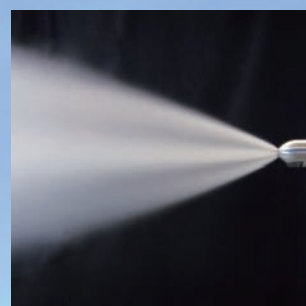
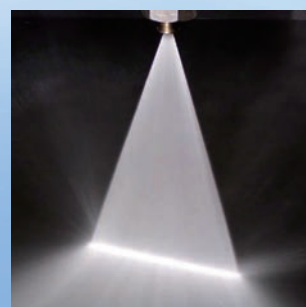




“The Fog Engineers”

H. IKEUCHI & CO., LTD.

LINEUP OF IKEUCHI'S SPRAY NOZZLES



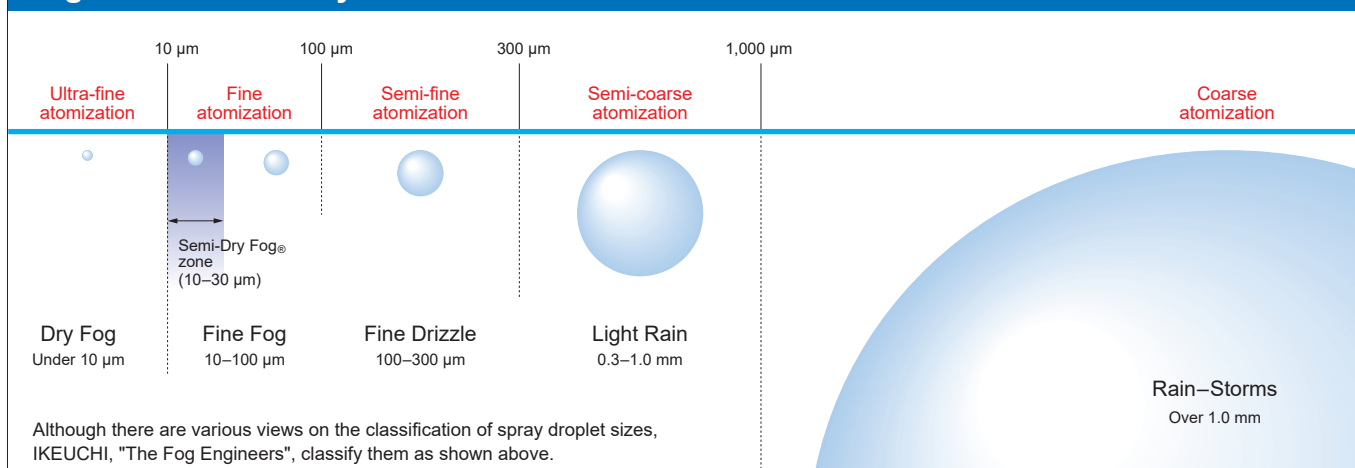
IKEUCHI, "The Fog Engineers"

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 more diverse and sophisticated needs of its customers, and to contribute to the development of a greater industrial world.

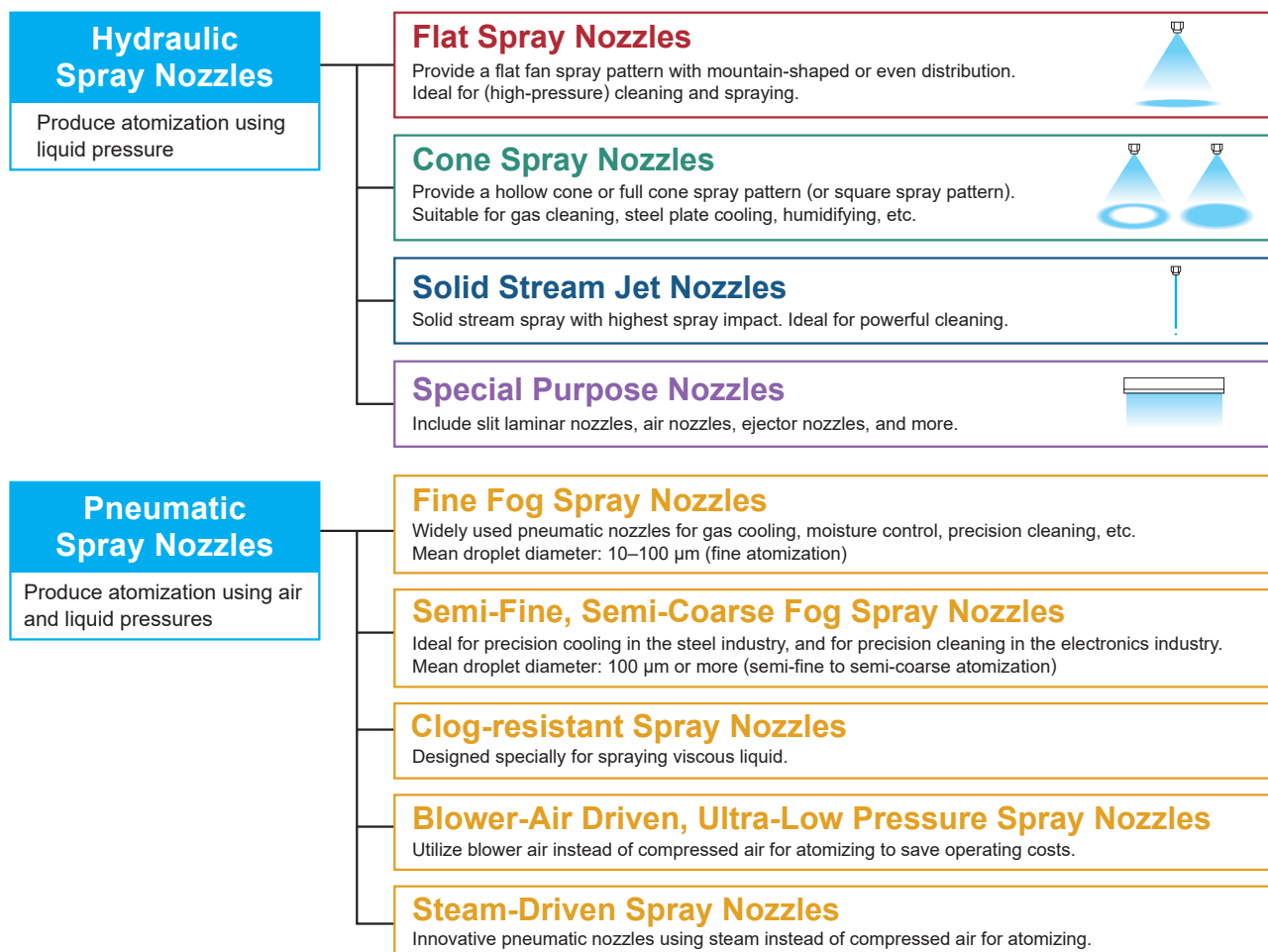
Spray Nozzle Precision Guarantee

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

Fog Classification System



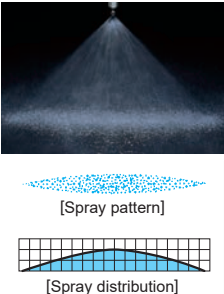
Variety of Spray Nozzles



HYDRAULIC SPRAY NOZZLES—FLAT SPRAY

[Symbol key] ● : Features ■ : Main applications

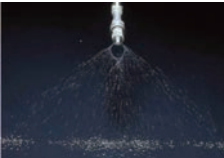
Standard Flat Spray Nozzles

 [Spray pattern] [Spray distribution]	 3-piece structure V/VV series	● Flat spray pattern with a mountain-shaped distribution. Tapered edges overlap to provide uniform spray distribution in multi-nozzle arrangements.	 Coin-shaped CVVP series	● So thin that nozzle alignment in tight spaces is easy. ■ Cleaning and cooling.
	 One-piece structure VP/VVP series	■ Cleaning, spraying, cooling, etc. - For polishing, available in UPE material (UVVP series).	 Quick detachable INVV series	● Quick-detachable design helps to reduce maintenance time. ■ Applications that require accurate nozzle positioning. Etching, cleaning, etc.

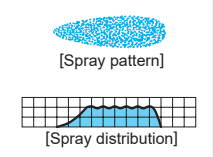
Even Flat Spray Nozzles

 [Spray pattern] [Spray distribution]	 3-piece structure VE series	● Flat spray pattern with uniform distribution across the pattern area. Even spray impact across the entire spray area.	 High-pressure cleaning VNP series	● Flat spray with uniform distribution. ■ High pressure cleaning (for cars, containers, tanks).
	 One-piece structure VEP series	■ Cleaning, cooling and spraying.	 Descaling nozzles DSP series	● Powerful cleaning and descaling nozzle with a thin flat spray like a razor blade.
			 Descaling nozzles TDSS series	● Water saving & high impact descaling nozzle for steel industries. Longer lasting design, uniform spray impact.

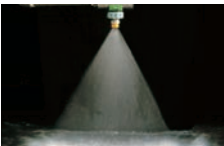
Wide-angle Flat Spray Nozzles

	 Wide-angle spray YYP series	● Wide-angle flat spray nozzle to use at low pressure. Minimal clogging among our flat spray nozzles with the same flow rate. ■ Cleaning, foam breaking, water screen applications.
	 Wide-angle, ultra-low pressure LYYP series	● Wide-angle flat spray nozzle to use at ultra-low pressure of 0.015 MPa. Low spray impact creating a bubble-free spray surface. ■ Spraying developing solution in semi-conductor manufacturing processes.

Off-center Even Flat Spray Nozzles

	 Off-center spray OVVEP series	
 [Spray pattern] [Spray distribution]		● The diagonal spray of the OVVEP series prevents accumulation of spray fluid in a multiple nozzle arrangement. No need for oblique installation as it is already angled. ■ Steel plate cooling, water rinsing after acid washing.

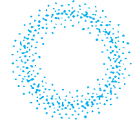
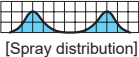
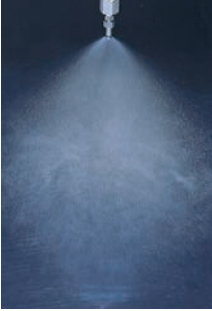
Special Flat Spray Nozzles

 [Spray pattern] [Spray distribution]	 Self-cleaning MOMoJet® series	● Nozzle tip purges foreign particles by reducing the liquid pressure. The straight-through orifice makes this nozzle suitable for multi-nozzle set-up. ■ Cleaning with circulated water, cooling, foam breaking, and cleaning wire and felt parts of paper making machines. - For solid stream spray, MOMoJet® C series is available.
 [Spray pattern] [Spray distribution]	 Universal-jointed UT+VP series	● Includes an integrated universal ball joint to adjust the spray direction over a range of 40 degrees as desired. ■ Cleaning, spraying, etc. - For solid stream spray, UT+CP series is available.
 [Spray pattern] ← Water is sprayed to show spray pattern.	 Air & steam spraying VZ series	● Produces a flat spray pattern of air or steam. Air flow volume is adjustable by changing the nozzle tip. ■ Cleaning, dust suppression, drying, air curtain, humidification, moisture control, etc.
 [Spray pattern] [Spray distribution]	 Quick installation QB series	● Easy to install. Just drill a hole into the pipe and insert the nozzle. Spray direction is adjustable within 50 degrees as desired. Quick-detachable design helps to reduce maintenance time significantly. ■ Pre-treatment for painting, water cleaning, etc.

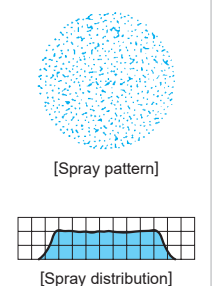
HYDRAULIC SPRAY NOZZLES—CONE SPRAY

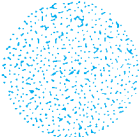
[Symbol key] ●: Features ■: Main applications

Hollow Cone Spray Nozzles

	 [Spray pattern]  [Spray distribution]	 Fine fog, ultra-low flow rate KB series	● Finest atomization among our hydraulic nozzles. Ceramic parts provide high wear resistance. ■ Humidifying, cooling, etc.	 Fine fog, ultra-low flow rate KBN series	● Finest atomization among our hydraulic nozzles. Plastic nozzle with alumina-ceramic orifice. ■ Cooling, humidifying, dust suppression, etc.
		 Semi-fine fog, low flow rate K series	● Ceramic orifice and closer provide excellent wear resistance. ■ Humidifying, cooling, spraying, etc.	 Semi-fine fog, low flow rate KKB series	● Large free passage diameter minimizes clogging. Easy maintenance with detachable whirler. ■ Humidifying, cooling, snow making, etc.
	 [Spray pattern]  [Spray distribution]	 Low flow rate KD series	● Combines compact design and semi-fine atomization capability. Ceramic parts provide high wear resistance. ■ Cooling, spraying, etc.	 Alumina ceramic AP-AL92 series	● Highly wear-resistant alumina ceramic nozzle with a stainless steel socket. ■ Cooling, cleaning, etc.
		 Medium capacity AAP series	● Stable spray pattern at both low and high pressure. No-whirler design minimizes clogging. ■ Cleaning, cooling, etc.	 Large capacity TAA series	● Stable spray pattern even at low pressure. Made highly wear-resistant silicon carbide. ■ Spraying in absorber of gas desulfurization equipment, slurry spraying, etc.

Full Cone Spray Nozzles

	 Low flow rate J series	● Lowest flow rate among our full cone spray nozzles. Ceramic parts provide high wear resistance. ■ Spraying, cleaning, cooling, etc.	 Quick detachable INJJX(-Y) series	● Quick-detachable design helps to reduce maintenance time. Made of chemical and heat resistant plastic. ■ Etching, cleaning, etc.
	 Standard type JJXP series	● Spray capacity ranges from small to medium. X-shaped whirler provides a large free passage, minimizing clogging. Made of stainless steel or PVDF. ■ Cleaning, cooling, spraying, etc.	 Low flow rate JJRP series	● Plastic nozzle with a disc whirler, providing a uniform distribution even at low flow rate. Available in PTFE or PVDF. ■ Pure water cleaning, spraying, etc.
	 Ceramic orifice & whirler JUP series	● Ceramic disc whirler and ceramic orifice provide excellent wear resistance. ■ Cleaning, cooling, spraying, etc.	 Narrow-angle spray NJJP series	● No whirler, minimal clogging. Unique design to produce a narrow-angle full cone spray pattern. ■ Cleaning, cooling, etc.
	 Alumina ceramic JUXP-AL92 series	● High wear-resistant alumina ceramic nozzle with a stainless steel socket. ■ Spraying in absorber of gas desulfurization equipment, slurry spraying, etc.	 Clog-resistant AJP series	● No-whirler design with a large free passage diameter minimizes clogging. Available in stainless steel, PPS, or alumina ceramic. ■ Cleaning, cooling, and other applications where clogging is a concern.
	 Large capacity TJJX series	● Large spray capacity. Flanged connection. ■ Cooling, reacting, spraying, etc.	 Wide-angle spray BBXP series	● The 120° spray angle provides a larger spray coverage. ■ Cleaning, cooling, fire extinguishing, etc.

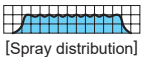


[Spray pattern]

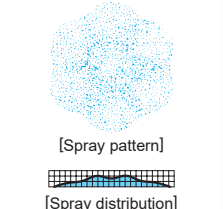


[Spray distribution]

Square Spray Nozzles

	 Square spray SSXP series
 [Spray pattern]  [Spray distribution]	● Square full cone spray pattern with uniform distribution leaves no gaps in multi-nozzle arrangement. Wide spray angle of 90–100° provides large spray coverage. ■ Cleaning, cooling, spraying, etc.

Special Full Cone Spray Nozzles

	 Seven-head, fine fog 7KB series	● Seven KB hollow cone spray nozzles with a compact adaptor header produce large volume of fine atomization. ■ Flue gas cooling/cleaning, moisture control, humidification, etc.
	 Seven-head, all metal 7JJXP series	● Seven JJXP full cone spray nozzles with a compact adaptor. Mean spray droplet diameter is about half the size of other single-head full cone spray nozzles with the same spray capacity. ■ Flue gas cooling/cleaning, dust suppression, etc.

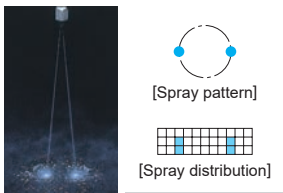
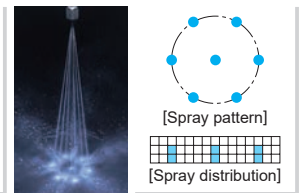
HYDRAULIC SPRAY NOZZLES—SOLID STREAM SPRAY

[Symbol key] ●: Features ■: Main applications

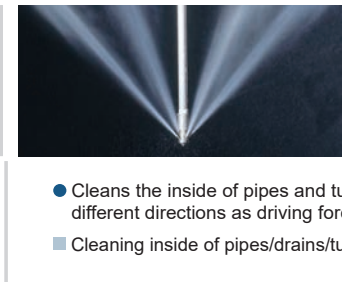
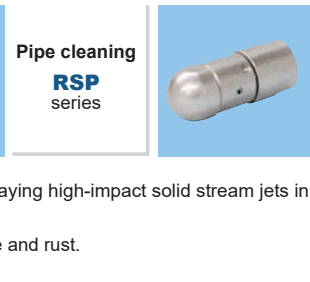
Solid Stream Spray Nozzles

 [Spray pattern] [Spray distribution]	 Standard type CP/CCP series  Convex round inlet CRP/CCRP series	● Highest spray impact solid stream jet having a large flow as compared to other nozzles having the same orifice diameters. ■ High pressure cleaning. ● Designed for minimal clogging. The convex round inlet prevents floating particles from flowing into the nozzle, thereby reducing clogging. ■ Cleaning in paper & pulp making process.	  Trimming nozzles CM/CTM series CMP-T series	● Extra fine solid stream with high impact cutting force. Wear-resistant nozzle orifice made of ceramic, alumina ceramic, or tungsten carbide. ■ Paper trimming, cleaning of precision machine parts, food cutting, etc.
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Multi-orifice Solid Stream Spray Nozzles

 [Spray pattern] [Spray distribution]	 [Spray pattern] [Spray distribution]	 Multi-orifice solid stream 2CP/2CCP series 7CP/7CCP series	● Multiple solid streams with high impact force. 2-orifice and 7-orifice nozzles are available. Compact design. ■ Bottle washing, cleaning dandy rolls and returnable containers, etc.
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Special Solid Stream Spray Nozzles

 ON/OFF spray control SO-CM series ● Spray ON/OFF can be regulated by turning the pilot air ON/OFF. Anti-drip design. ■ Trimming, cutting, marking, etc. For flat spray, SO-V series is available.	 Pipe cleaning RSP series ● Cleans the inside of pipes and tubes, moving by spraying high-impact solid stream jets in different directions as driving force. ■ Cleaning inside of pipes/drains/tubes, removing scale and rust.	 Rotating pipe cleaning RSP-R series
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SPECIAL PURPOSE NOZZLES/RELATED PRODUCTS

Air Nozzles

TAIFUJet® series



- Takes in surrounding air, boosting the volume of powerful air flow.

Special Purpose Nozzles

Slit laminar nozzles



- Slit nozzles with thin laminar flow of water or air. Water is sprayed in the above to better show the spray pattern.

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



- **EJX** series spouts out 3–4 times the supplied amount. Ideal for solution agitation.

Nozzle-related Products / Accessories

Spray header BRASIKan® series  ● Rotated by the handwheel, the brushes inside the header pipe clear the clog.	ARS Filter  ● Auto reverse self-cleaning by powerful jet spraying. Water saving and minimal maintenance.	Mist fan COOLJetter®  ● Combined unit of a fan and nozzles that delivers Semi-Dry Fog® over a broad area using fan wind.	Universal joints  UT WUT Photo of adaptor with a spray nozzle ● Universal joint adaptors to adjust spray direction.
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PNEUMATIC SPRAY NOZZLES

[Symbol key] ● : Features ■ : Main applications

Fine Fog Spray Nozzles



Low flow rate
● **BIM** series
● **CBIM** series
● **SCBIM** series

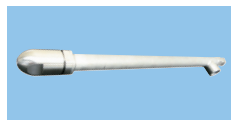
- Fine atomization with mean droplet diameters of 20–100 μm . Unique, minimal-clogging design. Available in flat fan spray, full cone spray, or hollow cone spray pattern.

- Spraying, cooling, moisture control, washing, etc.



Dry fog humidifier AKIMist® "E"

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



Large capacity
● **GSIM II** series

- Large spray capacity, low air-water ratio. Simple structure, easy maintenance.
- Flue gas cooling in waste incineration facilities.



Medium capacity
● **AKIJet®** series

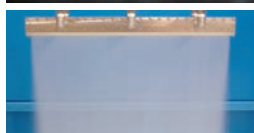
- Atomized droplets are impinged against each other at optimum condition, resulting in a uniform distribution of fine droplet sizes.
- Moisture control, combustion, cooling.

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 turn-down ratio.
- Precision cleaning, etc.



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 turn-down ratio. A large free passage diameter. **DOVEA** series for even flat spray pattern, **DDA** series for thick even flat spray pattern, and **JJA** series for full cone spray pattern.



Thick flat spray
● **DDA** series



Full cone spray
● **JJA** series

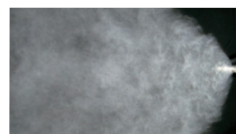
- Gas cooling, steel plate cooling, waste water combustion, etc.

Clog-resistant Spray Nozzles



Full cone spray SETOJet series
Flat spray SETOV series

- Pneumatic spray nozzles 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.

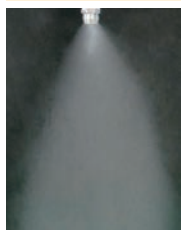


Wide-angle flat spray YYA series

- 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. Saves energy using blowers with low operating costs. Large free passage diameter.
- Steel plate cooling, cleaning, etc.

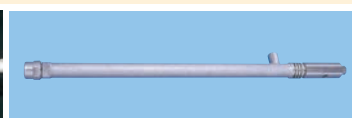
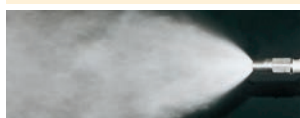


Semi-fine fog LSIM series

- Semi-fine atomization by applying blower air pressure. Low operating costs by using blower air for atomizing.
- Gas cooling, etc.



Steam-Driven Spray Nozzles



Steam-driven
● **JOKIJet®** series

- Atomization by steam instead of compressed air. Drastic saving on operating costs.
- Gas cooling, moisture control, etc.

SPRAY NOZZLE SYSTEMS

Cooling Systems

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.

LYOHM System for outdoor cooling



- Energy-saving, outdoor cooling system using Semi-Dry Fog® reduces temperatures with evaporative cooling without wetting passersby.

Humidification Systems

Hydraulic humidification system **AirULM®**



- Humidifies large spaces with low operating costs. Air compressor is not required.

Office humidification system **AU-KIT**



- Humidification system for offices and other large indoor spaces, easy to use with tap water and a power source.

Industrial humidification system **AirAKI®**



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

Fog Landscape System (Creating Artificial Sea of Clouds)

- Fog system that uses special nozzles developed for creating artificial sea of clouds for landscape purposes.





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



ISO9001: 2015 certified
(H. IKEUCHI & CO., LTD., Japan only)

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