

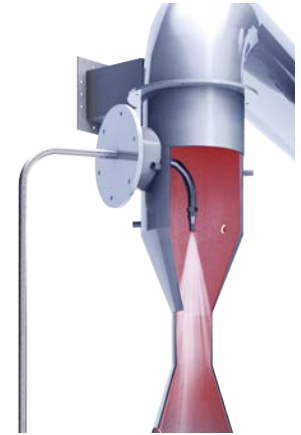


SPRAY TECHNOLOGY FOR REFINING

BETE is a trusted international spray technology supplier for many leading oil and gas companies. Leveraging over 70 years of experience with industrial nozzle design, advanced engineering, and manufacturing resources, BETE offers a comprehensive range of solutions that go beyond a traditional nozzle supplier.

Our spray technology offers first-in-class reliability and durability for abrasive media, corrosive reagents, and extreme temperatures found in refineries. We are the only nozzle manufacturer with a complete in-house foundry stocked with a wide range of alloys, including stainless steel, nickel, cobalt, and more.

Our mission extends beyond sales to delivering solutions that consistently surpass customer expectations in every detail.



WORK WITH ONE SUPPLIER FOR ALL YOUR DESIGN, FABRICATION, & TESTING REQUIREMENTS

At BETE, our team of experts works closely with you throughout the entire process. From modeling your spray operations to identifying areas for improvement, we provide new insights to enhance your productivity. We can assist in selecting the best nozzles, optimizing injector placement within vessels, and designing and fabricating injectors tailored to your performance requirements. Our comprehensive services include thorough testing and documentation, ensuring code compliance with all necessary standards.

Design Requirements

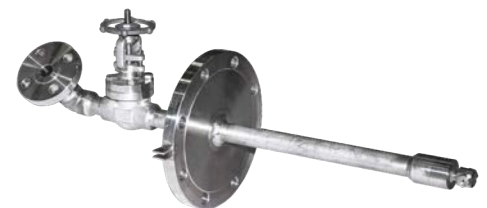
- ✓ ASME B31.3 - Process Piping
- ✓ ASME B31.1 - Power Piping (PP Authorization)
- ✓ ASME Boiler and Pressure Vessel Code Section VIII, Division 1 (U Authorization)
- ✓ Welding qualification to ASME B&PVC Section IX
- ✓ Canadian Registration (CRN)
- ✓ Pressure Equipment Directive (PED) 2014/68/EU
- ✓ NACE compliance

Nondestructive Examination

- ✓ RT - Radiographic
- ✓ UT - Ultrasonic
- ✓ PT - Visible Dye Penetrant
- ✓ Hydrostatic
- ✓ Hardness
- ✓ PMI - Positive Material Identification

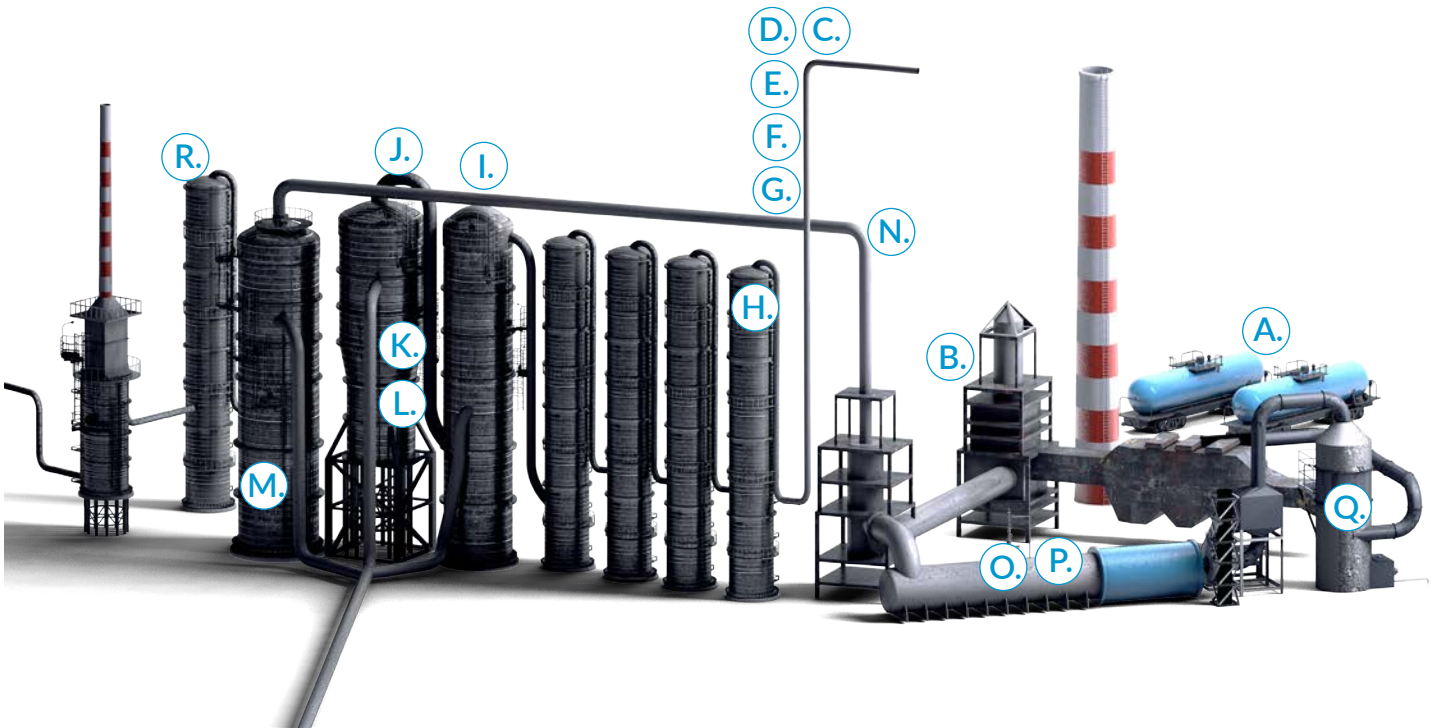
Performance Inspections

- ✓ Flow
- ✓ Spray Angle
- ✓ Spray Pattern
- ✓ Droplet Size
- ✓ Special Customer Requirements



SPRAY NOZZLE APPLICATIONS FOR YOUR REFINERY

WASHING, INJECTION, COOLING, CONDITIONING, SCRUBBING, & MORE



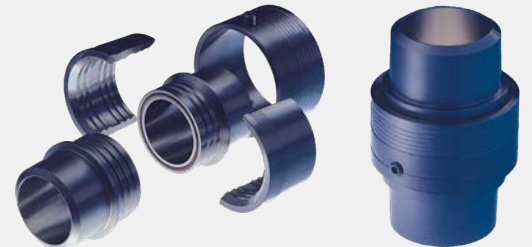
- A. Railcar Tank Cleaning
- B. Heat Exchanger Cooling & Washing
- C. Chemical Injection
- D. Steam Quench Injection
- E. Catalyst Reformer Gas Cooling
- F. Chloride Injection

- G. Desuperheating
- H. Vacuum Distillation Column
- I. Fractionator Water Wash Injection
- J. FCCU Overhead Wash
- K. Mix Temperature Control
- L. Slurry Back Flush Injection

- M. Torch Oil Injection
- N. Coker Off-Gas Cooling
- O. SNCR NOx Control Injection
- P. SCR NOx Control Injection
- Q. Flue Gas Desulfurization Injection
- R. Distillation Column Injection

LIGHTWEIGHT, THREADLESS, & BOLTLESS COUPLING ALTERNATIVE TO FLANGES

Replace standard ANSI flanges with Dur O Lok threadless, boltless, light weight pipe couplings. Reduce maintenance, material costs, and space requirements for pipe racks in refinery applications over a wide range of temperatures.



Dur O Lok® Pipe Couplings

CHOOSE THE RIGHT PARTNER FOR ALL YOUR SPRAY REQUIREMENTS

IMPROVE PROCESS OPTIMIZATION WITH SPRAY TECHNOLOGY FABRICATIONS

We understand how important nozzle placement is for your process. Our spray injectors offer superior control over spray patterns, droplet sizes, and flow rates, engineered for precision spraying in your process stream.

BETE spray injectors optimize the effectiveness of spray media agents, particularly in critical process applications such as scrubbing, conditioning, and cleaning the inner walls of pipes.



Our retractable lances allow you to withdraw your nozzle, isolate it from the process, and remove it entirely for servicing without taking your process offline. Such features are often critical for refineries where process outages are costly.

Avoid These Problems With BETE Spray Technology

- Wall Wetting
- Pipe Corrosion
- Damage to Equipment
- Costly Repairs
- Unscheduled Outages

Spray Injectors

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



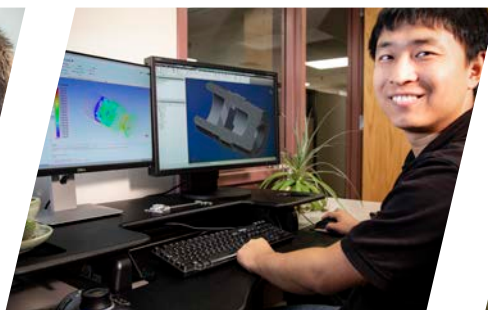
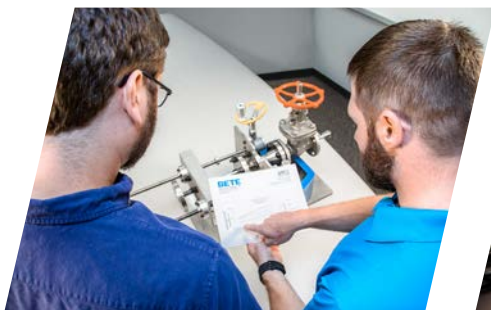
Retractable Spray Lances

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










LEVERAGE OUR EXPERTISE & DISCOVER EXCEPTIONAL SERVICE

- ✓ Over 70 years of spray technology experience
- ✓ Advanced engineering & design support
- ✓ Code-compliant design, manufacturing, and inspection
- ✓ Computational simulation with FEA and CFD
- ✓ On-site spray laboratory & testing
- ✓ In-house casting foundry stocked with a wide range of corrosion and erosion resistant alloys



SPRAY NOZZLE SOLUTIONS FOR ALL YOUR REFINING APPLICATIONS

APPLICATION	 FULL CONE	 HOLLOW CONE	 FAN	 MISTING	 AIR ATOMIZING	 TANK CLEANING	 FIRE SUPPRESSION
Absorption (Gas Washing)							
Amine Scrubbing							
Catalyst Reformer Gas Cooling							
Chemical Injection							
Chloride Injection							
Corrosion Inhibitor Spray							
Desuperheating (Water Injection)							
Electrostatic Precipitator (ESP) Pre-Scrubbing and Gas Cooling							
Electrostatic Precipitator (Particulate Washing)							
Fire Suppression							
Flue Gas Desulfurization							
General Wash for Process Piping, Condenser, and Columns							
Gas Cooling (Quenching Oil)							
Heat Exchanger Cooling/Washing							
Mist Eliminator Washing							
Packed Tower Cleaning							
Quench Tower Gas Cooling							
Rail Car Cleaning							
SCR NOx Control							
SNCR NOx Control							
Slurry Back Flush Injector							
Spent Acid/Sulfur Regeneration Nozzles (SAR)							
Steam Condenser Spray							
Steam Quench Injector (LCO Injection)							
Tank Cleaning							

