# Spray Engineering

BETE's extensive resources and more than 60 years of experience are available to help you with nozzle selection, solving existing spray problems, or designing a new nozzle or process. The spray engineering group is available on a contract basis and works with all of BETE's resources to help you design your process or solve your spray problem. At each stage of contracted Advanced Spray Engineering Services (ASES) we work with you to ensure we're solving the right problem within the given constraints. Our resources include:
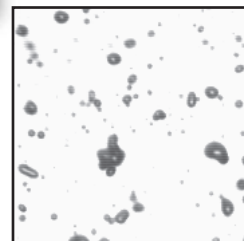
Physical Spray Laboratory Testing

For an engineering analysis we use our spray laboratory to evaluate the spray characteristics of a nozzle or process or to generate data for use in another analysis such as a CFD model. Spray characteristics like droplet size, spray angle, spray reach, and more can all be evaluated in the lab. In addition, we can evaluate hydrostatic integrity, reliability, and other essential nozzle characteristics not directly related to the spray. Noteworthy instrumentation includes:

- Patternator for measuring spray pattern
- BETE Model 700 Imaging Particle Analyzer
- TSI Phase-Doppler Particle Analyzer
- Integrated Data Aquisition Control System
- Containment Booth for alternative fluids
- Mechanical Inspection precision equipment
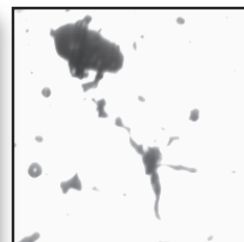
The BETE Droplet Analyzer is capable of characterizing non-spherical droplets like those seen in this actual image.

Physical Models

Sometimes there is no substitute for actually testing a nozzle in a process. It could be that the physics is too complicated to model or the desired result, such as an aesthetic effect, may be difficult to measure, or it might be necessary to validate a computer model. In these cases we can build a model of the system and test it in the laboratory.

Actual droplet images captured using the BETE Model 700 Spray Analysis System.

Computer Modeling

BETE offers computer modeling of sprays and processes using ANSYS® FLUENT® computational fluid dynamics software (CFD).

Modeling of a spray process can be very helpful in selecting nozzles, operating conditions, and mounting locations when initially designing a process especially if the process is not amenable to physical testing. It can also help find the cause of problems in an existing operation.

Droplet Pathlines

Temperature Profile
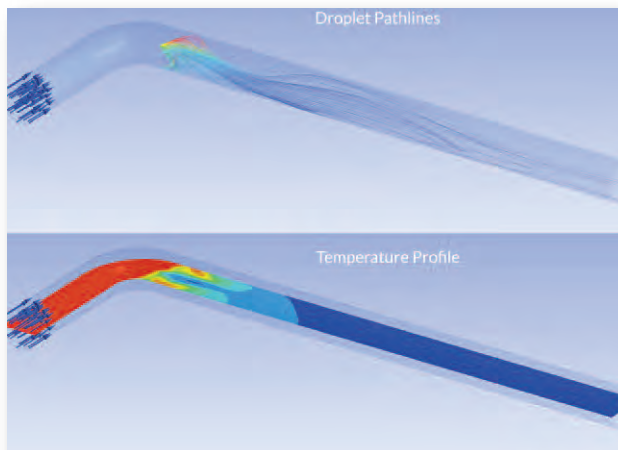
Are you ready to see how BETE's Advanced Spray Engineering can help? Tell us what you need by contacting Daniel deLesdernier: ddel@bete.com. We'll get back to you with an outline of what we can do for you.

While as a matter of course we maintain confidentiality, we are always willing to negotiate special confidentiality agreements if necessary.

Manufacturing

The manufacturing facility is only few steps away from the lab so when a goal of the engineering work is a piece of hardware we collaborate with our manufacturing and design groups throughout the analysis process to ensure that the result is manufacturable and cost-effective. The manufacturing group also is available to help build test nozzles and fixtures from nozzles with microscopic orifices to multi-ton fabrications.

Design of Experiments

When the number of variables in an experiment is large, careful selection of combinations of test conditions can reduce the amount of testing needed. BETE works with JMP statistical analysis software to assist with experimental design and data analysis.

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