Spray Performance Considerations

Basic Nozzle Characteristics
Spray nozzles are precision components designed to yield very specific performance under specific conditions. To help you determine the best nozzle type for your application, the following reference chart summarizes the performance that each nozzle type is designed to deliver.

Contact your local Spraying Systems Co. sales engineer for more detailed technical bulletins or a no-obligation consultation.

**Hollow Cone (Whirlchamber-Type)**

- **General Spray Characteristics**: Available in a wide range of capacities and drop sizes. Provides a good interface between air and drop surfaces.
- **Comments**: The extensive range of capacities and drop sizes makes the hollow cone nozzle useful for a variety of applications where a combination of small drop size and capacity is required.
- **Spray angles**: 40° to 165°

**Hollow Cone (Deflected-Type)**

- **General Spray Characteristics**: Utilizes a deflector cap to form an “umbrella” shaped hollow cone pattern.
- **Comments**: Larger capacities can be used to flush or clean tube and pipe interiors and small tanks.
- **Spray angles**: 100° to 180°

**Hollow Cone (Spiral-Type)**

- **General Spray Characteristics**: Provides a hollow cone pattern with drops that are slightly coarser than those in other hollow cone sprays.
- **Comments**: Provides high flow rate in a compact nozzle size. The one-piece design features maximum throughput for a given pipe size.
- **Spray angles**: 50° to 180°

**Full Cone**

- **General Spray Characteristics**: Utilizes an internal vane to provide a uniform, round, full spray pattern with medium-to-large sized drops.
- **Comments**: Provides full spray pattern coverage with medium-to-large flow rates. Some vaneless models and oval spray models are also available.
- **Spray angles**: 15° to 125°

**Full Cone (Spiral-Type)**

- **General Spray Characteristics**: Provides relatively coarse drops in a full cone pattern with minimal flow obstruction.
- **Comments**: Spray coverage is not as uniform as that from conventional internal vane-type nozzles. Provides high flow rates in a compact nozzle size.
- **Spray angles**: 50° to 170°
# Spray Performance Considerations

<table>
<thead>
<tr>
<th>Type</th>
<th>Spray pattern</th>
<th>General Spray Characteristics</th>
<th>Comments</th>
<th>Spray angles</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Flat Spray (Tapered)</strong></td>
<td></td>
<td>A tapered-edge flat spray pattern nozzle is usually installed on a header to provide uniform coverage over the entire swath as a result of overlapping distributions.</td>
<td>Designed to be used on a spray manifold or header for uniform, overall coverage across the impact area.</td>
<td>15° to 110°</td>
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<tr>
<td><strong>Flat (Even)</strong></td>
<td></td>
<td>Provides even distribution throughout the entire flat spray pattern. Produces medium-sized drops. Ideal where high and uniform spray impact is required.</td>
<td>The thin rectangular pattern of this nozzle provides uniform coverage. In manifold set-ups, the nozzles are carefully positioned for edge-to-edge pattern contact. Designed primarily for high-impact applications.</td>
<td>25° to 65°</td>
</tr>
<tr>
<td><strong>Flat Spray (Deflected-Type)</strong></td>
<td></td>
<td>Produces a relatively even flat spray pattern of medium-sized drops. The spray pattern is formed by liquid flowing over the deflector surface from a round orifice.</td>
<td>Large free passage design through the round orifice reduces clogging. Narrow spray angles provide higher impact, while the wide-angle versions produce a lower impact.</td>
<td>15° to 150°</td>
</tr>
<tr>
<td><strong>Solid Stream</strong></td>
<td></td>
<td>Solid stream nozzles provide the highest impact per unit area.</td>
<td>Ideal wherever a very high spray impact is required.</td>
<td>0°</td>
</tr>
<tr>
<td><strong>Atomizing (Hydraulic, Fine Mist)</strong></td>
<td></td>
<td>A hydraulic, finely atomized, low capacity spray in a hollow cone pattern.</td>
<td>Used to produce finely atomized sprays when compressed air is not desirable.</td>
<td>35° to 165°</td>
</tr>
<tr>
<td><strong>Air Atomizing and Air Assisted</strong></td>
<td></td>
<td>Atomization produced by a combination of air and liquid pressures. Air assisted nozzles feature internal impingement atomization to assist fine drop formation.</td>
<td>The most widely used nozzle group for producing finely atomized sprays in a wide range of capacities.</td>
<td>Cone and flat spray patterns</td>
</tr>
</tbody>
</table>