profile spacing</li> <li>• Angled profile inlet and outlet design</li> <li>• Stainless steel and special</li> </ul>
		<h3>LTH 600</h3>	<ul style="list-style-type: none"> <li>• Horizontal flow</li> <li>• Highest separation performance</li> <li>• Low pressure loss</li> <li>• Available in four variants for optimum adaptation to process requirements</li> </ul>	<ul style="list-style-type: none"> <li>• High hydraulic separation capacity</li> <li>• Variable profile spacing</li> <li>• Improved flow routing</li> <li>• Suitable for high flow velocities</li> <li>• PP, stainless steel, and special</li> </ul>
		<h3>LTV 271</h3>	<ul style="list-style-type: none"> <li>• Vertical flow</li> <li>• Standardized profile widths</li> <li>• Good separation performance</li> <li>• Low pressure loss</li> </ul>	<ul style="list-style-type: none"> <li>• 23 mm baffle vane spacing</li> <li>• PP, PVDF, and PE</li> </ul>
		<h3>LTV 300</h3>	<ul style="list-style-type: none"> <li>• Vertical flow</li> <li>• Highest hydraulic separation capacity</li> <li>• Highest separation performance</li> </ul>	<ul style="list-style-type: none"> <li>• Installation at angles up to 45°</li> <li>• PP, PVDF, PE, stainless steel, and special</li> </ul>
		<h3>LTV 400</h3>	<ul style="list-style-type: none"> <li>• Vertical flow</li> <li>• Very good separation performance with minimum pressure loss</li> <li>• Suitable for high dust loads</li> <li>• Reduced support structure</li> </ul>	<ul style="list-style-type: none"> <li>• Variable widths and baffle vane spacing</li> <li>• Easy to clean</li> <li>• PPTV, PVDF, PE, stainless steel, and special</li> </ul>

## TALK TO US

Customer requirements are different. Sometimes standard solutions do not always make sense. Speak with us today to find the best solution for your purposes.

