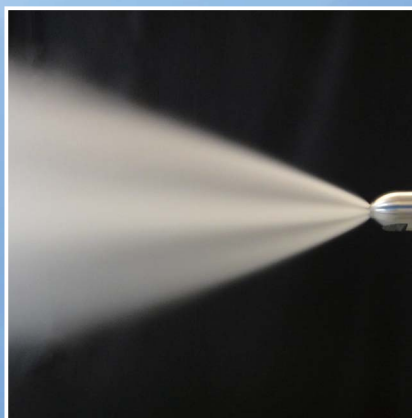
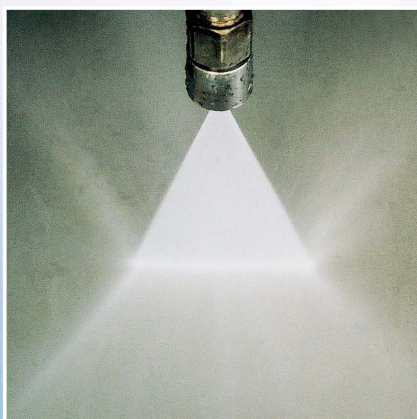




# LINEUP OF IKEUCHI'S SPRAY NOZZLES



# IKEUCHI, “The Fog Engineers”

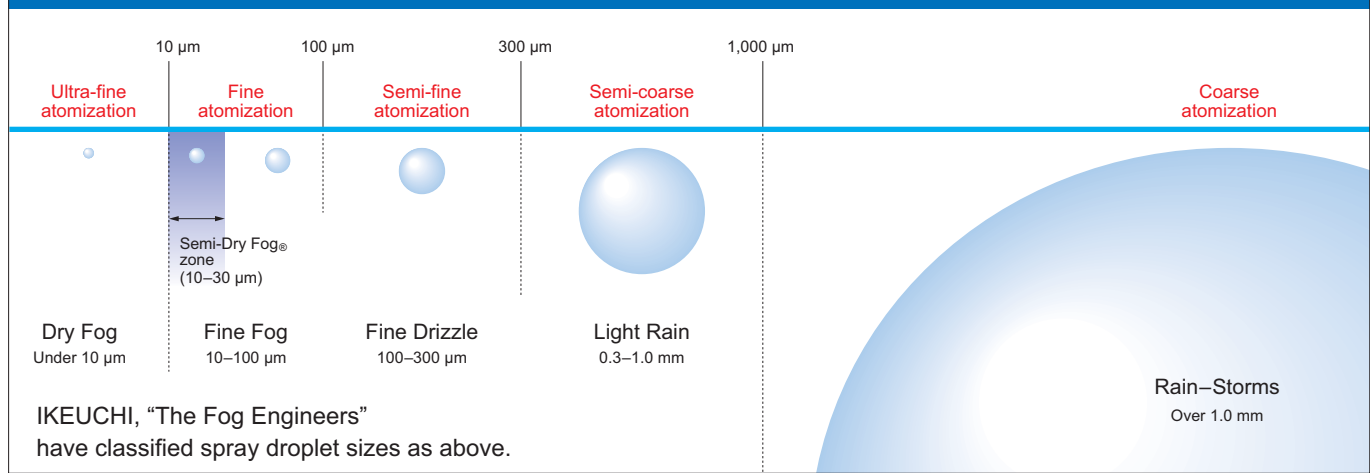
Based on accumulated advanced technology and know-how as the Fog Engineers, IKEUCHI continues to pursue methods to generate and utilize fog to meet the ever diversifying and sophisticated needs of its customers, and to contribute to the development of a greater industrial world.



## Guarantee of Precision Nozzle Performance

All IKEUCHI's precision-made hydraulic spray nozzles (except for air nozzles) are guaranteed for spray angles and spray capacities. Each pneumatic spray nozzle series also has spray capacity inspection standard, and only the nozzles that pass the inspection will be shipped.

## Classification of Spray Droplet Size



## Variety of Spray Nozzles

### Hydraulic Spray Nozzles

Produce atomization using liquid pressure

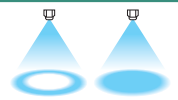
#### Flat Spray Nozzles

Provide a flat fan spray pattern with mountain-shaped or even distribution. Ideal for (high-pressure) cleaning and spraying.



#### Cone Spray Nozzles

Provide a hollow cone or full cone spray pattern (or square spray pattern). Suitable for gas cleaning, steel plate cooling, humidifying, etc.



#### Solid Stream Jet Nozzles

Solid stream with highest spray impact. Ideal for powerful cleaning.



#### Special Purpose Nozzles

Include slit laminar nozzles, air nozzles, ejector nozzles, and more.



### Pneumatic Spray Nozzles

Produce atomization using air and liquid pressures

#### Fine Fog Spray Nozzles

Widely used pneumatic nozzles for gas cooling, moisture control, precision cleaning, etc. Mean droplet diameter: 10–100 µm

#### Semi-Fine, Semi-Coarse Fog Spray Nozzles

Ideal for precision cooling in the steel industry, and for precision cleaning in the electronics industry. Mean droplet diameter: 100 µm or more (semi-fine atomization)

#### Clog-resistant Spray Nozzles

Designed specially for spraying viscous liquid.

#### Blower-Air Driven, Ultra-Low Pressure Spray Nozzles

Utilize blower air instead of compressed air for atomizing to save installation and running cost.




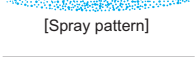


#### Steam-Driven Spray Nozzles

Innovative pneumatic nozzles using steam instead of compressed air for atomizing.

# HYDRAULIC SPRAY NOZZLES — FLAT SPRAY

[Symbol key] ●: Features ■: Main applications





## Standard Flat Spray Nozzles

		<b>3-piece structure</b> <b>V/VV series</b>	<ul style="list-style-type: none"> <li>● Flat spray pattern with mountain-shaped distribution. Tapered spray pattern edges provide uniform spray distribution in multiple-nozzle arrangements.</li> </ul>		<b>Coin-shaped</b> <b>CVVP series</b>	<ul style="list-style-type: none"> <li>● So thin that nozzle alignment in a narrow space is easy.</li> <li>■ Cleaning and cooling.</li> </ul>
 [Spray pattern]		<b>One-piece structure</b> <b>VP/VVP series</b>	<ul style="list-style-type: none"> <li>■ Cleaning, spraying, cooling, etc.</li> <li>For polishing, available in UPE material (UVVP series).</li> </ul>		<b>Quick detachable</b> <b>INVV series</b>	<ul style="list-style-type: none"> <li>● Easy installation without tools, which saves maintenance time.</li> <li>■ Applications that require accurate nozzle positioning. Etching, cleaning, etc. (Successor to ISVV series)</li> </ul>




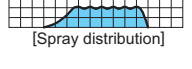
## Even Flat Spray Nozzles

		<b>3-piece structure</b> <b>VE series</b>	<ul style="list-style-type: none"> <li>● Flat spray with uniform distribution and even spray impact across the entire spray area.</li> </ul>		<b>High-pressure cleaning</b> <b>VNP series</b>	<ul style="list-style-type: none"> <li>● Flat spray with uniform distribution.</li> <li>■ High pressure cleaning (for cars, containers, tanks).</li> </ul>
 [Spray pattern]		<b>One-piece structure</b> <b>VEP series</b>	<ul style="list-style-type: none"> <li>■ Cleaning, cooling and spraying.</li> </ul>		<b>Descaling nozzles</b> <b>DSP series</b>	<ul style="list-style-type: none"> <li>● Powerful cleaning and descaling nozzle with a thin flat spray like a razor blade.</li> </ul>
 [Spray distribution]					<b>Descaling nozzles</b> <b>TDSS series</b>	<ul style="list-style-type: none"> <li>● Water saving &amp; high impact descaling nozzle for steel industries. Longer lasting design, uniform spray impact. (See TDSS individual catalog.)</li> </ul>













## Wide-angle Flat Spray Nozzles

		<b>Wide-angle spray</b> <b>YYP series</b>	<ul style="list-style-type: none"> <li>● Produces wide-angle flat spray at low liquid pressure with minimal clogging.</li> <li>■ Cleaning, foam breaking, water screen applications.</li> </ul>
 [Spray pattern]		<b>Wide-angle, ultra-low pressure</b> <b>LYYP series</b>	<ul style="list-style-type: none"> <li>● Low spray impact without bubbles. Uniform distribution produced at ultra-low pressure.</li> <li>■ Spraying developer in semi-conductor manufacturing processes.</li> </ul>

## Off-center Even Flat Spray Nozzles

		<b>Off-center spray</b> <b>OVVEP series</b>
 [Spray pattern]		<ul style="list-style-type: none"> <li>● With obliquely-angled flow, OVVEP series prevents accumulation of spray fluid in multiple-nozzle arrangements. No need for oblique installation, as the angle is built-in.</li> <li>■ Steel plate cooling, water rinsing after acid washing.</li> </ul>
 [Spray distribution]		











## Special Flat Spray Nozzles

	 [Spray pattern]		<b>Self-cleaning</b> <b>MOMOJet® series</b>	<ul style="list-style-type: none"> <li>● Nozzle tip purges foreign particles by reducing the pressure. Straight-through orifice is suitable for multiple-nozzle arrangement.</li> <li>■ Cleaning with circulated water, cooling, defoaming, and cleaning wire and felt parts of paper making machines.</li> </ul> For solid stream spray, MOMOJet® C series is available.
	 [Spray pattern]		<b>Universal-joint type</b> <b>UT+VP series</b>	<ul style="list-style-type: none"> <li>● Universal joint allows easy adjustment of the spray direction after connected to a pipe. Spray direction is adjustable over a range of 40 degrees as desired.</li> <li>■ Cleaning, spraying, etc.</li> </ul> For solid stream spray, UT+CP series is available.
	 [Spray pattern]		<b>Air &amp; steam spraying</b> <b>VZ series</b>	<ul style="list-style-type: none"> <li>● Produces flat spray pattern of air or steam.</li> <li>■ Cleaning, dust suppression, drying, air curtain, humidification, moisture control, etc.</li> </ul>
	 [Spray pattern]		<b>Quick installation</b> <b>QB series</b>	<ul style="list-style-type: none"> <li>● Easy installation just by drilling a hole on a pipe and inserting a nozzle. Spray direction is adjustable within 50 degrees as desired. Quick-detachable design to reduce maintenance time.</li> <li>■ Pre-treatment for painting, water cleaning, etc.</li> </ul>

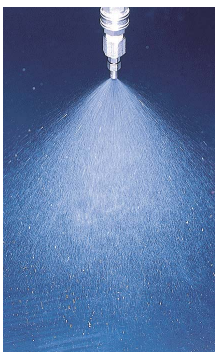



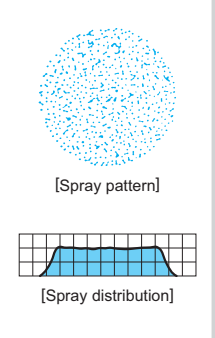





# HYDRAULIC SPRAY NOZZLES — CONE SPRAY

[Symbol key] ●: Features ■: Main applications




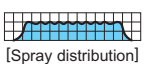
## Hollow Cone Spray Nozzles

		<b>Fine fog, ultra-small capacity</b> <b>KB</b> series	<ul style="list-style-type: none"> <li>● Finest atomization among hydraulic nozzles, with high wear resistant ceramic tip.</li> <li>■ Humidifying, cooling, spraying, etc.</li> </ul>		<b>Fine fog, ultra-small capacity</b> <b>KBN</b> series	<ul style="list-style-type: none"> <li>● Finest atomization among our hydraulic nozzles. Wear-resistant ceramic tip with plastic body.</li> <li>■ Cooling, humidifying, dust suppression.</li> </ul>
		<b>Semi-fine fog, small capacity</b> <b>K</b> series	<ul style="list-style-type: none"> <li>● Ceramic orifice and closer provide excellent wear-resistance.</li> <li>■ Humidifying, cooling, spraying, etc.</li> </ul>		<b>Semi-fine fog, small capacity</b> <b>KKBP</b> series	<ul style="list-style-type: none"> <li>● Unique whirler design with large free passage diameter minimizes clogging. Easy maintenance with a detachable whirler.</li> <li>■ Humidifying, cooling, snow making, etc.</li> </ul>
		<b>Small capacity</b> <b>KD</b> series	<ul style="list-style-type: none"> <li>● Semi-fine atomization, compact design with ceramic orifice and whirler for high wear-resistance.</li> <li>■ Cooling, spraying, etc.</li> </ul>		<b>Alumina ceramic</b> <b>AP-AL92</b> series	<ul style="list-style-type: none"> <li>● High wear-resistant alumina ceramic nozzle with a stainless steel socket.</li> <li>■ Cooling, cleaning, etc.</li> </ul>
		<b>Medium capacity</b> <b>AAP</b> series	<ul style="list-style-type: none"> <li>● Stable spray pattern for a wide range of operating pressures. No whirler design minimizes clogging.</li> <li>■ Cooling, spraying, cleaning, etc.</li> </ul>		<b>Large capacity</b> <b>TAA</b> series	<ul style="list-style-type: none"> <li>● Stable spray pattern under low pressure. Made of high wear-resistant silicon carbide. Lightweight.</li> <li>■ Spraying in absorber of gas desulfurization equipment, slurry spraying, etc.</li> </ul>



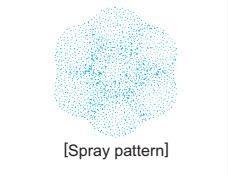

## Full Cone Spray Nozzles

		<b>Small capacity</b> <b>J</b> series	<ul style="list-style-type: none"> <li>● Smallest spray capacity among full cone spray nozzles. Wear-resistant with ceramic orifice and ceramic closer.</li> <li>■ Spraying, cleaning, cooling, etc.</li> </ul>		<b>Quick detachable</b> <b>INJJX(-Y)</b> series	<ul style="list-style-type: none"> <li>● Easy installation without tools, saving maintenance time.</li> <li>■ Etching, cleaning, etc. (Successor to ISJJX(-Y) series)</li> </ul>
		<b>Standard type</b> <b>JJXP</b> series	<ul style="list-style-type: none"> <li>● Spray capacity ranges from small to medium. X-shaped whirler provides largest free passage for minimal clogging. Available in brass, stainless steel, or PVDF.</li> <li>■ Cleaning, cooling, spraying, etc.</li> </ul>		<b>Small capacity</b> <b>JJRP</b> series	<ul style="list-style-type: none"> <li>● Plastic nozzle with disc whirler, providing uniform distribution at small spray capacity.</li> <li>■ Pure water cleaning, spraying, etc.</li> </ul>
		<b>Ceramic orifice &amp; whirler</b> <b>JUP</b> series	<ul style="list-style-type: none"> <li>● Ceramic disc whirler and ceramic orifice provide excellent wear-resistance.</li> <li>■ Cleaning, cooling, spraying, etc.</li> </ul>		<b>Narrow-angle spray</b> <b>NJJP</b> series	<ul style="list-style-type: none"> <li>● No whirler, minimal clogging. Unique design to produce narrow-angle full cone spray.</li> <li>■ Cleaning, cooling, etc.</li> </ul>
		<b>Alumina ceramic</b> <b>JUXP-AL92</b> series	<ul style="list-style-type: none"> <li>● High wear-resistant alumina ceramic nozzle with a stainless steel socket.</li> <li>■ Spraying in absorber of gas desulfurization equipment, slurry spraying, etc.</li> </ul>		<b>Clog-resistant</b> <b>AJP</b> series	<ul style="list-style-type: none"> <li>● No-whirler design with large free passage diameter minimizes clogging. Available in stainless steel, PPS, or alumina ceramic.</li> <li>■ Cleaning, cooling, applications where clogging is a concern.</li> </ul>
	<b>Large capacity</b> <b>TJJX</b> series	<ul style="list-style-type: none"> <li>● Large spray capacity. Flanged connection.</li> <li>■ Cooling, reacting, spraying, etc.</li> </ul>		<b>Wide-angle spray</b> <b>BBXP</b> series	<ul style="list-style-type: none"> <li>● Spray angle of 120° provides larger spray coverage.</li> <li>■ Fire extinguishing, cooling, spraying, etc.</li> </ul>	

## Square Spray Nozzles

		<b>Square spray</b> <b>SSXP</b> series
	<ul style="list-style-type: none"> <li>● Square spray pattern with uniform distribution, which leaves no gaps in multiple-nozzle arrangements.</li> <li>■ Cleaning, cooling, spraying.</li> </ul>	
		

## Special Full Cone Spray Nozzles

		<b>Seven-head, fine fog</b> <b>7KB</b> series	<ul style="list-style-type: none"> <li>● Seven KB hollow cone spray nozzles with a compact adaptor produce large volume of fine atomization.</li> <li>■ Flue gas cooling/cleaning, moisture control, humidification.</li> </ul>
		<b>Seven-head, all metal</b> <b>7JJXP</b> series	<ul style="list-style-type: none"> <li>● Seven JJXP full cone spray nozzles with a compact adaptor. Spray droplet diameter is about half the size of other full cone spray nozzles having the same spray capacity.</li> <li>■ Flue gas cooling/cleaning, dust suppression, etc.</li> </ul>

# HYDRAULIC SPRAY NOZZLES — SOLID STREAM

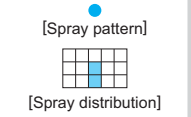
[Symbol key] ●: Features ■: Main applications

## Solid Stream Spray Nozzles



**Standard type**  
**CP/CCP** series

- Highest impact solid stream. Much larger flow of solid stream than other solid stream nozzles having the same orifice diameter.
- High pressure cleaning.



**Convex round inlet**  
**CRP(AL99)/CCRP** series

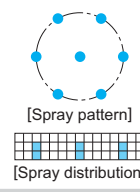
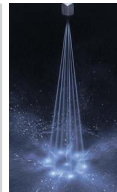
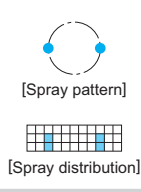
- Designed for minimal clogging. Convex round inlet inside pipe prevents foreign particles from flowing into nozzle.
- Cleaning in paper & pulp making process.



**Trimming nozzles**  
**CM/CTM** series  
**CMP-T** series  
**CM-F** series

- Extra fine solid stream with high impact cutting force. Wear-resistant with nozzle orifice made of ceramic, alumina, or tungsten carbide.
- Paper trimming, cleaning of precision machine parts, food cutting, etc.

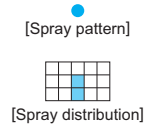
## Multiple-orifice Solid Stream Spray Nozzles



**Multiple-orifice solid stream**  
**2CP/2CCP** series  
**7CP/7CCP** series

- Multiple solid streams with high impact force. 2-orifice and 7-orifice types are available. Compact design.
- Bottle washing, cleaning dandy rolls and returnable containers, etc.

## Special Solid Stream Spray Nozzles



**ON/OFF spray control**  
**SO-CM** series

- Quick spray ON/OFF function, regulated by pilot air ON/OFF, which prevents dripping after spraying stops.
- Trimming, cutting, marking, etc. For flat spray, **SO-V** series is available.



**Pipe cleaning**  
**RSP** series

- Cleans inside pipes and tubes, moving itself by spraying high-impact solid stream jets in different directions as driving force.
- Cleaning inside pipes/drains/tubes, removing scale and dirt inside tubes of heat exchangers and cooling machines.

## SPECIAL PURPOSE NOZZLES

### Air Nozzles

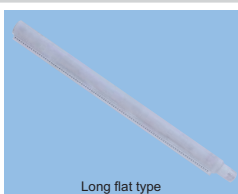
Air booster nozzles *TAIFUJet*® series



Flat type



Round type



Long flat type

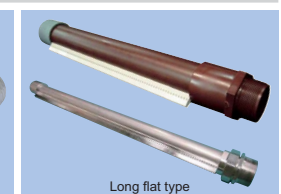
For compressors



Flat type



Round type



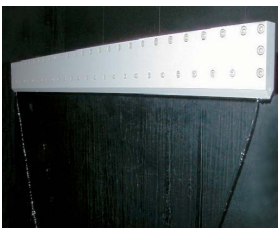
Long flat type

For blowers

- Takes in surrounding air, boosting the volume of powerful air flow. Available in stainless steel or plastic.
- Blowing off drying, blowing off dust, cleaning, cooling, etc.

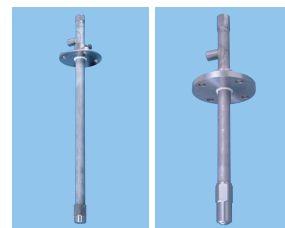
### Special Purpose Nozzles / Accessories

#### Slit laminar nozzles



- Slit nozzles with thin laminar flow of water or air.

#### Spillback nozzles



- Spray capacity is variable without changing spray pressure. Available in a variety of types.

#### Tank cleaning nozzles



- Compact rotating nozzle. Rotates by cleaning liquid force only. Ideal for tank and container cleaning.

#### Ejector nozzles



- Spouts out 3–4 times the supplied amount. Ideal for solution agitation.

#### Universal joints

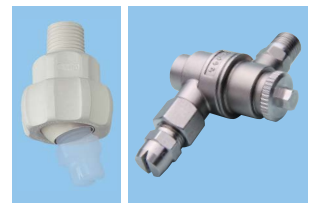


Photo of adaptor with a spray nozzle

- Universal joint adaptors to adjust spray direction. Made of metal or plastic.

# PNEUMATIC SPRAY NOZZLES

[Symbol key] ●: Features ■: Main applications

## Fine Fog Spray Nozzles

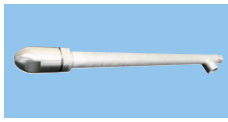


Photo of BIM series

### Small capacity

**BIM** series  
**CBIM** series  
**SCBIM** series

- Fine atomization with mean droplet diameters 20–100 μm. Unique, minimal-clogging design. Available in flat spray, full cone spray, or hollow cone spray pattern. Spray ON/OFF can be regulated with controlling adaptors.
- CBIM series: Compact version of BIM series. Space-saving design.
- SCBIM series: Further miniaturized version of CBIM series. Capable of spraying smallest flow rate among all of our pneumatic spray nozzles.
- Spraying, cooling, moisture control, washing, etc.



### Medium/Large capacity

**GSIMII** series

- Large spray capacity, low air-water ratio. Simple structure, easy maintenance.
- Gas cooling tower in waste incineration plant.



### Impinging-atomization

**AKIJet®** series

- Atomized droplets are impinged against each other at optimum condition, which results in uniform distribution of droplet size.
- Moisture control, combustion, cooling, etc.

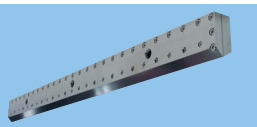
## Semi-Fine, Semi-Coarse Fog Spray Nozzles



### High impact, flat spray

**VVEA** series

- Thin and sharp spray pattern with high impact. Stable spray angle over large turndown ratio.
- Precision cleaning.



### Slit nozzles

**PSN** series

- Pneumatic slit nozzles providing uniform spray in the total width. Achieve higher spray impact by installing closer to the object.
- Glass substrate cleaning, etc.



### Flat spray

**DOVEA** series

- Secondary cooling nozzles developed to satisfy crucial requirements for spray nozzles in continuous casting processes in steel making. Minimal variation in spray angle, spray distribution and droplet size over a large turndown ratio. A large free passage diameter.

### Thick flat spray

**DDA** series

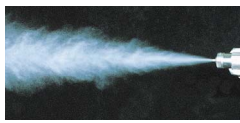
**DOVEA** series for even flat spray pattern, **DDA** series for thick even flat spray, **JJA** series for full cone spray.

### Full cone spray

**JJA** series

- Gas cooling, steel plate cooling, waste water combustion.

## Clog-resistant Spray Nozzles

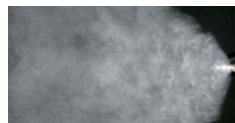


### Full cone spray **SETOJet** series Flat spray **SETOV** series

- Pneumatic spray nozzle specially designed for spraying viscous liquid. Clog-resistant design. External mixing type that air and liquid are mixed outside nozzle for atomization.
- Spraying viscous liquid (oil, lubricant, etc.) or slurry. Solenoid-activated type (**SETO-SD** series) is also available.



Photo of SETOJet series



### Wide-angle flat spray **YYA** series

- Combines "clog-resistant" and "wide spray angle" features. Capable of spraying viscous liquid up to approx. 300 cP. Compact design.
- Spraying viscous liquid (oil, honey, etc.)



## Blower-Air Driven, Ultra-Low Pressure Spray Nozzles



### Fine fog, flat spray **BAVV** series

- Flat spray pattern, fine atomization with mean droplet diameter of 40 μm or more. Energy-saving for blower-use. Low running cost. Large free passage diameter.
- Steel plate cooling, cleaning, etc.



### Semi-fine fog **LSIM** series

- Semi-fine atomization by applying blower air pressure. Saves on installation and running cost due to utilizing blower air for atomizing.
- Gas cooling, etc.



## Steam-Driven Spray Nozzles



### Steam-driven **JOKIJet®** series

- Atomization by steam instead of compressor air. Drastic saving on running cost.
- Gas cooling, moisture control.

# SPRAY NOZZLE RELATED PRODUCTS

## Spray Nozzle Headers

**BRASIKan® series**



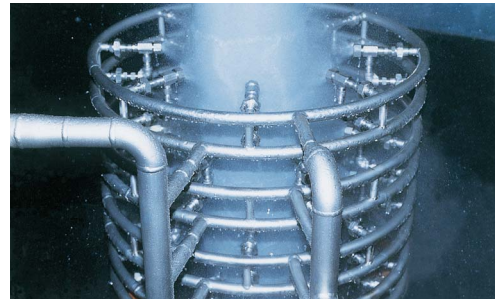
- Rotated by the handwheel, brushes in the header pipe clear the clog.

**MOMOJet® Spray Header**



- Spray header with MOMOJet® nozzles, purging foreign particles by reducing the pressure.

**Ring Header**



- Ring header equipped with pneumatic nozzles, providing uniform spray from all directions.

## Related Products Applying Spray Nozzles

**Fog + Fan cooling unit COOLJetter®**



- Combined unit of a fan and nozzles that can blow Semi-Dry Fog® further and broader using fan wind. Ideal for cooling and dust suppression.

**Cooling system COOLJetter® Dome**



- Cooling system with COOLJetter®, providing effective and low-cost cooling for large spaces.

**Industrial cooling system**



- Industrial cooling solution for solid and gas.

**LYOHH System for outdoor cooling**



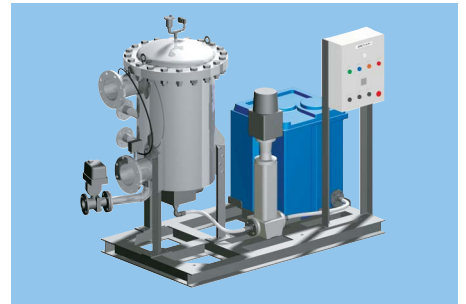
- Energy-saving, outdoor cooling system with Semi-Dry Fog®, which provides effective evaporative cooling effect without wetting people.

**Humidification unit ULM®**



- Easy-to-use, large-space humidification unit. One ULM® covers approx. 150 m<sup>2</sup>.

**Auto reverse self-cleaning filter ARS Filter**



- Auto reverse self-cleaning by powerful jet spraying. Water saving and minimal maintenance.

**Hydraulic humidification system AirULM®**



- Humidifies large spaces at low running cost. Air compressor is not required.

**Dry Fog humidifier AKIMist® "E"**



- Compact, high efficiency humidifier that produces a large volume of Dry Fog (non-wetting fog). Energy-saving design.

**Industrial humidification system AirAKI®**



- The world's first humidification system that guarantees the target humidity using the highest quality Dry Fog.



“The Fog Engineers”  
**H. IKEUCHI & CO., LTD.**



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