

BE

NOZZLES FOR THE FOOD INDUSTRY

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TF spiral nozzle test in BETE Spray Lab



BETE World Headquarters, Greenfield, MA



In-house investment casting foundry

BETE®

Spray Nozzle Leader

Virtually every business uses nozzles, and for virtually every nozzle application the first choice is BETE. Spray droplets formed by BETE nozzles can neutralize micron-size pollutants, extinguish fires, cool hot gases, coat delicate electronics, apply colorants and flavorings, clean processing machinery automatically, and much more.

In all areas of nozzle engineering, manufacturing, and application, BETE is a pioneer. Ever since 1950 when John Bete invented the spiral (corkscrew) nozzle, our innovations have gone into deep sea, deep space, and everywhere in between.

In 1993, we were the first spray nozzle company to have its quality management system registered to ISO 9001. In 2003, we became the first spray nozzle company in the world with a quality management system registered to the demanding ISO 9001:2000 standard.

BETE makes over **20,000** different nozzles. We pioneered the use of Teflon (PTFE) and titanium for nozzles, and we're the only nozzle manufacturer with a complete in-house investment casting foundry. The majority of our products are specially engineered for our customers, and nearly one-third of our business is international.

The *BETE Difference* is our unparalleled ability to respond quickly and effectively to any kind of spraying challenge, whether simple or complex, anywhere in the world.

BETE®

Nozzles for the Food Industry



Food
Processing



Meat & Poultry
Processing



Food & Beverage
Production

BETE® products are used in all aspects of the food industry, ranging from large-scale raw foods processing to the application of the shell on little chocolate candies. Whether you use a standard product or specialized design, BETE delivers innovation, quality and value.

Our nozzle designs incorporate food-grade materials, connectors and spray patterns to meet clean-in-place requirements. Product innovations like the Twist & Dry™ have a proven track record in the food ingredients and dairy industries.

Nozzles play a critical role in maintaining a clean, safe and bacteria free environment. Smoke houses and meat packers, for example, have reduced maintenance costs and increased process throughput with the efficient application of BETE spray nozzles. We also make products for reliable washing, sanitizing, lubricating, and drying during the packaging or bottling process.

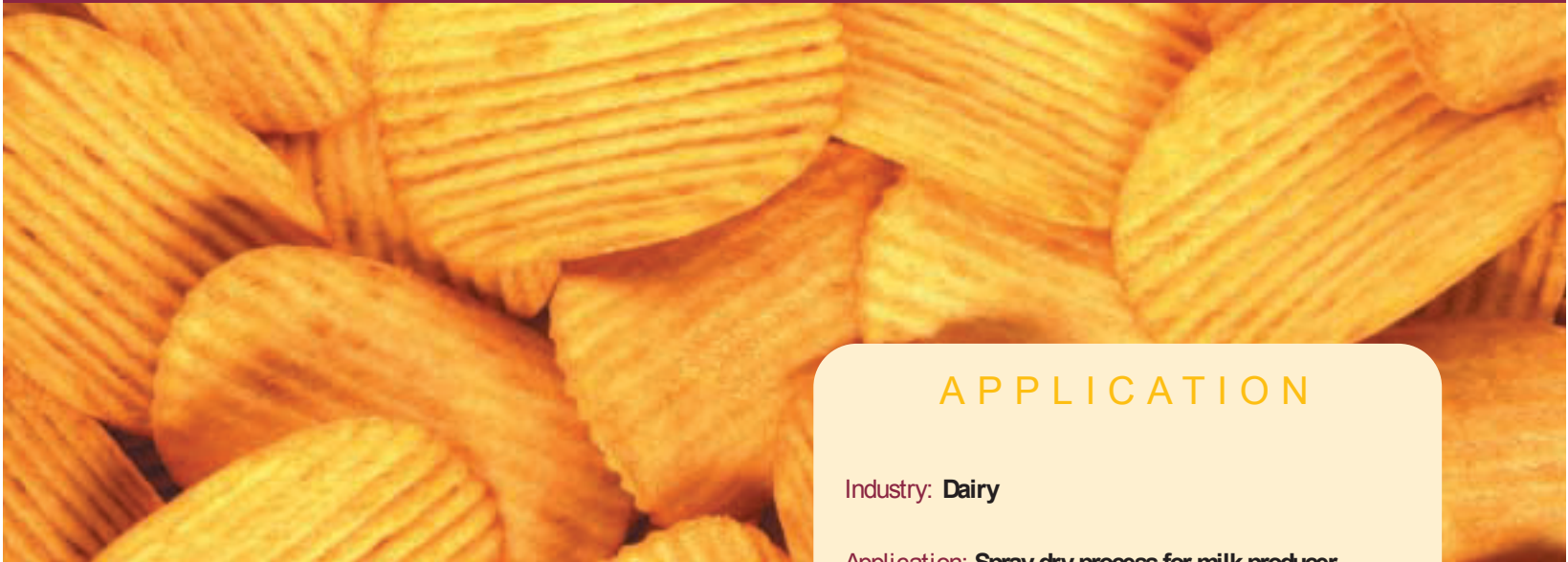
No matter how your business fits into the food processing industry, BETE's sales, engineering, and technical service teams have the experience to support you during trial runs and help you to choose the optimal solution.

www.beteuk.com

BETE®

Food Processing

Nozzles for greater productivity with less downtime



APPLICATION

Industry: **Dairy**

Application: **Spray dry process for milk producer**

Product: **Twist and Dry™ - TDL**

Problem: A plant spray-dried milk in a box drier with 24 nozzles that typically operated between 2,500 to 3,500 psi. The nozzles, however, started to become clogged after about 8 hours of operation. This produced variances in quality, increased costs related to cleaning, and caused periodic production shut downs.

Solution: To address the problem, BETE recommended six 1/4TDL2-36 nozzles for testing. During tests of eight hours and 28 hours, BETE nozzles sprayed flawlessly without clogging and showed no visible signs of wear. Cost savings from the switch to BETE nozzles enabled the plant to purchase two complete sets of nozzles. The BETE TDL nozzle eliminates the need to shut down the drier for cleaning, providing additional savings.

Other Applications:

- spraying preservative • moistening before baking
- cooling drums • color coating • dough splitting
- pan lubrication • evaporative cooling
- moisture control



TF



TW

TF Dust Control

- Fine atomization, wide coverage for controlling dust at transfer points and conveyers. The original spiral nozzle, one piece clog resistant.

TW Tank Washing

- Cleaning tanks used in processing of food products. Clog resistant spiral design, energy efficient, and compact design to fit small openings.



TD



SM

TD Spray Dry

- Spray dry sour cream flavorings on snack food. Easy assembly, patented locking mechanism for quick change-out and maintenance.

SM Cleaning Tanks

- Rinsing of tanks during food processing. Superior cleaning at low pressures, self-cleaning, compact design fits through small openings, high impact.



XA



WL

XA Spraying Coatings

- Spraying butter flavor on popcorn or sugar onto cereal. Low flow, various spray patterns with extremely fine atomization for even spray coating.

WL Washing

- Washing salad in rotating drum. Advanced whirl plate design produces uniform coverage, medium to coarse atomization.

BETE®

Meat and Poultry

Nozzles for reliable sanitation and quality assurance

APPLICATION

Industry: **Meat Packing**

Application: **Elimination of bacteria**

Product: **1/4XAAD**

Problem: It is absolutely crucial to prevent contamination from bacteria such as listeria, salmonella and e-coli in the processing of meat and poultry, as well as fish, seafood, and soft cheese.

Solution: OEM wall-mounted systems were designed to house two to six XAAD nozzles (either siphon feed or pressure feed). To sanitize surfaces, the nozzles spray chlorine dioxide (ClO_2) at 30 psi or greater in solutions of between 50 to 100 ppm. Chlorine dioxide, unlike chlorine, is non-corrosive, relatively odorless and FDA approved. It also reduces ambient odor in the processing area where the systems are employed. The BETE nozzles work so well that the customer has installed nearly 60 of the systems to date.

Other Applications:

- meat & sausage cooling • poultry cooling
- automatic sanitizing • carcass cooling
- prewashing • spray coating

XA



XA Liquid Smoke

- Used by meat producers to saturate curing ovens with flavoring. Provide an evenly controlled amount of coating, nozzles can be fine tuned to your requirements.

NF



NF Washing

- Washing conveyor lines to remove debris. High impact fan nozzle with one-piece construction with no internals to clog, uniform distribution.

PJ



PJ Spraying Solutions

- Spraying mineral oil onto meat. Very fine atomization with cone-shaped fog, highly energy efficient, with a one-piece compact design.

Food and Beverage Production

Nozzles for packaging and washing systems



APPLICATION

Industry: **Brewing**

Application: **Tank washing**

Product: **3/4TF32XP**

Problem: During the brewing process, hops, barley and other grains float in tanks. Areas hidden by piping structures (shadow areas) were difficult to clean. Existing nozzles had ineffective spray patterns and frequently clogged after being submerged. Failure to remove spent grains impacts consistency and quality control, and causes production downtime while the inside of tanks are cleaned manually.

Solution: Working with plant managers, BETE engineers designed a spray arrangement that could apply more impact in shadow areas where particles had dried onto the piping. 3/4TF32XP's and were specified to cover shadow areas and to perform reliably without clogging, even after submersion. This BETE nozzle arrangement is so effective that it is now the standard for cleaning these tanks in all of the brewer's plants.

Other Applications:

- can cooling • sterilizing jars • blow off
- bottle washing • evaporative cooling
- equipment sanitation • can washing

TFXP



TFXP Cleaning

- Cleaning of kettles using submerged spray nozzles. Excellent free passage in spiral design, greater surface area spray, high-energy efficiency.

XA



XA Humidify

- Humidify a bakery mixing room. Low flow atomization using compressed air to produce highly atomized sprays at low flow rates, various types of spray patterns.

NF



NF Pasteurization

- Use steam for pasteurization. Uniform distribution from a high impact fan nozzle, sizes for all applications, one-piece construction.

FINZ



FINZ Water removal

- Air control nozzle for removing water droplets. Unique design features quiet, efficient, high-impact distribution of compressed air.

BETE®

The BETE® Difference



Our integrated, customer-focused approach to excellence in all aspects of nozzle design, manufacture and service sets BETE apart.

Quality has been an ongoing commitment at BETE since our founding in 1950. In 1993, we were the first spray nozzle company to have its quality management system registered to ISO 9001. In 2003, we became the first spray nozzle company in the world with a quality management system registered to the demanding ISO 9001:2000 standard.

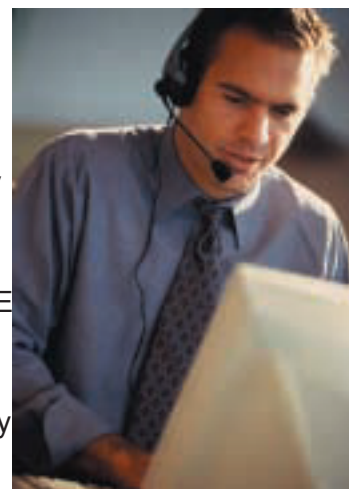
Research is performed at our on-site laboratory. The BETE Droplet Analyzer provides dynamic droplet size analysis utilizing advanced digital imaging. It's fully integrated with our unique high speed Patternator for liquid distribution measurement, enabling precise measurement of spray coverage, uniformity, density, and droplet size.



Innovation is a BETE hallmark, and we are proud that over 60% of the nozzles we ship have been customized to meet the specific needs of a customer. Our new rapid prototype machine speeds development of customized nozzle solutions. We can test a prototype nozzle in our laboratory hours after it was designed for a customer.

Delivery is another business function where BETE leads the industry. Every sequence in our production process is computer controlled and constantly monitored to maximize throughput. As a result, we can manufacture any one of thousands of products quickly and provide on-time delivery.

Service to customers drives every successful organization, and BETE focuses on providing the best solution for your spray nozzle requirements. Our service team **averages 20 years experience** at BETE working with customers to provide the ultimate in customer satisfaction, every time.



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