

## What are the key factors in selecting a spray nozzle?

Answer this question with the following questions.

**What is the function of the spray?** The two common objectives are:

1. Distribute the liquid over an area.
2. Generate spray surface area to increase the evaporation rate.  
A smaller drop size increases surface area.

**What spray pattern is required?** The optimal spray pattern is often based on experience with this system or similar systems. The geometry of the system constrains the shape of the spray.

**What operational characteristics are required?** Identifying the normal, minimum, and maximum rate of operation is essential to select the best nozzle or atomization technology. Consider the requirements for stand-by operation, shut-down, and start-up.

**What are the fluid properties of the material being sprayed?** The density, viscosity, and surface tension are critical liquid properties. Many industrially sprayed materials are complex fluids that require rheological evaluation. Knowing the fluid shear sensitivity of viscosity is important in the spray nozzle selection.

## Myths cloud the choice of optimal spray technology.

**Myth:** A smaller drop size is an advantage for nearly all spray applications.

**Reality:** Liquid distribution and cleaning or washing applications may have poorer performance with a smaller drop size. A smaller drop size for distribution applications may result in greater spray drift or entrainment, both of which have adverse effects. Cleaning applications performance depends on spray impact. A smaller drop size reduces spray impact, therefore cleaning ability.

**Myth:** Nearly all spray nozzles have a long service life.

**Reality:** A very small number of nozzles perform well for 30 years of operation. Many require periodic replacement due to erosion or mechanical issues. The degradation in performance is often slow, years. Inspect the nozzle, test periodically, and replace.

**Myth:** Spray nozzles do not need a process control system.

**Reality:** Two-fluid (air atomized) nozzles require control to maintain performance and avoid excessive energy consumption. The energy cost from inefficient operation may justify the replacement.

**Practical Spray Technology: Fundamentals and Practice**, a 253 page book published in 2012, is the suggested reference.

