



BETE's mission goes beyond just selling spray nozzles. It is to provide engineered spray process solutions that exceed customer's expectations in every detail. From initial discussions to design, fabrication, and on-going service – we will make your project a success.

CHEMICAL PROCESSING SPRAY TECHNOLOGY SOLUTIONS

BETE is a fourth-generation family-owned company with decades of experience providing innovative spray solutions to the chemical and petrochemical industries. We make tens of thousands of different products, including fog and misting nozzles, tank washing nozzles, material injection nozzles, custom spray lances, fabrications, and spray systems. Our spray technology is manufactured with durable and corrosion-resistant materials to perform in the harshest environments.



INJECTION QUILLS AND SPRAY LANCES

Injection Quills

- Pipe and flange
- Stationary or retractable
- Used to introduce metered chemical injection into process



Spray Lances

- Drop in solution
- Single or two-fluid (Air-Atomizing) spray nozzles
- Complex code compliant fabrications



Retractable Spray Lances

- Inspect and service nozzles without disrupting process
- Options include lance, isolation valve, drain valve, and retraction mechanism



SPRAY BARS, MANIFOLDS, HEADERS, AND SPOOLS

Spray Bars & Manifolds

- Uniform spray coverage across wide areas
- Optimize liquid/air flow and nozzle placement



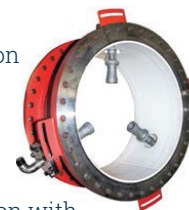
Headers

- Multiple nozzle arrangements
- Common for spray tower or area distribution
- Branched or ring designs



Spools

- Entire spray injection assembly for bolt-in or weld-in installation
- Consists of duct, vessel, or pipe section with spray lance(s) or quill(s) installed



WE OFFER MANY CERTIFICATIONS & QUALIFICATIONS FOR OUR FABRICATIONS



BETE FOG NOZZLE, INC. QUALIFIED FOR THE TASK



- ASME B&PV Code Section VIII-1
- U Stamp, PP Stamp, R Stamp
- ASME B31.1 – Power Piping Code
- ASME B31.3 – Process Piping Code
- ASME B&PV Code Section IX Welding Qualification
- ASME PTC 19.3-2016 Vibration Analysis
- Canadian Registration Number (CRN)
- Pressure Equipment Directive (PED) 2014/68/EU
- NACE Corrosion Compliance Non-Destructive Examination (NDE) Qualifications
- PMI, PT, RT, UT, VT, Hydrostatic Testing, Hardness Testing

- Fabricated assemblies are designed around process conditions and nozzle engineering to meet all mechanical requirements and achieve optimal spray performance.
- Working with BETE as your primary fabricator ensures all component designs fit and work together.
- Reduced need for coordinating between multiple suppliers saves you time and hassle.
- As a world leader and innovator in the nozzle industry for over half a century, BETE provides personalized service and experience to guarantee solution confidence.



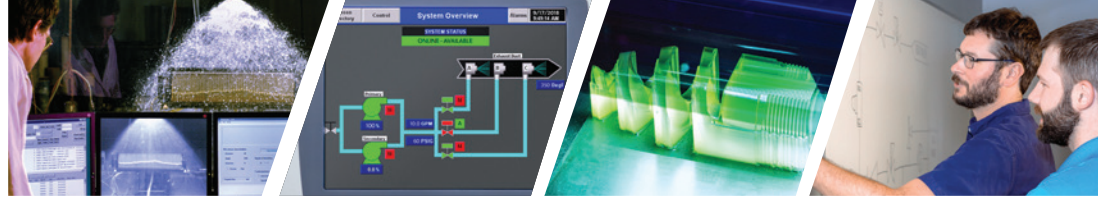
SPRAY NOZZLES FOR CHEMICAL PROCESSING APPLICATIONS

BETE is a trusted international nozzle supplier for chemical processing operations. We design and manufacture our products with material solutions for extreme temperatures, corrosive environments, and abrasive spray media. Achieved through BETE's extensive experience, in-house foundry, and machining abilities, we offer a range of materials to ensure nozzle durability and increased service life. Options include nickel alloys and stainless steels for high-temperature environments, plastics for maximum corrosion resistance, cobalt alloys, silicon carbides, and tungsten carbides for abrasive spray media and environments.

COMMON PROCESS APPLICATIONS	COMMON SPRAY NOZZLE SOLUTIONS																																				
	FULL CONE													HOLLOW CONE						FAN					MISTING				AIR ATOMIZING								
	TF	TFRA	TFXP	ST	STXP	WL	MPL	MP	CW	WTZ	SC	NC	NCS	NCK	TSC	WT/WTX	CW	TF	NCJ	TH/THW	DTH	SB	BJ	NFV	NF	NFD	FF	MW	PJ	P	L	XA	SA				
Absorption (Gas Washing)																																					
Amine Scrubbing																																					
Catalyst Reformer Gas Cooling																																					
Chemical Injection																																					
Chloride Injection																																					
Corrosion Inhibitor Spray																																					
Desuperheating (Inject water)																																					
Electrostatic Precipitator (ESP - Pre-scrubbing & gas cooling)																																					
Electrostatic Precipitator (particulate washing collection tube or plate)																																					
Gas Cooling (Quenching oil)																																					
General Wash for process piping, condenser and columns																																					
Heat Exchanger Cooling/Washing																																					
Packed Tower Cleaning																																					
Pollution Control Nozzles (FGD in Mist Eliminators, Packing, Quench, Pre-Scrubber, Absorbers)																																					
· Flue Gas Desulfurization																																					
· SCR/SNCR NOx Control																																					
Quenching water																																					
Slurry Back Flush Injector																																					
Spent Acid/Sulfur Regeneration Nozzles (SAR)																																					
Steam Condenser Spray																																					
Steam Quench Injector (inject LCO)																																					

SPECIALIZED SPRAY NOZZLES		
TANK WASHING		
Static	HC	TW
Rotating	HWS	HP
Rotary Jet	HWO	HWO 100
FIRE SUPPRESSION		
FM Approved	AFF	
FM & UL Approved	N	
SPRAY DRYING		
Hydraulic	TD	TDL
Air Atomizing	SA	XA
BLENDING & MIXING		
Educator	TM	

SPRAY SYSTEMS & ENGINEERING SERVICES



BETE's extensive resources and 70 years of experience are available to help you solve existing spray problems and achieve process improvements. Our facilities include a spray laboratory, state-of-the-art production machinery, rapid prototyping, computer modeling, an in-house foundry, and a staff with decades of combined experience in diverse fields.

AUTOMATED SPRAY SYSTEMS

BETE's deep understanding of spray nozzle system performance allows us to design and build custom-tailored flow control systems to meet your specific spray process needs and operate with precision. We evaluate your existing process or new project requirements and recommend solutions to achieve performance and reliability. Optimizations for preexisting systems can address pressure loss caused by pipe friction, elevation, and valve or instrument flow coefficients.

APPLICATIONS ENGINEERING

BETE Applications Engineers are available to assist you when your application requires nozzle recommendations, involves precise spray performance, unusual operating conditions, or custom-designed spray technology. Our engineers have many years of experience in process specifications and spray science.

SPRAY LABORATORY

BETE's spray laboratory analyzes and characterizes sprays, spray nozzles, and their uses. We measure common spray characteristics, including flow rate and pressure, liquid distribution, droplet size, spray angle, and droplet velocity. Our team can build physical models of your process to help diagnose problems or select the best nozzle for your application. Through testing and modeling, we can provide definitive spray characterization and assist in confirming process validation.

Examples of physical tests:

- Flow visualization in pipes, ducts, and tanks.
- Applications-based testing to measure the effect of a spray either in or on a system. These include such things as impact, coating uniformity, reach, wind drift, and spray effectiveness.

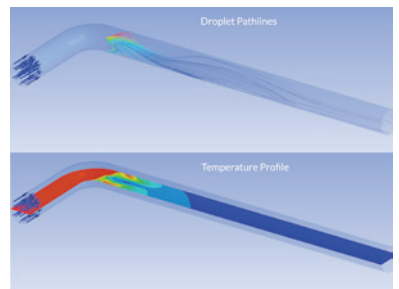
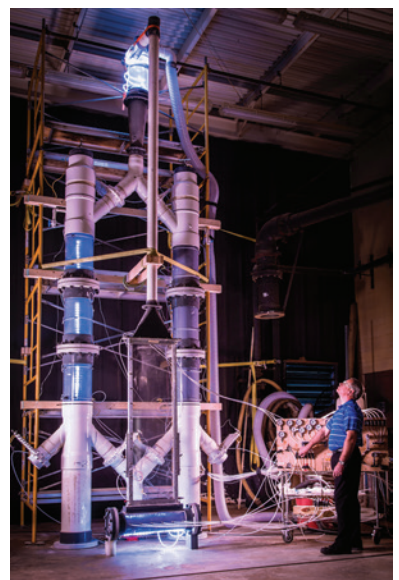
COMPUTATIONAL MODELING

BETE offers computer modeling of sprays and processes using ANSYS® FLUENT® computational fluid dynamics software (CFD). Modeling a spray process can help select nozzles, operating conditions, and positions when designing or improving processes. It can also identify the cause of problems in an existing operation.

Examples of computer modeling:

- Droplet trajectories and evaporation of sprays in ducts
- Wetting walls in furnaces
- Mixing chemicals in pipelines

Computer modeling, combined with physical testing in our laboratory, gives you confidence in your system design or problem solution.



For more details please contact us at sales@bete.com or 413-772-2166, Ext 5.