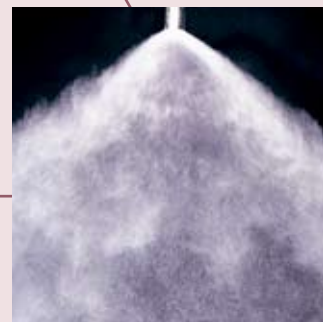
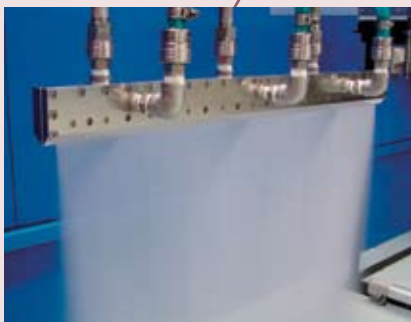
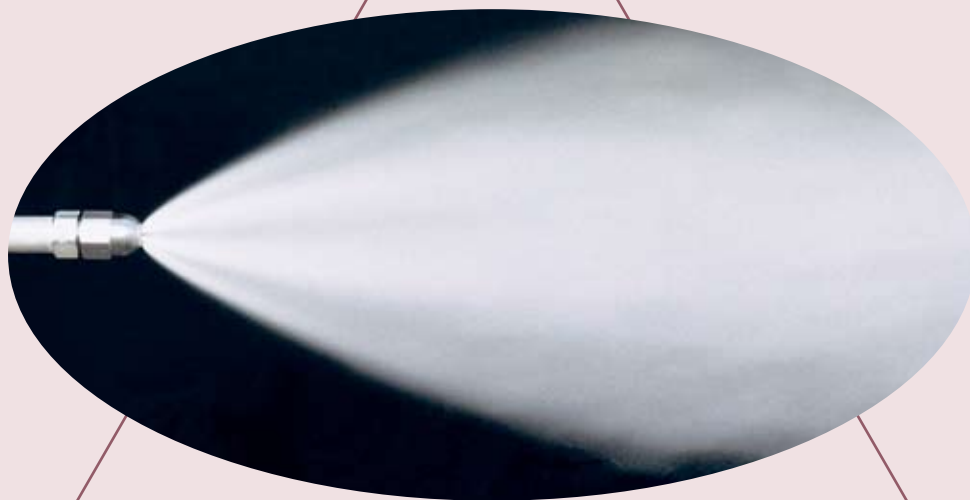


IKEUCHI

Catalog
on
Pneumatic
Spray
Nozzles



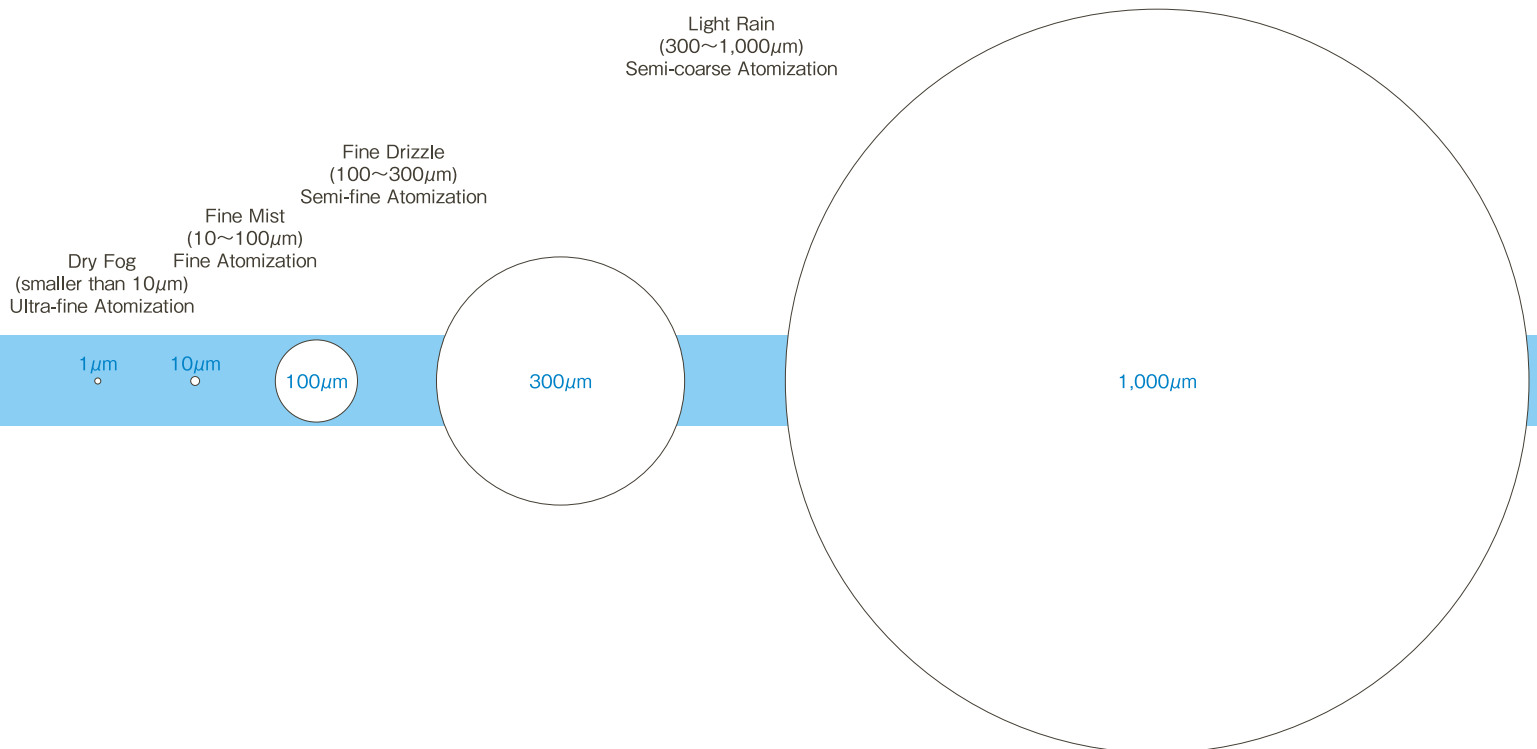
"The Mist Engineers"

H. IKEUCHI & CO., LTD.

11PA

Classification of Spray Droplet Size

IKEUCHI "The Mist Engineers," have classified spray droplet sizes as follows;



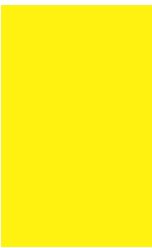
IKEUCHI, "The Mist Engineers".....
This is the registered trademark of our company. We are continuously developing methods for generation and application of Mist as a new industrial material.

Rain~Storms
(Over 1,000 μ m)
Coarse Atomization

4,000 μ m

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What are Pneumatic Spray Nozzles? (before selection)

The pneumatic spray nozzle utilizes a high-velocity flow of compressed air and has the following features as compared with hydraulic spray nozzles.

【Features】

1. Excellent atomizing performance

The minimum average droplet size produced by hydraulic spray nozzles is around $50\mu\text{m}$ (*1) but pneumatic spray nozzles can generate average droplet sizes smaller less than $10\mu\text{m}$ (*1).

2. Large turn-down ratio

Pneumatic spray nozzles have large turn-down ratios of spray flow-rate(*2) with little variation in droplet size and spray distribution.

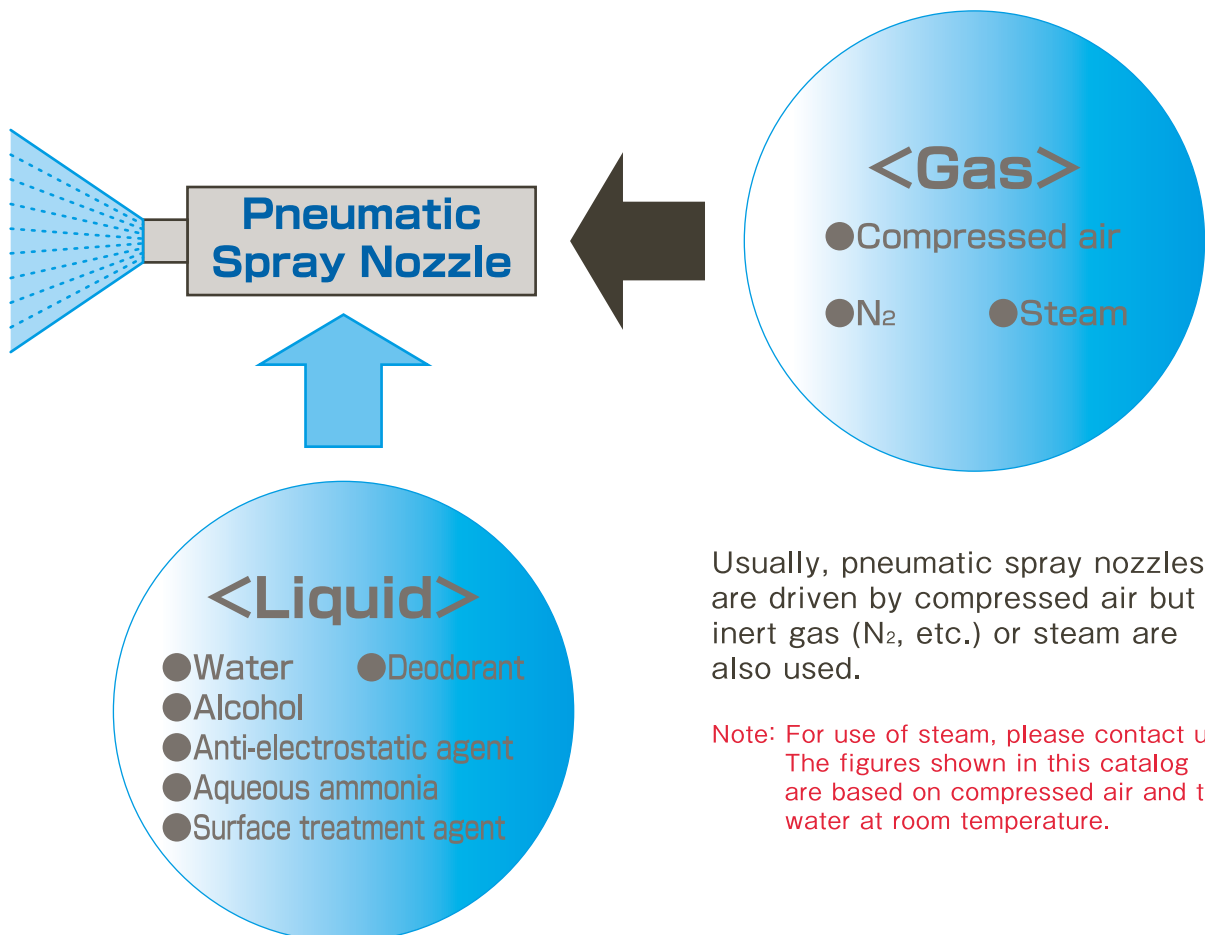
3. Large free passage diameter

Pneumatic spray nozzles have larger free passage diameters as compared with hydraulic nozzles, which is effective for reducing clogging problems.

*1) Measured by immersion sampling method (See page 6 for the droplet measuring method)

*2) Spray flow rate is expressed as spray capacity in this catalog. Please see page 8 for the turn-down ratio

Various types of pneumatic spray nozzles are available.
Please select a suitable nozzle for each application.



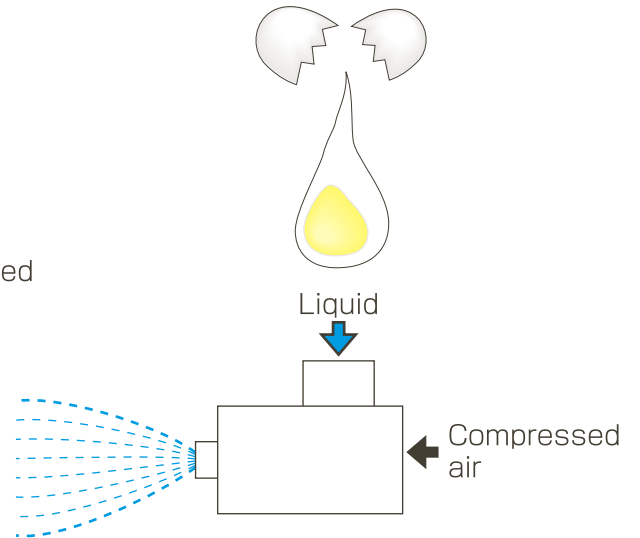
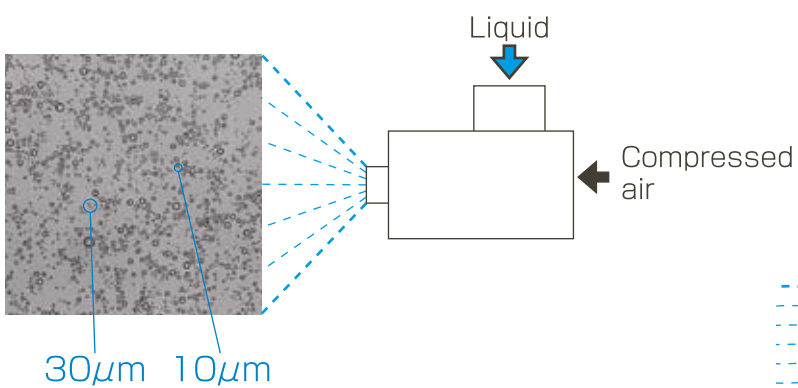
Usually, pneumatic spray nozzles are driven by compressed air but inert gas (N₂, etc.) or steam are also used.

Note: For use of steam, please contact us.
The figures shown in this catalog are based on compressed air and tap water at room temperature.

【Applications】

Where fine atomization is required...

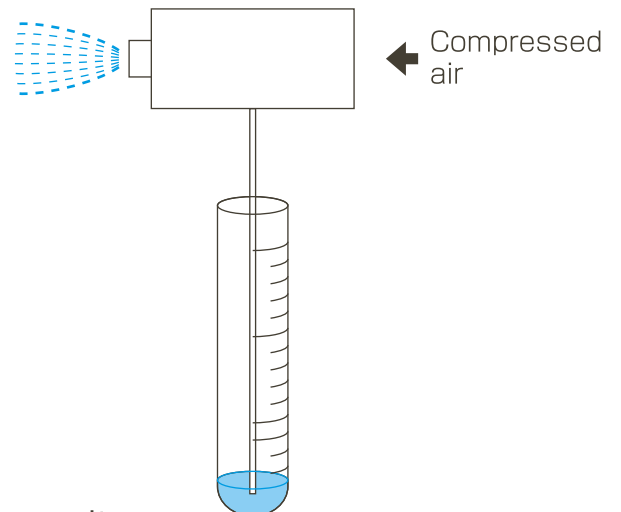
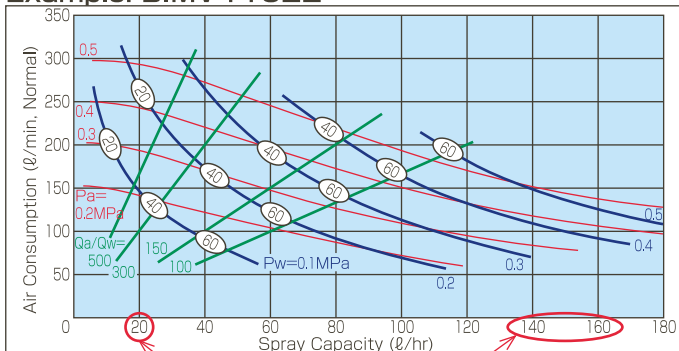
Where viscous liquid is sprayed...



Where a large turn-down ratio is required...

Where extremely small spray capacity is required...

Example: BIMV 1 1022



One spray nozzle can cover a wide range of spray capacity.

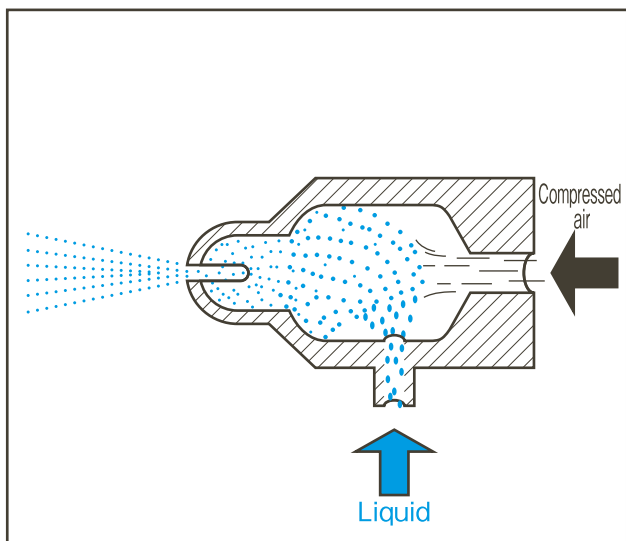
Technical Information on Pneumatic Spray Nozzles

1. Air-liquid mixing systems

Three air-liquid mixing systems are available for atomizing liquid.

Internal mixing type

Compressed air and liquid are mixed inside the nozzle. Generally, this type is excellent for atomizing liquid.

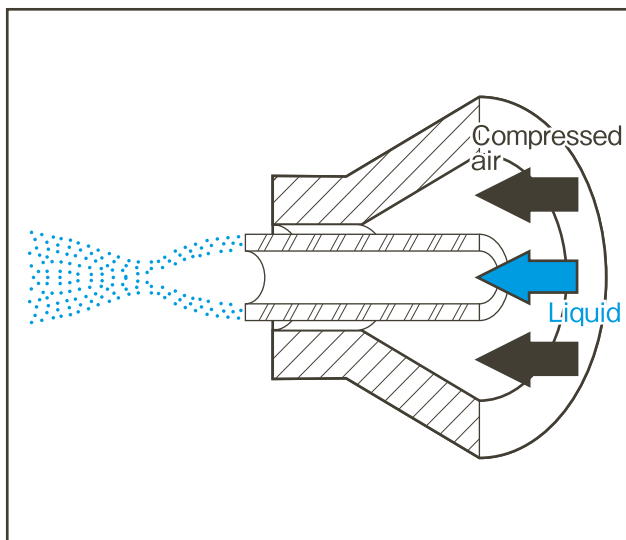


This internal mixing type is further classified into three types.

1. Inner air type... Compressed air flows in the center of the nozzle, while liquid flows along its circumference. This type provides an important benefit with a larger free passage diameter which minimizes clogging.
2. Outer air type... Liquid flows in the center of the nozzle, while compressed air flows along its circumference. This type of nozzle is selected for wide range of applications. Larger orifice size can be designed on demand while the spray droplets become a little coarser.
3. Pre-mix type... Even at a low air-water ratio, the increased velocity of the droplets results in a strong impact force. Furthermore, the turn-down ratio is larger and this type is suitable for cooling objects in high temperature range.

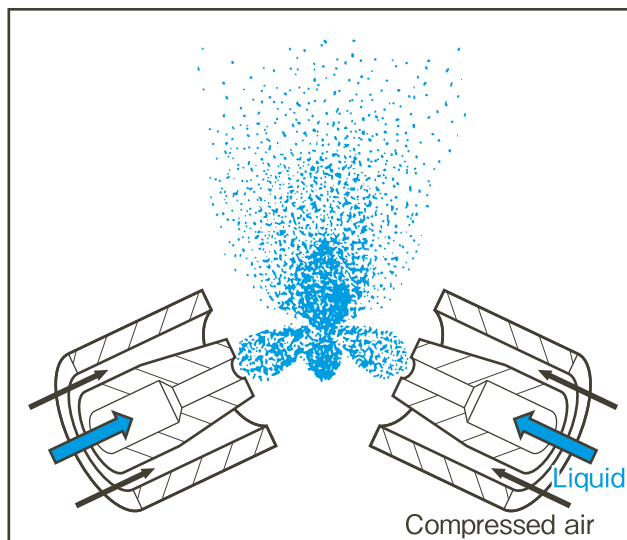
External mixing type

Compressed air and liquid are mixed outside the nozzle. Hence, this type clogs the least. This is also classified into inner air type and outer air type.



Impinging type

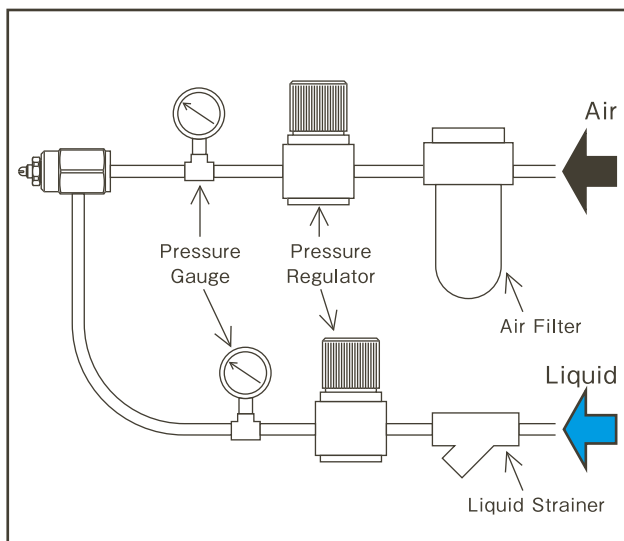
Air-stream entraining fine mist jets out from the nozzle and impinges against another air-stream of the same nature for shattering the mist into even finer, more-uniform droplets. This is an original method of IKEUCHI, "The Mist Engineers."



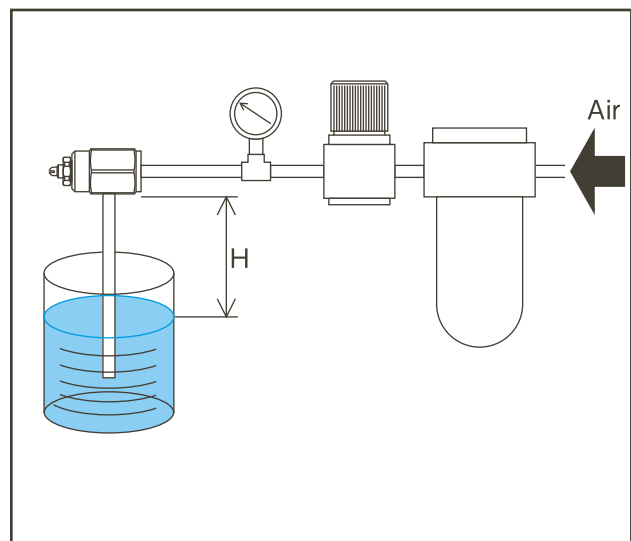
2. Liquid feeding system

Two liquid feeding systems are available. One is the **liquid pressure system** and the other is the **liquid siphon system**.

Liquid pressure system

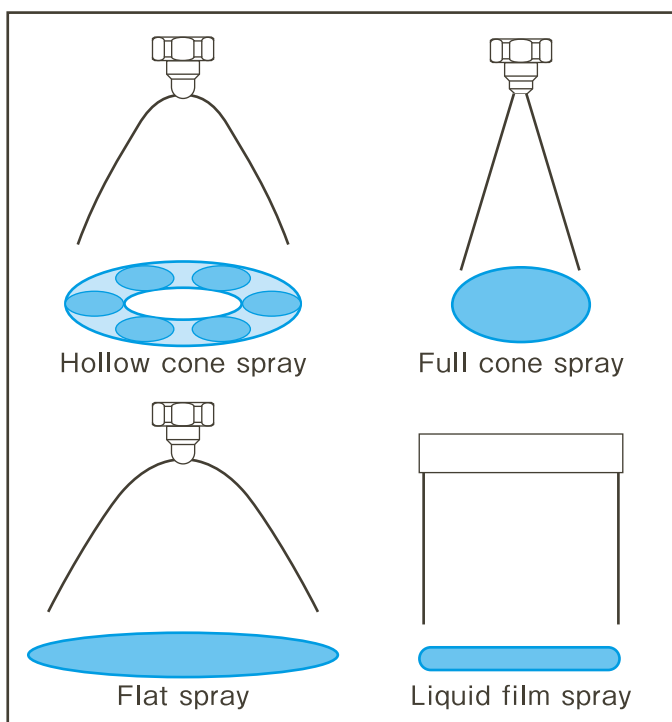


Liquid siphon system



Spray capacity differs depending on liquid siphon height(H).

3. Spray pattern



Spray pattern means the cross sectional shape of spray.

As illustrated, spray patterns are available in cone spray (hollow cone spray and full cone spray), flat spray, and liquid film spray.

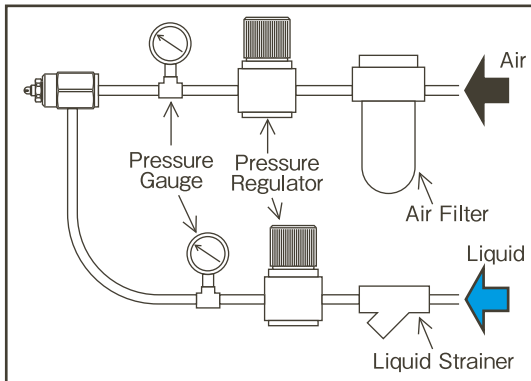
The best spray pattern among them can be selected for each application.

Hollow cone sprays and full cone sprays are suitable for humidification, cooling gases, chemical reactions and moisture control, etc., while flat sprays and liquid film spray are suitable for cooling, coating, etc.

The spray patterns of pneumatic spray nozzles deform significantly as the distance from the nozzle becomes greater.

Technical Information on Pneumatic Spray Nozzles

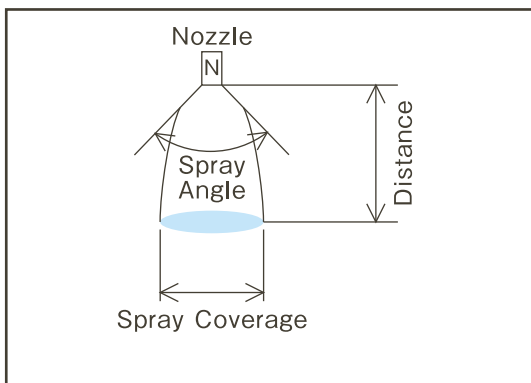
4. Pressure



For each series of pneumatic spray nozzles, the most commonly used pressures or pressures at which the characteristics can be achieved are defined as the standard pressures.

The figures in this catalog are based on compressed air and tap water at room temperature and the pressures are measured at the immediate upstream of each nozzle.

5. Spray angle

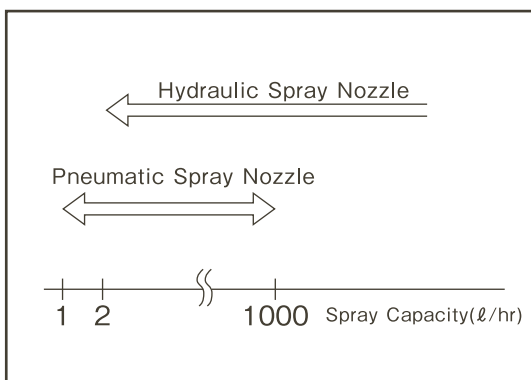


The spray angle is measured at the top of the spray made by straight lines extending along the outer edges of the spray.

Pneumatic spray nozzle's flow velocity is so fast that the specified spray angle is maintained only at the top of spray.

For nozzle alignment, please refer to the spray coverage data indicated in each table.

6. Spray capacity

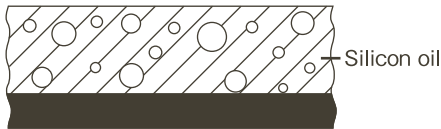
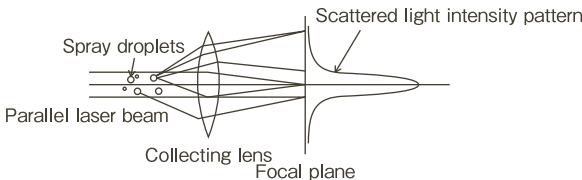
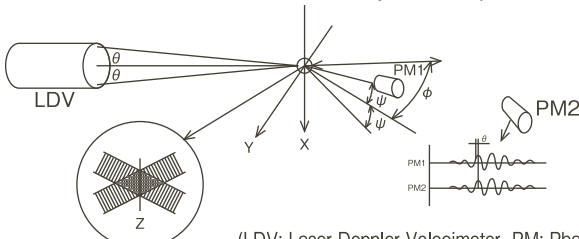


The spray capacity is the water volume flow rate sprayed from the nozzle. One of the features of pneumatic spray nozzle is to spray at extremely small capacity such as 17cc/min. or 1 ℓ/hr.

Spray capacities shown in this catalog are based on tap water at room temperature. (The air consumption is expressed as the normal volume at atmospheric pressure.)

7. Spray droplet size

1) Principles and features of each droplet measuring method

Measuring method		Principle and features	Proper range of droplet size measurement
Immersion sampling method		<p>Droplets are collected on a glass plate coated with silicon oil and are immediately photographed at high magnification for subsequent scanning. As the collected droplets remain suspended in the silicon oil, they are measured as perfect spheres. However, ultra-fine droplets are incapable of breaking the surface tension of the oil and will evaporate without settling. Thus, the average droplet size determined by this method is larger than the actual value.</p> 	10~5000 μm
Laser analyzer	Fraunhofer diffraction method	<p>A laser beam scatters at the surface of droplets in the laser beam path and the diffraction pattern due to interference of scattered light is focused behind the droplets. This method can simultaneously measure all droplets on the laser beam path but if the concentration of droplets is too high, it would result in a phenomenon (multi-scatter) such that a once-scattered laser beam is re-scattered due to another droplet, which could then cause the measured droplet size to be smaller than the actual droplet size.</p> 	1~1000 μm
	Laser Doppler method	<p>This method forms an interference fringe by crossing two laser beams. In detail, this method detects scattered light, which results from droplets having passed through this interference fringe, by two or more receivers located at a certain distance from the spray and determines droplet size from the phase difference at that time. This method is not as affected by droplet concentration because it measures droplets one by one and, as one more advantage, it can measure droplet velocity simultaneously. However, the measurement is made only at one point.</p>  <p>(LDV: Laser Doppler Velocimeter PM: Phase monitor)</p>	0.5~2500 μm

Technical Information on Pneumatic Spray Nozzles

2) Mean droplet diameter

■ Example of calculation of Sauter mean droplet diameter

Range(μm)	Mean value(μm)	Q'ty(n)	nd ²	nd ³
0-100	50	1664	4160000	208000000
100-200	150	2072	46620000	6993000000
200-300	250	444	27750000	6937500000
300-400	350	161	19722500	6902875000
400-500	450	73	14782500	6652125000
500-600	550	35	10587500	5823125000
600-700	650	17	7182500	4668625000
700-800	750	4	2250000	1687500000
	計	4470	133055000	3.987275×10 ¹⁰

$$d_{32} = \frac{\sum nd^3}{\sum nd^2} = 299.6711886 = 299.67 \mu\text{m}$$

Mean droplet diameter is one of the important factors in selecting nozzles and designing nozzle-related equipment. Commonly used definitions include the following three.

- Sauter Mean Droplet Diameter(d_{32})..... $\sum nd^3 / \sum nd^2$
- Volume Mean Droplet Diameter(d_V)..... $(\sum nd^3 / \sum n)^{1/3}$
- Mass Median Droplet Diameter($D_{v,5}$)..... $\int_0^{D_{v,5}} dv/v = \int_{D_{v,5}}^{\infty} dv/v = 50\%$

It is often used in chemical processes such as cooling, evaporation, combustion and drying, where efficiency is determined by the ratio of volume to surface area, i.e. specific surface. Because a small portion of large droplets is more influential over the rate of reaction than a large portion of small droplets, it is advisable to use Sauter Mean Droplet Diameter as the representative droplet size. Sauter Mean Diameter is used in this catalog.

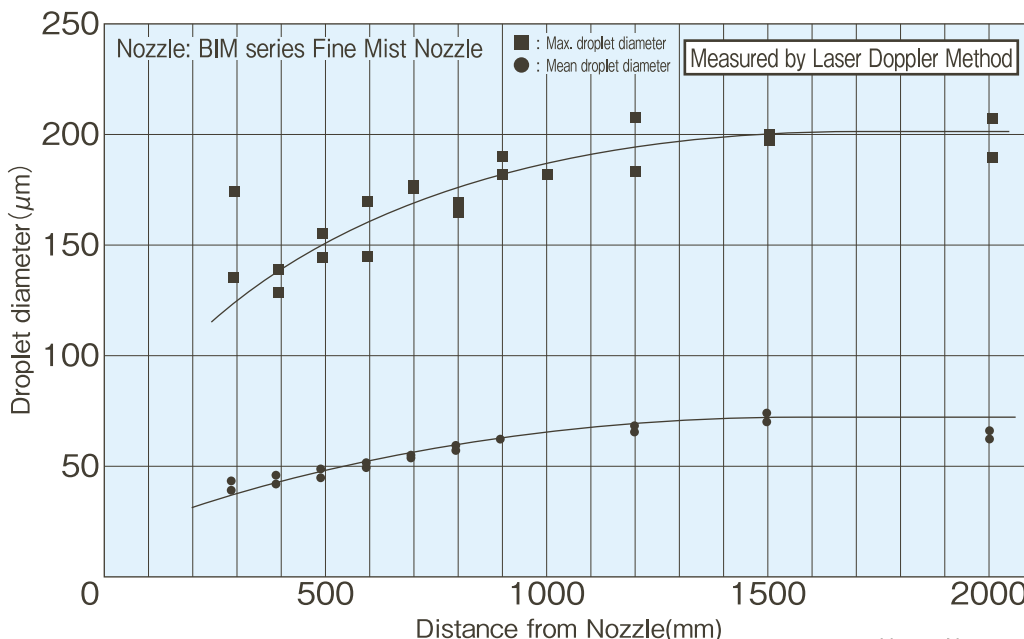
3) Correlation of spray droplet diameter

Measured results differ depending on each measuring method. Assuming the droplet diameter measured by the immersion sampling method as 1, the correlation of Sauter mean droplet diameters among three measuring methods is shown right.

Nozzle type		Measuring method	Immersion Sampling Method	Fraunhofer Diffraction Method	Laser Doppler Method
			1	0.45	0.7~0.9
Hydraulic spray nozzles	Flat spray, Full cone spray		1	0.45	0.7~0.9
	Hollow cone spray		1	0.45	0.7~0.9
Pneumatic spray nozzles	Fine & semi-fine atomization		1	0.45	0.7~0.9
	Ultra-fine atomization		1	0.45	0.7~0.9

4) Evaluation of droplet diameter

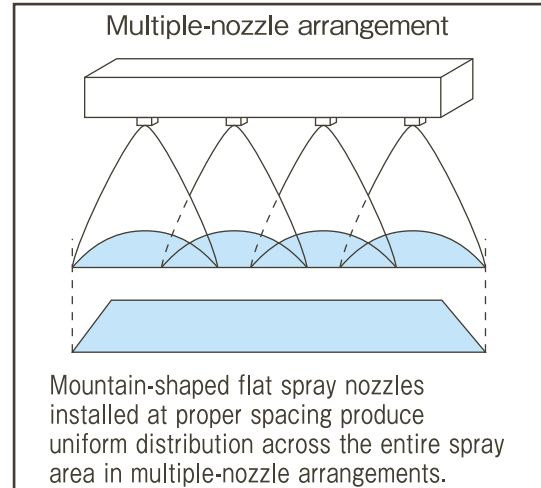
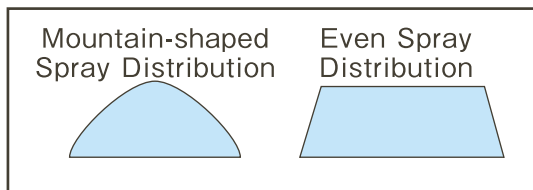
Good care must be exercised in evaluating droplet diameter because droplet diameters differ depending on each measuring method as described above. In comparing spray droplet diameters of several different spray nozzles, needless to say, the measuring method applied must be uniform and, when the laser method is applied, measurement distance, droplet concentration, etc. must also be as consistent as possible. Too high a concentration would result in multiple scattering in the Fraunhofer laser diffraction and Laser Doppler methods, which would then prevent correct evaluation of droplet diameter. Therefore, it is desirable to avoid measuring at proximity with the nozzle and to measure at a standardized distance from the nozzle.



Droplet diameters at various distances from the nozzle Note : Air pressure: 0.49MPa Liquid pressure: 0.46MPa

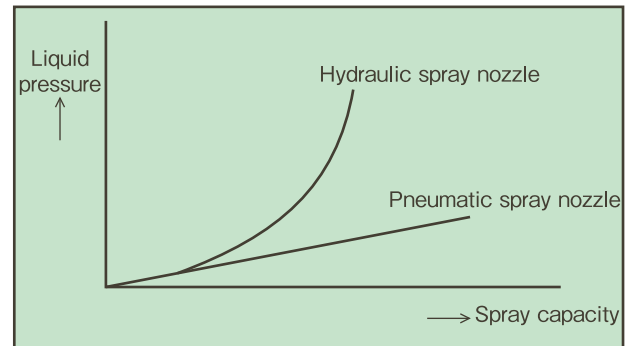
8. Spray distribution

The spray distribution means the distribution of spray flow in the spray width direction. A mountain-shaped distribution is useful in producing uniform spray distribution across the entire spray width by overlapping patterns in multiple-nozzle arrangements, while even spray distribution is suitable for applications that require uniform spray distribution by one nozzle. The spray distribution depends on operational conditions such as spray height, pressure and other conditions.

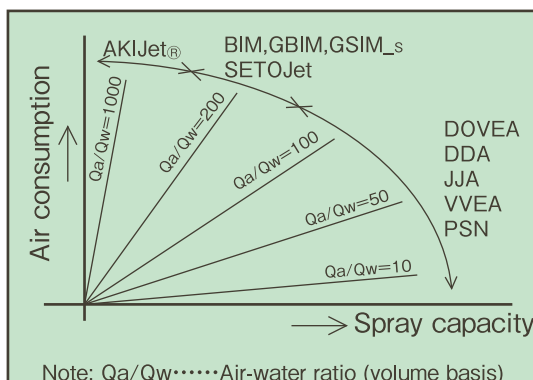


9. Turn-down ratio

The turn-down ratio means the ratio between the adjustable minimum spray capacity and the maximum spray capacity. The spray capacity of hydraulic spray nozzles is proportional to square root of the pressure and the variation of spray capacity greatly depends on the power of pump, so the turn-down ratio is small. On the other hand, pneumatic spray nozzles enable users to obtain large turn-down ratios by adjusting both air and liquid pressures. Hence, pneumatic spray nozzles are the most suitable for cooling combustion fumes or applications requiring the nozzles producing small droplets and having large turn-down ratios.



10. Air-water ratio



Air-water ratio means the rate of air consumption divided by spray capacity. This is expressed as either a volume ratio or weight ratio. If the nozzles used are the same, the spray droplet size becomes smaller as the air-water ratio becomes higher.

The air-water ratio in this catalog is based on volume ratio, unless specifically stated.

Spray Nozzle Materials

The standard and optional materials available for nozzles are shown in the tables of each nozzle type.

As "The Mist Engineers", we, IKEUCHI, have been developing nozzles in a variety of materials to meet the desires and applications of our customers. We were the first to develop ceramic orifice-inserted spray nozzles and succeed in marketing them throughout the world.

The materials of nozzles and parts are listed below.

Resistance characteristics of each material against common chemicals are also listed below.

Metals	B ······ Brass(C3604)
	S304 ····· Stainless steel 304
	S303 ····· Stainless steel 303
	S316 ····· Stainless steel 316
	S316L ····· Stainless steel 316L
	S420J2 ····· Hardened stainless steel 420J2
	SCS2 ····· Die-cast stainless steel equiv. to S420
	SCS13 ····· Die-cast stainless steel equiv. to S304
	SCS14 ····· Die-cast stainless steel equiv. to S316
	SCS16 ····· Die-cast stainless steel equiv. to S316L
	TN ······ Titanium alloy

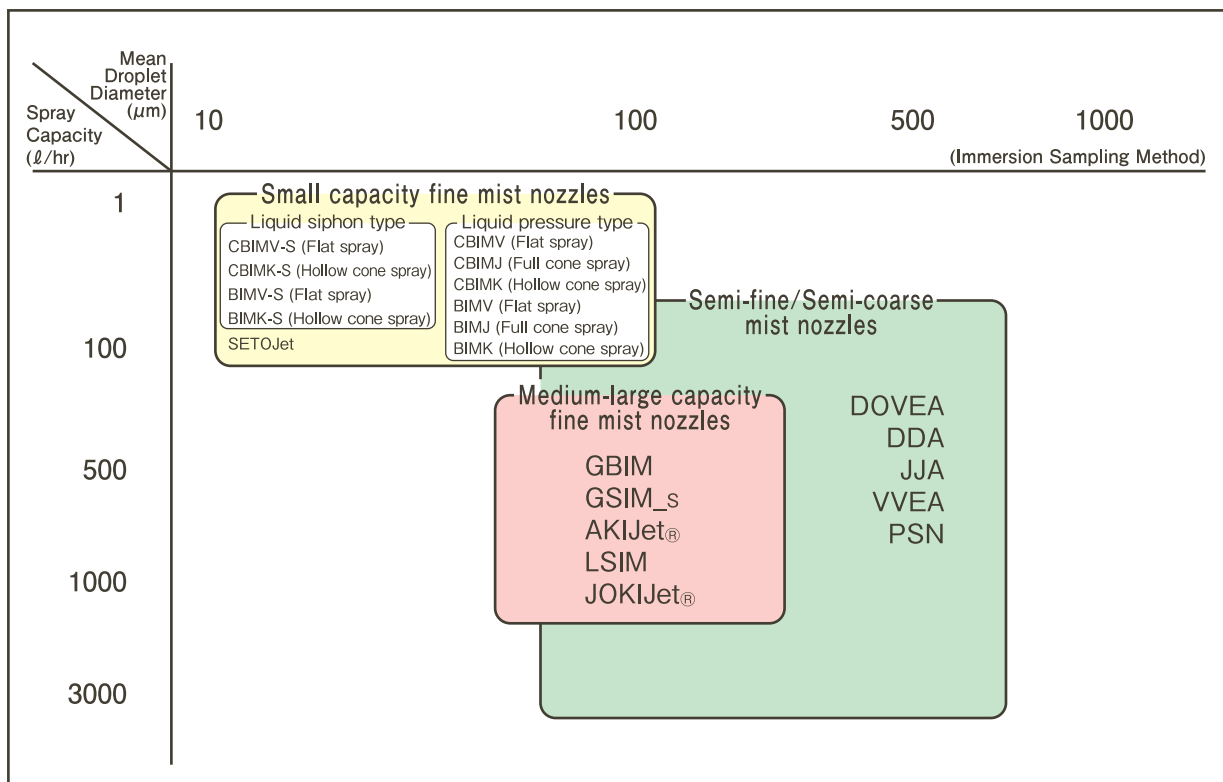
Plastics	PVC ······ Polyvinyl chloride
	HTPVC ····· Heat-treated polyvinyl chloride
	PP ······ Polypropylene
	FRPP ····· Glass-fiber reinforced polypropylene
	PTFE ····· Polytetrafluoroethylene
	PCTFE ····· Polychlorotrifluoroethylene
	PVDF ····· Polyvinylidene fluoride
	PPS ······ Polyphenylene sulfide

Items	Materials	Metals					Plastics				
		B	S303	S316	HC22 equivalent (*)	TN	PVDF	PPS	PVC	PP	PTFE
Chemical resistance	Hydrochloric acid	×	×	×	○	△	○	○	○	○	○
	Concentrated Hydrochloric acid	×	×	×	×	×	○	○	○	△	○
	Sulfuric acid(35%)	×	×	×	○	×	○	○	○	○	○
	Concentrated sulfuric acid	×	×	△	○	×	○	△	○	×	○
	Nitric acid(35%)	×	○	○	○	○	○	△	○	×	○
	Concentrated nitric acid	×	△	△	○	○	○	×	×	×	○
	Acetic acid	×	△	○	○	○	○	○	○	○	○
	Sodium hydroxide(caustic soda)	△	○	○	○	○	△	○	○	○	○
	Aqueous ammonia	△	○	○	○	○	○	○	○	○	○
	Acetone	○	○	○	○	○	×	○	×	○	○
	Trichloroethylene	○	○	○	○	○	○	○	×	△	○
	Ethyl alcohol	○	○	○	○	○	○	○	○	○	○
Heat resistance	Suitable(°C)	<200	<400	<400	<400	<500	80	170	40	80	100
	Short-term Use(°C)	400	800	800	800	1000	120	180	50	90	150

*The above HC22 is equivalent to HASTELLOY® C-22 (HASTELLOY is a registered trademark of Haynes International, Inc.).

○·····Suitable △·····Possible for short term ×·····Unusable

How to Select Pneumatic Spray Nozzles



Nozzle type	Spray pattern	Liquid feeding system	Series	Air-liquid mixing system	Spray capacity	units	Spray Angle (°)	Air consumption (ℓ/min, Normal)	Page
Small capacity Fine mist nozzle	Flat spray	Liquid pressure	BIMV, CBIMV	Internal mixing Inner air type	1~107	ℓ/hr	110~45	15~250	13, 31
		Liquid siphon	BIMV-S, CBIMV-S		0.7~4.5		80	15~94	15, 33
	Hollow cone spray	Liquid pressure	BIMK, CBIMK		2~107		60	27~250	17, 32
		Liquid siphon	BIMK-S, CBIMK-S		1.5~5		60	27~94	19, 33
Medium-large capacity Fine mist nozzle	Full cone spray	Liquid pressure	BIMJ, CBIMJ	Impinging type	2~107	ℓ/hr	20	27~250	21, 32
		Liquid pressure	GBIM		70~1560		20~60	340~5900	37
		Liquid pressure	GSIM_s						41
		Liquid pressure & Liquid siphon	AKIJet®		AKIJet®-S		67		
Liquid pressure	AKIJet®-S	69							
Semi-fine/ Semi-coarse mist nozzle	Flat spray	Liquid pressure	VVEA	Internal mixing Pre-mix type	0.29~4.5	ℓ/min	60~80	14~128	57
		Liquid pressure	DOVEA		0.42~40		30~620	46	
		Liquid pressure	DDA		0.5~57.3		170~610	51	
	Full cone spray	Liquid pressure	JJA		0.9~23.9		125~25	50~690	54
	Liquid film spray	Liquid pressure	PSN		8~50		—	520~2500	60
Clog-resistant nozzle	Full cone spray	Liquid pressure & Liquid siphon	SETOJet	External mixing Outer air type	2.0~95	ℓ/hr	—	36~230	63
Ultra-low pressure Semi-fine mist nozzle	Full cone spray	Liquid pressure	LSIM	Internal mixing Outer air type	~1000	ℓ/hr	20	1500~6000	73
Steam driven nozzle	Full cone spray	Liquid pressure	JOKIJet®	External mixing Outer air type	10~1200	ℓ/hr	—	—	76

[Spray conditions]

Small capacity Fine mist nozzle: spray capacity at air press. 0.3MPa & liquid press. 0.1-0.3MPa, air consumption at air press. of 0.2-0.4MPa

Medium-Large capacity Fine mist nozzle: spray capacity at air press. 0.3MPa & liquid press. 0.2-0.5MPa, air consumption at air press. of 0.3-0.4MPa

Semi-fine/Semi-coarse mist nozzle (except PSN): spray capacity and air consumption at air press. 0.1-0.4MPa & liquid press. 0.07-0.7MPa

PSN nozzle: spray capacity and air consumption at air & liquid press. 0.1-0.4MPa, slit length 1000mm, slit opening 0.05mm

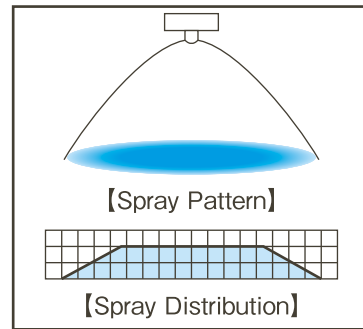
Clog-resistant nozzle: spray capacity and air consumption at air press. 0.3MPa & liquid press. 0-0.05MPa

Ultra-low pressure Semi-fine mist nozzle: spray capacity at liquid press. 0-2MPa, air consumption at air press. of 0.02-0.06MPa

Steam-driven nozzle: spray capacity at steam press. 0.1-0.6MPa, liquid press. 0.1-0.5MPa

How to Read Product Tables

- Spray nozzle specifications are shown in the respective tables.



- Spray pattern and spray distribution

Table

• ℓ/min, Normal: ℓ/min at Normal Conditions (0°C, 1atm)

• Spray coverage at the specified pressure (Spray coverage: 280mm at air pressure of 0.2MPa and liquid pressure of 0.1MPa)

• Spray angle code (110°)

• Air consumption at the specified pressure (estimated value)
: (25ℓ/min, Normal at 0.4MPa)

• Minimum passage diameters of each part (approx. value)

• Air consumption code (02)

Spray Angle Code ^{*2}	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)										Spray Coverage ^{*3} (mm)			Mean Droplet Dia. (μm) Laser Doppler Method	Free Passage Diameter (mm)							
			Liquid Pressure (MPa)										Liquid Press. (MPa)				Spray Tip	Adaptor						
			0.1		0.15		0.2		0.25		0.3		0.1	0.15	0.25			Liquid	Air					
110°	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	—	—	280	340	—	15	0.2	0.9	0.7			
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420	—	230	340				100		
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	—	—	—	—	—				—	—	
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	—	—	300	360	—	15	0.3	0.9	0.9			
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	230	270	430	—	250	350				100		
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	—	—	—	—	—				—	—	
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	—	—	320	380	—	15	0.5	1.2	1.4			
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	240	300	450	—	270	370				100		
		0.4	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				—	—	
	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	0.8	1.8	1.9	
				—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				—
				—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—				—

• Calculated spray capacity at the specified pressures: 4.7ℓ/hr at air pressure of 0.3MPa and liquid pressure of 0.15MPa

• At air pressure of 0.2MPa and liquid pressure of 0.3MPa, defined spray pattern does not develop (coarse droplets, wheezing, etc)

• Sauter mean droplet diameter measured by Laser Doppler Method

■ Dimensions

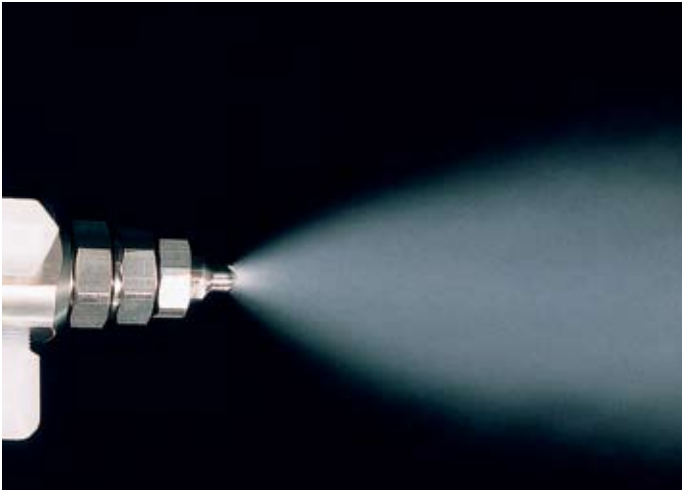
Spray Angle Code	Air Consumption Code	Pipe Conn. Size (in.)		Outer Diameter φd (mm)	Free Passage Diameter (mm)	
		Air	Liquid		Air	Liquid
60	75	PT1/2F	PT1/2F	45	2.4	2.5
	110				2.4	2.7
	150				PT3/4F	PT1/2F

• [Size of pipe connection]
PT1/2F: 1/2" Female thread (PT), Rc1/2
PT1/4M: 1/4" Male thread (PT), R1/4

Small Capacity Fine Mist Nozzles

BIM/CBIM series Fine Mist Nozzles

Patented



- BIM/CBIM series produces fine atomization with a mean droplet diameter of 10-100 μ m measured by Laser Doppler Method.
- Unique design greatly minimizes clogging. Designed using fewer parts than typical nozzles for easier maintenance and lower price.
- Available in 3 spray patterns, BIMV/CBIMV flat spray, BIMK/CBIMK hollow cone spray and BIMJ/CBIMJ full cone spray. Versatile pneumatic spray nozzles - you can select a suitable type depending on the intended use.
- Available with integrated spray header combining air and liquid conduits, ring-shaped header, and other compact headers to fit your site.

Contents

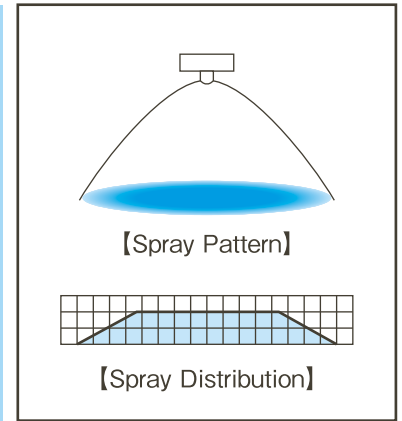
BIMV series Small Capacity Fine Mist Nozzles / Flat Spray —Liquid pressure type—	p.13
BIMV-S series Small Capacity Fine Mist Nozzles / Flat Spray —Liquid siphon type—	p.15
BIMK series Small Capacity Fine Mist Nozzles / Hollow Cone Spray —Liquid pressure type—	p.17
BIMK-S series Small Capacity Fine Mist Nozzles / Hollow Cone Spray —Liquid siphon type—	p.19
BIMJ series Small Capacity Fine Mist Nozzles / Full Cone Spray —Liquid pressure type—	p.21
Types and structures of adaptors for BIM series nozzles	p.23
Dimensions and pipe connection size	p.25
How to use BIM controlling adaptors	p.26
BIM-PP series Small Capacity Fine Mist Nozzles —Liquid pressure type—	p.27
Integrated Spray Header with BIM Fine Mist Nozzles	p.28
CBIM Compact Design Small Capacity Fine Mist Nozzles —Liquid pressure type—	p.30
CBIM Compact Design Small Capacity Fine Mist Nozzles —Liquid siphon type—	p.33
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List of spray tip interchangeability	p.35



Features

- Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of $100\mu\text{m}$ or less (*1).
- Features large turn-down ratio under liquid pressures of 0.1-0.3MPa.
- Three spray angles of 110° , 80° , and 45° are available.
- Produces two different spray distributions; uniform spray distribution throughout spray pattern area (when spraying at a low air-water ratio), and a mountain-shaped distribution having gradually tapered edges (at a high air-water ratio).

*1) Measured by Laser Doppler Method



BIM with SN-type adaptor

Applications

- Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea, etc.
- Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products, etc.
- Moisture control: Paper, gas, ceramics, concrete, etc.
- Cleaning: Printed circuit boards, glass tubes, etc.

Structure & Materials

- Comprising 4 parts: Spray tip, core, cap and adaptor. (Details of adaptors are shown on pages 23 and 24.)
- Materials: S303 (Optional material; S316L)

Dimensions & Pipe Conn. Sizes

- Dimensions and pipe connection sizes are shown on page 25.

Accessories

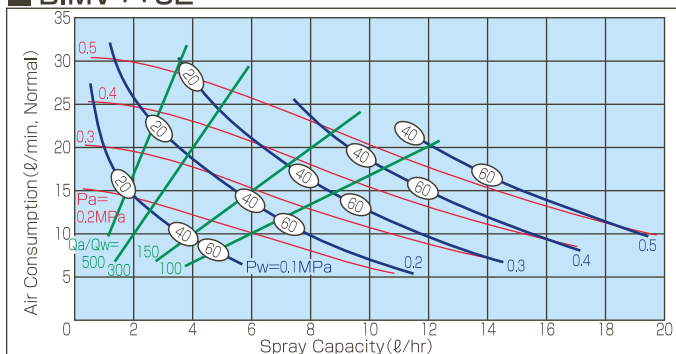
- Fixing support for easy installation is shown on page 26.

Flow-rate Diagram

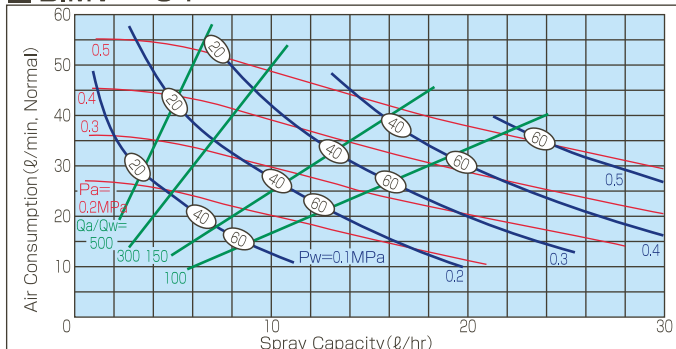
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Red lines (—) represent compressed air pressure P_a in MPa.
Blue lines (—) represent liquid pressure P_w in MPa.
Green lines (—) represent air-water ratio Q_a/Q_w .
- ③ Figures in ovals \bigcirc indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.
- ④ ** to be filled by spray angle code of 110, 80 or 45.

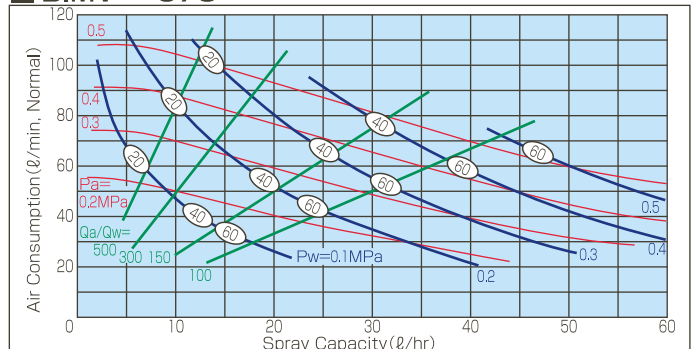
BIMV**02



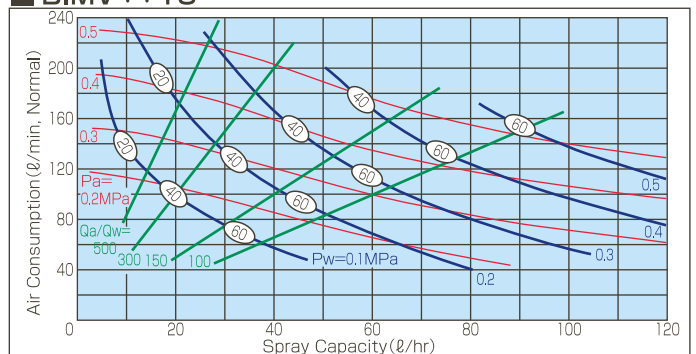
BIMV**04



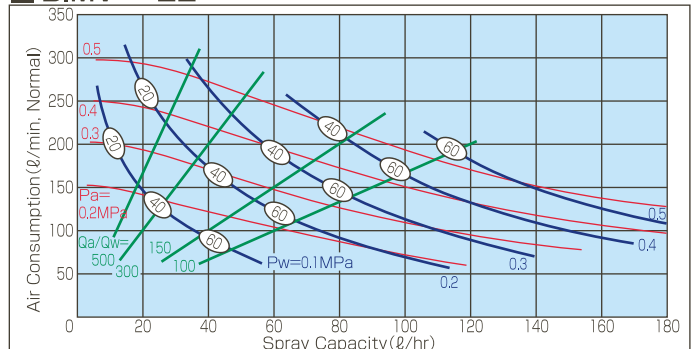
BIMV**075



BIMV**15

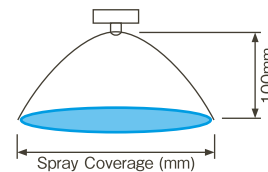


BIMV**22



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)												Spray Coverage*3 (mm)	Mean Droplet Dia. (μm)	Free Passage Diameter (mm)			
			Liquid Pressure (MPa)														Laser Doppler Method	Spray Tip	Adaptor	
			0.1		0.15		0.2		0.25		0.3		Liquid Press. (MPa)							
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15						0.25
110°	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	280	340	—	15 } 100	0.2	0.9	0.7	
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420					
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	230	340					—
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	300	360	—	15 } 100	0.3	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	230	270	430					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	250	350					—
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	320	380	—	15 } 100	0.5	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	240	300	450					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	270	370					—
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	340	400	—	15 } 100	0.8	1.8	1.9	
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	270	320	470					
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	280	380					—
	22	0.2	22.3	140	45.6	116	92.1	76.9	—	—	—	—	350	420	—	15 } 100	0.9	2.1	2.2	
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	280	330	490					
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	300	400					—
80°	02	0.2	2.2	14	5.3	11	—	—	—	—	—	200	260	—	15 } 100	0.3	0.9	0.7		
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	170	210					300	
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	200					250	—
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	200	260	—	15 } 100	0.4	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	170	210	310					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	200	260					—
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	200	270	—	15 } 100	0.6	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	170	210	310					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	200	260					—
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	210	280	—	15 } 100	0.9	1.8	1.9	
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	180	220	320					
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	200	270					—
	22	0.2	22.3	140	45.6	116	92.1	76.9	—	—	—	—	210	280	—	15 } 100	1.1	2.1	2.2	
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	180	220	330					
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	210	280					—
45°	02	0.2	2.2	14	5.3	11	—	—	—	—	—	100	130	—	15 } 100	0.4	0.9	0.7		
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	80	110					150	
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	100					130	—
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	100	130	—	15 } 100	0.5	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	80	110	150					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	100	130					—
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	100	140	—	15 } 100	0.9	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	80	110	160					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	100	140					—
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	110	150	—	15 } 100	1.2	1.8	1.9	
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	90	120	170					
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	110	150					—
	22	0.2	22.3	140	45.6	116	92.1	76.9	—	—	—	—	110	160	—	15 } 100	1.6	2.1	2.2	
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	90	120	180					
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	110	150					—

Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0.1MPa.
*3) Measured at 100mm from nozzle.



How to inquire / order

To determine specifications, please specify a spray angle code and air consumption code referring to the above chart, then select a connecting adaptor from the 8 types (type N, T, ND, etc.). Please inquire or order for a specific nozzle using this coding system.

<Example> BIMV 1 1002S303+NS303

BIMV

110

Spray Angle Code

- 110°
- 80°
- 45°

02

Air Consumption Code

- 02
- 04
- 075
- 15
- 22

S303

Material of Spray Tip, Core & Cap (S303)

+

N

Type of Adaptor

- N
- T
- ND, UND
- SP, USP
- SN, USN

S303

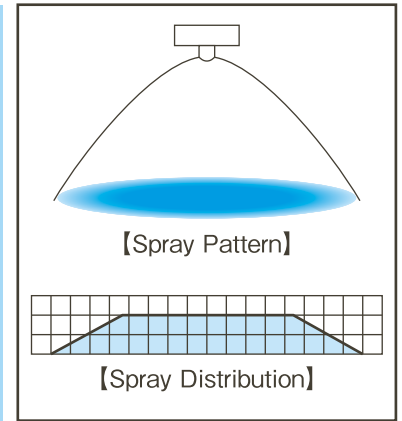
Material of Adaptor (S303)

Details of adaptors are shown on pages 23 and 24.

Features

- Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30 μ m or less (*1).
- Liquid siphon feed type.
- Spray angle is 80°.
- Even spray distribution across the entire spray area.

*1) Measured by Laser Doppler Method



BIM with T-type adaptor

Applications

- Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea, etc.
- Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products, etc.
- Moisture control: Paper, gas, ceramics, concrete, etc.
- Cleaning: Printed circuit boards, glass tubes, etc.

Structure & Materials

- Comprising 4 parts: Spray tip, core, cap and adaptor. (Details of adaptors are shown on [pages 23 and 24.](#))
- Materials: S303 (Optional material; S316L)

Dimensions & Pipe Conn. Sizes

- Dimensions and pipe connection sizes are shown on [page 25.](#)

Accessories

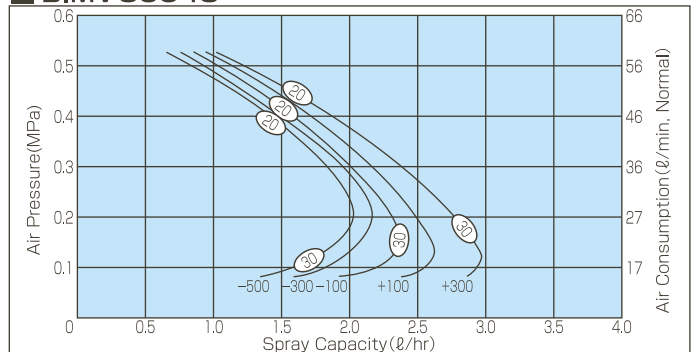
- Fixing support for easy installation is shown on [page 26.](#)

Flow-rate Diagram

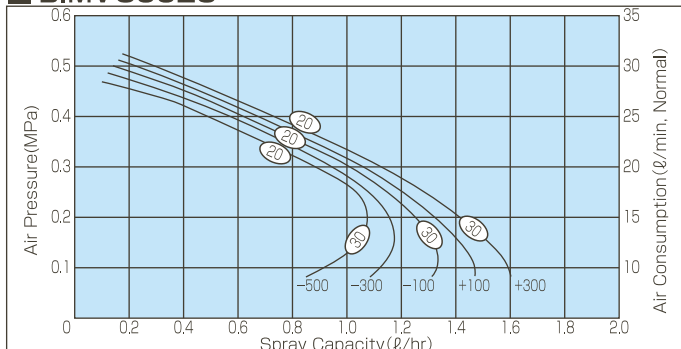
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Figures at foot of each curve indicate gravity head (+) and siphon height (-) in mm.
- ③ Figures in ovals \circ indicate Sauter mean droplet diameters (μ m) measured by the Laser Doppler Method.

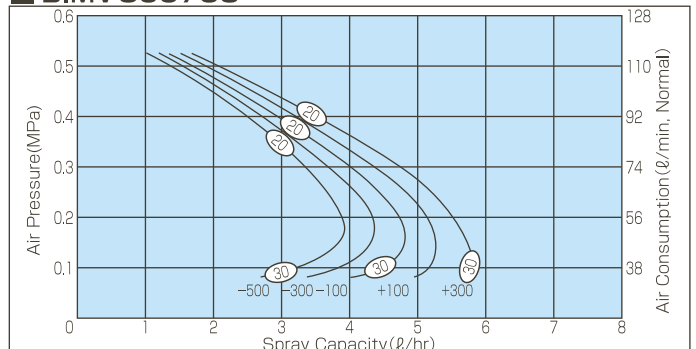
BIMV8004S



BIMV8002S



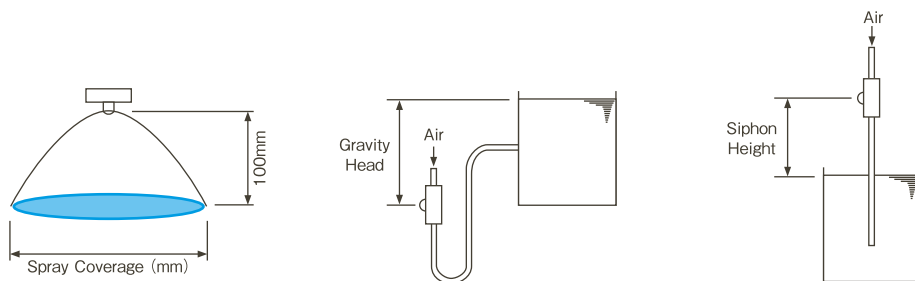
BIMV80075S



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr)					Spray Coverage*3 (mm)	Mean Droplet Diameter (μm) Laser Doppler Method	Free Passage Diameter (mm)		
				Gravity Head (mm)		Siphon Height (mm)					Spray Tip	Adaptor	
				+300	+100	-100	-300	-500				Liquid	Air
80°	02	0.2	15	1.4	1.3	1.2	1.2	1.1	160	20 30	0.3	0.9	0.7
		0.3	20	1.1	1.0	1.0	0.9	0.9	165				
		0.4	25	0.7	0.7	0.6	0.6	0.5	170				
	04	0.2	27	2.8	2.5	2.3	2.2	2.0	165	20 30	0.5	0.9	0.9
		0.3	36	2.4	2.1	2.0	1.9	1.8	170				
		0.4	46	1.9	1.7	1.6	1.5	1.4	175				
	075	0.2	56	5.5	5.1	4.7	4.3	3.9	170	20 30	0.7	1.2	1.4
		0.3	74	4.7	4.3	4.0	3.7	3.3	180				
		0.4	92	3.5	3.2	2.9	2.7	2.5	190				

Note: *2) Measured under air pressure of 0.3MPa and liquid siphon height of 100mm.

*3) Measured at 100mm from nozzle and liquid siphon height of 100mm.



How to inquire / order

To determine specifications, please specify a spray angle code and air consumption code referring to the above chart, then select a connecting adaptor from the 8 types (type N, T, ND, etc.). Please inquire or order for a specific nozzle using this coding system.

<Example> BIMV8002SS303+NS303

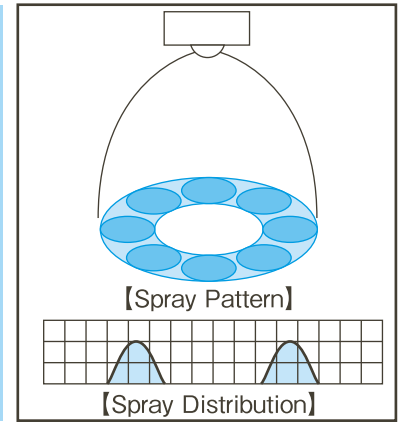
BIMV	80	02	S	S303	+	N	S303
	Spray Angle Code	Air Consumption Code	Siphon Type	Material of Spray Tip, Core & Cap (S303)		Type of Adaptor	Material of Adaptor (S303)
	■80°	■02 ■04 ■075				■N ■T ■ND, UND ■SP, USP ■SN, USN	

Details of adaptors are shown on pages 23 and 24.

Features

- Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of $100\mu\text{m}$ or less (*1).
- Features a large turn-down ratio under the liquid pressures of 0.1-0.3MPa.
- Spray angle is 60° .

*1) Measured by Laser Doppler Method



BIM with T-type adaptor

Applications

- Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea, etc.
- Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products, etc.
- Moisture control: Paper, gas, ceramics, concrete, etc.

Structure & Materials

- Comprising 4 parts: Spray tip, core, cap and adaptor. (Details of adaptors are shown on [pages 23 and 24](#).)
- Materials: S303 (Optional material; S316L)

Dimensions & Pipe Conn. Sizes

- Dimensions and pipe connection sizes are shown on [page 25](#).

Accessories

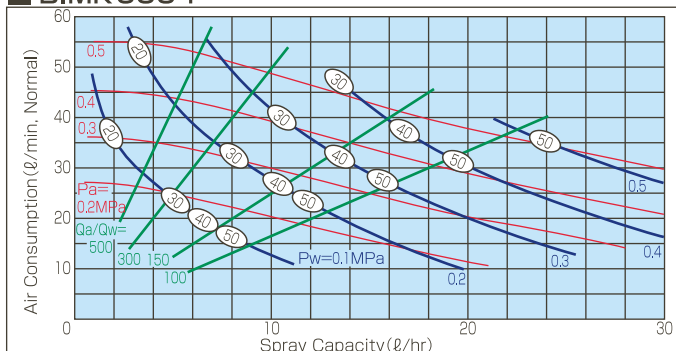
- Fixing support for easy installation is shown on [page 26](#).

Flow-rate Diagram

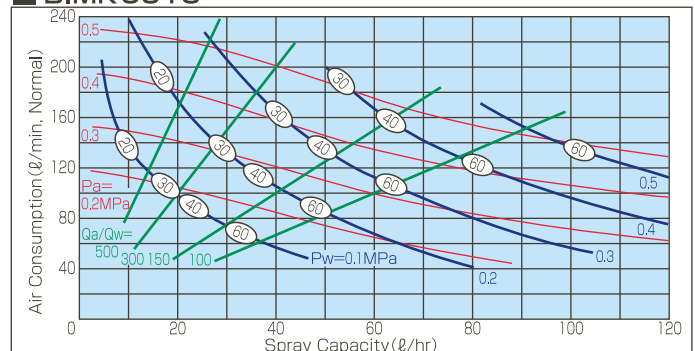
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② **Red lines (—)** represent compressed air pressure P_a in MPa.
Blue lines (—) represent liquid pressure P_w in MPa.
Green lines (—) represent air-water ratio Q_a/Q_w .
- ③ Figures in ovals \bigcirc indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.

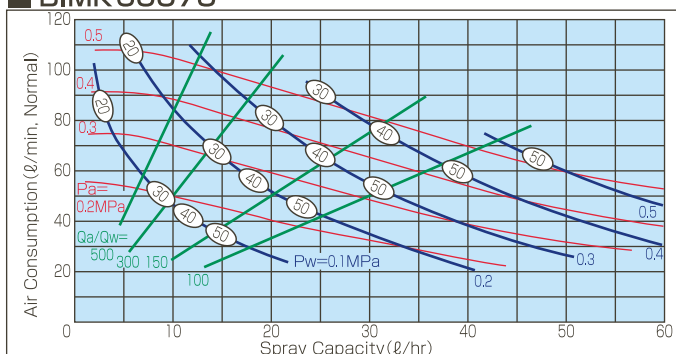
BIMK6004



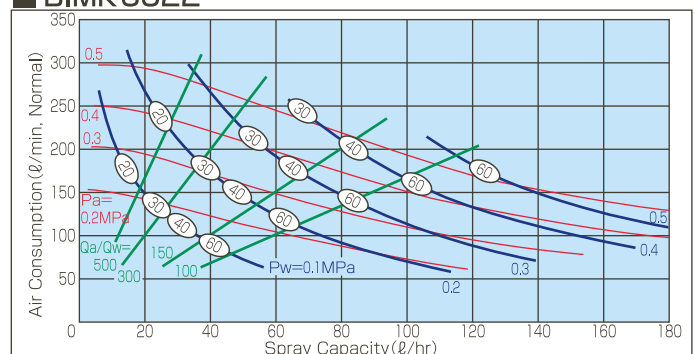
BIMK6015



BIMK60075

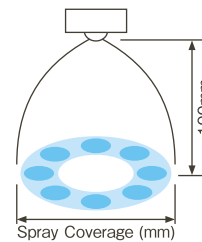


BIMK6022



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)										Spray Coverage*3 (mm)			Mean Droplet Diameter (μm)	Free Passage Diameter (mm)		
			Liquid Pressure (MPa)										Liquid Press. (MPa)				Laser Doppler Method	Spray Tip	Adaptor
			0.1		0.15		0.2		0.25		0.3		0.1	0.15	0.25	20 100			0.5
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid		Air		
60°	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	140	160	—	20 100	0.5	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	130	160	170				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	150	170				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	170	—	20 100	0.7	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	130	160	180				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	150	170				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	150	170	—	20 100	0.9	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	140	170	180				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	160	180				
	22	0.2	22.3	140	45.6	116	92.1	76.9	—	—	—	—	160	180	—	20 100	1.1	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	140	170	190				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	160	180				

Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0.1MPa.
 *3) Measured at 100mm from nozzle.



How to inquire / order

To determine specifications, please specify a spray angle code and air consumption code referring to the above chart, then select a connecting adaptor from the 8 types (type N, T, ND, etc.). Please inquire or order for a specific nozzle using this coding system.

<Example> BIMK6004S303+NS303

BIMK

60

Spray Angle Code

■60°

04

Air Consumption Code

■04
 ■075
 ■15
 ■22

S303

Material of Spray Tip, Core & Cap (S303)

+

N

Type of Adaptor

■N
 ■T
 ■ND, UND
 ■SP, USP
 ■SN, USN

S303

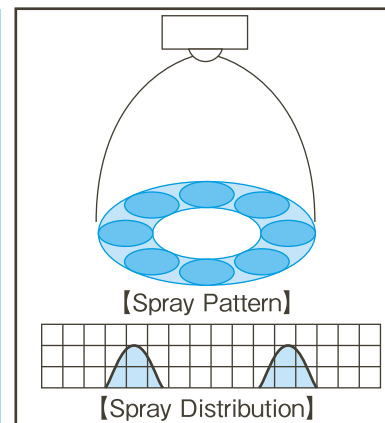
Material of Adaptor (S303)

Details of adaptors are shown on pages 23 and 24.

Features

- Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of $30\mu\text{m}$ or less (*1).
- Liquid siphon feed type.
- Spray angle is 60° .

*1) Measured by Laser Doppler Method



BIM with T-type adaptor

Applications

- Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea, etc.
- Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products, etc.
- Moisture control: Paper, gas, ceramics, concrete, etc.

Structure & Materials

- Comprising 4 parts: Spray tip, core, cap and adaptor. (Details of adaptors are shown on [pages 23 and 24](#).)
- Materials: S303 (Optional material; S316L)

Dimensions & Pipe Conn. Sizes

- Dimensions and pipe connection sizes are shown on [page 25](#).

Accessories

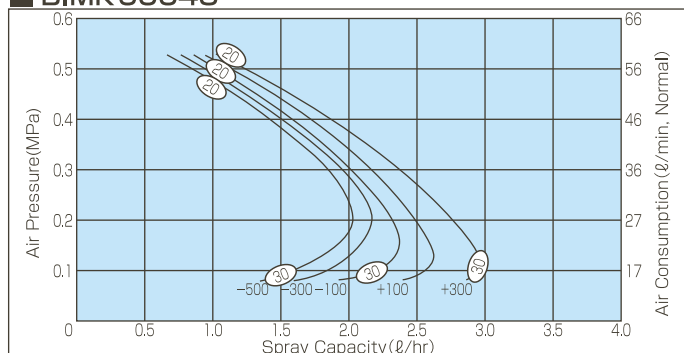
- Fixing support for easy installation is shown on [page 26](#).

Flow-rate Diagram

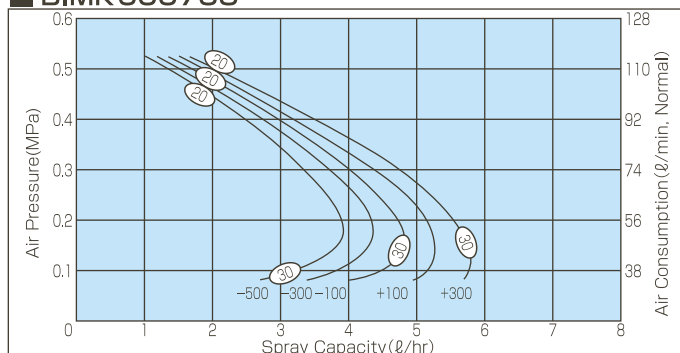
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Figures at foot of each curve indicate gravity head (+) and siphon height (−) in mm.
- ③ Figures in ovals \bigcirc indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.

■ BIMK6004S



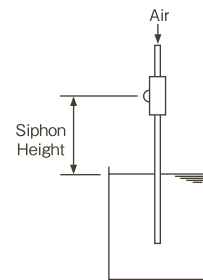
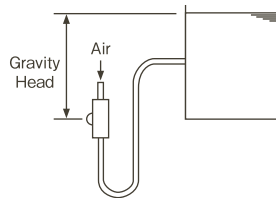
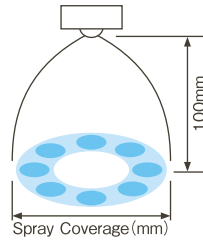
■ BIMK60075S



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr)					Spray Coverage*3 (mm)	Mean Droplet Dia. (μm)	Free Passage Diameter (mm)		
				Gravity Head (mm)		Siphon Height (mm)					Spray Tip	Adaptor	
				+300	+100	-100	-300	-500				Liquid	Air
60°	04	0.2	27	2.8	2.5	2.3	2.2	2.0	120	20 } 30	0.6	0.9	0.9
		0.3	36	2.4	2.1	2.0	1.9	1.8	120				
		0.4	46	1.9	1.7	1.6	1.5	1.4	120				
	075	0.2	56	5.5	5.1	4.7	4.3	3.9	120	20 } 30	0.8	1.2	1.4
		0.3	74	4.7	4.3	4.0	3.7	3.3	120				
		0.4	92	3.5	3.2	2.9	2.7	2.5	120				

Note: *2) Measured under air pressure of 0.3MPa and liquid siphon height of 100mm.

*3) Measured at 100mm from nozzle and liquid siphon height of 100mm.



How to inquire / order

To determine specifications, please specify a spray angle code and air consumption code referring to the above chart, then select a connecting adaptor from the 8 types (type N, T, ND, etc.). Please inquire or order for a specific nozzle using this coding system.

<Example> BIMK60075SS303+NS303

BIMK

60

Spray Angle Code

■60°

075

Air Consumption Code

■04
■075

S

Siphon Type

S303

Material of Spray Tip, Core & Cap (S303)

+

N

Type of Adaptor

■N
■T
■ND, UND
■SP, USP
■SN, USN

S303

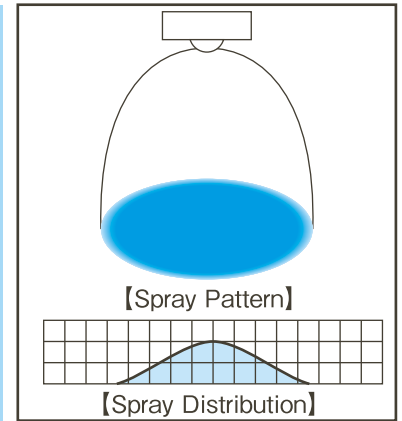
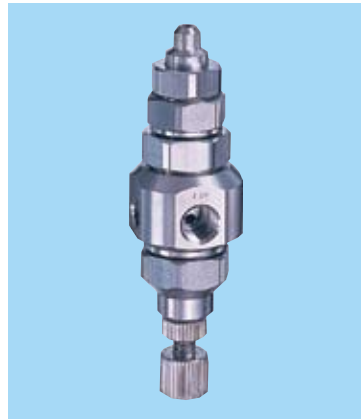
Material of Adaptor (S303)

Details of adaptors are shown on pages 23 and 24.

Features

- Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of $100\mu\text{m}$ or less (*1).
- Features a large turn-down ratio under the liquid pressures of 0.1-0.3MPa.
- Spray angle is 20° .

*1) Measured by Laser Doppler Method



Applications

- Spraying: Mold release agent, lubricant, deodorant, oil, surface treatment agent, rust preventive, honey, insecticide, aqueous urea, etc.
- Cooling: Dies, gas, glass, steel plates, steel pieces, moldings, automobile bodies, plastic products, etc.
- Moisture control: Paper, gas, ceramics, concrete, etc.

Structure & Materials

- Comprising 4 parts: Spray tip, core, cap and adaptor. (Details of adaptors are shown on pages 23 and 24.)
- Materials: S303 (Optional material; S316L)

Dimensions & Pipe Conn. Sizes

- Dimensions and pipe connection sizes are shown on page 25.

Accessories

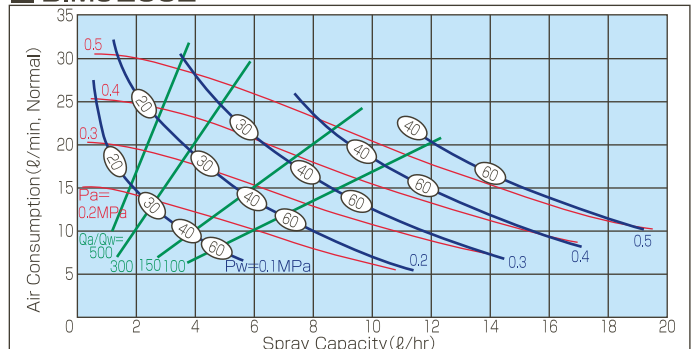
- Fixing support for easy installation is shown on page 26.

Flow-rate Diagram

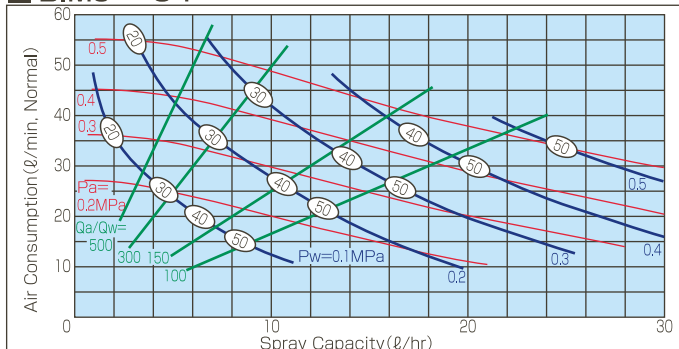
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Red lines (—) represent compressed air pressure P_a in MPa.
Blue lines (—) represent liquid pressure P_w in MPa.
Green lines (—) represent air-water ratio Q_a/Q_w .
- ③ Figures in ovals \bigcirc indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.

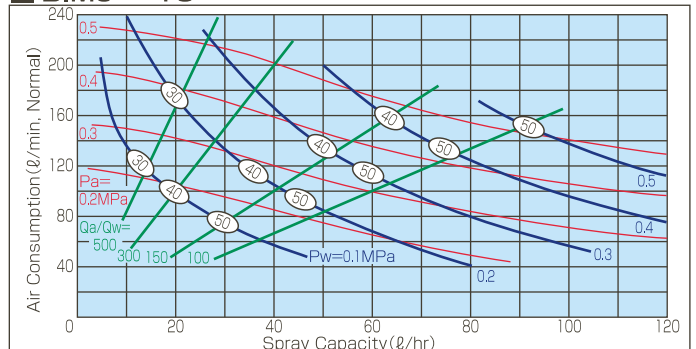
BIMJ2002



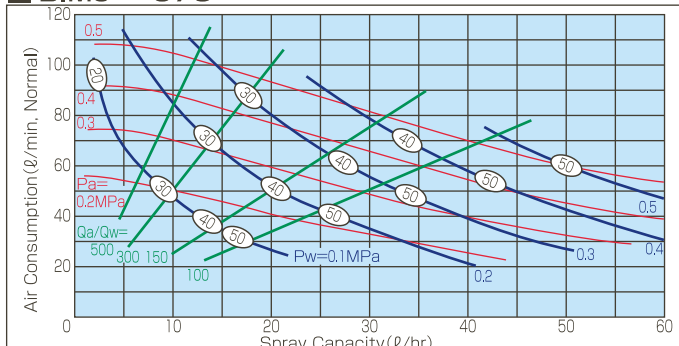
BIMJ**04



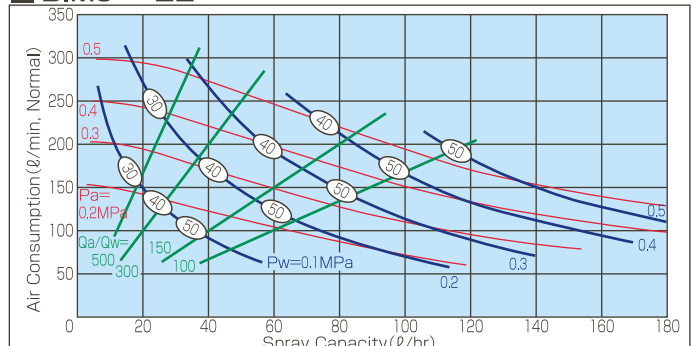
BIMJ**15



BIMJ**075



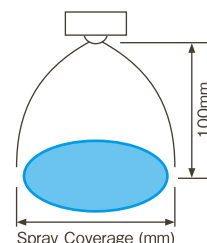
BIMJ**22



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)										Spray Coverage*3 (mm)			Mean Droplet Diameter (μm)	Free Passage Diameter (mm)		
			Liquid Pressure (MPa)										Liquid Press. (MPa)				Laser Doppler Method	Spray Tip	Adaptor
			0.1		0.15		0.2		0.25		0.3		0.1	0.15	0.25	Liquid			Air
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air							
70°	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	140	160	—	20 } 100	0.4	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	131.1	27	19.6	20	140	160	170				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	170	170				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	160	—	20 } 100	0.4	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	140	160	170				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	170	170				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	140	160	—	20 } 100	0.5	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	140	160	170				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	170	170				
	22	0.2	22.3	140	45.6	116	92.1	76.9	—	—	—	—	140	160	—	20 } 100	0.7	2.1	2.2
		0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	140	160	170				
		0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	170	170				
20°	02	0.2	1.7	14	5.3	11	—	—	—	—	—	25	25	—	20 } 100	1.1	0.9	0.7	
		0.3	—	—	1.5	19	4.5	17	8.1	17	14.1	7	30	30					25
		0.4	—	—	1.3	25	2.3	25	4.0	24	6.2	20	—	30					30
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	30	25	—	20 } 100	1.6	0.9	0.9
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	35	35	30				
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	35	35				
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	30	25	—	20 } 100	2.0	1.2	1.4
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	35	35	30				
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	35	35				
	15	0.2	16.8	107	34.8	90	64.4	60	—	—	—	—	35	30	—	20 } 100	2.7	1.8	1.9
		0.3	8.0	150	17.7	144	30.8	130	50.0	108	74.5	87	40	40	35				
		0.4	—	—	11.2	190	18.3	183	29.1	172	42.9	154	—	40	40				
22	0.2	22.3	140	45.6	116	92.1	76.9	—	—	—	—	35	30	—	20 } 100	3.1	2.1	2.2	
	0.3	11.5	200	23.9	189	41.3	169	68.5	138	107	103	40	40	35					
	0.4	—	—	15.3	245	24.5	238	39.1	220	57.7	198	—	40	40					

Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0.1MPa.

*3) Measured at 100mm from nozzle.



How to inquire / order

To determine specifications, please specify a spray angle code and air consumption code referring to the above chart, then select a connecting adaptor from the 8 types (type N, T, ND, etc.). Please inquire or order for a specific nozzle using this coding system.

<Example> BIMJ2004S303+NS303

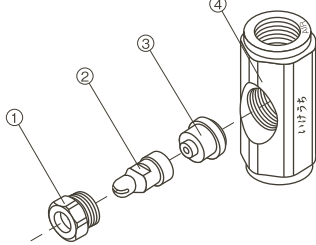
BIMJ	20	04	S303	+	N	S303
	Spray Angle Code	Air Consumption Code	Material of Spray Tip, Core & Cap (S303)		Type of Adaptor	Material of Adaptor (S303)
	■70° ■20°	■02 (for 20° only) ■04 ■075 ■15 ■22			■N ■T ■ND, UND ■SP, USP ■SN, USN	

Details of adaptors are shown on pages 23 and 24.

The following 8 types of adaptors are available for BIM Small Capacity Fine Mist Nozzles; BIMV, BIMV-S, BIMK, BIMK-S, BIMJ, which are introduced on [pages 13 to 22](#).

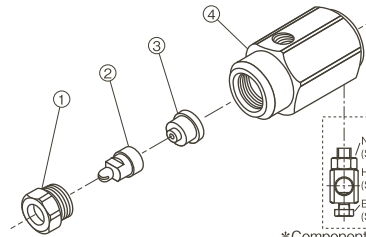
● **Types and Structures of Adaptors for BIM series nozzles**

Type N Liquid and air enter into Adaptor from both sides.



No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Adaptor	S303

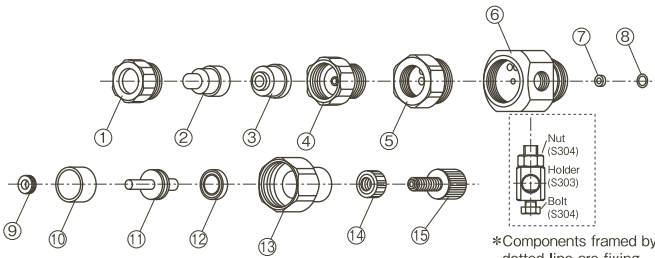
Type T Air inlet is on the center line and liquid inlet is on a 90° angle line to the center line. Suitable for use in a small space.



*Components framed by dotted line are fixing support (option, p.26).

No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Adaptor	S303

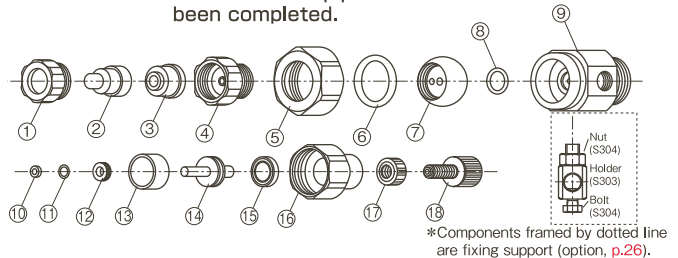
Type ND Spray capacity is adjustable with Needle Valve.



*Components framed by dotted line are fixing support (option, p.26).

No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Nozzle Adaptor	S303
⑤	Connector	S303
⑥	Adaptor	S303
⑦	Seal Sleeve	PTFE
⑧	O-ring	FKM
⑨	Lock Nut	S303
⑩	Sleeve	PTFE
⑪	Piston	S303
⑫	Y-packing	NBR
⑬	Needle Cap	S303
⑭	Needle Lock Nut	S303
⑮	Needle Lock Bolt	S303

Type UND Besides the features of the ND-type adaptor, spray direction can be adjusted within +/- 15° by means of a ball joint. It is convenient for finer tuning of spray direction after pipe assemblies have been completed.

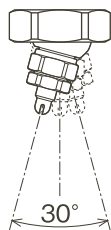


*Components framed by dotted line are fixing support (option, p.26).

No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Nozzle Adaptor	S303
⑤	UT-Cap	S303
⑥	O-ring	NBR
⑦	UT-Ball	S303
⑧	O-ring	FKM
⑨	Adaptor	S303
⑩	Seal Sleeve	PTFE
⑪	O-ring	FKM
⑫	Lock Nut	S303
⑬	Sleeve	PTFE
⑭	Piston	S303
⑮	Y-packing	NBR
⑯	Needle Cap	S303
⑰	Needle Lock Nut	S303
⑱	Needle Lock Bolt	S303



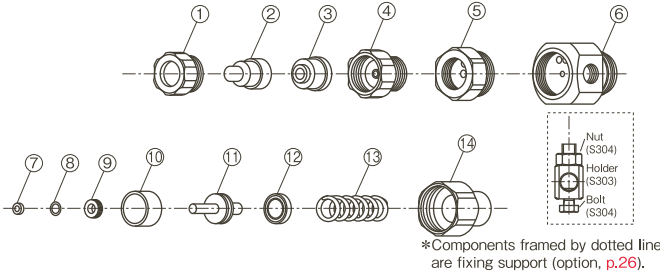
● **Ball joint (Option)**



- Spray direction can be adjusted with +/- 15° in all directions.
- Accurate spray alignment can be done easily after installation onto a pipe.
- Ball joint is available for ND, SP and SN types.

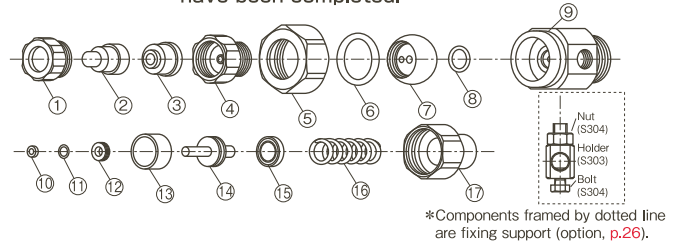
Types and Structures of Adaptors for BIM series nozzles

Type SP Spray (ON/OFF) can be regulated by switching the pilot air ON/OFF. The pilot air actuates an internal piston to regulate the spray. (Pilot air pressure more than 0.2MPa required) This type of adaptor is suitable for applications to avoid scattering droplets of mist.



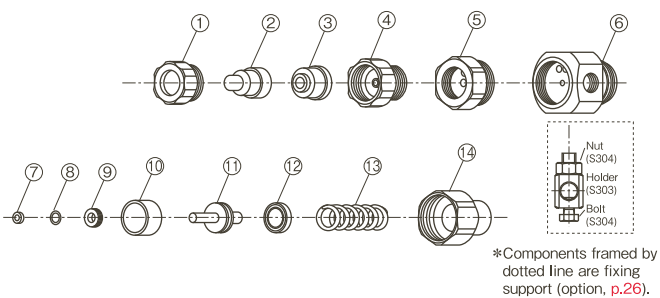
No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Nozzle Adaptor	S303
⑤	Connector	S303
⑥	Adaptor	S303
⑦	Seal Sleeve	PTFE
⑧	O-ring	FKM
⑨	Lock Nut	S303
⑩	Sleeve	PTFE
⑪	Piston	S303
⑫	Y-packing	NBR
⑬	Spring	S304
⑭	Spring Cap	S303

Type USP Besides the features of the SP-type adaptor, spray direction can be adjusted within +/- 15° by means of a ball joint. It is convenient for finer tuning of spray direction after pipe assemblies have been completed.



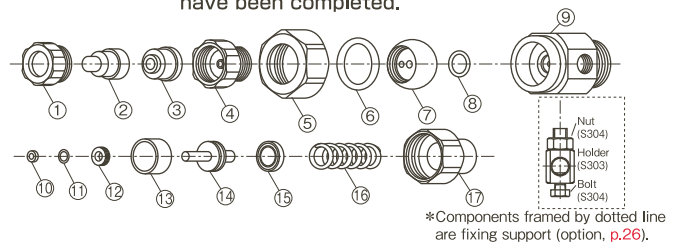
No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Nozzle Adaptor	S303
⑤	UT-Cap	S303
⑥	O-ring	NBR
⑦	UT-Ball	S303
⑧	O-ring	FKM
⑨	Adaptor	S303
⑩	Seal Sleeve	PTFE
⑪	O-ring	FKM
⑫	Lock Nut	S303
⑬	Sleeve	PTFE
⑭	Piston	S303
⑮	Y-packing	NBR
⑯	Spring	S304
⑰	Spring Cap	S303

Type SN Spray (ON/OFF) can be regulated by turning compressed air ON/OFF, which actuates an internal piston, to open or close the nozzle. Air pressure over 0.2MPa starts the spray.



No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Nozzle Adaptor	S303
⑤	Connector	S303
⑥	Adaptor	S303
⑦	Seal Sleeve	PTFE
⑧	O-ring	FKM
⑨	Lock Nut	S303
⑩	Sleeve	PTFE
⑪	Piston	S303
⑫	Y-packing	NBR
⑬	Spring	S304
⑭	Spring Cap	S303

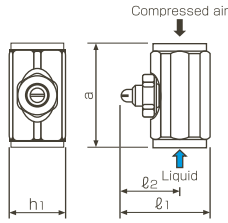
Type USN Besides the features of the SN-type adaptor, spray direction can be adjusted within +/- 15° by means of a ball joint. It is convenient for finer tuning of spray direction after pipe assemblies have been completed.



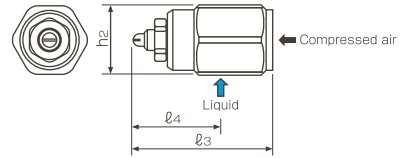
No.	Component	Standard Material
①	Cap	S303
②	Spray Tip	S303
③	Core	S303
④	Nozzle Adaptor	S303
⑤	UT-Cap	S303
⑥	O-ring	NBR
⑦	UT-Ball	S303
⑧	O-ring	FKM
⑨	Adaptor	S303
⑩	Seal Sleeve	PTFE
⑪	O-ring	FKM
⑫	Lock Nut	S303
⑬	Sleeve	PTFE
⑭	Piston	S303
⑮	Y-packing	NBR
⑯	Spring	S304
⑰	Spring Cap	S303

● Dimensions and Pipe Connection Size

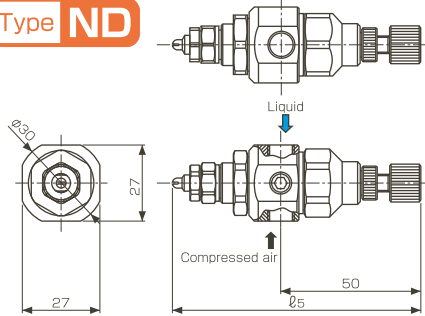
Type N



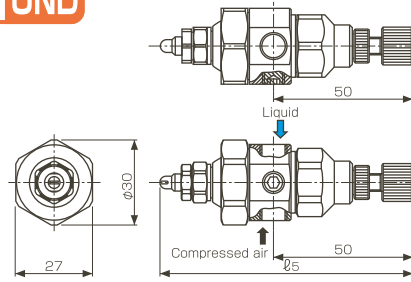
Type T



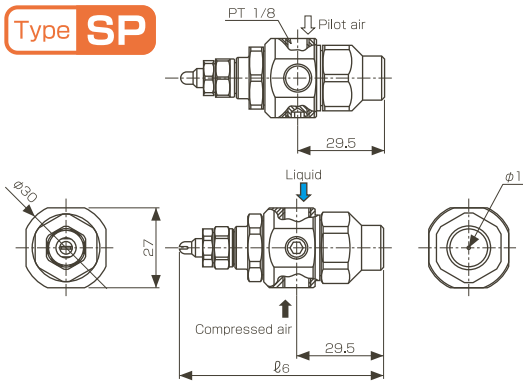
Type ND



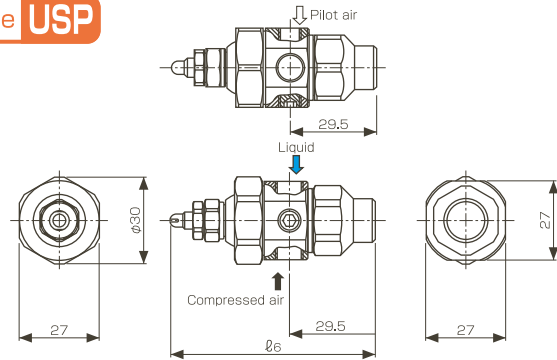
Type UND



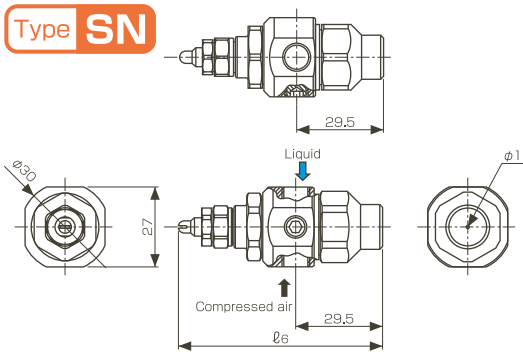
Type SP



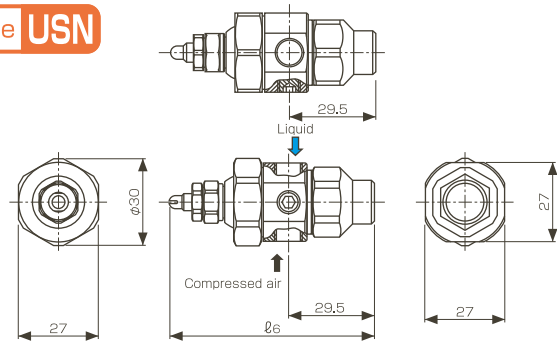
Type USP



Type SN



Type USN



Air Consumption Code	Dimensions (mm)								
	l ₁	l ₂	l ₃	l ₄	l ₅	l ₆	a	h ₁	h ₂
02	25.3	16.3	40.8	24.8	87.3	66.8	32	17	21
04*1	26.8	17.8	42.3	26.3	88.8	68.3	32	17	21
BIMJ 2004	27.0	18.0	42.5	26.5	89.0	68.5	32	17	21
075	28.1	19.1	43.6	27.6	90.1	69.6	32	17	21
15	39.1	26.6	60.1	38.1	97.8	77.3	43	23	29
22	41.3	28.8	62.3	40.3	100	79.5	43	23	29

*1 excludes BIMJ2004.

Note: Dimensions and designs may be changed without prior notice.

■ Pipe Connection Size and Mass

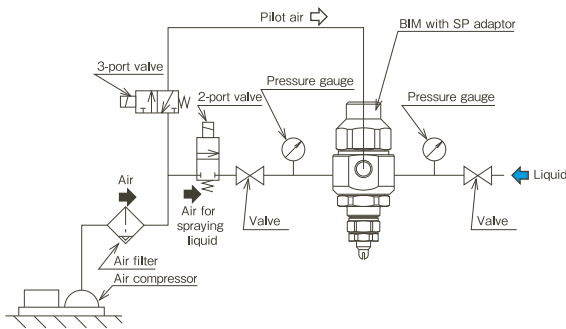
Adaptor	Air Consumption Code	Pipe Conn. Size (in.)			Mass (g)
		Compressed Air	Liquid	Pilot Air	
N	02,04,075	PT1/8F	PT1/8F	-	55
	15,22	PT1/4F	PT1/4F	-	130
T	02,04,075	PT1/8F	PT1/8F	-	80
	15,22	PT1/4F	PT1/4F	-	210
ND(UND)	02,04,075	PT1/8F	PT1/8F	-	172
	15,22	PT1/8F	PT1/8F	-	193
SP(USP)	02,04,075	PT1/8F	PT1/8F	PT1/8F	146
	15,22	PT1/8F	PT1/8F	PT1/8F	167
SN(USN)	02,04,075	PT1/8F	PT1/8F	-	151
	15,22	PT1/8F	PT1/8F	-	172

● How to use BIM controlling adaptors

■ SP-adaptor

Spray (ON/OFF) can be regulated by switching the pilot air ON/OFF.
The pilot air actuates an internal piston to regulate the spray.
(Pilot air pressure must be 0.2MPa or higher.)
As even low pressure atomizing air can be used, production of a range of fine to coarse mists is possible. Best-suited for when there is concern about scattering droplets.

Example of connections for adaptor



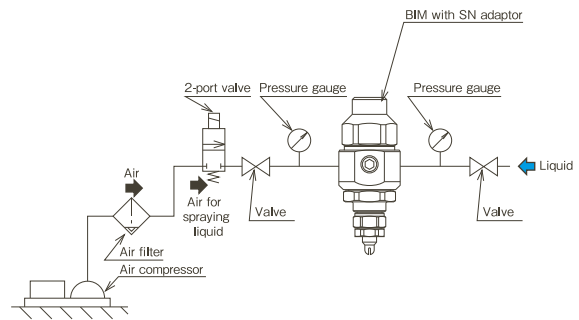
Function chart

Compressed air		ON		
Liquid	Stop	Spray	Spray	Stop
Pilot air	OFF	ON	ON	OFF

■ SN-adaptor

Spray (ON/OFF) can be regulated by turning compressed air ON/OFF.
Air pressure must be 0.2MPa or higher in order to start the spray.

Example of connections for adaptor



Function chart

Compressed air	OFF	ON	OFF	ON	OFF
Liquid	Stop	Spray	Stop	Spray	Stop

■ Option

● Fixing Support



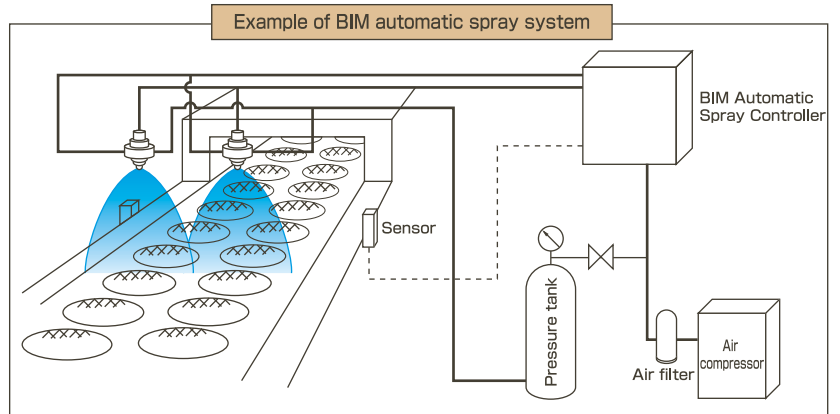
Fixing supports are available for easy installation of BIM nozzles. BIM nozzle can be fixed on pole at any position and spray direction. Two types are available for pole diameters of 8mm and 10mm.

● Spray Controller



It is recommended to use IKEUCHI Spray Controllers, especially designed for utilizing all kinds of adaptors and optimizing operational conditions of BIM nozzles for customer's processes.

■ Example of applications controlled by BIM automatic spray system



Small Capacity Fine Mist Nozzles

Polypropylene, BIM-PP — Liquid Pressure Type —

BIM-PP

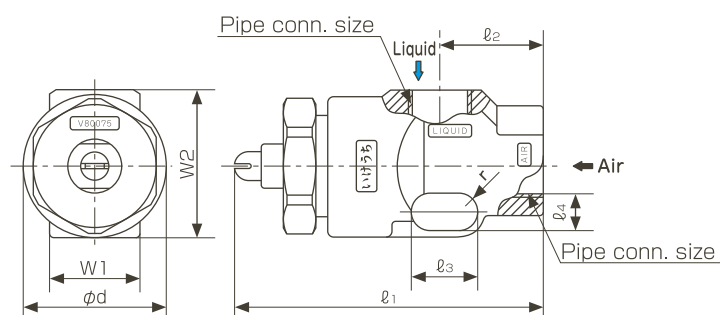
Features

- Excellent chemical resistance with Polypropylene construction.
- Two types, BIMV (flat spray type) and BIMJ (full cone spray type) are available.
- Liquid pressure type with approx. 0.1 to 0.3MPa.



Applications

- Spraying: Deodorant, germicide, disinfectant, etc.
- Moisture control: Paper, textile, printing, etc.
- Cleaning: Printed circuit boards, electrical components, etc.

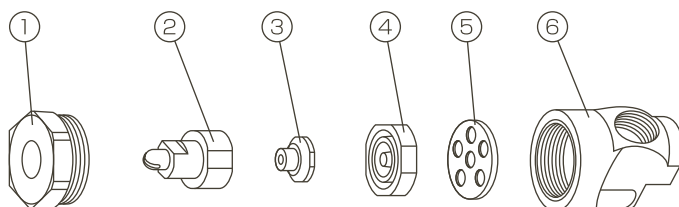


Dimensions & Pipe Conn. Sizes

■ Dimensions

Type	Nozzle No.	Dimensions (mm)								Pipe Conn. Size (in.)	Mass (g)
		l ₁	l ₂	l ₃	l ₄	φd	r	w1	w2		
BIMV (flat spray)	BIMV80075	47.5	16	10	5	22	2.5	14	23	PT1/8F	10
BIMJ (full cone spray)	BIMJ2004	46.7									

Structure & Materials



■ Components and materials

No.	Component	Standard Material
①	Cap	PP
②	Spray Tip	PP
③	Core	PP
④	Orifice	PP
⑤	Packing	PTFE
⑥	Adaptor	PP

Characteristics of the flat spray nozzle BIMV80075PP are equivalent to BIMV80075 on [pages 13 and 14](#).
 Characteristics of the full cone spray nozzle BIMJ2004PP are equivalent to BIMJ2004 on [pages 21 and 22](#).

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

For flat spray nozzle

BIMV 80075 PP + TPP-IN

For full cone spray nozzle

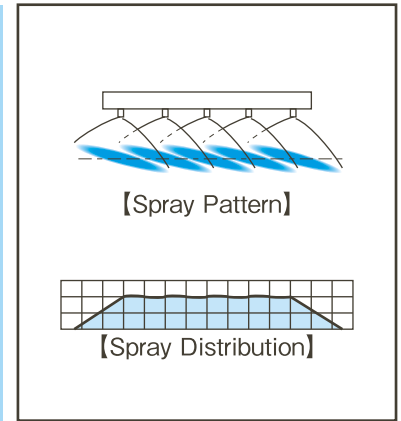
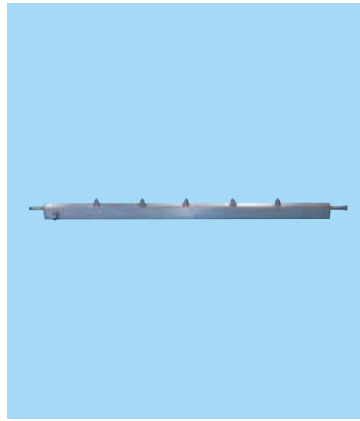
BIMJ 2004 PP + TPP-IN

Integrated Spray Header with BIM Fine Mist Nozzles

Features

- Spray header equipped with BIMV-series (liquid pressure type) producing fine atomization with mean droplet diameter of 100 μ m or less (*1).
- Combines two pipes for air and water into one rectangular spray header. Very compact and easy for installation and maintenance.
- Uniform spray distribution across the entire spray area.

*1) Measured by Laser Doppler Method

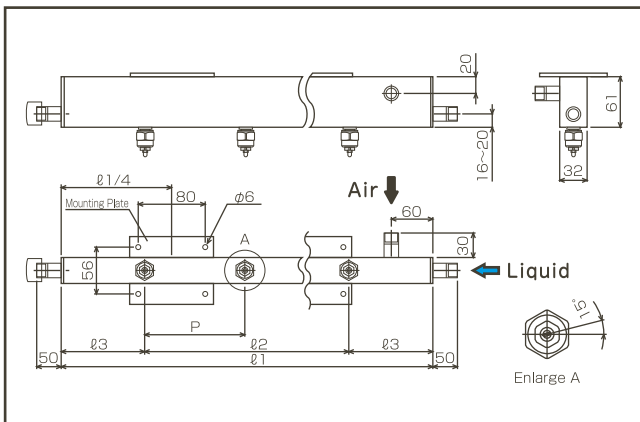


Applications

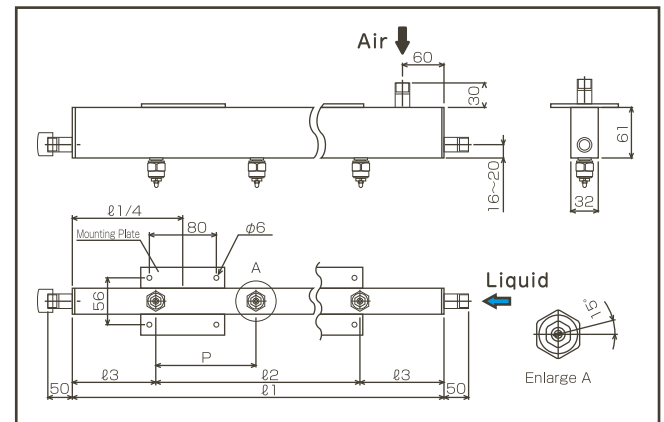
- Spraying: Oil, surface treatment agent, etc.
- Cooling: Moldings, metal sheets, glass plates, steel plates, plastic film, etc.
- Cleaning: Printed circuit boards, shadow masks, etc.

Structure, Materials & Dimensions

Mounting type-A



Mounting type-B



Dimensions

Header Code	Nozzle Spacing P(mm)	Nozzle Quantity (pcs.)	Spacing (mm)		Pipe Connection Size (in.)						Material	
					BIMV11002		BIMV11004		BIMV110075			
			ø2	ø3	Air	Liquid	Air	Liquid	Air	Liquid	Nozzle	Header
1000	100	10	900	50	PT3/8M	PT1/4M	PT3/8M	PT1/4M	PT1/2M	PT3/8M	S303	S304
	200	5	800	100					PT3/8M	PT1/4M		
2000	100	20	1900	50	PT1/2M	PT3/8M	PT1/2M	PT3/8M	PT3/4M	PT1/2M		
	200	10	1800	100	PT3/8M	PT1/4M	PT3/8M	PT1/4M	PT1/2M	PT3/8M		

Air Consumption & Spray Capacity

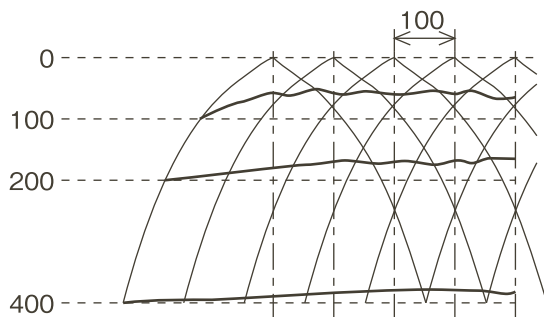
Nozzle Code	Nozzle Quantity	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr) (at liquid pressure of 0.1MPa)
BIMV11002	5	0.3	100	5.0
	10		200	10.0
	20		400	20.0
BIMV11004	5	0.3	180	10.0
	10		360	20.0
	20		720	40.0
BIMV110075	5	0.3	370	20.0
	10		740	40.0
	20		1480	80.0

Note: Total air consumption and spray capacities shown in the above table are calculated from number of nozzles used, based on each air consumption and spray capacity described on page 14.

Spray Distribution

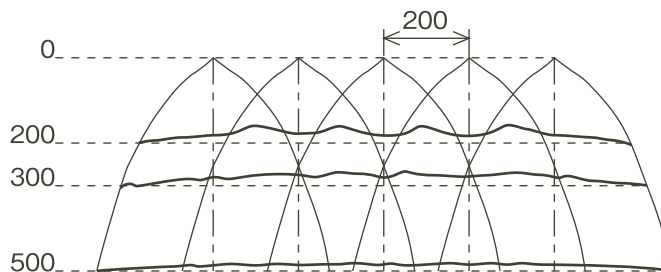
■ BIMV1 1004S303

Nozzle spacing:100mm, Air press.:0.3MPa, Liquid press.:0.1MPa, Offset angle (nozzle tip angle to axis of header):15°



■ BIMV1 1004S303

Nozzle spacing:200mm, Air press.:0.3MPa, Liquid press.:0.1MPa, Offset angle (nozzle tip angle to axis of header):15°



How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> BIMV1 1002S303+10(P100) 1000(Pre-setting 15°)

BIMV1 1002	S303	+	10	(P 100)	1000	(Pre-setting 15°)
Nozzle Code*	Material of Nozzle		Nozzle Quantity	Nozzle Spacing	Header Code	Offset Angle
■BIMV1 1002			■5	■100	■1000	■0°
■BIMV1 1004			■10	■200	■2000	(No indication if 0°)
■BIMV1 10075			■20			■15°
			(pcs.)			

*Note: For details of BIMV nozzles, see page 14.
Please contact our local sales office for other specifications.

Compact Design Small Capacity Fine Mist Nozzles

CBIM

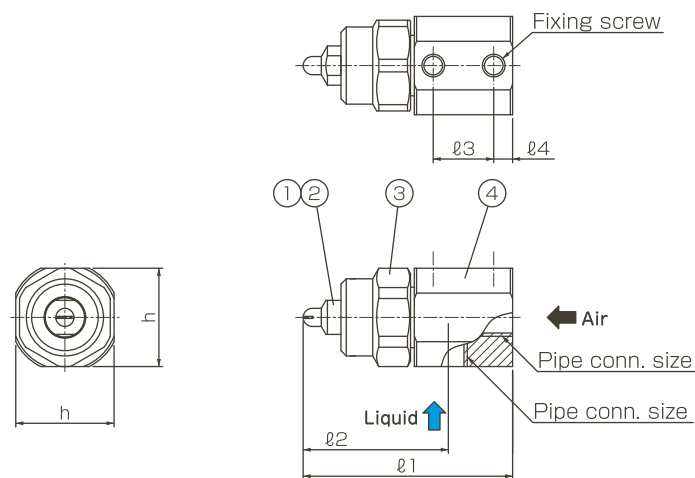
Features

- Compact version of BIM series producing fine atomization. Space-saving design.
- Clog-resistant. Easy maintenance due to low number of parts.
- Available in liquid pressure or liquid siphon feed type (*1), 3 spray pattern types (flat spray, hollow cone spray, full cone spray) - 23 varieties in total. Wide selection.
- Able to spray the smallest flow rate among IKEUCHI's all pneumatic spray nozzles.

*1) Liquid pressure type only for CBIMJ (Full cone spray)



Dimensions & Pipe Conn. Sizes



Components and materials

No.	Components	Standard Materials
①	Spray Tip	S303
②	Core	S303
③	Cap	S303
④	Adaptor	S303

Dimensions

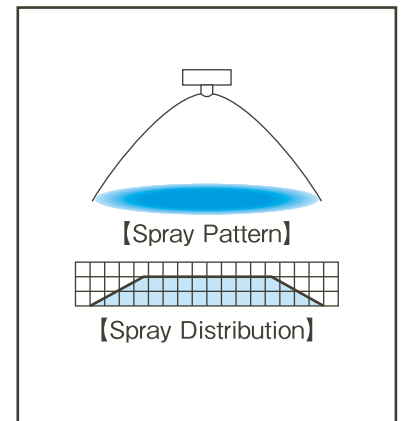
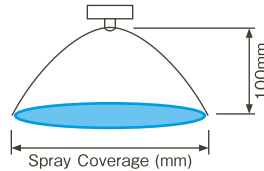
Air Consumption Code	Dimensions (mm)					Pipe Connection Size			Approx. Mass (g)
	l1	l2	l3	l4	h	Air	Liquid	Fixing Screw	
01	27.7	19.2	8	2.5	13	M5x3	M5x3	M3x2	22
02	28	19.5							
04	31.3	22.8							
075	32.6	24.1							

CBIMV (Flat Spray)

Features

- Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100μm or less (*1).
- Features large turn-down ratio under liquid pressures of 0.1-0.3MPa.
- Three spray angles of 110°, 80°, and 45° are available.
- Produces two different spray distributions; uniform spray distribution throughout spray pattern area (when spraying at a low air-water ratio), and a mountain-shaped distribution having gradually tapered edges (at a high air-water ratio).

*1) Measured by Laser Doppler Method



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)										Spray Coverage*3 (mm)			Mean Droplet Diameter (μm)	Free Passage Diameter (mm)			
			Liquid Pressure (MPa)																	
			0.1		0.15		0.2		0.25		0.3		Liquid Press. (MPa)				Laser Doppler Method	Spray Tip	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	0.1	0.15	0.25				Liquid	Air
110°	01	0.2	1.2	7	3.0	5	—	—	—	—	—	—	280	330	—	15 } 100	0.2	0.6	0.5	
		0.3	0.5	10	1.0	9.5	2.1	8.5	3.8	6.5	—	—	200	250	380					
		0.4	—	—	0.5	12.5	0.9	12	2.0	11	3.0	9.5	—	220	300					300
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	280	340	—	15 } 100	0.2	0.6	0.7	
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	220	250	420					
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	230	340					340
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	300	360	—	15 } 100	0.3	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	230	270	430					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	250	350					350
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	320	380	—	15 } 100	0.5	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	240	300	450					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	270	370					370
80°	01	0.2	1.2	7	3.0	5	—	—	—	—	—	—	220	250	—	15 } 100	0.2	0.6	0.5	
		0.3	0.5	10	1.0	9.5	2.1	8.5	3.8	6.5	—	—	140	200	250					
		0.4	—	—	0.5	12.5	0.9	12	2.0	11	3.0	9.5	—	140	220					220
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	200	260	—	15 } 100	0.3	0.6	0.7	
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	170	210	300					
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	200	250					250
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	200	260	—	15 } 100	0.4	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	170	210	310					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	200	260					260
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	200	270	—	15 } 100	0.6	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	170	210	310					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	200	260					260
45°	01	0.2	1.2	7	3.0	5	—	—	—	—	—	—	120	150	—	15 } 100	0.3	0.6	0.5	
		0.3	0.5	10	1.0	9.5	2.1	8.5	3.8	6.5	—	—	70	110	150					
		0.4	—	—	0.5	12.5	0.9	12	2.0	11	3.0	9.5	—	70	120					120
	02	0.2	2.2	14	5.3	11	—	—	—	—	—	—	100	130	—	15 } 100	0.4	0.6	0.7	
		0.3	1.0	20	2.5	19	4.6	17	8.3	12	14.3	7	80	110	150					
		0.4	—	—	1.4	25	2.3	24	4.0	23	6.3	20	—	100	130					130
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	100	130	—	15 } 100	0.5	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	80	110	150					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	100	130					130
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	100	140	—	15 } 100	0.9	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	80	110	160					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	100	140					140

Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0.1MPa.

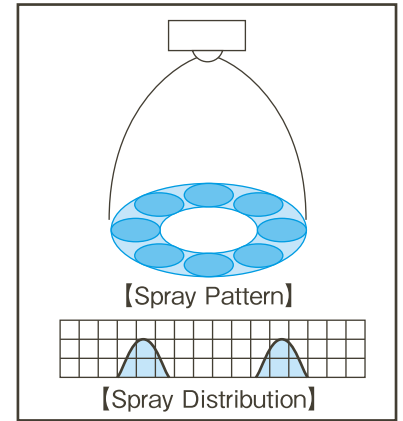
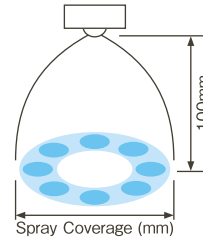
*3) Measured at 100mm from nozzle.

CBIMK (Hollow Cone Spray)

Features

- Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100µm or less (*1).
- Features large turn-down ratio under liquid pressures of 0.1-0.3MPa.
- Spray angle is 60°.

*1) Measured by Laser Doppler Method



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)												Spray Coverage*3 (mm)	Mean Droplet Dia. (µm)	Free Passage Diameter (mm)			
			Liquid Pressure (MPa)														Laser Doppler Method	Spray Tip	Adaptor	
			0.1		0.15		0.2		0.25		0.3		Liquid Press. (MPa)						Liquid	Air
60°	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	140	160	—	20 100	0.5	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	130	160	170					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	150	170					—
		0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	170	—					
	075	0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	130	160	180	20 100	0.7	1.2	1.4	
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	150	170					—
		0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	140	170	—					
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	130	160	180					

Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0.1MPa.

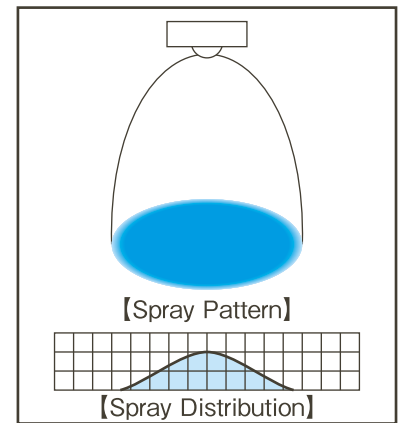
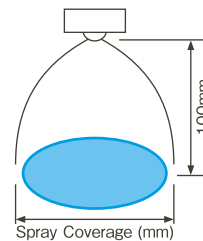
*3) Measured at 100mm from nozzle.

CBIMJ (Full Cone Spray)

Features

- Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 100µm or less (*1).
- Features large turn-down ratio under liquid pressures of 0.1-0.3MPa.
- Spray angle is 20°.

*1) Measured by Laser Doppler Method



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/hr) & Air Consumption (ℓ/min, Normal)												Spray Coverage*3 (mm)	Mean Droplet Dia. (µm)	Free Passage Diameter (mm)			
			Liquid Pressure (MPa)														Laser Doppler Method	Spray Tip	Adaptor	
			0.1		0.15		0.2		0.25		0.3		Liquid Press. (MPa)						Liquid	Air
20°	01	0.2	1.2	7	3.0	5	—	—	—	—	—	—	30	30	—	20 100	0.8	0.6	0.5	
		0.3	0.5	10	1.0	9.5	2.1	8.5	3.8	6.5	—	—	35	30	25					
		0.4	—	—	0.5	12.5	0.9	12	2.0	11	3.0	9.5	—	30	30					30
	02	0.2	2.7	13	5.0	11	8.0	8	—	—	—	—	25	20	—	20 100	1.1	0.6	0.7	
		0.3	1.0	20	2.5	19	4.5	17	6.8	14	9.7	11.5	30	30	25					
		0.4	—	—	1.2	26	2.5	24.5	4.1	23	6.3	20	—	30	30					30
	04	0.2	4.5	25	9.5	20	17.0	13	—	—	—	—	30	25	—	20 100	1.6	0.9	0.9	
		0.3	2.0	36	4.7	35	8.5	31	13.1	27	19.6	20	35	35	30					
		0.4	—	—	2.8	45	4.8	44	7.7	41	11.4	37	—	35	35					—
	075	0.2	8.7	51	18.4	42	33.3	29	—	—	—	—	30	25	—	20 100	2.0	1.2	1.4	
		0.3	4.0	74	8.8	71	15.5	64	24.3	54	38.5	40	35	35	30					
		0.4	—	—	5.6	91	9.1	89	14.8	82	21.8	74	—	35	35					—

Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0.1MPa.

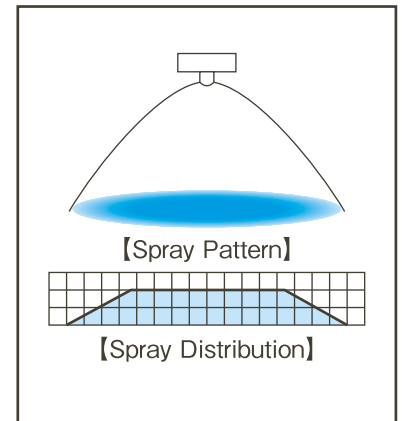
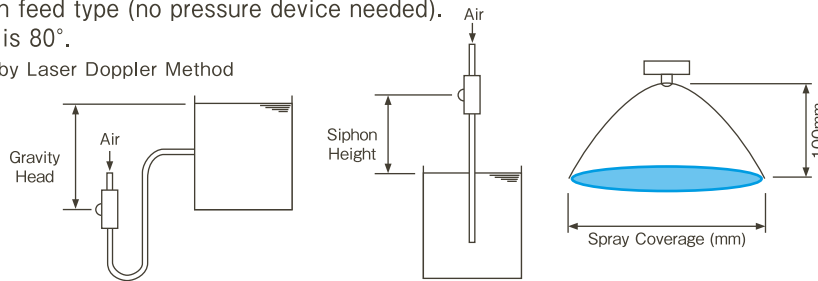
*3) Measured at 100mm from nozzle.

CBIMV-S (Flat Spray)

Features

- Flat spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30μm or less (*1).
- Produces uniform spray distribution throughout spray pattern area.
- Liquid siphon feed type (no pressure device needed).
- Spray angle is 80°.

*1) Measured by Laser Doppler Method



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr)					Spray Coverage *3 (mm)	Mean Droplet Diameter (μm) Laser Doppler Method	Free Passage Dia. (mm)		
				Gravity Head (mm)		Siphon Height (mm)					Spray Tip	Adaptor	
				+300	+100	-100	-300	-500				Liquid	Air
80°	02S	0.2	15	1.4	1.3	1.2	1.2	1.1	160	20 30	0.3	0.6	0.7
		0.3	20	1.1	1.0	1.0	0.9	0.9	165				
		0.4	25	0.7	0.7	0.6	0.6	0.5	170				
	04S	0.2	27	2.8	2.5	2.3	2.2	2.0	165	20 30	0.5	0.9	0.9
		0.3	36	2.4	2.1	2.0	1.9	1.8	170				
		0.4	46	1.9	1.7	1.6	1.5	1.4	175				
	075S	0.2	56	5.5	5.1	4.7	4.3	3.9	170	20 30	0.7	1.2	1.4
		0.3	74	4.7	4.3	4.0	3.7	3.3	180				
		0.4	92	3.5	3.2	2.9	2.7	2.5	190				

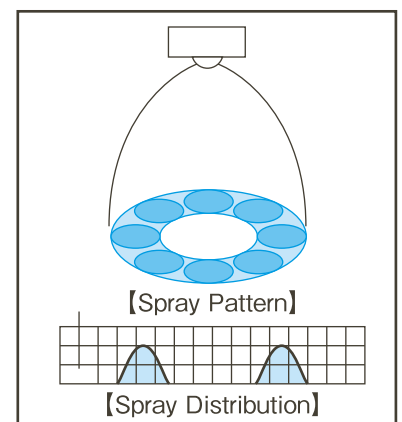
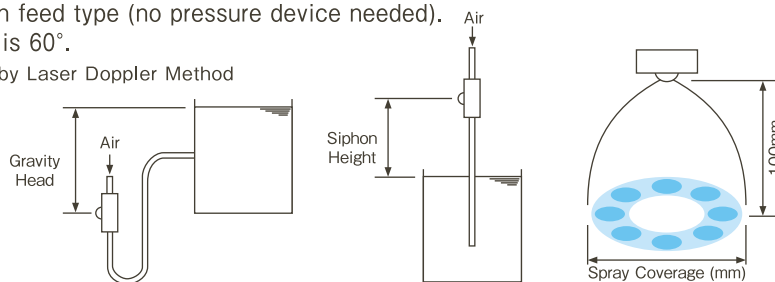
Note: *2) Measured under air pressure of 0.3MPa and liquid siphon height of 100mm. *3) Measured at 100mm from nozzle and liquid siphon height of 100mm.

CBIMK-S (Hollow Cone Spray)

Features

- Hollow cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 30μm or less (*1).
- Liquid siphon feed type (no pressure device needed).
- Spray angle is 60°.

*1) Measured by Laser Doppler Method



Spray Angle Code *2	Air Consumption Code	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr)					Spray Coverage *3 (mm)	Mean Droplet Diameter (μm) Laser Doppler Method	Free Passage Dia. (mm)		
				Gravity Head (mm)		Siphon Height (mm)					Spray Tip	Adaptor	
				+300	+100	-100	-300	-500				Liquid	Air
60°	04S	0.2	27	2.8	2.5	2.3	2.2	2.0	120	20 30	0.6	0.9	0.9
		0.3	36	2.4	2.1	2.0	1.9	1.8	120				
		0.4	46	1.9	1.7	1.6	1.5	1.4	120				
	075S	0.2	56	5.5	5.1	4.7	4.3	3.9	120	20 30	0.8	1.2	1.4
		0.3	74	4.7	4.3	4.0	3.7	3.3	120				
		0.4	92	3.5	3.2	2.9	2.7	2.5	120				

Note: *2) Measured under air pressure of 0.3MPa and liquid siphon height of 100mm. *3) Measured at 100mm from nozzle and liquid siphon height of 100mm.

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> **CBIMV11002S303+TS303**

CBIMV

- CBIMV, CBIMV-S
- CBIMK, CBIMK-S
- CBIMJ

110

Spray Angle Code
(See chart)

02

Air Consumption Code
(See chart)

S303

Material of
Nozzle Tip,
Core, Cap

+

T

S303

Material of
Adaptor

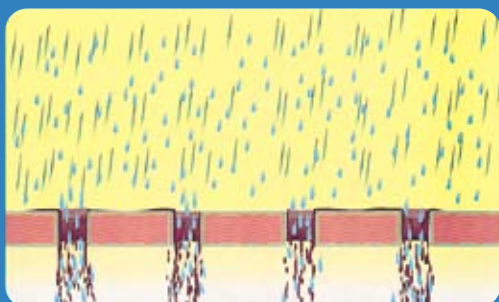
● Common Applications



- **Paper & Pulp** : Moisture control, spraying mold lubricant, preventing cardboard from curling, etc.
- **Plastics** : Spraying anti-electrostatic agent, coating, etc.
- **Iron & Steel** : Cooling metal sheets, etc.
- **Glass** : Coating and cooling glass sheets, etc.
- **Textile** : Moisture control of textile and fiber.
- **Printing** : Moisture control of paper after dryer of web offset printing machine.
- **Automotive** : Cooling carriages of automobile bodies on the painting lines after oven.
- **Food** : Spraying egg yolk, oil, honey, etc.

● New cleaning method "Mist Cleaning"

Cleaning Mechanism



■ For precise cleaning in cleaning process of photo-processing products

In conventional cleaning methods large droplets created by hydraulic nozzles are used and cannot clean within fine interstices. By using air, pneumatic nozzles produce very fine droplets for "mist cleaning".

Features of Mist Cleaning

- ① Very fine droplets get into interstices and wash out dirt.
- ② Velocity of cleaning water has been remarkably improved due to compressed air blow, that contributes to maximizing spray impact.
- ③ Compressed air will blow off puddles on surfaces of objects, stopping chemical reactions and get better cleaning effects.

List of Spray Tip Interchangeability

		Liquid Pressure Type																				Liquid Siphon Type																		
		BIMV										BIMK				BIMJ						BIMV-S		BIMK-S																
		11002	11004	110075	11015	11022	8002	8004	80075	8015	8022	4502	4504	45075	4515	4522	6004	60075	6015	6022	2004	20075	7015	7022	2002	2004	20075	2015	2022	8002S	8004S	80075S	6004S	60075S						
Liquid Pressure Type	BIMV	11002	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X							
		Liquid Pressure Type	BIMK	6004	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X						
				Liquid Pressure Type	BIMJ	7004	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
						Liquid Siphon Type	BIMV-S	8002S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
								Liquid Siphon Type	BIMK-S	6004S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

		Liquid Pressure Type														Liquid Siphon Type													
		CBIMV							CBIMK			CBIMJ				CBIMV-S		CBIMK-S											
		11001	11002	11004	11075	8001	8002	8004	80075	4501	4502	4504	45075	6004	60075	2001	2002	2004	20075	8002S	8004S	80075S	6004S	60075S					
Liquid Pressure Type	CBIMV	11001	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X					
		Liquid Pressure Type	CBIMK	6004	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X				
				Liquid Pressure Type	CBIMJ	2001	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
		Liquid Siphon Type	CBIMV-S			8002S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		
						Liquid Siphon Type	CBIMK-S	6004S	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Medium / Large Capacity Fine Mist Nozzles

GBIM series Nozzles

Patent pending



- GBIM series fine mist nozzles are large capacity pneumatic nozzles generating fine mist with very low air-water ratios.
- GBIM series nozzles save running costs with low consumption of compressed air due to their very low air-water ratios.

Contents

GBIM series Medium / Large Capacity Fine Mist Nozzles	p.37
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Medium / Large Capacity Fine Mist Nozzles

GBIM

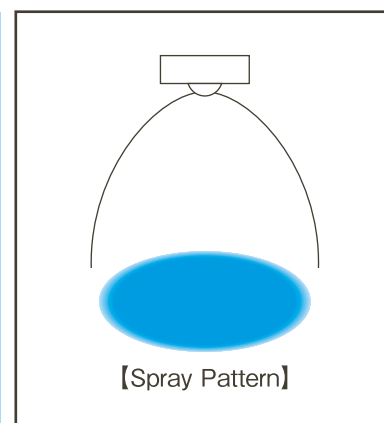
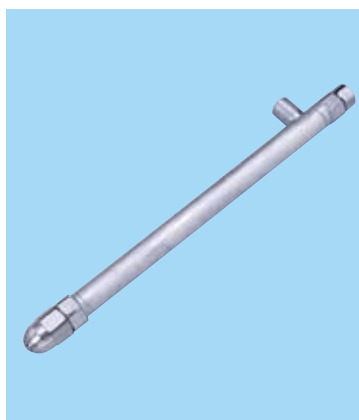
Features

- Produces fine atomization having a mean droplet diameter of $60\mu\text{m}$ and a maximum droplet diameter of $150\mu\text{m}$ (*1), with spray capacity 700l/hr at an air-water ratio of 100. Low air-water ratio design.

- Spray angle is 60° .

- Compact. Nozzle tip designed for heavy-duty environments such as a cooling tower after an incinerator.

*1) Measured by Laser Doppler Method



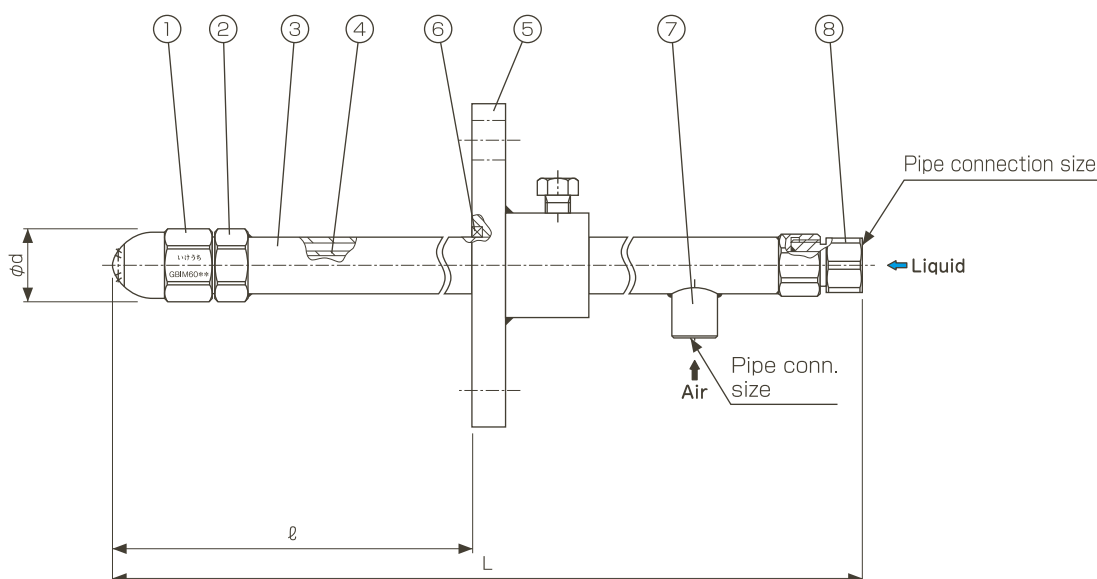
Applications

- Cooling: Gas, molding, refractories

- Moisture control: Paper, gas, concrete

- Combustion: Oil

Structure, Dimensions, Materials and Pipe Connection Sizes



Components and materials

No.	Component	Standard Material
①	Nozzle Tip & Cap	S316L
②	Adaptor	S316L
③	Outer Pipe (for air)	S316LTP
④	Inner Pipe (for liquid)	S304
⑤	Flange	S304
⑥	Packing	Ceramic fiber + Stainless steel wire
⑦	Air Connection	S304
⑧	Liquid Connection	S304

Dimensions

Spray Angle Code	Air Consumption Code	Pipe Conn. Size (in.)		Outer Diameter φd (mm)	Free Passage Diameter (mm)	
		Air	Liquid		Air	Liquid
60	75	PT1/2F		45	2.4	2.5
	110	PT1/2F			2.4	2.7
	150	PT3/4F	PT1/2F	50	3.1	3.4

Nozzle length

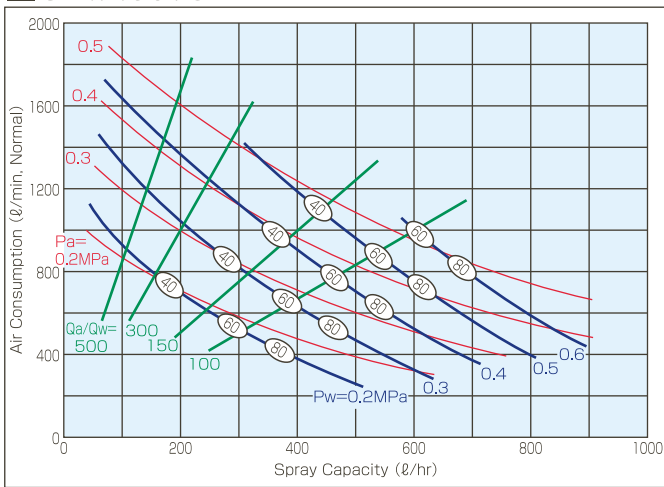
Type	Total Length L (mm)	Length ℓ (mm)
A	560	300~400
B	760	400~600
C	960	600~800
D	1160	800~1000

Flow-rate Diagram

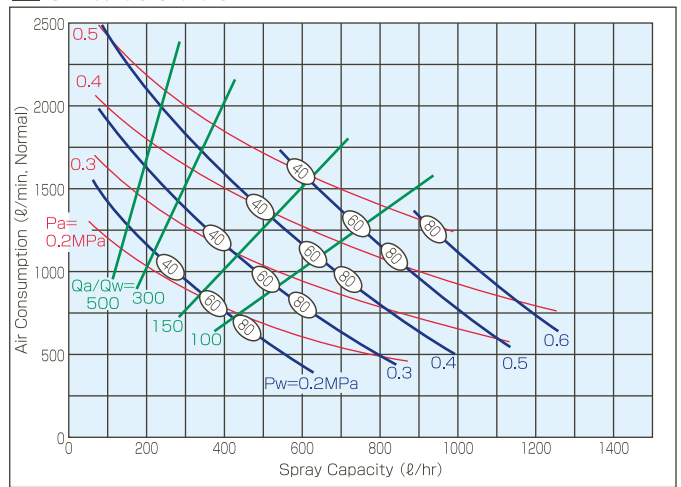
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② **Red lines** (—) represent compressed air pressure P_a in MPa.
Blue lines (—) represent liquid pressure P_w in MPa.
Green lines (—) represent air-water ratio Q_a/Q_w .
- ③ Figures in ovals \bigcirc indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.

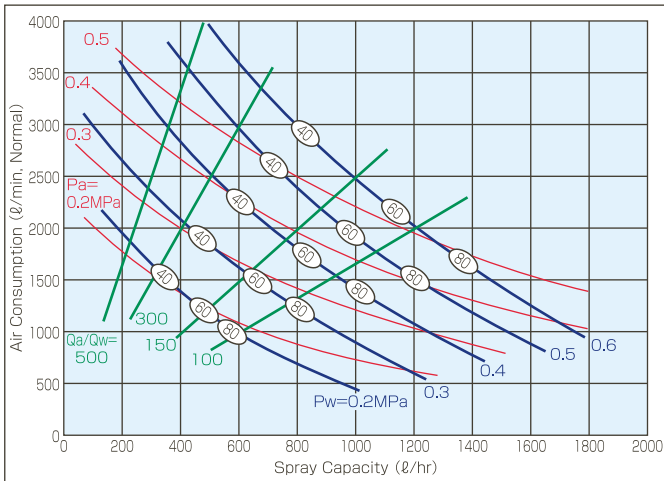
GBIM6075



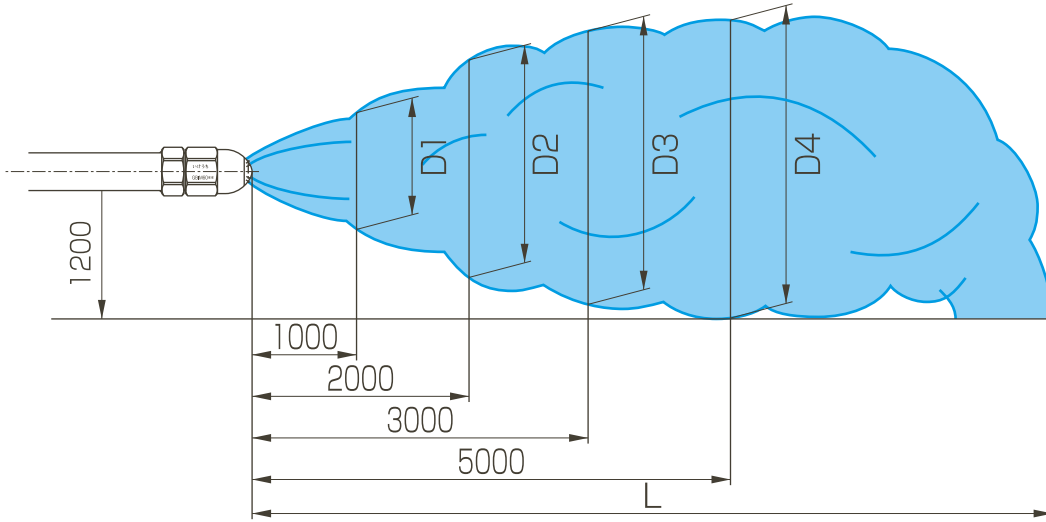
GBIM60110



GBIM60150



Spray Dimensions



Spray Angle Code	Air Consumption Code	Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Dimensions (mm)				
				D1	D2	D3	D4	L
60	75	0.3	0.25~0.35	800	1200	1500	2000	8000
		0.4	0.35~0.45	700	1100	1400	2000	8000
		0.5	0.45~0.55	650	1050	1300	2000	9000
	110	0.3	0.25~0.35	850	1250	1550	2100	9000
		0.4	0.35~0.45	750	1150	1450	2100	9000
		0.5	0.45~0.55	700	1100	1400	2100	10000
	150	0.3	0.25~0.35	900	1300	1600	2200	10000
		0.4	0.35~0.45	800	1200	1500	2200	10000
		0.5	0.45~0.55	750	1150	1450	2200	11000

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> **GBIM 60110 C S316L+2T10S304(ℓ)**

GBIM	60	110	C	S316L	+	2T10	S304	(ℓ)
	Spray Angle Code	Air Consumption Code	Nozzle Length	Material of Nozzle Tip		Flange Size	Material of Flange	Length between the nozzle head and flange
	■ 60°	■ 75 ■ 110 ■ 150	■ A ■ B ■ C ■ D					

(See p.37)

Flange size: Refer to the table of flange dimensions on page 78.

Medium / Large Capacity Fine Mist Nozzles

GSIM_s series Nozzles

Patented



- GSIM_s series fine mist nozzles, developed from a new nozzle engineering concept, have excellent atomization capabilities.
- GSIM_s series nozzles produce a large volume of fine atomization with a low consumption of compressed air, having very low air-water ratios.
- Simple structure, easy maintenance.

Contents

GSIM_s series Medium / Large Capacity Fine Mist Nozzles	p.41
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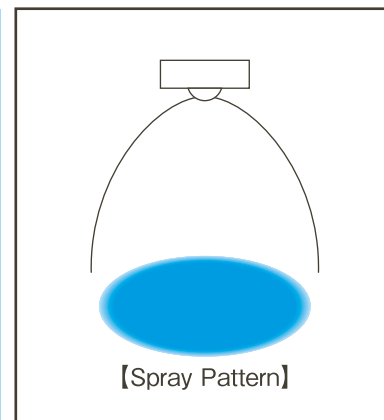
Medium / Large Capacity Fine Mist Nozzles – GSIM_s + Adaptor type –

GSIM_s

Features

- Pneumatic spray nozzle producing large amount of "fine mist", spray capacity 30ℓ/hr-1000ℓ/hr.
- Energy-saving design - mean droplet diameter of 50μm and a maximum droplet diameter of 150μm (*1) at an air-water ratio of 150.
- Available in spray angles of 20° and 60°, in 6 spray capacity types - 12 varieties in total. Wide selection.
- Easy maintenance with simple structure and compact body.

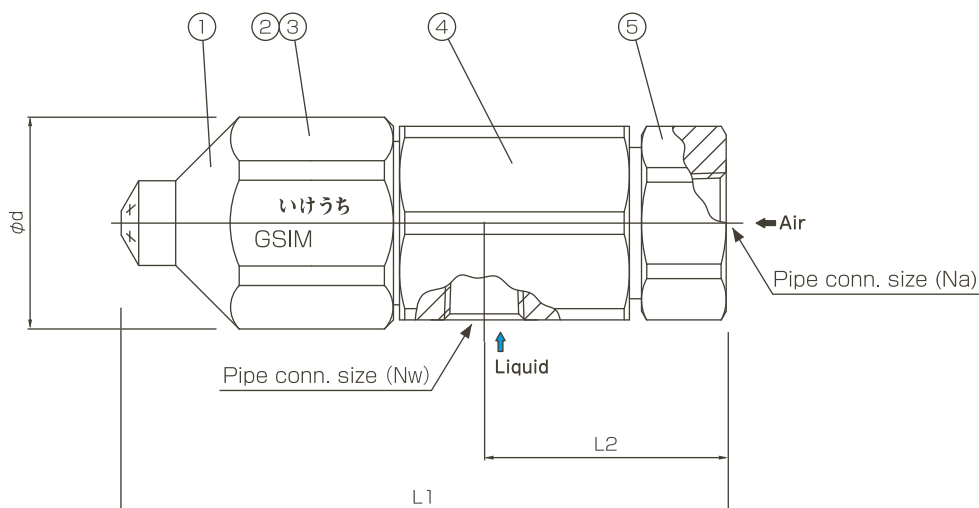
*1) Measured by Laser Doppler Method



Applications

- Cooling: Gas, moldings, refractories
- Moisture control: Gas, concrete
- Combustion: Oil, waste fluid
- Dust suppression: Recycling facilities, material facilities, moldings

Structure, Dimensions, Materials and Pipe Connection Sizes



Components and materials

No.	Components	Standard Materials
①	Nozzle Tip	S316L
②	Nozzle Core	S316L
③	Whirler	S316L
④	Nozzle Adaptor	S303
⑤	Air Connection	S303

Dimensions

Spray Angle Code	Air Consumption Code	Pipe Connection Size (in)		Outer Diameter φd (mm)	Total Length L1 (mm)	Length L2 (mm)	Free Passage Diameter*2 (mm)	
		Air (Na)	Liquid (Nw)				Liquid	Air
20,60	37	PT3/8F	PT1/4F	35	100	40	1.9(2.2)	1.7(1.7)
	55						2.2(2.2)	2.0(2.0)
	75	PT1/2F	PT3/8F	45	120	42	2.7(3.2)	2.3(2.3)
	110						3.2(3.2)	3.0(3.0)
	150						3.9(4.0)	3.5(3.5)
220	PT3/4F	PT1/2F	50	140	44	4.0(4.0)	4.3(4.3)	

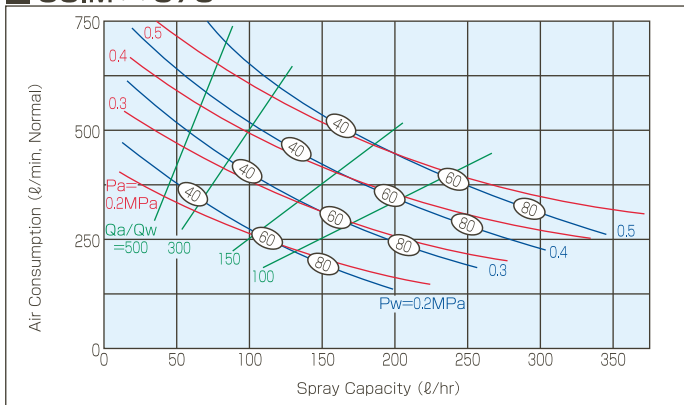
*2) Free passage diameter in () shows that of GSIM_s with spray angle of 20°.

Flow-rate Diagram

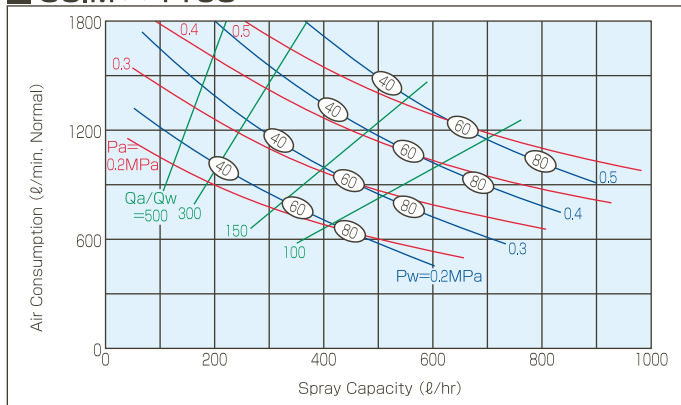
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② **Red lines** (—) represent compressed air pressure P_a in MPa.
Blue lines (—) represent liquid pressure P_w in MPa.
Green lines (—) represent air-water ratio Q_a/Q_w .
- ③ Figures in ovals \bigcirc indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.
- ④ ** is to be filled by spray angle code No. 20 or 60.

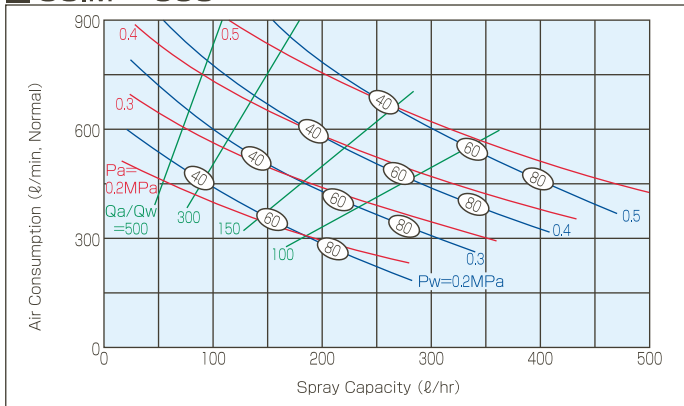
GSIM**37S



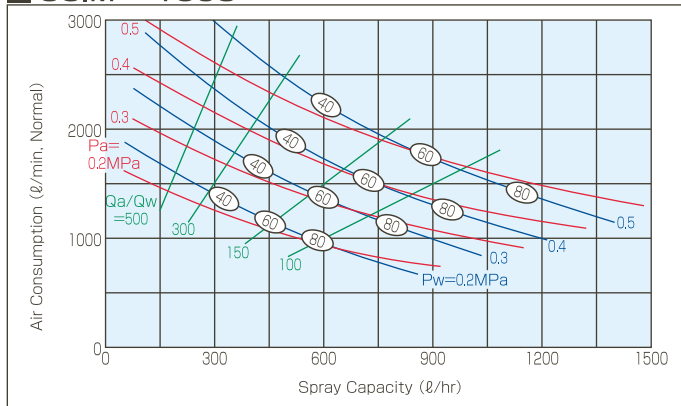
GSIM**110S



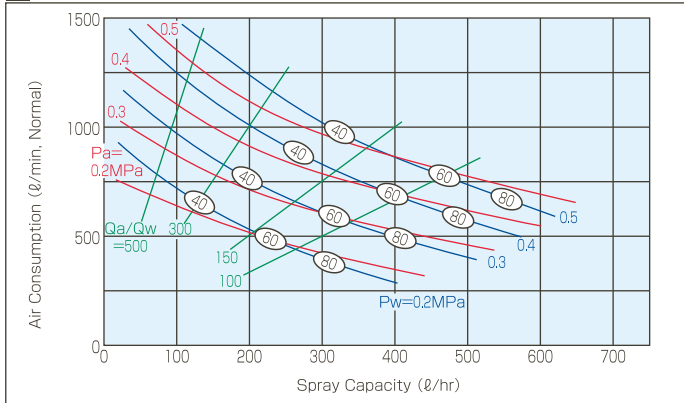
GSIM**55S



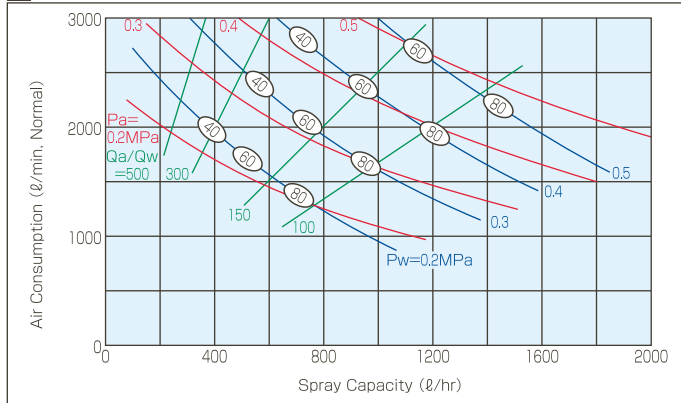
GSIM**150S



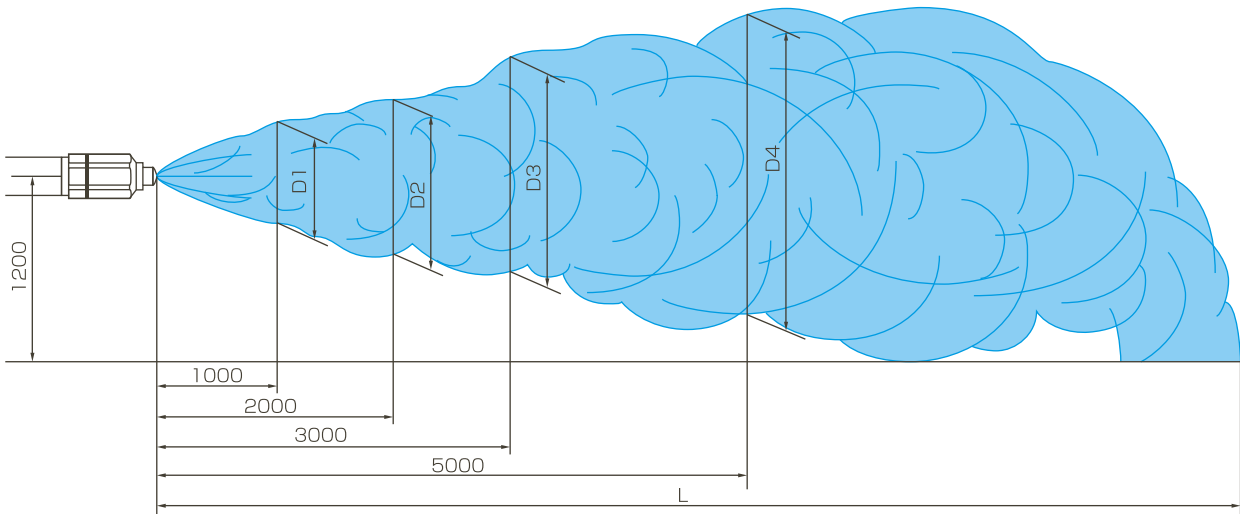
GSIM**75S



GSIM**220S



Spray Dimensions



Spray Angle Code	Air Consumption Code	Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Dimensions (mm)				
				D1	D2	D3	D4	L
20°	37	0.3	0.25~0.35	200	450	750	1,100	9,000
		0.4	0.35~0.45	250	500	850	1,200	10,000
		0.5	0.45~0.55	300	550	900	1,300	10,000
	55	0.3	0.25~0.35	250	500	800	1,200	10,000
		0.4	0.35~0.45	300	550	900	1,300	11,000
		0.5	0.45~0.55	350	600	1,000	1,400	11,000
	75	0.3	0.25~0.35	300	550	900	1,300	12,000
		0.4	0.35~0.45	350	650	1,000	1,400	13,000
		0.5	0.45~0.55	400	750	1,100	1,500	13,000
	110	0.3	0.25~0.35	350	600	1,000	1,400	12,000
		0.4	0.35~0.45	400	700	1,100	1,500	13,000
		0.5	0.45~0.55	450	800	1,200	1,600	13,000
	150	0.3	0.25~0.35	400	750	1,100	1,500	13,000
		0.4	0.35~0.45	450	800	1,200	1,600	14,000
		0.5	0.45~0.55	500	850	1,300	1,700	14,000
	220	0.3	0.25~0.35	450	800	1,200	1,500	13,000
		0.4	0.35~0.45	500	850	1,250	1,600	14,000
		0.5	0.45~0.55	550	900	1,300	1,700	14,000

Spray Angle Code	Air Consumption Code	Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Dimensions (mm)				
				D1	D2	D3	D4	L
60°	37	0.3	0.25~0.35	600	900	1,200	1,700	8,000
		0.4	0.35~0.45	550	850	1,100	1,700	8,000
		0.5	0.45~0.55	500	800	1,000	1,700	8,000
	55	0.3	0.25~0.35	650	950	1,300	1,800	9,000
		0.4	0.35~0.45	600	900	1,200	1,800	9,000
		0.5	0.45~0.55	550	850	1,100	1,800	9,000
	75	0.3	0.25~0.35	700	1,000	1,400	1,900	10,000
		0.4	0.35~0.45	650	950	1,300	1,900	10,000
		0.5	0.45~0.55	600	900	1,200	1,900	10,000
	110	0.3	0.25~0.35	700	1,000	1,400	1,900	10,000
		0.4	0.35~0.45	650	950	1,300	1,900	11,000
		0.5	0.45~0.55	600	900	1,200	1,900	11,000
	150	0.3	0.25~0.35	800	1,200	1,500	2,000	11,000
		0.4	0.35~0.45	700	1,100	1,400	2,000	12,000
		0.5	0.45~0.55	600	1,000	1,300	2,000	12,000
	220	0.3	0.25~0.35	900	1,300	1,600	2,100	11,000
		0.4	0.35~0.45	800	1,200	1,500	2,100	12,000
		0.5	0.45~0.55	700	1,100	1,400	2,100	12,000

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> GSIM6075SS316L+TS303

GSIM	60	75	S	S316L	+	T	S303
	Spray Angle Code	Air Consumption Code		Material of Nozzle Tip			Material of Adaptor
	■ 20°	■ 37					
	■ 60°	■ 55					
		■ 75					
		■ 110					
		■ 150					
		■ 220					

Medium / Large Capacity Fine Mist Nozzles

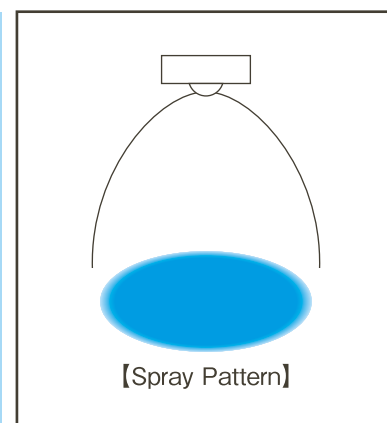
— GSIM_s + Nozzle Lance type —

GSIM_s

Features

- Produces fine atomization having a mean droplet diameter of 50 μ m and a maximum droplet diameter of 150 μ m (*1) at an air-water ratio of 150.
- Available in two spray angles of 20° and 60°.
- Fixed with a flange.

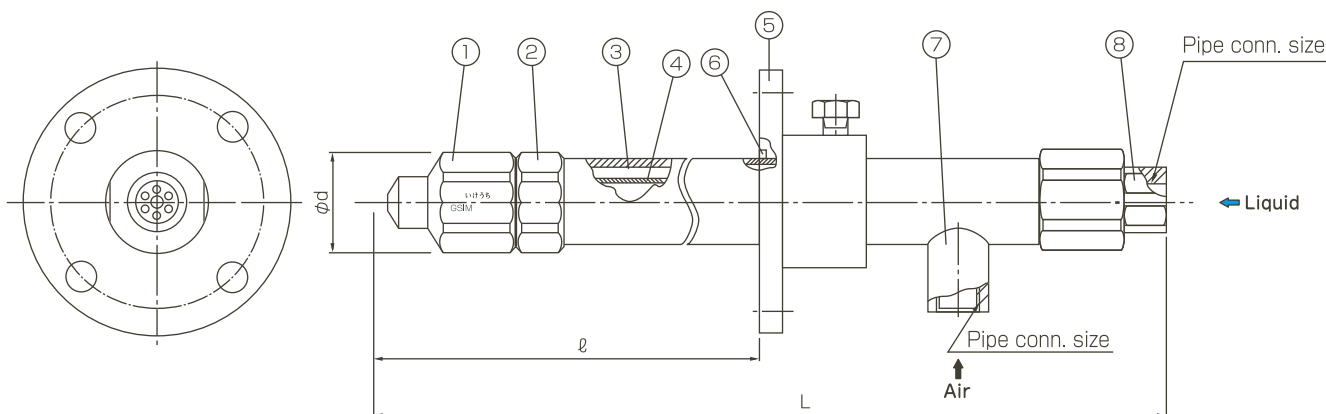
*1) Measured by Laser Doppler Method



Applications

- Cooling: Gas, moldings, refractories
- Moisture control: Gas, concrete
- Combustion: Oil

Structure, Dimensions, Materials and Pipe Connection Sizes



Components and materials

No.	Component	Standard Material
①	Nozzle Tip	S316L
②	Adaptor	S316L
③	Outer Pipe(for air)	S316LTP
④	Inner Pipe(for liquid)	S304TP
⑤	Flange	S304
⑥	Packing	Ceramic fibre + stainless steel wire
⑦	Air Connection	S304
⑧	Liquid Connection	S304

Dimensions

Spray Angle Code	Air Consumption Code	Pipe Conn. Size (in.)		Outer Diameter ϕ d	Free Passage Diameter*2 (mm)	
		Air	Liquid		Liquid	Air
20,60	37	PT3/8F	PT3/8F	35	1.9(2.2)	1.7(1.7)
	55				2.2(2.2)	2.0(2.0)
	75	PT1/2F	PT1/2F	45	2.7(3.2)	2.3(2.3)
	110				3.2(3.2)	3.0(3.0)
	150	PT3/4F		50	3.9(4.0)	3.5(3.5)
	220				4.0(4.0)	4.3(4.3)

*2) Free passage diameter in () shows that of GSIM_S with spray angle of 20°.

Nozzle length

Type	Total Length L (mm)	Length ℓ (mm)
A	560	300~400
B	760	400~600
C	960	600~800
D	1160	800~1000

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> GSIM60110SBS316L+3T5S304(ℓ)

GSIM	60	110	S	B	S316L	+	3T5	S304	(ℓ)
	Spray Angle Code	Air Consumption Code		Nozzle Length	Material of Nozzle		Flange Size	Material of Flange	Length between the nozzle head and flange
	■20 ■60	■37 ■110 ■55 ■150 ■75 ■220		■A ■D ■B ■C					

Flange size: Refer to the table of flange dimensions on page 78.

Semi-Fine Mist, Semi-Coarse Mist Nozzles

DOVEA / DDA / JJA series Nozzles VVEA / PSN

Patented

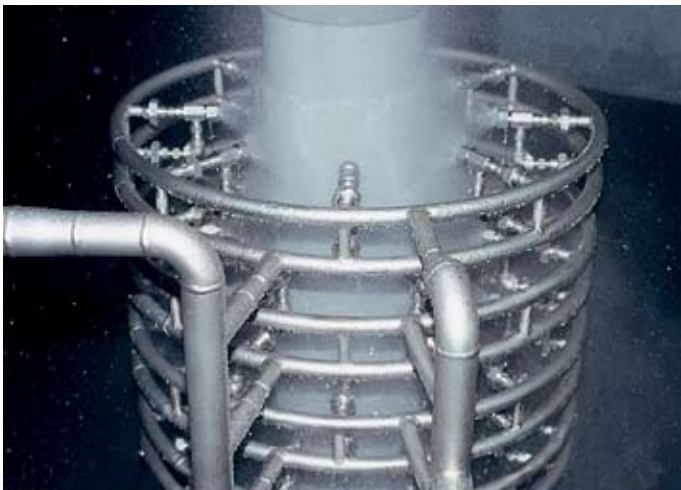


■DOVEA, DDA and JJA series, developed to satisfy the crucial requirements for spray nozzles in the continuous casting process of steel making, feature stable spray angles and distributions with large turndown ratios, having fine and uniform spray droplet size distributions across the entire spray area.

Also, free passage diameters are twice as large as those of hydraulic nozzles to minimize clogging.

With these features, DOVEA, DDA and JJA series are highly effective nozzles for steel / gas cooling.

■VVEA, PSN series are innovative pneumatic spray nozzles developed for new cleaning method requiring high-velocity and concentrated spraying of fine atomization, which can wash out fine dirt particles that conventional cleaning could not clean.



Contents

DOVEA series Flat Spray Semi-fine, Semi-coarse Mist Nozzles	p.46
DDA series Oval Spray Semi-fine, Semi-coarse Mist Nozzles	p.51
JJA series Full Cone Spray Semi-fine, Semi-coarse Mist Nozzles	p.54
VVEA series High Impact Flat Spray Semi-Fine/Semi-Coarse Mist Nozzles	p.57
PSN series Pneumatic Slit Nozzles	p.60

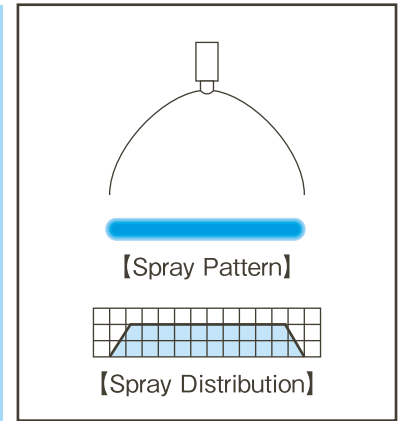
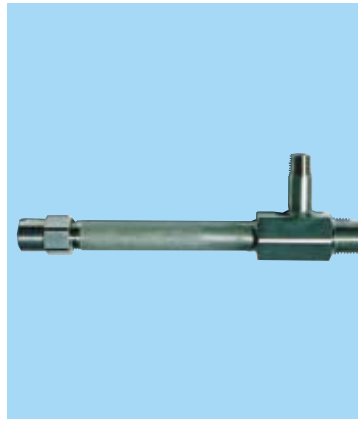
Flat Spray Semi-fine, Semi-coarse Mist Nozzles

DOVEA

Features

- Flat spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of $50\mu\text{m}$ or more (*1).
- Large turn-down ratio with minimal variation in spray angle.
- Uniform spray droplet size distribution across the entire spray area.
- Uniform distribution suitable for multiple-nozzle arrangements.
- Large free passage diameter minimizes clogging.

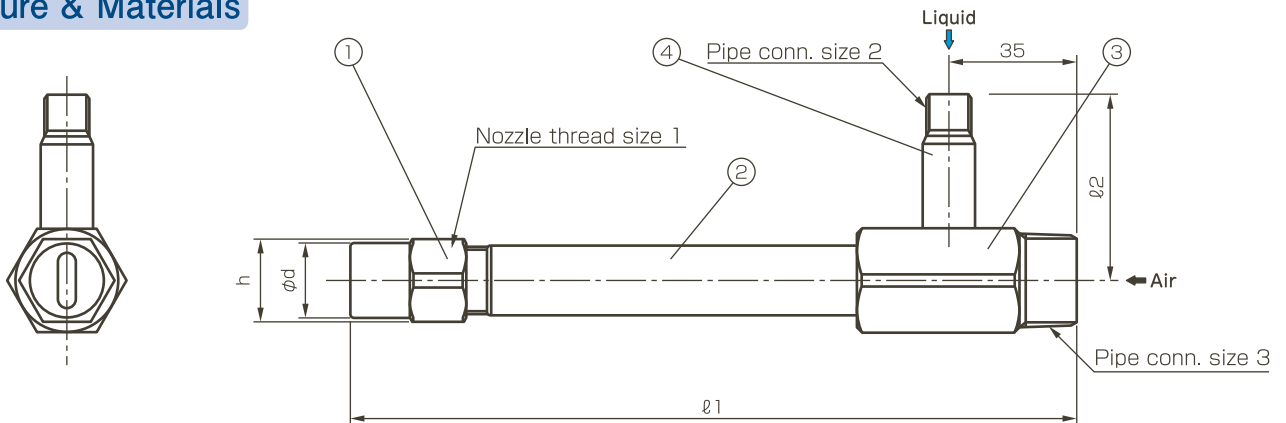
*1) Measured by the Fraunhofer Diffraction method.
Please refer to page 6-7 for comparison with Laser Doppler Method.



Applications

- Cooling: Gas, steel plates, steel pieces, moldings, etc.
- Moisture control: Gas, etc.
- Combustion: Waste water, etc.

Structure & Materials



Components and materials

No.	Component	Standard Material
①	Nozzle	S303
②	Pipe	S304
③	Mixing Adaptor	S304
④	Liquid Pipe	S304

Dimensions & Pipe Conn. Sizes

Spray Capacity Code	Nozzle Thread Size (in.)			Pipe Connection Sizes*2 (in.)				Outer Dimensions*1 (mm)				Mass*3 (kg)
	1	2	3	$\varnothing 1$	$\varnothing 2$	$\varnothing d$	h					
82 110	PT1/4M	PT1/4M	PT1/2M	500	47.5	18	19	0.55				
180 230	PT3/8M	PT1/4M	PT1/2M	500	47.5	19	21	0.65				
400	PT1/2M	PT1/4M	PT1/2M	500	47.5	25	26	0.85				

Note: Please ask our sales offices about the union joint option for secure fitting and easy installation/removal.

*1: $\varnothing 1=200\sim 1500\text{mm}$

*2: Pipe connection sizes for air and liquid are the same.

*3: The mass shown is for DOVEA with 500mm straight pipe.

For the mass of DOVEA with a longer/shorter pipe, please add or subtract the corresponding mass (listed below) for each 100mm of length.

1/4B 63g
3/8B 85g
1/2B 130g

Flat Spray Semi-fine, Semi-coarse Mist Nozzles

DOVEA series

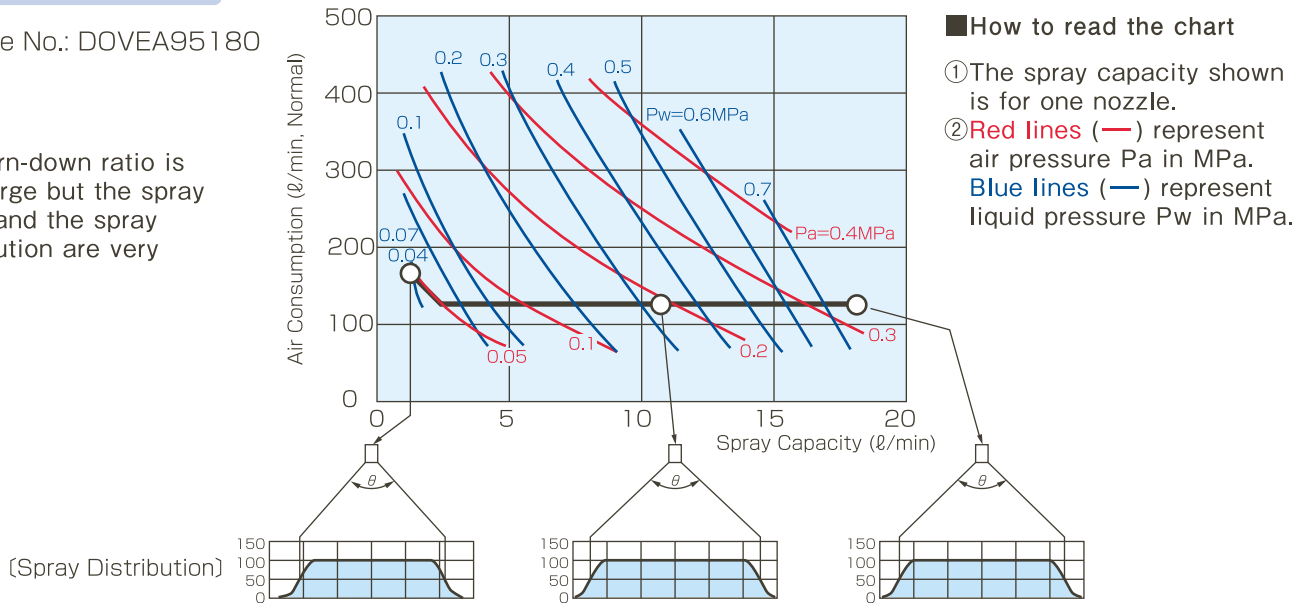
Spray Angle Code	Spray Capacity Code	Air Pressure (MPa)	Spray Capacity (ℓ/min) & Air Consumption (ℓ/min, Normal)										Mean Droplet Diameter (μm)		Free Passage Diameter (mm)			
			Liquid Pressure (MPa)										Immersion Sampling Method	Fraunhofer Diffraction Method	Spray Tip	Adaptor		
			0.07		0.1		0.2		0.4		0.7					Liquid	Air	
Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air							
110°	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100	50	2.7	3.6	5.1	
		0.2	—	—	—	—	—	4.34	280	12.9	100	—	—	∫				∫
		0.3	—	—	—	—	—	—	—	9.49	250	18.0	100	∫				∫
		0.4	—	—	—	—	—	—	—	—	—	15.9	200	350				150
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100	50	4.1	5.2	7.7	
		0.2	—	—	—	—	9.65	630	28.6	220	—	—	∫	∫				
		0.3	—	—	—	—	—	—	21.1	560	40	225	∫	∫				
		0.4	—	—	—	—	—	—	—	—	35.4	450	400	200				
95°	82	0.1	0.42	125	1.45	85	4.19	30	—	—	—	—	100	50	2.0	2.5	3.5	
		0.2	—	—	—	—	1.98	125	5.86	45	—	—	∫	∫				
		0.3	—	—	—	—	—	—	4.32	110	8.2	45	∫	∫				
		0.4	—	—	—	—	—	—	—	—	7.26	90	300	150				
	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100	50	3.0	3.6	5.1	
		0.2	—	—	—	—	4.34	280	12.9	100	—	—	∫	∫				
		0.3	—	—	—	—	—	—	9.49	250	18.0	100	∫	∫				
		0.4	—	—	—	—	—	—	—	—	15.9	200	350	175				
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100	50	4.5	5.2	7.7	
		0.2	—	—	—	—	9.65	630	28.6	220	—	—	∫	∫				
		0.3	—	—	—	—	—	—	21.1	560	40	225	∫	∫				
		0.4	—	—	—	—	—	—	—	—	35.4	450	400	200				
70°	110	0.1	0.56	180	1.94	120	5.63	40	—	—	—	—	100	50	2.8	2.8	4.1	
		0.2	—	—	—	—	2.65	180	7.87	65	—	—	∫	∫				
		0.3	—	—	—	—	—	—	5.8	160	11.0	65	∫	∫				
		0.4	—	—	—	—	—	—	—	—	9.74	130	300	150				
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100	50	4.1	4.0	5.9	
		0.2	—	—	—	—	5.55	370	16.4	130	—	—	∫	∫				
		0.3	—	—	—	—	—	—	12.1	320	23.0	130	∫	∫				
		0.4	—	—	—	—	—	—	—	—	20.4	260	350	150				
55°	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100	50	5.6	5.2	7.7	
		0.2	—	—	—	—	9.65	630	28.6	220	—	—	∫	∫				
		0.3	—	—	—	—	—	—	21.1	560	40	225	∫	∫				
		0.4	—	—	—	—	—	—	—	—	35.4	450	400	200				

Technical Data

Flow-rate Diagram

Nozzle No.: DOVEA95180

The turn-down ratio is very large but the spray angle and the spray distribution are very stable.

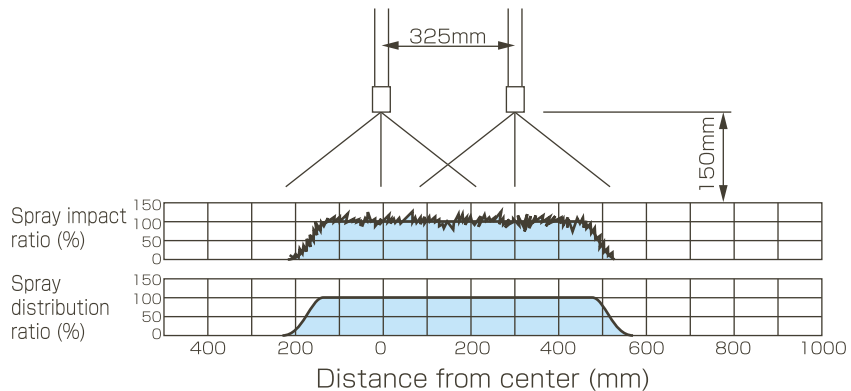


Spray Distribution & Spray Impact

Nozzle No.: DOVEA95180

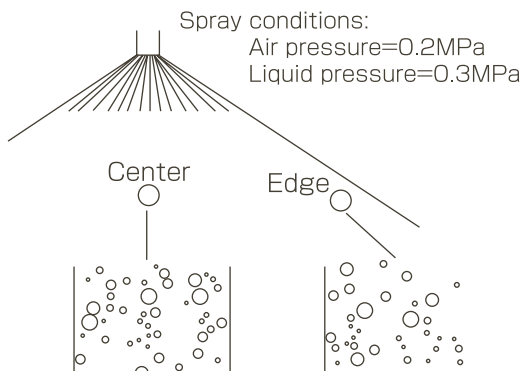
Spray conditions:
Air pressure=0.2MPa
Liquid pressure=0.3MPa

DOVEA nozzles produce a flat spray pattern with tapered spray pattern edges, which provide uniform spray distribution and spray impact in multiple-nozzle arrangements.



Spray Droplet

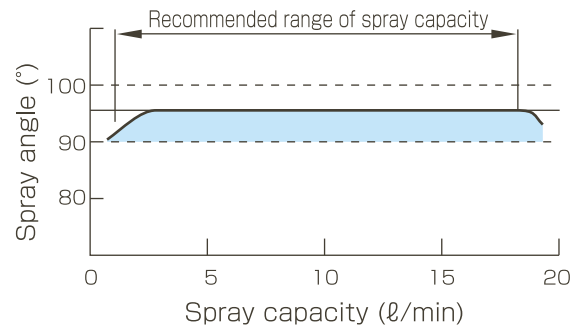
Nozzle No.: DOVEA95180



The spray droplet sizes are fine and uniform across the entire spray area.

Variation in Spray Angle

Nozzle No.: DOVEA95180

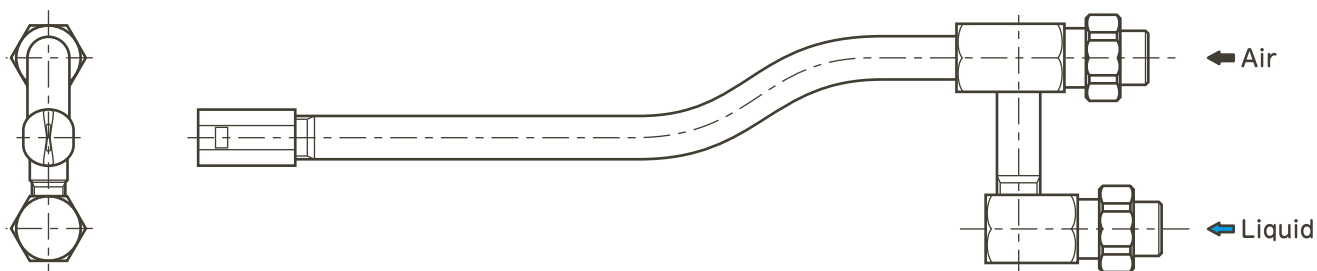


The variation in spray angle is minimized despite the large modulation of spray capacities.

*Spray angle (θ) means the angle between two lines from the nozzle orifice to both sides of spray distribution where the spray distribution ratio is 50%, taking the spray distribution ratio at the center as 100%.

Special Pipe

— Bent Pipe —



Note: For details of bent pipes, please contact our local sales office.

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

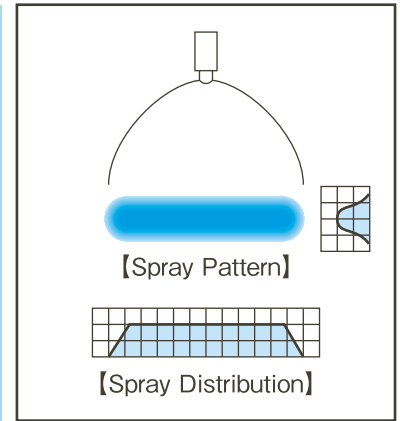
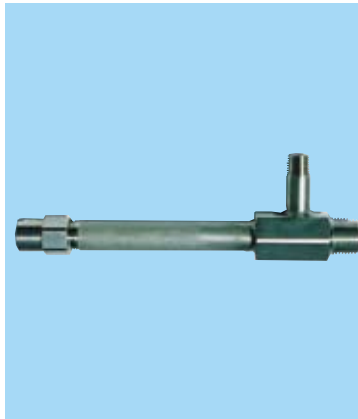
<Example> 1/4DOVEA95180-U×500S303-n

1/4	DOVEA	95	180	U	×	500	S303	-	n
Nozzle Thread Size 1		Spray Angle Code	Spray Capacity Code	Pipe Connection		Total Length $\varnothing 1$			Code of Bent Pipe*
■ 1/4		■ 110°	■ 82	■ U (Union Joint)		■ Min. 200			
■ 3/8		■ 95°	}	■ M (Male Thread)		■ Standard 500			
■ 1/2		■ 70°	■ 400			■ Max. 1500			
		■ 55°							

(*This code will be determined upon receipt of an inquiry.)

Features

- Flat spray pneumatic nozzle with spray area larger in direction of spray thickness compared with DOVEA series.
- Feature uniform distribution of flow-rate and spray droplets across the entire spray area, large turn-down ratio with minimal variation in spray angle as with DOVEA series.
- DOVEA-W series have a high cooling effect for cooling metal sheets.



Applications

- Cooling: Steel plates, steel pieces, gas, etc.

Double-wide spray thickness makes a difference in cooling applications (Comparison with DOVEA)

DOVEA-W series



Conventional nozzles (DOVEA-series)



For further information, please contact our local sales office.

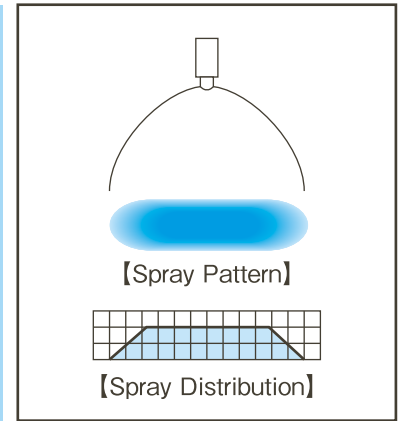
Oval Spray Semi-fine, Semi-coarse Mist Nozzles

DDA

Features

- Oval spray pneumatic nozzle producing a large volume of semi-fine atomization with a mean droplet diameter of 50 μ m or more (*1).
- Oval spray pattern covers wide area.
- Large turn-down ratio with minimal variation in spray angle.
- Uniform spray droplet size distribution across the entire spray area.
- Uniform distribution suitable for multiple-nozzle arrangements.
- Large free passage diameter minimizes clogging.

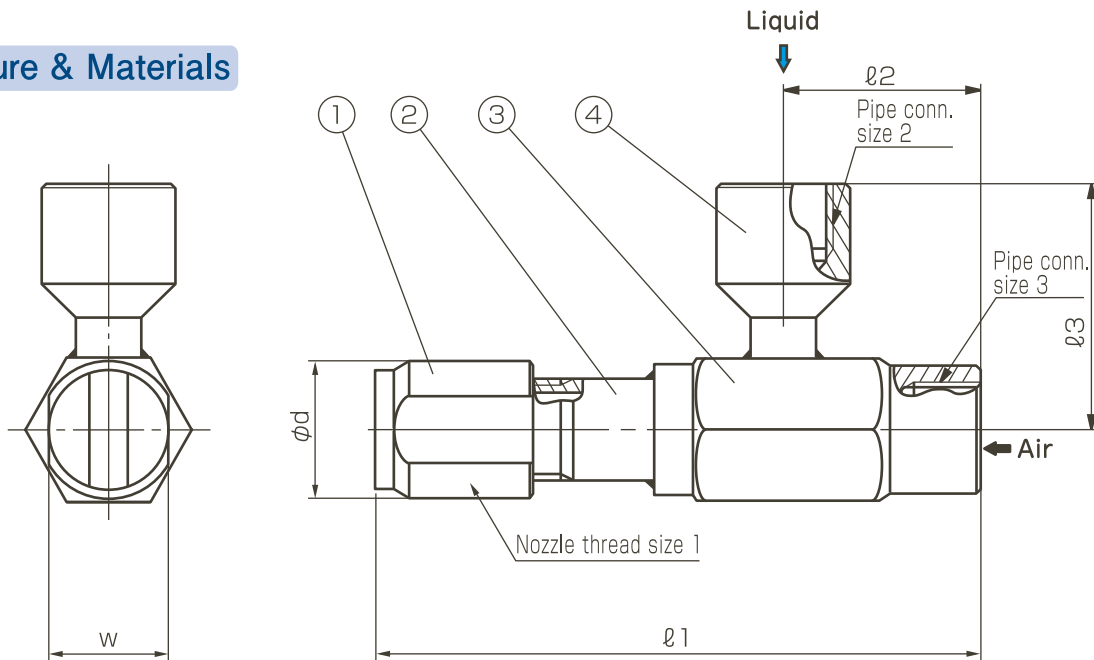
*1) Measured by the Fraunhofer Diffraction method.
Please refer to page 6-7 for comparison with Laser Doppler Method.



Applications

- Cooling: Gas, steel plates, steel pieces, pipes, moldings, etc.
- Moisture control: Gas, etc.
- Combustion: Waste water, etc.

Structure & Materials



Components and materials

No.	Component	Standard Material
①	Nozzle Body	S303
②	Pipe	S304
③	Mixing Adaptor	S304
④	Liquid Pipe	S304

Dimensions & Pipe Connection Sizes

Dimensions

Nozzle Thread Size 1 (in.)	Pipe Connection Size 2,3 (in.) *2	ϕd (mm)	w (mm)	l_1 (mm) *1	l_2 (mm)	l_3 (mm)	Mass(g) *3
PT1/8F	PT1/4F	18	16	70	32.5	40	170
PT1/4F	PT1/4F	18	16	70	32.5	40	180
PT1/2F	PT1/2F	28	25	130	40	50	450
PT3/4F	PT1/2F	35	32	150	45	50	650

- *1: l_1 shows the standard length which is shortest, and the longest length is 1500mm.
- *2: Pipe connection sizes for air and liquid are the same.
- *3: Each mass shows DDA with standard length. For longer lengths please add the corresponding mass (listed below) for each 100mm of length.

Pipe size	Mass per 100mm
1/4"	80g
3/8"	110g
1/2"	160g

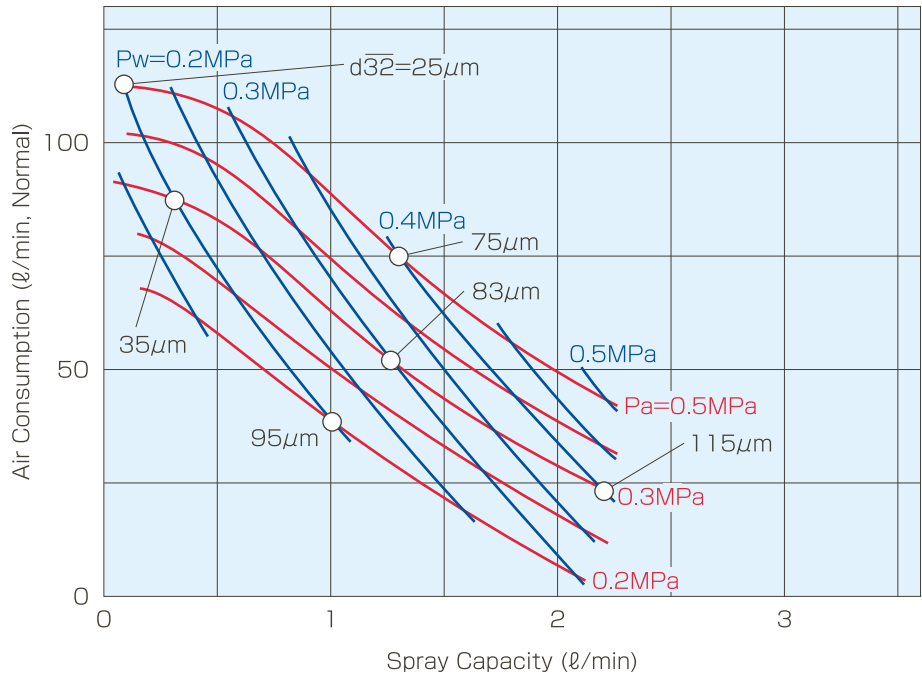
Spray Angle Code		Spray Capacity Code	Nozzle Thread Size 1 (in.)	Pipe Conn. Size 2,3 (in.)	Air Press. (MPa)	Spray Capacity (ℓ/min) & Air Consumption (ℓ/min, Normal)										Mean Droplet Diameter (μm)		Free Passage Diameter (mm)		
Coverage	Thick-ness					Liquid Pressure (MPa)										Immersion Sampling Method	Fraunhofer Diffraction Method	Spray Tip	Adaptor	
						0.07		0.1		0.2		0.4		0.7					Liquid	Air
125°	20°	70	1/4F	1/4F	0.1	1.51	29	2.22	24	—	—	—	—	—	—	200	100	2.4	2.2	1.5
					0.2	1.39	47	2.02	47	3.18	45	5.13	33	7.07	18	∫	∫			
					0.3	1.29	63	1.84	63	2.92	63	4.77	55	6.66	41	∫	∫			
					0.4	1.19	79	1.70	79	2.70	79	4.42	77	6.29	64	300	150			
110°	25°	36	1/4F	1/4F	0.1	0.87	34	1.20	34	1.87	31	—	—	—	—	200	100	2.0	1.7	1.5
					0.2	0.75	50	1.10	50	1.76	49	2.80	44	3.70	36	∫	∫			
					0.3	0.63	66	1.00	66	1.66	66	2.64	64	3.64	57	∫	∫			
					0.4	0.50	82	0.90	82	1.55	82	2.50	82	3.60	76	300	150			
	20°	50	1/4F	1/4F	0.1	1.20	46	1.62	46	2.72	41	—	—	—	—	200	100	2.4	2.0	1.8
					0.2	1.00	69	1.47	69	2.45	65	3.86	55	5.13	43	∫	∫			
					0.3	0.80	92	1.28	92	2.17	91	2.56	85	5.04	72	∫	∫			
					0.4	0.60	114	1.10	114	1.93	114	3.30	111	4.86	99	300	150			
100°	45°	470	3/4F	1/2F	0.1	8.79	220	15.6	170	—	—	—	—	—	—	120	60	6.0	5.8	4.1
					0.2	5.86	370	12.2	330	20.2	280	—	—	—	—	∫	∫			
					0.3	3.45	490	9.66	480	15.5	443	32.1	285	—	—	∫	∫			
					0.4	1.21	610	7.07	610	12.9	587	20.7	491	46.3	240	350	175			
	45°	580	3/4F	1/2F	0.1	12.6	278	18.8	213	—	—	—	—	—	—	140	70	7.0	6.5	4.7
					0.2	6.87	500	12.2	462	24.2	336	—	—	—	—	∫	∫			
					0.3	—	—	—	—	17.9	550	38.9	325	—	—	∫	∫			
					0.4	—	—	—	—	—	—	32.5	535	57.3	190	400	200			
15°	25	1/8F	1/4F	0.1	—	—	—	—	—	—	—	—	—	—	30	15	2.0	1.9	1.8	
				0.2	—	—	—	—	1.05	37	—	—	—	—	∫	∫				
				0.3	—	—	—	—	0.34	87	2.20	240	—	—	∫	∫				
				0.4	—	—	—	—	—	—	1.30	75	—	—	200	100				
80°	20°	14	1/4F	1/4F	0.1	0.36	19	0.50	19	0.71	19	1.11	18	1.40	17	70	35	2.0	1.1	1.2
					0.2	0.29	29	0.46	29	0.68	29	1.10	28	1.41	27	∫	∫			
					0.3	0.22	39	0.41	39	0.65	39	1.08	39	1.42	37	∫	∫			
					0.4	0.14	49	0.37	49	0.62	49	1.06	49	1.43	48	150	75			
	20°	37	1/4F	1/4F	0.1	0.93	33	1.35	32	2.02	30	3.01	24	3.74	17	200	100	2.8	1.7	1.5
					0.2	0.80	51	1.23	51	1.92	50	2.90	47	3.74	41	∫	∫			
					0.3	0.68	68	1.12	68	1.83	68	2.80	65	3.74	61	∫	∫			
					0.4	0.57	84	1.00	84	1.74	84	2.72	83	3.74	80	300	150			
	20°	50	1/4F	1/4F	0.1	1.06	44	1.70	41	2.78	32	—	—	—	—	200	100	2.8	2.0	1.8
					0.2	0.86	71	1.40	70	2.37	65	3.79	48	4.95	35	∫	∫			
					0.3	0.67	96	1.18	95	2.05	92	3.40	82	4.84	62	∫	∫			
					0.4	0.50	121	0.92	121	1.68	119	3.06	111	4.70	89	300	150			
75°	25°	230	1/2F	1/2F	0.1	4.48	133	7.03	116	—	—	—	—	—	—	120	60	4.0	4.1	2.9
					0.2	3.50	207	5.76	199	10.4	168	16.2	104	—	—	∫	∫			
					0.3	2.54	271	4.58	268	9.27	249	15.1	200	22.3	110	∫	∫			
					0.4	1.61	330	3.47	330	8.33	320	14.1	278	21.7	191	300	150			

Flow-rate Diagram

Nozzle No.: DDA1001525

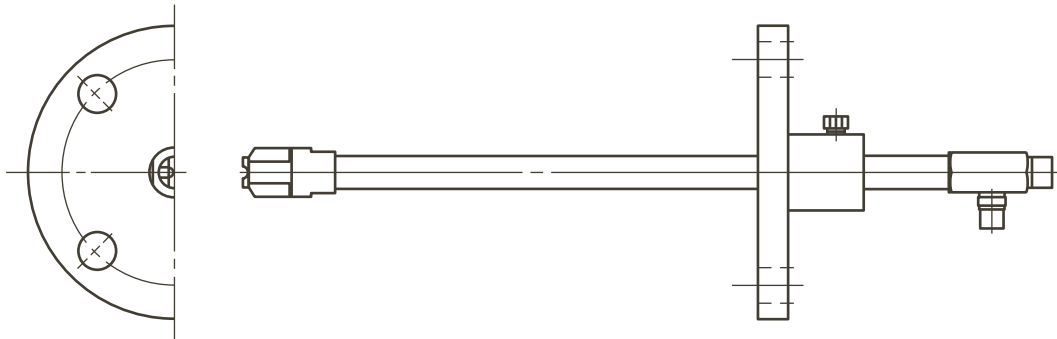
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Red lines (—) represent air pressure Pa in MPa.
Blue lines (—) represent liquid pressure Pw in MPa.
- ③ Droplet diameter d_{32} is Sauter mean droplet diameter measured by the Immersion Sampling Method.



DDA with Flange

- DDA with a fixed flange is available.



How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> 1/4DDA1252070×(70)S303-n

1/4	DDA	125	20	70	×	(70)	S303	-	n
Nozzle Thread Size 1		Spray Angle Code (Coverage)	Spray Angle Code (Thickness)	Spray Capacity Code		Total Length			Code of Bent Pipe*2
■ 1/8 ■ 1/4 ■ 1/2 ■ 3/4		■ 125° ■ 110° ■ 100° ■ 80° ■ 75°	■ 45° } ■ 15°	■ 14 } ■ 580		■ Standard (70~150)*1 ■ Max. 1500			(*2 This code will be determined upon receipt of an inquiry.)

*1: Standard length differs with nozzle code. See "Dimensions" on page 51.

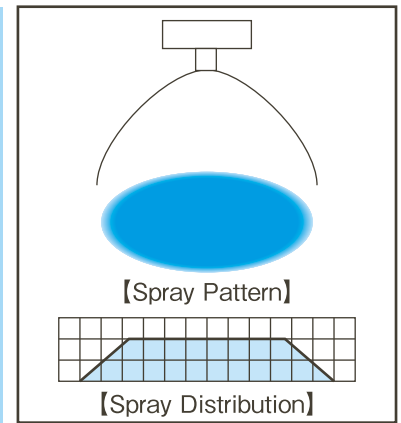
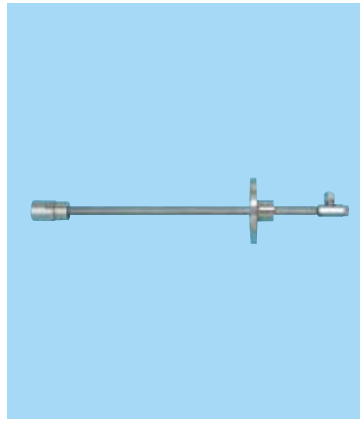
Full Cone Spray Semi-fine, Semi-coarse Mist Nozzles

JJA

Features

- Full cone spray pneumatic nozzle producing a large volume of semi-fine to semi-coarse atomization with a mean droplet diameter of $50\mu\text{m}$ or more (*1).
- Large turn-down ratio.
- Uniform spray droplet size distribution across the entire spray area.
- Large free passage diameter minimizes clogging. Ideal for spraying liquid containing foreign particles and combustion of waste liquid at waste incinerators.

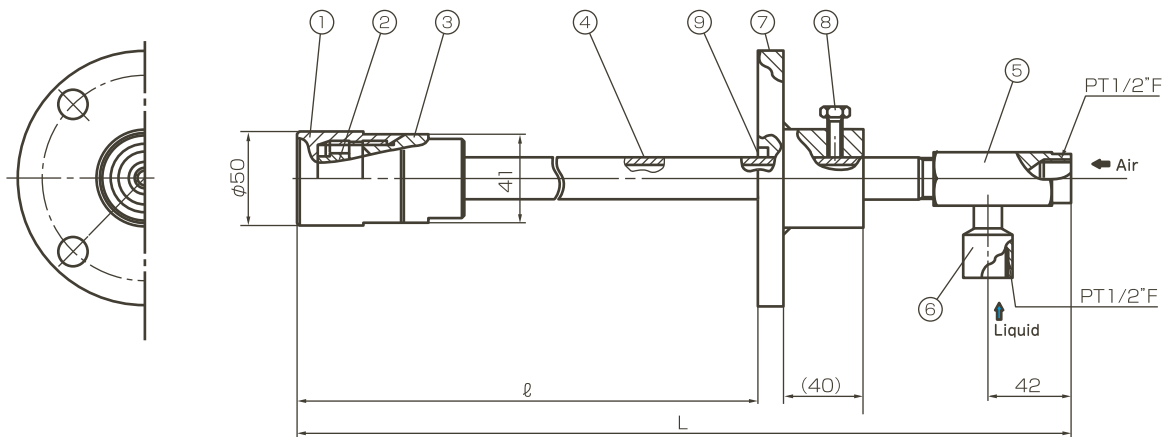
*1) Measured by the Fraunhofer Diffraction method.
Please refer to page 6-7 for comparison with Laser Doppler Method.



Applications

- Spraying: Refuse waste water, etc.
- Cooling: Gas, moldings, etc.
- Combustion: Waste water, etc.

Structure, Dimensions, Materials and Pipe Connection Sizes



■ Nozzle length

Type	Total Length L (mm)	Length l (mm)	Mass (kg) *1 (without Flange)
A	440	200~300	1.8
B	540	300~400	2.0
C	740	400~600	2.3
D	940	600~800	2.6
E	1140	800~1000	2.9

*1) Mass of Flange is not included.

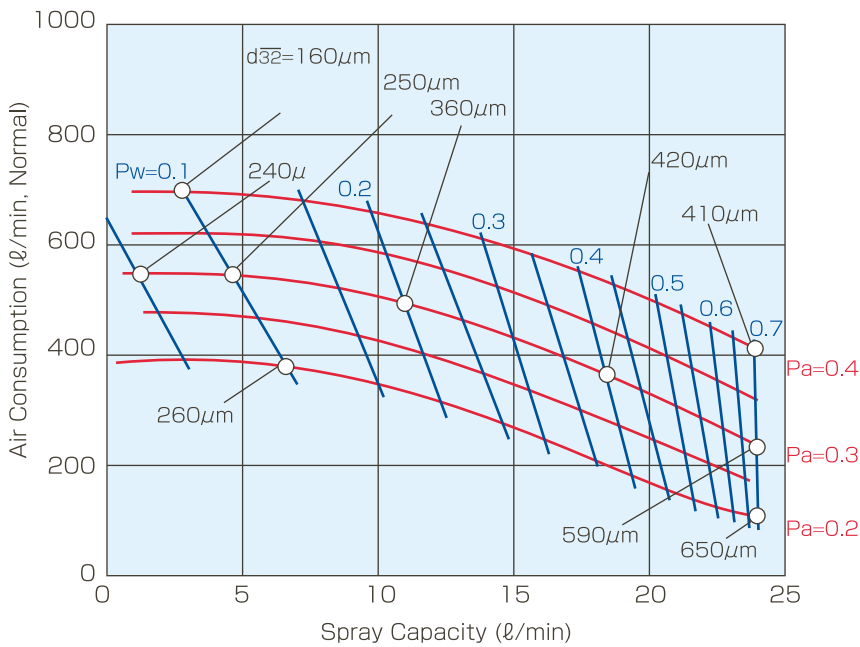
■ Components and materials

No.	Component	Standard Material
①	Nozzle Body	S316L
②	Core	S316L
③	Nozzle Adaptor	S316L
④	Pipe	S316LTP
⑤	Mixing Adaptor	S304
⑥	Liquid Connection	S304
⑦	Flange	S304
⑧	Bolt	S304
⑨	Packing	Ceramic fibre + Stainless steel wire

Spray Capacity Code	Air Pressure (MPa)	Spray Capacity (ℓ/min) & Air Consumption (ℓ/min, Normal)										Mean Droplet Diameter (μm)		Free Passage Diameter (mm)		
		Liquid Pressure (MPa)										Immersion Sampling Method	Fraunhofer Diffraction Method	Spray Tip	Adaptor	
		0.05		0.1		0.3		0.5		0.7					Liquid	Air
Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air					
12	0.2	1.4	190	2.8	190	7.1	160	10.6	100	13.0	50	150	75	3.7	2.9	3.0
	0.3	0.9	250	2.3	250	6.5	230	9.8	190	12.0	150	∫	∫			
	0.4	—	—	1.7	330	6.0	310	8.1	270	11.2	230	450	230			
24	0.2	3.9	380	6.6	380	16.0	250	21.5	150	24.2	110	200	100	5.2	4.1	4.2
	0.3	1.2	540	4.6	540	14.9	430	20.7	310	24.0	240	∫	∫			
	0.4	—	—	3.7	690	13.8	620	20.0	500	23.9	420	650	330			

Flow-rate Diagram

Nozzle No.: JJA24



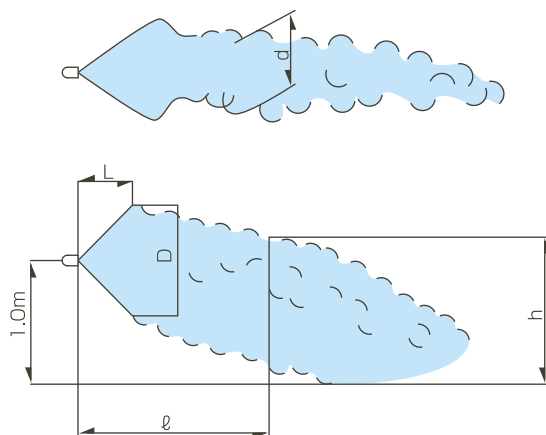
How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Red lines (—) represent air pressure Pa in MPa. Blue lines (—) represent liquid pressure Pw in MPa.
- ③ Droplet diameter d_{32} is Sauter mean droplet diameter measured by the Immersion Sampling Method.

Spray Dimensions

Spray Capacity Code	Pressure (MPa)		Spray Dimensions (m)					
			L	D	h/d			
	Air	Liquid			ℓ=2.0	ℓ=3.0	ℓ=4.0	ℓ=5.0
12	0.2	0.05	0.6	0.7	0.5/1.1	-	-	-
		0.1	1.4	1.1	0.8/1.2	-	-	-
		0.2	1.5	1.2	1.1/1.5	0.5/1.2	-	-
		0.4	1.8	1.4	1.4/1.7	0.6/1.2	-	-
		0.7	1.9	1.7	1.5/1.8	0.9/1.6	0.6/1.1	-
	0.3	0.05	1.1	0.8	0.7/1.0	0.4/1.4	-	-
		0.1	1.5	1.1	1.0/1.2	0.8/1.4	-	-
		0.2	1.5	1.3	1.2/1.3	0.9/1.5	0.5/1.0	-
		0.4	2.0	1.5	1.5/1.4	1.2/1.5	0.6/1.1	-
		0.7	2.1	1.8	1.7/1.5	1.5/1.6	1.0/1.3	0.7/0.9
	0.4	0.05	1.4	0.9	0.8/1.0	0.5/1.5	-	-
		0.1	1.9	1.1	1.1/1.0	0.9/1.5	0.5/1.0	-
		0.2	2.0	1.5	1.5/1.4	1.3/1.4	0.9/1.5	0.4/1.5
		0.4	2.1	1.5	1.5/1.4	1.4/1.5	1.3/1.5	0.5/1.6
		0.7	2.3	1.8	1.7/1.8	1.8/1.9	1.8/1.9	1.0/2.0
24	0.2	0.05	0.7	0.8	0.7/0.8	-	-	-
		0.1	1.4	1.4	1.3/0.8	0.8/0.7	-	-
		0.2	1.5	1.6	1.3/1.5	1.1/1.8	0.6/0.9	-
		0.4	1.8	1.8	1.8/2.8	1.3/2.0	0.9/1.4	-
		0.7	2.0	2.1	2.1/3.0	1.5/2.5	1.2/2.0	1.7/1.5
	0.3	0.05	1.1	0.9	0.9/1.2	0.7/1.0	-	-
		0.1	1.5	1.3	1.1/1.5	0.8/1.8	0.6/1.0	-
		0.2	1.5	1.4	1.3/1.5	1.1/2.0	0.7/1.3	-
		0.4	1.9	1.5	1.5/2.0	1.3/2.1	0.9/1.7	0.6/1.2
		0.7	2.1	2.0	2.0/2.3	1.5/2.5	1.2/1.8	0.9/1.4
	0.4	0.05	1.4	1.1	1.0/1.2	0.8/1.0	0.4/0.9	-
		0.1	1.9	1.2	1.1/1.0	0.9/1.5	0.7/1.3	-
		0.2	2.0	1.4	1.4/1.1	1.1/1.6	0.8/1.5	0.5/1.0
		0.4	2.2	1.5	1.5/1.8	1.2/2.5	1.1/1.8	0.6/1.8
		0.7	2.4	1.8	1.7/2.8	1.4/3.0	1.3/2.8	0.9/2.0

Note: The above data were measured with tap water in a laboratory, in windless conditions.



How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> JJA12BS316L+2T10S304

1/2F	JJA	12	B	S316L +	2T10	S304
		Spray Capacity Code	Nozzle Length	Material of Nozzle	Flange Size	Material of Flange
		■ 12	■ A ■ D			
		■ 24	■ B ■ E			
			■ C			

(See p.54)

Flange size: Refer to the table of flange dimensions on page 78.

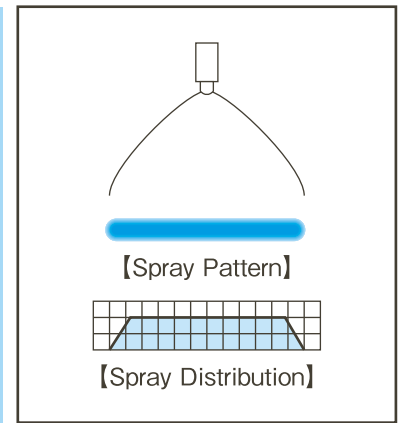
High Impact Flat Spray Semi-fine, Semi-coarse Mist Nozzles

VVEA

Features

- Flat spray pneumatic nozzle producing semi-fine (and semi-coarse) atomization having a mean droplet diameter of $50\mu\text{m}$ (*1) or more.
- High spray impact with thin flat spray pattern and uniform distribution.
- Large turn-down ratio with stable spray angle.
- Compact design.

*1) Measured by Laser Doppler Method

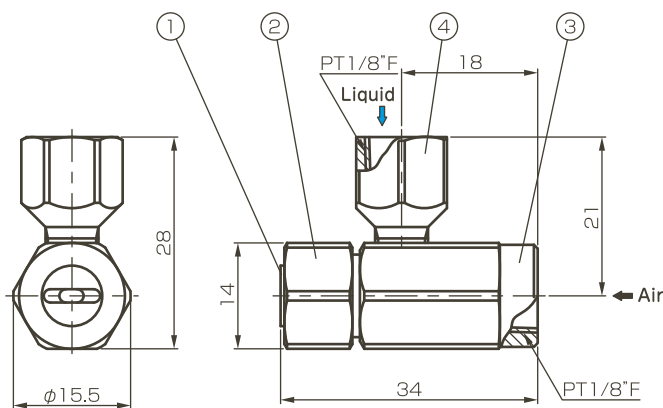


Applications

- Cleaning: Printed circuit boards, liquid crystal, steel plates

Structure & Materials

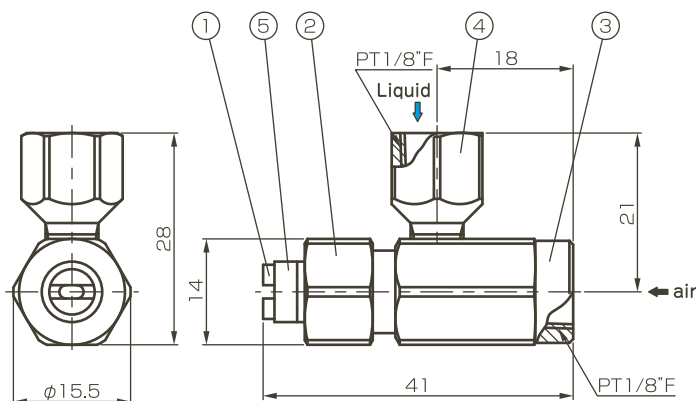
- Spray angle: 60° type



Components and materials

No.	Components	Standard Materials
①	Nozzle Tip	S303
②	Cap	S303
③	Mixing Adaptor	S303
④	Liquid Pipe	S303

- Spray angle: 80° type



Components and materials

No.	Components	Standard Materials
①	Nozzle Tip	S303
②	Cap	S303
③	Mixing Adaptor	S303
④	Liquid Pipe	S303
⑤	Sleeve	S303

Spray Angle Code *1	Air Consumption Code	Air Pressure (MPa)	Spray Capacity (ℓ/min) & Air Consumption (ℓ/min, Normal)								Mean Droplet Diameter (μm)	Free Passage Diameter (mm)		
			Liquid Pressure (MPa)									Laser Doppler Method	Spray Tip	Adaptor
			0.2		0.3		0.5		0.7		Liquid			Air
60°	05	0.2	0.31	17	0.45	14	0.58	18	0.70	20		20 } 250	1.0	
		0.3	0.23	24	0.36	22	0.50	25	0.64	27				
		0.4	—	—	0.29	29	0.43	33	—	—				
		0.5	—	—	—	—	—	—	—	—				
	10	0.2	0.54	36	0.90	24	1.28	25	1.78	11	20 } 250	1.4	1.1	1.3
		0.3	0.30	58	0.60	49	1.00	50	1.50	32				
		0.4	—	—	0.39	74	0.81	69	1.28	51				
		0.5	—	—	—	—	—	—	—	—				
	20	0.2	0.96	44	1.98	18	2.63	19	3.50	13	30 } 300	1.5	1.6	1.6
		0.3	0.53	81	1.10	59	2.00	50	2.95	39				
		0.4	—	—	0.53	104	1.30	89	—	—				
		0.5	—	—	—	—	—	—	—	—				
30	0.2	1.34	50	1.60	64	3.00	50	4.17	33	40 } 400	1.6	1.9	1.9	
	0.3	0.63	100	0.88	128	2.25	85	—	—					
	0.4	—	—	—	—	—	—	—	—					
	0.5	—	—	—	—	—	—	—	—					
80°	05	0.2	0.31	17	0.45	14	0.58	18	0.70	20	20 } 250	0.8	0.7	0.9
		0.3	0.23	24	0.36	22	0.50	25	0.64	27				
		0.4	—	—	0.29	29	0.43	33	—	—				
		0.5	—	—	—	—	—	—	—	—				
	10	0.2	0.54	36	0.90	24	1.28	25	1.78	11	20 } 250	1.0	1.1	1.3
		0.3	0.30	58	0.60	49	1.00	50	1.50	32				
		0.4	—	—	0.39	74	0.81	69	1.28	51				
		0.5	—	—	—	—	—	—	—	—				
	20	0.2	0.96	44	1.98	18	2.63	19	3.50	13	30 } 300	1.1	1.6	1.6
		0.3	0.53	81	1.10	59	2.00	50	2.95	39				
		0.4	—	—	0.53	104	1.30	89	—	—				
		0.5	—	—	—	—	—	—	—	—				
30	0.2	1.34	50	1.60	64	3.00	50	4.17	33	40 } 400	1.3	1.9	1.9	
	0.3	0.63	100	0.88	128	2.25	85	—	—					
	0.4	—	—	—	—	—	—	—	—					
	0.5	—	—	—	—	—	—	—	—					

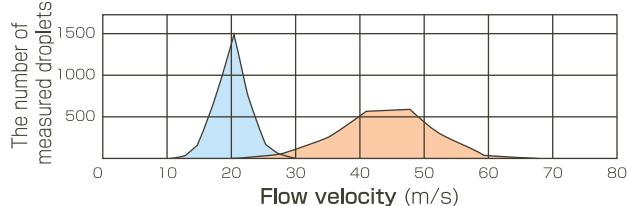
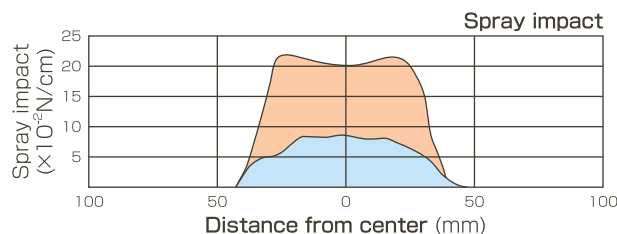
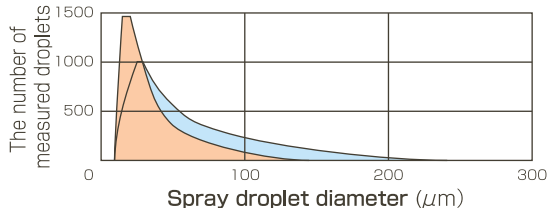
Note: *1) Measured under air pressure of 0.4MPa and liquid pressure of 0.5MPa.

Spray Impact

In comparison to a hydraulic spray nozzle having equal spray capacity at the same pressure, VVEA series achieves the more powerful spray impact (2.5 times higher) with fine droplets (at twice the speed).

- Air pressure: 0.3Mpa ■ Air consumption: 59ℓ/min, Normal
- Liquid pressure: 0.3Mpa ■ Spray capacity: 1.1ℓ/min
- (Air pressure, air consumption are only for VVEA)

○=VVEA6520(pneumatic) ○=VVP6510(hydraulic)



How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> 1/8VVEA6010S303

1/8
Pipe Conn. Size

VVEA

60
Spray Angle Code

- 60°
- 80°

10
Air Consumption Code

- 05
- 10
- 20
- 30

S303
Material

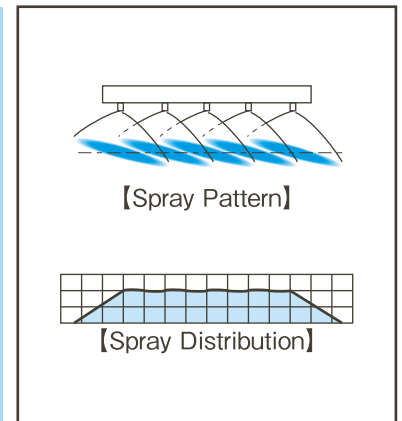
Integrated Spray Header with VVEA high impact flat spray nozzles

VVEA

Features

- Spray header equipped with VVEA-series nozzles producing semi-fine (and semi-coarse) atomization having a mean droplet diameter of $50\mu\text{m}$ (*1) or more.
- Combines two pipes for air and liquid into one rectangular spray header. Compact and easy for installation and maintenance.
- Uniform spray distribution across the entire spray area.

*1) Measured by Laser Doppler Method



Applications

- Cleaning: Printed circuit boards, liquid crystal, steel plates

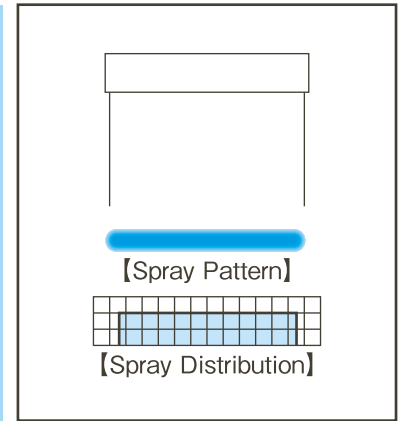
High impact flat spray header
ideal for cleaning applications



Please contact our local sales office for details.

Features

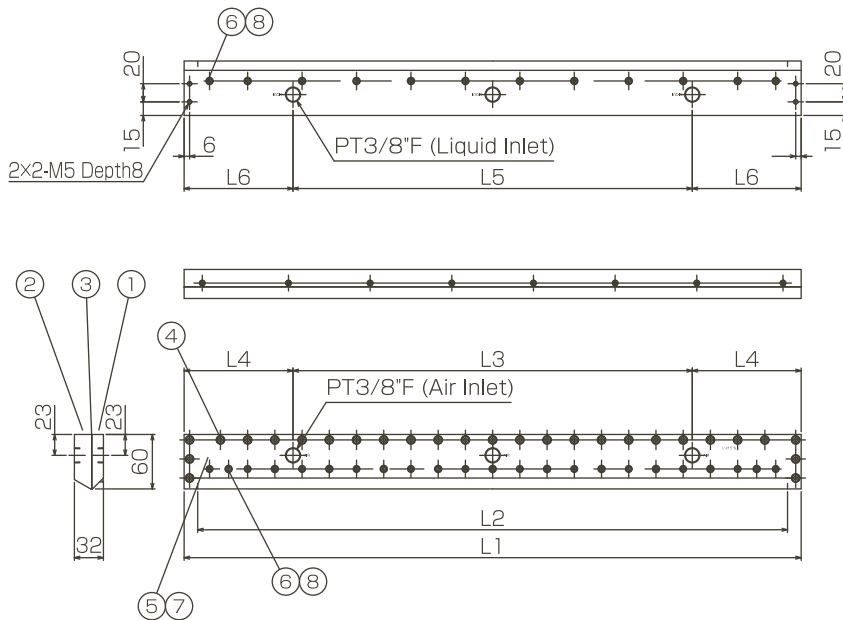
- New pneumatic slit-laminar nozzle provides uniform spray distribution with high impact, which ensures perfect and complete cleaning, leaving no spot unwashed.
- PSN can be used at spray distances as short as 5-10mm.



Applications

- Cleaning: Glass substrate, liquid crystal, FPD, PCB
- Cooling: Steel plates, moldings
- Moisture control: Paper, cardboard

Structure, Dimensions, Materials and Pipe Connection Sizes



Components and materials

No.	Components	Standard Materials
①	Body (Air inlet side)	S304
②	Body (Liquid inlet side)	S304
③	Packing	PE
④	Bolt (M5x12)	S304
⑤	Bolt (M4x8)	S304
⑥	Bolt (M4x10)	S305
⑦	O-ring (P-4)	FPM
⑧	O-ring	FPM

Nozzle Code		(Number of Inlets)-(Thread Size)		L1	L2	L3	L4	L5	L6	Mass (kg)
Slit Length L2 (mm)	Slit Opening (mm)	Air Inlet	Liquid Inlet							
460	0.05	2-PT3/8"F	2-PT3/8"F	490	460	230	130	230	130	5.6
600		3-PT3/8"F	3-PT3/8"F	630	600	400	115	400	115	7.2
700		3-PT3/8"F	3-PT3/8"F	730	700	460	135	460	135	8.4
780		3-PT3/8"F	3-PT3/8"F	810	780	520	145	520	145	9.3
1200		5-PT3/8"F	5-PT3/8"F	1230	1200	960	135	960	135	14

Unit: mm (for L1-L6)

Spray Performance

Nozzle: 2x3-3/8F PSN 650x0.15 S304, Spray distance: 10mm

NO.	Spray Conditions					Spray Impact Distribution	Spray Flow Distribution
	Air Consumption (l/min, Normal)	Spray Capacity (L/min)	Air-water Ratio	Air Pressure (MPa)	Water Pressure (MPa)		
1	780	15.6	50	0.07	0.08	<p>Max. value: 12.18 Min. value: 10.98 Median value: 11.58 Deviation from median +/- 5.2%</p>	<p>Deviation from median +/- 5.4%</p>
2	1560	15.6	100	0.17	0.17	<p>Max. value: 27.63 Min. value: 25.41 Median value: 26.52 Deviation from median +/- 4.2%</p>	<p>Deviation from median +/- 4.5%</p>
3	2340	15.6	150	0.27	0.25	<p>Max. value: 45.14 Min. value: 42.14 Median value: 43.64 Deviation from median +/- 3.4%</p>	<p>Deviation from median +/- 6.1%</p>

Note: At both ends 50mm are excluded for deviation calculations.

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> 2 x 3-3/8F PSN 700 x 0.05 S304

2 x	3-3/8F	PSN	700	x	0.05	S304
	Number of inlets -Thread size	Series	Slit Length		Slit Opening	Material
	■ 2-3/8F		■ 460		■ 0.05	
	■ 3-3/8F		■ 600		■ 0.1	
	■ 5-3/8F		■ 700		■ 0.15	
			■ 780			
			■ 1200			

Please feel free to inquire with our local sales office about slit length.

Clog-resistant Fine Mist Nozzles / Full Cone Spray

SETOJet / SETOJet-R / SETOJet-PTFE series Nozzles

Patented



■ SETOJet is the clog-resistant pneumatic nozzle specially designed for spraying viscous liquid.

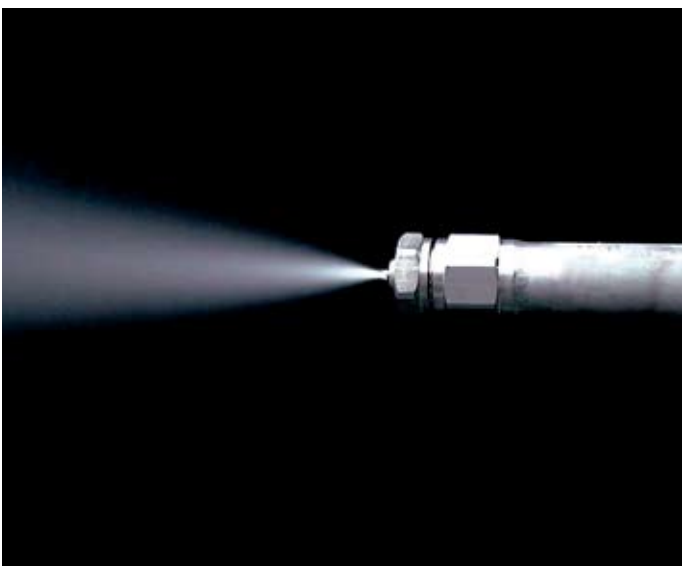
■ External mixing type nozzle (compressed air and liquid are mixed outside the nozzle) featuring minimal clogging.

Contents

SETOJet series
Clog-resistant Fine Mist Nozzles
Full Cone Spray p.63

SETOJet-R series
Air Whirling Design p.64

SETOJet-PTFE series
for Wafer Cleaning p.65



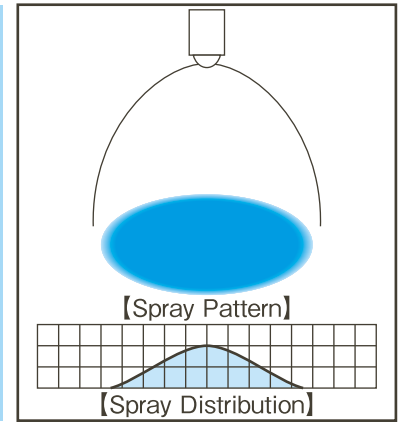
Clog-resistant Fine Mist Nozzles / Full Cone Spray

SETOJet

Features

- Full cone spray pneumatic nozzle producing fine atomization with a mean droplet diameter of 50 μ m or less (*1).
- Clog-resistant design - Liquid passage is straight without curve, and circular in cross-section.
- External mixing type (designed to mix air and liquid outside the nozzle).

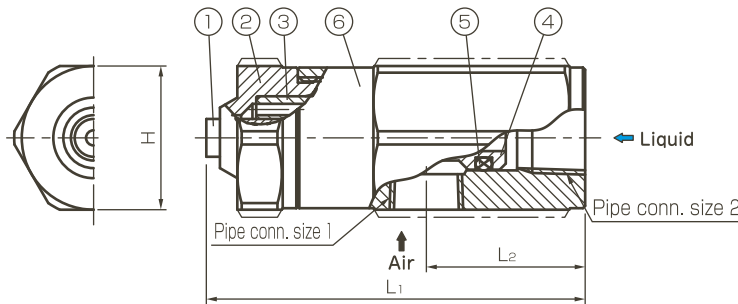
*1) Measured by the Fraunhofer Diffraction method.
Please refer to page 6-7 for comparison with Laser Doppler Method.



Applications

- Spraying: Oil, lubricant, mold release agent, honey, aqueous urea, rust preventive, glaze and other viscous liquid or slurry, etc.

Structure & Materials



Components and materials

No.	Components	Standard Materials
①	Nozzle Tip	S303
②	Nozzle Body	S303
③	Air Balancer	S303
④	Stem	S303
⑤	O-ring	FPM
⑥	Adaptor	S303

*Components ② and ③ are combined for SETO#04 and 075.

Dimensions & Pipe Connection Sizes

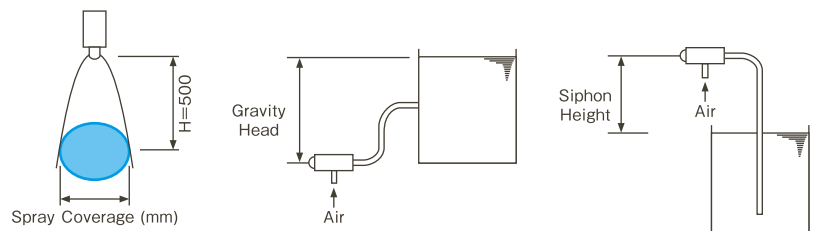
Dimensions

Air Consumption Code	Spray Capacity Code	Pipe Connection Size (in.)		L ₁ (mm)	L ₂ (mm)	H (mm)	Mass (g)
		1 (Air)	2 (Liquid)				
04	05	PT1/8F	PT1/8F	49.5	21	19	85
	07			49.5			
	10			49.5			
075	07			49.5			
	10			50.0			
	15			50.0			
22	10	50.0					
	20	50.0					

Air Consumption Code	Spray Capacity Code	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr)		Spray Coverage*2 (mm) H=500mm	Mean Droplet Dia.*2(μm)	Free Pass. Dia.(mm)		
				Liquid Press. 0MPa (Siphon)*3	Liquid Press. 0.05MPa			Liquid	Air	
04	05	0.3	38	2.0	5.5	130	20	10	0.1	0.5
	07		38	3.5	12.3	130			0.1	0.7
	10		38	8.0	27.7	130			0.1	1.0
075	07		80	5.0	13.9	160	}	}	0.2	0.7
	10		80	8.0	27.9	160			0.2	1.0
	15		220	8.0	27.7	170			0.3	1.0
15	20		220	25.0	111	170	50	25	0.3	2.0
	10		290	8.0	26.4	180			0.5	1.0
	22		290	26.0	111	180			0.5	2.0

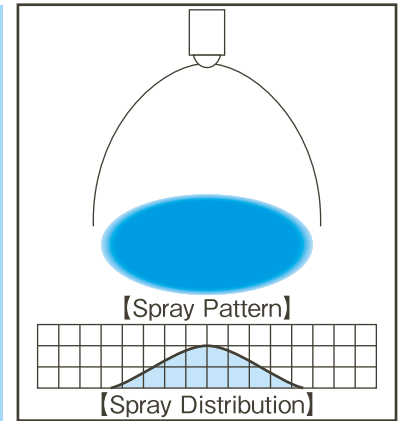
Note: *2) Measured under air pressure of 0.3MPa and liquid pressure of 0MPa (Liquid siphon feed).

*3) Siphon height; 100mm.



Features

- Clog-resistant full cone spray pneumatic nozzles producing fine atomization.
- Eddies from air makes further fine atomization.
- Optimal for spraying viscous liquids.



Dimensions & Pipe Connection Sizes

Dimensions

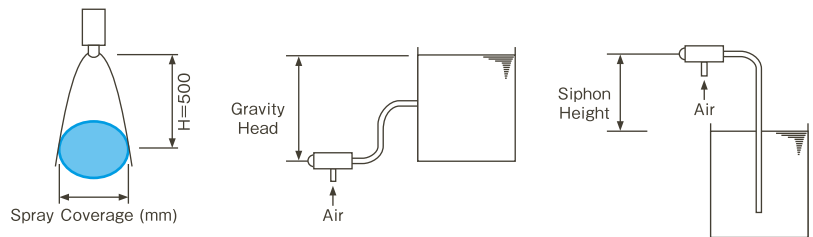
Air Consumption Code	Pipe Connection Size (in.)		L ₁ (mm)	L ₂ (mm)	H (mm)	Mass (g)
	1 (Air)	2 (Liquid)				
04	PT1/8F	PT1/8F	49.8	21	19	85
075						
15						
22						

*Please refer to page 63 for structure and materials.

Air Consumption Code	Spray Capacity Code	Air Pressure (MPa)	Air Consumption (ℓ/min, Normal)	Spray Capacity (ℓ/hr)		Spray Coverage*1 (mm) H=500mm	Mean Droplet Dia.*1 (μm)		Free Pass. Dia.(mm)	
				Liquid Press. 0MPa (Siphon)*2	Liquid Press. 0.05MPa		Immersion Sampling Method	Fraunhofer Diffraction Method	Liquid	Air
04	05R	0.3	36	2.0	5.5	130	20	10	0.1	0.5
	07R		36	2.0	12.3				0.1	0.7
	10R		36	8.0	26.4				0.1	1.0
075	07R		71	5.0	12.5	160	}	}	0.2	0.7
	10R		71	9.0	27.3				0.2	1.0
15	10R		150	10.0	28.2	170	50	25	0.3	1.0
22	10R	200	11.0	28.7	180	0.5			1.0	

Note: *1) Measured under air pressure of 0.3MPa and liquid pressure of 0MPa (Liquid siphon feed).

*2) Siphon height; 100mm.



How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> SET00405S303+TS303

SETO	04	05	S303	+	T	S303
	Air Consumption Code	Spray Capacity Code	Material of Nozzle Body and Nozzle Tip			Material of Adaptor
	■ 04	■ 05 ■ 05R				
	}	}				
	■ 22	■ 20 ■ 10R				

<Example> If SETO 0405 is required with optional S316L nozzle tip and adaptor, product code is SETO0405S303S316L + TS316L. (Specify the nozzle tip material after nozzle body material)

Material of Nozzle Tip

Note: Configuration and dimensions may differ with material of nozzle tip.

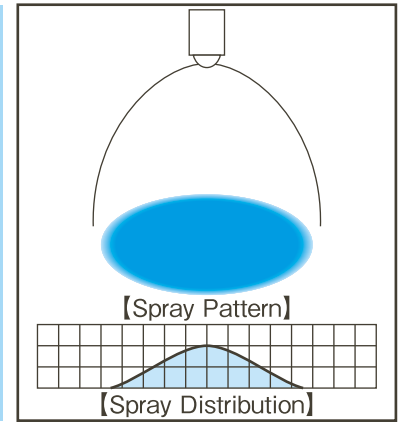
Clog-resistant Fine Mist Nozzles / Full Cone Spray

— for Wafer Cleaning —

SETOJet-PTFE

Features

- Pneumatic spray nozzle made of PTFE. Capable of spraying chemical solutions.
- External mixing type preventing contamination.

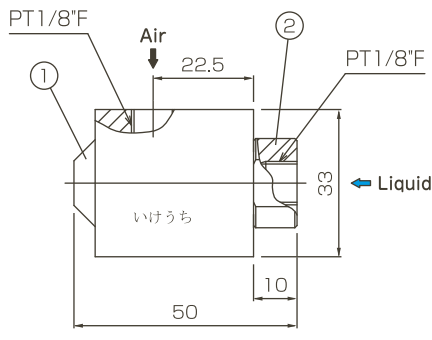


Applications

- Cleaning: Precise cleaning for semiconductor wafers

Structure & Materials

- Structure: External mixing type
- Material: PTFE (polytetrafluoroethylene)



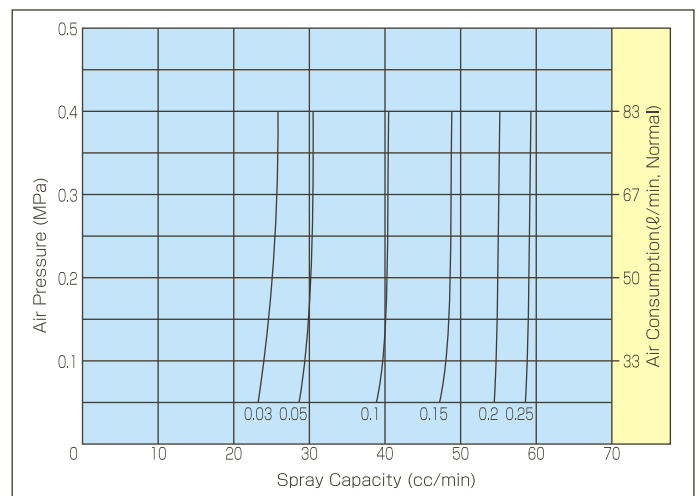
Components and materials

No.	Components	Standard Materials
①	Nozzle Body	PTFE
②	Nozzle Tip	PTFE

Flow-rate Diagram

- How to read the chart
- ① The spray capacity shown is for one nozzle.
- ② Figures at the foot of each curve indicate water pressure in MPa.

Note: This chart shows the performance data of an actual nozzle.



[Made-to-order product]

Please contact our local sales office for details and other specifications.

Medium / Large Capacity Impinging-type Fine Mist Nozzles

AKIJet® / AKIJet®-S series Nozzles



■AKIJet® is the impinging-atomization type pneumatic spray nozzle.

Atomized droplets are impinged against each other at optimum condition, which results in uniform distribution of droplet size.

■Medium capacity AKIJet® nozzle is an internal mixing type and large capacity AKIJet® nozzle is an external mixing type.

Contents

AKIJet® series Medium Capacity
Impinging-type Fine Mist Nozzles p.67
—Internal Mixing Type—

AKIJet®-S series Large Capacity
Impinging-type Fine Mist Nozzles p.69
—External Mixing Type—

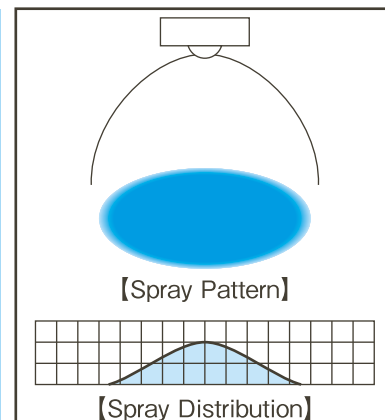


Medium Capacity Impinging-type Fine Mist Nozzles

AKIJet®

Features

- Impinging-type fine mist nozzle developed from a new engineering concept for generating fine mist.
- Atomized droplets are impinged against each other creating ultrasonic waves, which results in creation of a uniform distribution of even finer droplet sizes.
- Using a special mixing adaptor, AKIJet® can mix two different liquids outside of the orifices while spraying.



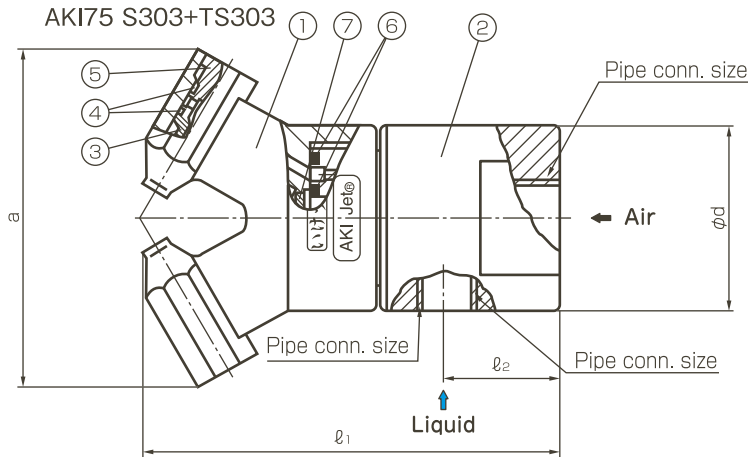
AKIJet® nozzles with T-type adaptors

Applications

- Cooling: Gas, steel plates, refractories, moldings, glass, etc.
- Moisture control: Gas, concrete, etc.
- Combustion: Oil, Waste water, etc.
- Others: Mixing two liquids, spray drying, etc.

Structure, Dimensions, Materials and Pipe Connection Sizes

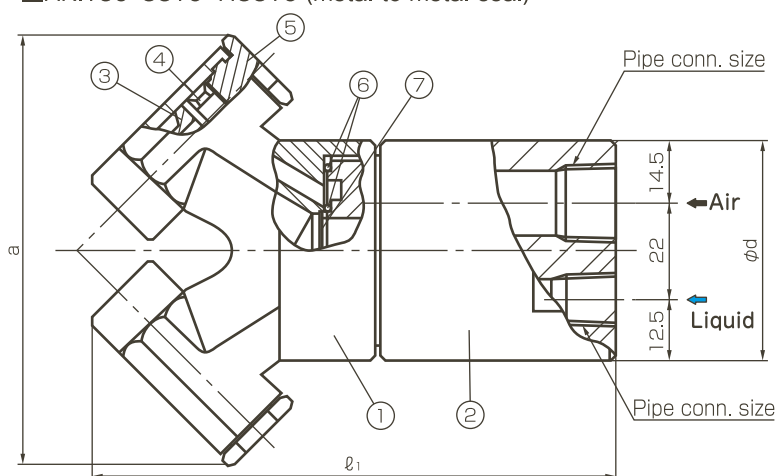
AKI37 S303+TS303 AKI75 S303+TS303



Components and materials

No.	Component	Standard Material
①	Nozzle Body	S303 equivalent
②	Adaptor	S303
③	Spray Tip	S303
④	O-ring	FPM
⑤	Plug	S303
⑥	Packing	PTFE
⑦	Strainer	S304

AKI150 S316+HS316 (metal-to-metal seal)



Components and materials

No.	Component	Standard Material
①	Nozzle Body	SCS14
②	Adaptor	S316
③	Spray Tip	S316
④	Liner	S316
⑤	Plug	S316
⑥	O-ring	S321
⑦	Strainer	S316

Dimensions

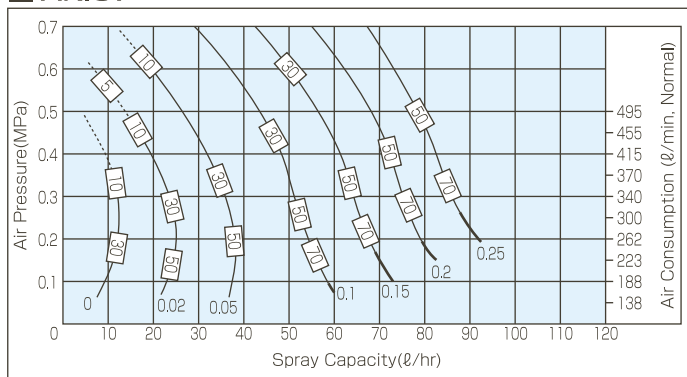
Nozzle Code	l ₁ (mm)	l ₂ (mm)	a (mm)	φd (mm)	Pipe Connection Size (in.)		Mass (g)
					Air	Liquid	
AKI37	72.5	19	62	33	PT1/4F	PT1/8F	300
AKI75	100	30	87	49	PT3/8F	PT1/4F	880
AKI150	105	-	94	49	PT3/8F	PT1/4F	970

Free passage diameter

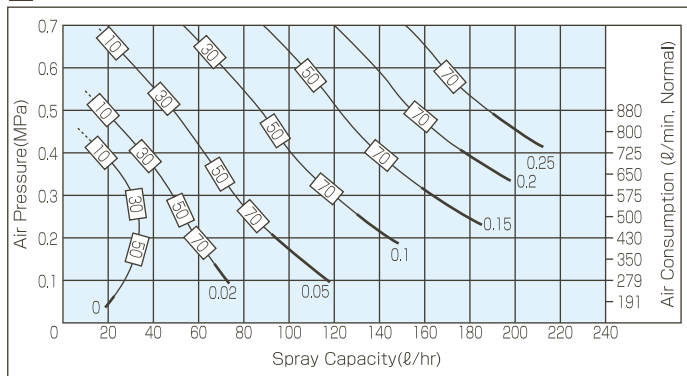
Nozzle Code	Free Pass. Dia. (mm)	
	Liquid	Air
AKI37	0.6	0.4
AKI75	0.8	0.4
AKI150	1.1	0.9

Flow-rate Diagram

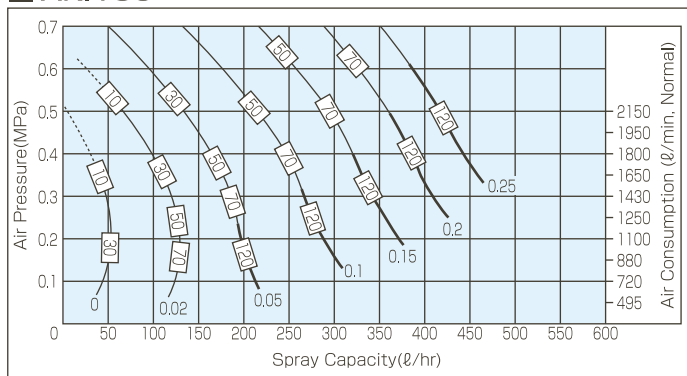
AKI37



AKI75



AKI150



How to read the chart

- ① The spray capacity shown is for one nozzle.
- ② Regular lines (—) represent fine atomization.
Bold lines (—) represent semi-fine atomization.
- ③ Figures at the foot of each curve indicate water pressure in MPa.
- ④ Figures in squares □ on each curve indicate Sauter mean droplet diameters (μm) measured by the Immersion Sampling Method.

Spray Dimensions

AKI37

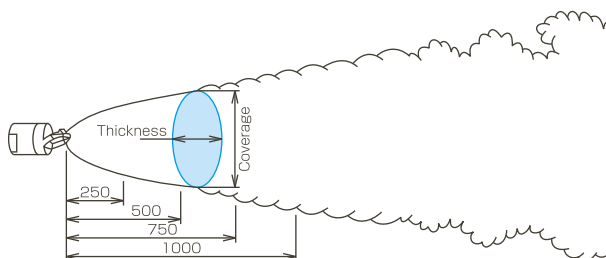
Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Coverage (mm)				Spray Thickness (mm)			
		250 mm	500 mm	750 mm	1000 mm	250 mm	500 mm	750 mm	1000 mm
0.2	0	230	350	430	500	160	260	340	400
	0.02	260	390	470	530	150	250	330	400
	0.05	250	370	450	510	140	240	320	390
	0.1	210	310	380	410	160	260	340	400
0.3	0	220	350	440	500	140	240	320	400
	0.02	250	380	470	540	150	260	340	420
	0.05	270	400	490	560	140	240	330	410
	0.1	260	390	480	550	150	260	340	420
0.4	0.02	230	350	440	520	140	270	360	410
	0.05	260	390	490	560	160	290	380	450
	0.1	280	420	520	590	150	280	370	430
	0.15	270	400	510	580	150	280	370	440
0.5	0.05	220	360	460	530	140	250	350	430
	0.1	270	410	500	570	160	280	380	460
	0.15	290	430	520	590	150	270	370	450
	0.2	250	390	480	550	160	280	390	470

AKI75

Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Coverage (mm)				Spray Thickness (mm)			
		250 mm	500 mm	750 mm	1000 mm	250 mm	500 mm	750 mm	1000 mm
0.2	0	340	460	540	590	160	270	360	430
	0.02	180	300	390	460	220	330	430	510
	0.05	150	250	340	410	270	400	500	590
	0.1	160	260	350	420	330	470	580	670
0.3	0	280	400	480	540	150	260	350	420
	0.02	360	490	570	630	170	280	380	460
	0.05	190	320	410	490	230	360	450	520
	0.1	180	290	390	460	290	420	510	580
0.4	0.02	300	420	510	570	170	280	380	460
	0.05	350	490	580	660	180	300	400	480
	0.1	190	300	390	460	240	360	460	530
	0.15	170	280	370	450	260	390	480	550
0.5	0.05	330	480	580	660	170	290	400	480
	0.1	280	420	500	560	190	320	420	500
	0.15	220	320	410	480	230	360	450	540
	0.2	190	300	390	460	250	370	470	550

AKI150

Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Coverage (mm)				Spray Thickness (mm)			
		250 mm	500 mm	750 mm	1000 mm	250 mm	500 mm	750 mm	1000 mm
0.2	0	260	360	460	520	150	260	370	460
	0.02	250	350	450	500	200	320	420	510
	0.05	270	370	480	550	180	300	400	490
	0.1	290	400	510	590	190	310	410	500
0.3	0	250	380	480	540	150	250	370	460
	0.02	310	440	550	640	190	290	410	510
	0.05	300	430	530	610	170	280	400	500
	0.1	290	420	520	600	180	300	420	520
0.4	0.02	270	400	520	590	160	280	400	500
	0.05	300	440	550	630	180	300	420	520
	0.1	320	470	590	670	160	280	400	500
	0.15	330	480	610	700	170	290	410	510
0.5	0.05	270	420	530	640	160	260	360	460
	0.1	320	490	610	730	180	280	390	490
	0.15	330	500	630	750	170	270	370	470
	0.2	350	530	660	780	170	270	390	490



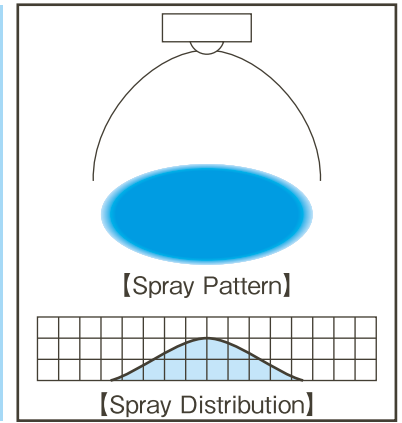
Large Capacity Impinging-type Fine Mist Nozzles

AKIJet®-S

Features

- Large capacity impinging-type AKIJet® nozzle.
- Atomized droplets are impinged against each other creating ultrasonic waves, which results in creation of a uniform distribution of even finer droplet sizes.
- Produces a large volume of fine atomization up to 1,000ℓ/hr with a mean droplet diameter of 50μm or less (*1).
- Minimal clogging due to the liquid orifices being set at the ends of the spray tips.

*1) Measured by the Fraunhofer Diffraction method.
Please refer to page 6-7 for comparison with Laser Doppler Method.

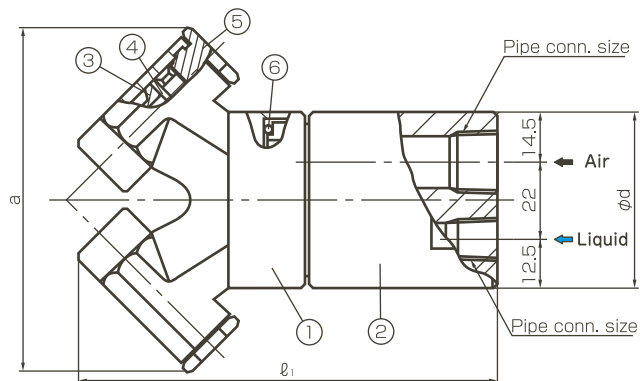


Applications

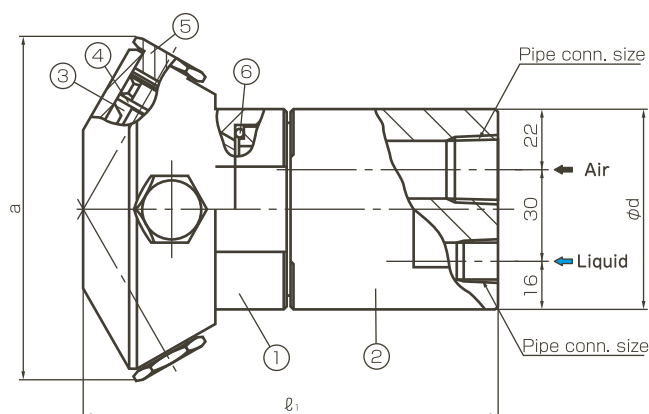
- Cooling: Gas, refractories, moldings, glass, etc.
- Moisture control: Gas, concrete, etc.
- Combustion: Oil, waste water, etc.
- Others: Mixing two liquids, spray drying, etc.

Structure, Dimensions, Materials and Pipe Connection Sizes

- AKI150S S316+HS316 (metal-to metal seal)
- AKI220S S316+HS316 (metal-to metal seal)



- AKI370S S316+HS316 (metal-to-metal seal)



Components and materials

No.	Component	Standard Material
①	Nozzle Body	S316 equivalent
②	Adaptor	S316
③	Spray Tip	S316
④	Liner	S316
⑤	Plug	S316
⑥	O-ring	S321

Dimensions

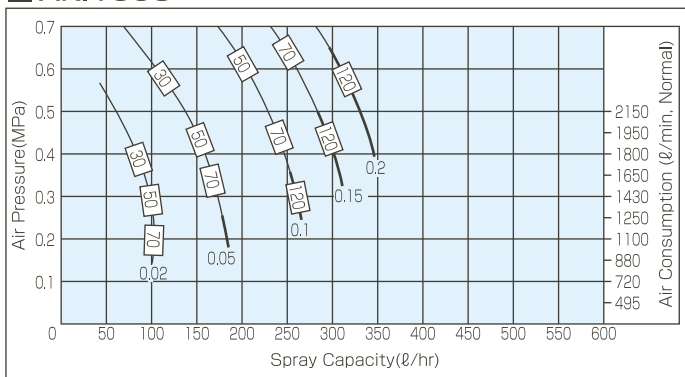
Nozzle Code	l ₁ (mm)	a (mm)	φd (mm)	Pipe Connection Size (in.)		Mass (g)
				Air	Liquid	
AKI150S	111	94	49	PT3/8F	PT1/4F	975
AKI220S	111	94	49	PT3/8F	PT1/4F	960
AKI370S	123	φ108	68	PT3/4F	PT3/8F	3700

Free passage diameter

Nozzle Code	Free Pass. Dia. (mm)	
	Liquid	Air
AKI150S	2.0	0.9
AKI220S	2.9	1.7
AKI370S	4.3	1.3

Flow-rate Diagram

AKI150S

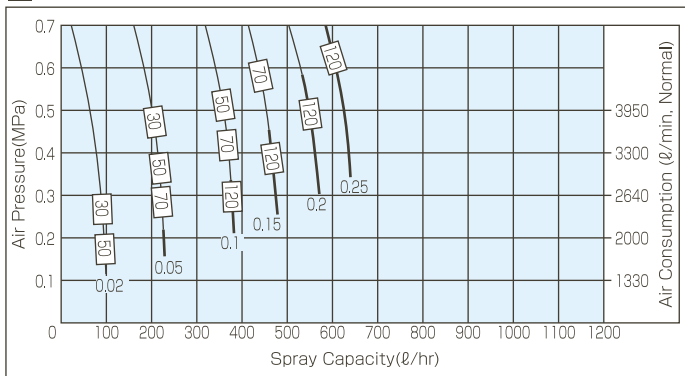


Spray Dimensions

AKI150S

Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Coverage (mm)				Spray Thickness (mm)			
		250 mm	500 mm	750 mm	1000 mm	250 mm	500 mm	750 mm	1000 mm
0.2	0.02	280	450	650	840	80	120	170	210
	0.05	360	520	750	950	120	160	210	250
	0.1	440	660	880	1120	150	190	240	270
	0.15	490	720	940	1190	160	210	260	300
0.3	0.02	240	400	590	780	110	150	210	260
	0.05	340	500	720	930	140	190	240	290
	0.1	400	650	840	1080	170	230	280	320
	0.15	500	720	940	1200	170	230	290	330
0.4	0.02	190	340	530	720	110	160	210	270
	0.05	310	470	680	890	130	180	240	290
	0.1	420	620	850	1080	160	220	280	320
	0.15	490	710	940	1200	170	240	300	340
0.5	0.02	260	410	620	850	110	170	220	280
	0.1	390	580	820	1060	130	190	260	300
	0.15	490	700	930	1190	150	220	280	330
	0.2	600	830	1060	1280	200	240	320	380

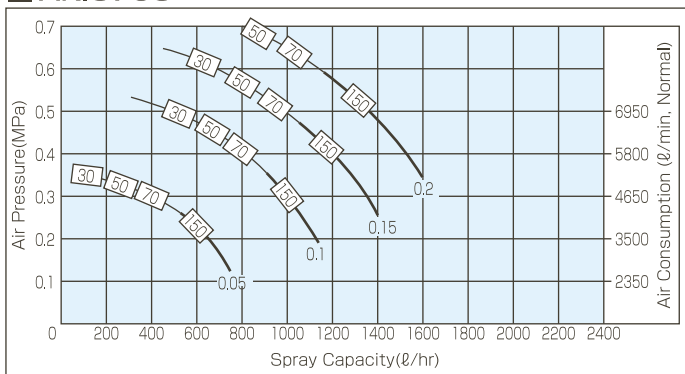
AKI220S



AKI220S

Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Coverage (mm)				Spray Thickness (mm)			
		250 mm	500 mm	750 mm	1000 mm	250 mm	500 mm	750 mm	1000 mm
0.2	0.02	460	640	800	1000	100	140	200	260
	0.05	560	720	880	1060	120	160	240	280
	0.1	660	840	1000	1180	140	180	240	300
	0.15	740	900	1060	1240	160	210	260	320
0.3	0.02	440	620	780	980	120	160	220	260
	0.05	520	720	860	1060	140	200	240	300
	0.1	640	820	980	1180	160	220	260	320
	0.15	720	900	1060	1260	200	240	280	340
0.4	0.02	400	600	760	960	120	180	220	280
	0.05	500	700	860	1080	140	200	240	320
	0.1	600	800	960	1180	160	220	280	340
	0.15	700	880	1060	1240	200	240	300	360
0.5	0.02	480	660	820	1020	120	180	220	300
	0.1	580	760	920	1120	140	200	260	320
	0.15	660	840	1000	1200	160	220	280	340
	0.2	760	960	1120	1320	180	240	300	360

AKI370S

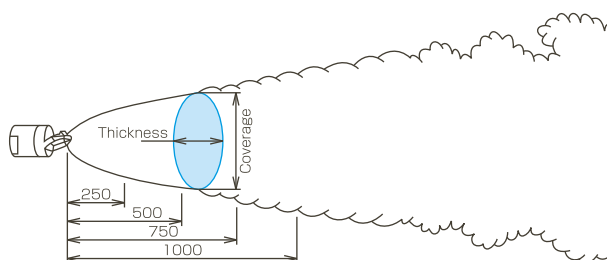


AKI370S

Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Coverage (mm)			
		250 mm	500 mm	750 mm	1000 mm
0.2	0.05	320	430	550	670
	0.1	360	490	620	750
	0.15	380	530	670	820
	0.2	400	550	700	860
0.3	0.05	220	300	390	480
	0.1	320	430	530	640
	0.15	390	510	630	750
	0.2	420	550	680	800
0.4	0.1	260	340	430	510
	0.15	340	430	520	610
	0.2	380	480	580	680
0.5	0.1	210	290	370	450
	0.15	290	380	460	540
	0.2	330	420	510	600

How to read the chart

- The spray capacity shown is for one nozzle.
- Regular lines (—) represent fine atomization. Bold lines (—) represent semi-fine atomization.
- Figures at the foot of each curve indicate water pressure in MPa.
- Figures in squares □ on each curve indicate Sauter mean droplet diameters (μm) measured by the Immersion Sampling Method.



How to inquire / order AKIJet® series nozzles

Please inquire or order for a specific nozzle as follows.

AKI37S303+TS303

AKI75S303+TS303

AKI150S316+HS316 (metal-to-metal seal)

How to inquire / order AKIJet®-S series nozzles

Please inquire or order for a specific nozzle using this coding system.

<Example> **AKI150SS316+HS316 (metal-to-metal seal)**

AKI	150S	S316	+	H	S316 (metal-to-metal seal)
	Nozzle Code	Material of Nozzle Body		Type of Adaptor	Material of Adaptor
	■ 150S				
	■ 220S				
	■ 370S				

Ultra-Low Pressure Semi-Fine Mist Nozzles

LSIM series Nozzles

Patented



- LSIM series nozzles produce semi-fine atomization by applying very low pressure air from conventional blowers.
- Saves on installation and operational costs due to utilization of conventional blowers.
- Simple construction and compact design make maintenance and handling easy.

Contents

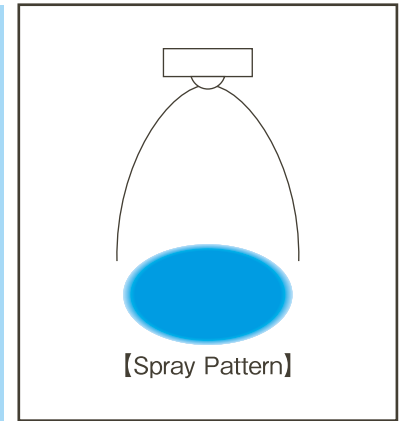
LSIM series Ultra-Low Pressure Semi-Fine Mist Nozzles	p.73
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Ultra-Low Pressure Semi-Fine Mist Nozzles

LSIM

Features

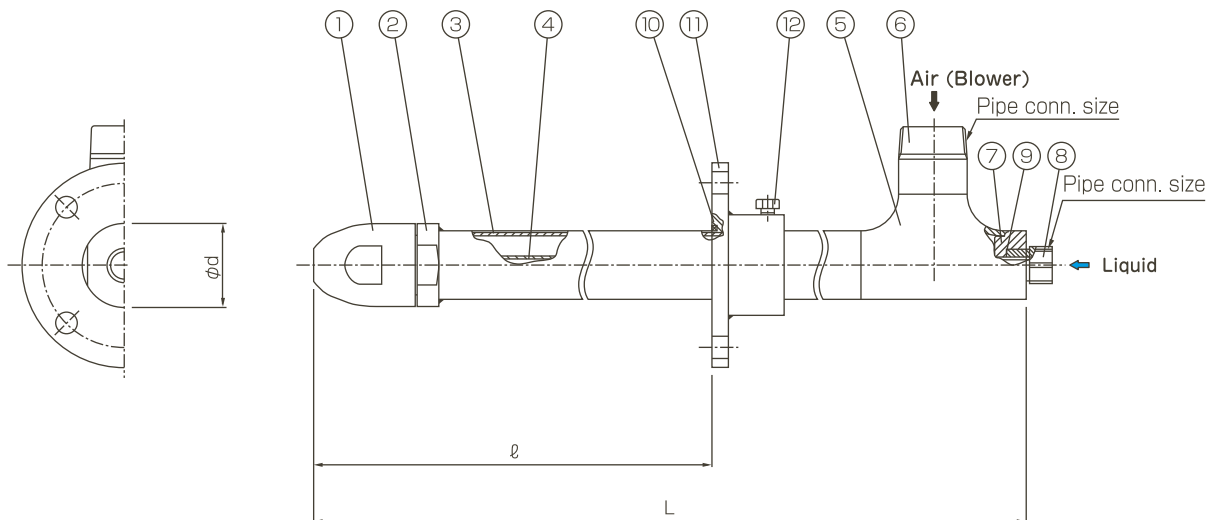
- 1/3 to 1/2 of installation cost and running cost is saved due to utilizing blower air for atomizing, compared with nozzles requiring compressed air.
- Fine atomization having maximum droplet size of 180 μ m (measured by Laser Doppler Method under air-water ratio of 250).
- Compact and lightweight design.
- Spray angle is 20°.



Applications

- Cooling: Gas, refractories

Structure, Dimensions, Materials and Pipe Connection Sizes



Components and materials

No.	Component	Standard Material
①	Nozzle Tip A,B & whirler	S316L
②	Nozzle Adaptor	S316L
③	Outer Pipe	S316LTP
④	Inner Pipe	S304TP
⑤	T-connection	S304
⑥	Air connection	S304
⑦	Joint	S304
⑧	Liquid Connection	S304
⑨	O-ring	FPM
⑩	Packing	Ceramic fiber + Stainless steel wire
⑪	Flange	S304
⑫	Bolt	S304

Dimensions

Nozzle Code	Pipe Conn. Size (in.)		Outer Diameter ϕd (mm)	Free Passage Diameter (mm)	
	Air (Blower)	Liquid		Liquid	Air
20500	PT1-1/2M	PT1/2F	60	1.5	4.0
201000	PT2M	PT1/2F	74	2.0	5.9

Nozzle length

Type	Total Length L (mm)	Length ℓ (mm)	Mass (kg)*	
			20500	201000
A	650	300~400	3.8	5.5
B	850	400~600	4.6	6.5
C	1050	600~800	5.4	7.5
D	1250	800~1000	6.2	8.6

*Mass of flange is not included.

Reference only:

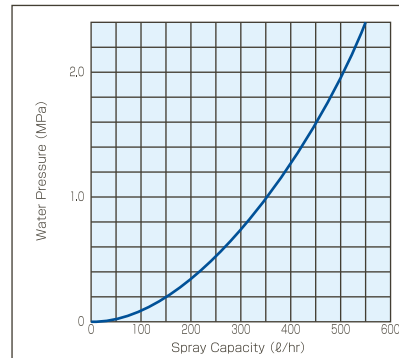
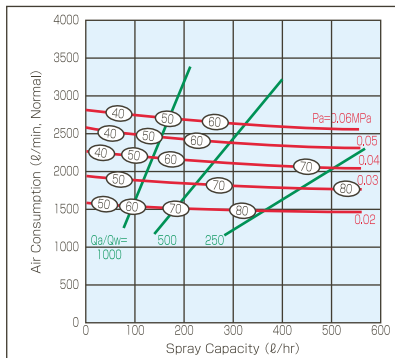
Nozzle	Size of flange	Mass of flange
20500	JIS5K 2.1/2B	2.6 kg
20500	JIS10K 2.1/2B	3.8 kg
201000	JIS5K 3B	3.7 kg
201000	JIS10K 3B	4.5 kg

Flow-rate Diagram

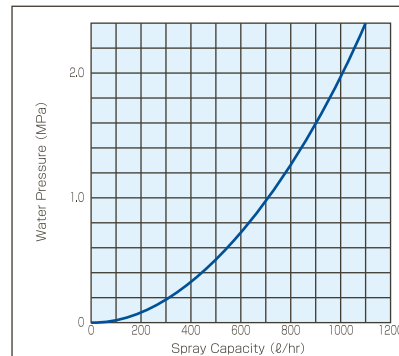
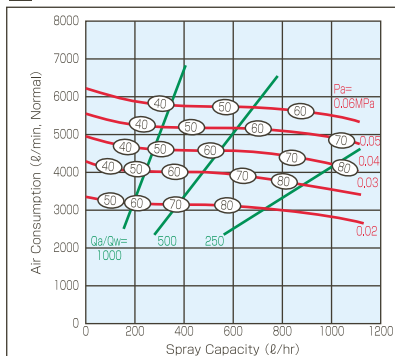
How to read the chart

- The spray capacity shown is for one nozzle.
- Red lines (—) represent (blower) air pressure Pa in MPa.
- Green lines (—) represent air-water ratio Qa/Qw.
- Figures in ovals ○ indicate Sauter mean droplet diameters (μm) measured by the Laser Doppler Method.
- Relation between water pressure and spray capacity of each nozzle is shown in the graphs to the right of flow-rate diagrams.

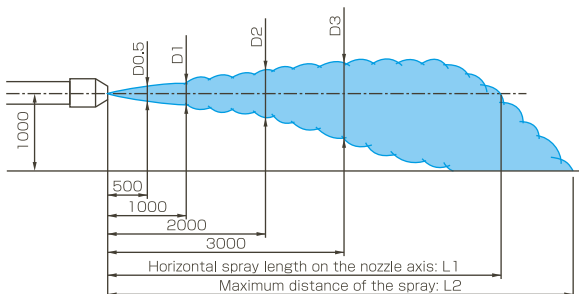
20500



201000



Spray Dimensions



Nozzle No.	Air Pressure (MPa)	Liquid Pressure (MPa)	Spray Dimensions (mm)					
			D0.5	D1	D2	D3	L1	L2
20500	0.03	0~0.2	180	350	600	800	4,000	7,000
		0.2~1.0	180	300	550	800	4,000	7,000
		1.0~2.0	180	350	600	800	4,000	7,000
	0.04	0~0.2	180	300	550	800	4,000	7,000
		0.2~1.0	180	300	550	800	5,000	8,000
		1.0~2.0	180	300	550	800	5,000	8,000
	0.05	0~0.2	200	350	550	800	5,000	8,000
		0.2~1.0	200	350	600	850	5,000	8,000
		1.0~2.0	200	350	600	850	5,000	8,000
201000	0.03	0~0.2	200	350	600	800	5,000	8,000
		0.2~1.0	180	300	600	800	5,000	8,000
		1.0~2.0	200	350	600	800	6,000	9,000
	0.04	0~0.2	200	400	800	1,000	5,000	8,000
		0.2~1.0	180	300	600	900	6,000	9,000
		1.0~2.0	180	350	600	900	6,000	9,000
	0.05	0~0.2	200	400	700	900	6,000	9,000
		0.2~1.0	160	280	600	850	6,000	9,000
		1.0~2.0	160	300	700	850	6,000	9,000

How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> LSIM20500CS316L+3T10S304(ℓ)

LSIM	20500	C	S316L	+	3T10	S304	(ℓ)
	Nozzle Code	Nozzle Length	Material of Nozzle Tip		Flange Size	Material of Flange	Length between the nozzle head and flange
	■20500	■A					
	■201000	■B					
		■C					
		■D					

Flange size: Refer to the table of flange dimensions on page 78.

Steam-Driven Nozzles

JOKIJet® series Nozzles

Patented



- JOKIJet® series uses steam instead of compressed air to atomize liquid. The world's first steam-driven pneumatic spray nozzle.

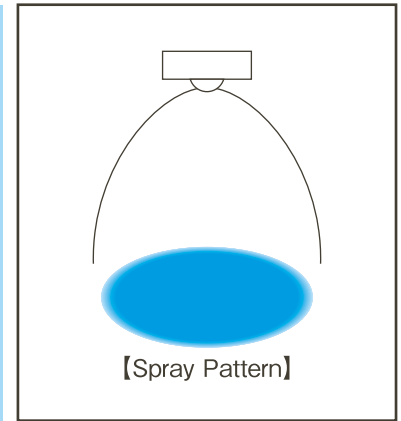
- Great savings on running costs realized by utilizing steam from an existing boiler facility.

Contents

JOKIJet® series Steam-Driven Nozzles	p.76
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Features

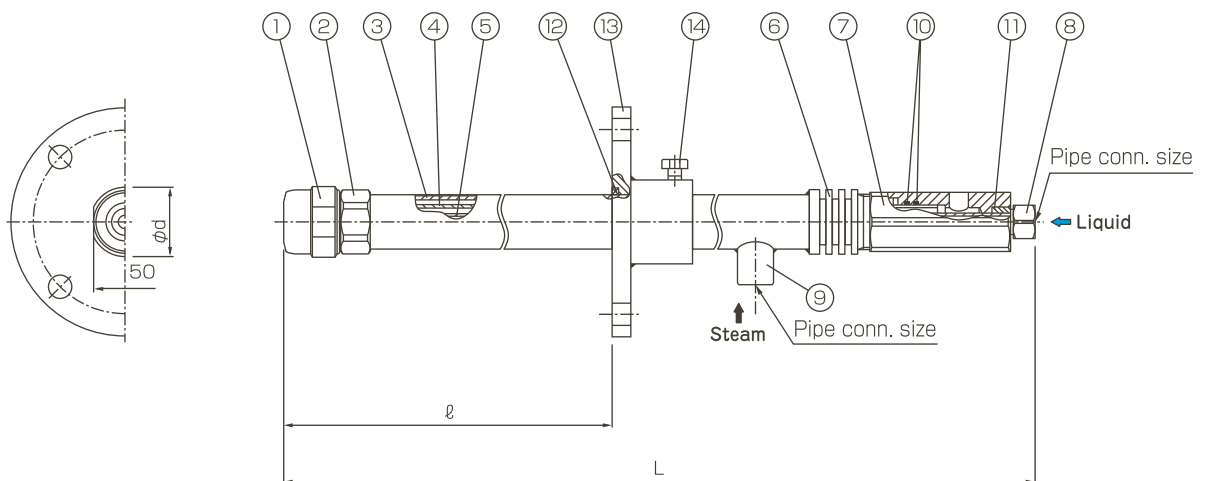
- Innovative pneumatic nozzles using steam instead of compressed air to produce fine (semi-fine) atomization.



Applications

- Cooling: Gas
- Moisture control: Gas, paper
- Chemical reaction: Denitration

Structure, Dimensions, Materials and Pipe Connection Sizes



■ Components and materials

No.	Component	Standard Material
①	Nozzle Body	S316L
②	Nozzle Adaptor	S316L
③	Outer Pipe	S316LTP
④	Inner Pipe	S304TP
⑤	Inner Pipe	S304TP
⑥	Fin	S304
⑦	Joint	S304
⑧	Liquid Connection	S304
⑨	Steam Connection	S304
⑩	O-ring(P-26)	FPM
⑪	O-ring(P-12.5)	FPM
⑫	Packing	Ceramic fiber + Stainless steel wire
⑬	Flange	S304
⑭	Bolt(M12)	S304

■ Dimensions

Spray Capacity Code	Pipe Conn. Size (in.)		Outer Diameter ϕd (mm)	Free Passage Diameter (mm)	
	Steam	Liquid		Steam	Liquid
15	PT1/2F	PT1/2F	55	0.8	1.3
37				1.6	1.6
75				2.8	2.7
150				4.0	4.0

■ Nozzle length

Type	Total Length L (mm)	Length ℓ (mm)	Mass (kg)*
A	720	300~400	5.4
B	920	400~600	6.5
C	1120	600~800	7.7
D	1320	800~1000	8.8

*Mass of flange is not included.

Flow-rate Diagram

■ How to read the chart

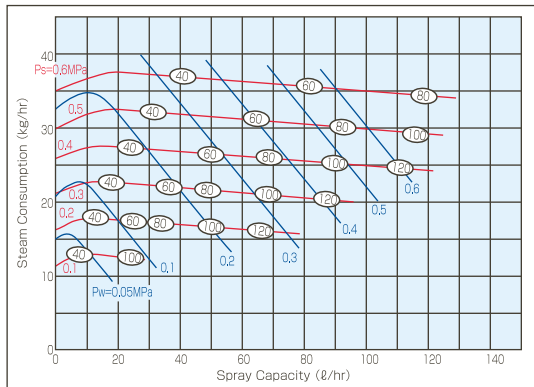
- ① The spray capacity shown is for one nozzle.
- ② **Red lines (—)** represent steam pressure P_s in MPa.
- ③ **Blue lines (—)** represent water pressure P_w in MPa.
- ④ Figures in ovals **○** indicate Sauter mean droplet diameter (μm) measured by the Immersion Sampling Method.

Note: Data shown in the diagrams are based on saturated steam.

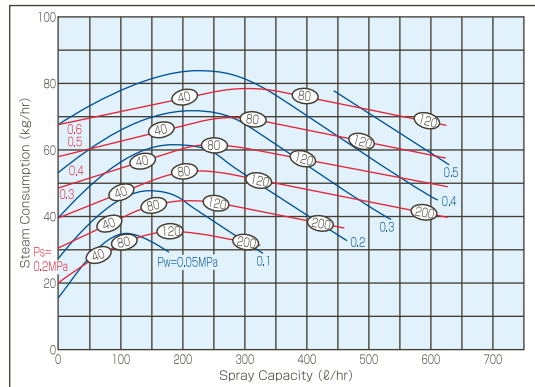
Technical advice

When controlling the spray out of JOKIJet® nozzles, control by steam pressure and spray capacity is recommended. Attempts to control the spray by controlling the steam pressure and water pressure may not allow stable spray control. For more details on JOKIJet® spray control, please contact a sales representative.

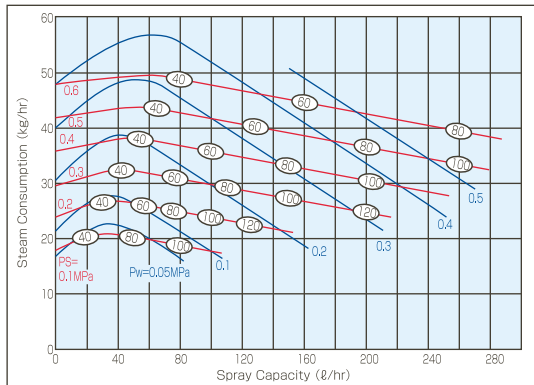
■ JOKI15



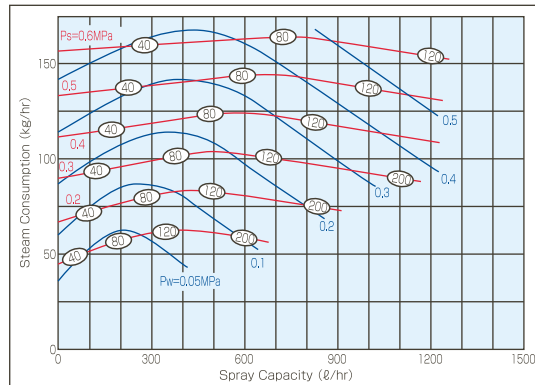
■ JOKI75



■ JOKI37



■ JOKI150



How to inquire / order

Please inquire or order for a specific nozzle using this coding system.

<Example> **JOKI15AS316L+2*1/2T10S304(ℓ)**

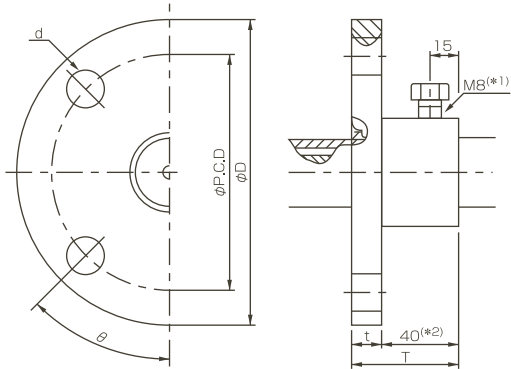
JOKI	15	A	S316L	+	2*1/2T10	S304	(ℓ)
	Spray Capacity Code	Nozzle Length	Material of Nozzle Tip		Flange Size	Material of Flange	Length between the nozzle head and flange
	■ 15	■ A					
	■ 37	■ B					
	■ 75	■ C					
	■ 150	■ D					

Flange size: Refer to the table of flange dimensions on [page 78](#).

Reference Data

Flange dimensions

Dimensions of flanges used for IKEUCHI's nozzles are listed below.



*1: M12 for pipe sizes 3/4" or larger.

*2: 50 for pipe sizes 1 1/4" or larger.

Description	Flange No.	D (mm)	P.C.D (mm)	t (mm)	T (mm)	n-d	Mass(kg)*4
2"JIS 10K	2T10	155	120	16	56	4-φ19	2.6
2 1/2"JIS 10K	2 1/2T10	175	140	18	58(*3)	4-φ19	3.6
3"JIS 10K	3T10	185	150	18	58(*3)	8-φ19	3.8
4"JIS 10K	4T10	210	175	18	58(*3)	8-φ19	4.3
2"JIS 5K	2T5	130	105	14	54	4-φ15	1.8
2 1/2"JIS 5K	2 1/2T5	155	130	14	54(*3)	4-φ15	2.4
3"JIS 5K	3T5	180	145	14	54(*3)	4-φ15	3.1

*3: Please add 10mm for pipe sizes 1 1/4" or larger.

*4: Mass for pipe size 1".

Conversion of units

Pressure	MPa	bar	kg/cm ²	lb/in ² (p.s.i.)	atm	mHg	mH ₂ O(mAg)
	0.001	0.01	0.011	0.145	9.87×10 ⁻³	7.50×10 ⁻³	0.102
	0.1	1	1.020	14.5	0.987	0.750	10.2
	0.09807	0.981	1	14.22	0.968	0.736	10.01
	0.00689	0.069	0.070	1	0.068	0.052	0.704
	0.101	1.013	1.033	14.7	1	0.76	10.34
	0.133	1.33	1.36	19.3	1.32	1	13.61
	0.009807	0.098	0.10	1.42	0.097	0.073	1

Flow Rate	ℓ/min	m ³ /min	m ³ /hr	in ³ /hr	ft ³ /h	U.S. gal/min	Imperial gal/min
	1	0.001	0.06	3.66×10 ³	2.12	0.264	0.22
	1,000	1	60	3.66×10 ⁶	2.12×10 ³	264	220
	16.67	0.017	1	6.10×10 ⁴	35.3	4.40	3.67
	2.73×10 ⁻⁴	2.7×10 ⁻⁷	1.64×10 ⁻⁵	1	5.79×10 ⁻⁴	7.22×10 ⁻⁵	6.01×10 ⁻⁵
	0.472	4.72×10 ⁻⁴	0.028	1,728	1	0.125	0.104
	3.79	0.004	0.227	1.39×10 ⁴	8.02	1	0.833
	4.55	0.005	0.273	1.66×10 ⁴	9.63	1.20	1

Length	μm	mm	cm	m	in	ft
	1	1×10 ⁻³	1×10 ⁻⁴	1×10 ⁻⁶	3.94×10 ⁻⁵	3.28×10 ⁻⁶
	1,000	1	0.1	1×10 ⁻³	3.94×10 ⁻²	3.28×10 ⁻³
	1×10 ⁴	10	1	1×10 ⁻²	3.94×10 ⁻¹	3.28×10 ⁻²
	1×10 ⁷	1×10 ³	100	1	3.94×10	3.28
	2.54×10 ⁴	25.4	2.54	2.54×10 ⁻²	1	8.33×10 ⁻²
	3.05×10 ⁵	3.05×10 ²	3.05×10	3.05×10 ⁻¹	12	1

Others

Viscosity	1P=100cP 1St=100cSt
Mass	1kg≐2.205lb 1lb≐0.454kg
Temperature	[°F]≐([°C]×9/5)+32 [°C]≐5/9([°F]-32)

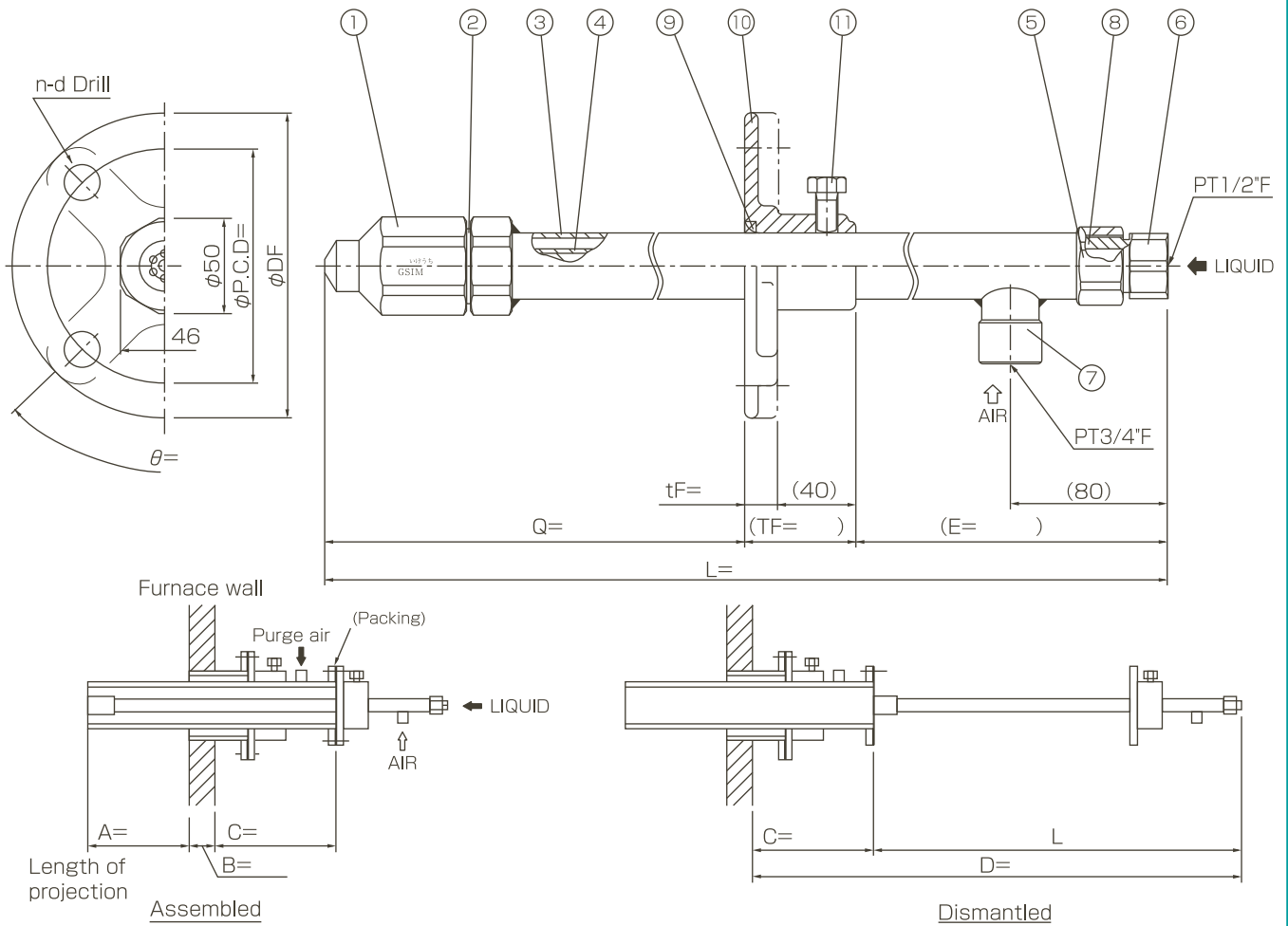
Water flow and proper pipe size

Pipe size	Steel pipe		Spray flow (ℓ/min) when pressure loss is 0.01~0.03 MPa per pipe length of 10m	
	A	B		
6A	1/8B	6.5	10.5	1.3~2.2
8A	1/4B	9.2	13.8	3~5.2
10A	3/8B	12.7	17.3	7~12
15A	1/2B	16.1	21.7	12~21
20A	3/4B	21.6	27.2	22~38
25A	1B	27.6	34.0	38~65
32A	1 1/4B	35.7	42.7	70~120
40A	1 1/2B	41.6	48.6	120~210
50A	2B	52.9	60.5	215~370
65A	2 1/2B	67.9	76.3	410~700
80A	3B	80.7	89.1	680~1,200
100A	4B	105.3	114.3	1,200~2,100
125A	5B	130.8	139.8	2,100~3,600
150A	6B	155.2	165.2	3,300~5,700

●Specifications and contents of this catalog are subject to change without prior notice.

Reference Data

Drawings of GSIM **150S and 220S



■ Dimensions required

Symbol	Entry	Remark
A		Length of projection(over 300mm)
B		Thickness of furnace wall
C		Length from furnace wall to flange +3mm (packing)
ℓ		$\ell=A+B+C$
n- ϕ d	JIS K- B	See Dimensions of Flanges shown on page 78 (Flange size must be over 1 1/2")
ϕ P.C.D		
ϕ DF		
θ		
tF		
TF		TF=tF+40
L		$L \geq \ell + TF + 100$ (See Standard Type of GSIM)
E		$E = L - (\ell + TF)$ $E \geq 100$ (Standard; 100)
D		$D = C + L$ (Enough space for dismantling is required)

■ Standard Type

Type No.	Total length L (mm)
A	560
B	760
C	960
D	1160

Inquiry drawing forms are available for lance type and header type nozzle assemblies to verify dimensional specifications.

Please contact a sales representative for details.



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