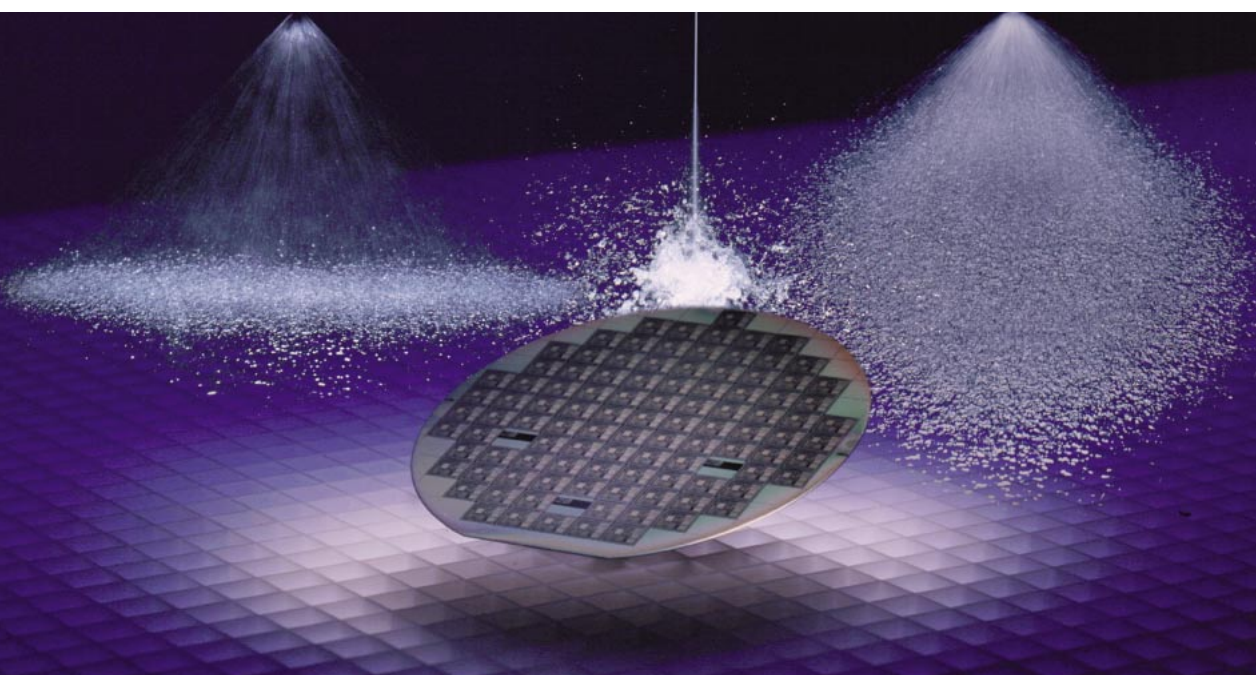


Spray nozzles for manufacturing of electronic products



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

Electronic technology supporting our information society . . .

With the downsizing and upgrade ongoing, now high-performance electronic products are seen in our every scene of daily life.

It is IKEUCHI's high-precision spray nozzles that hold the key to the success in electronic product manufacturing, which requires further miniaturization and better performance.

Semiconductors

Photomasks

Shadow Masks

Plasma Display Panel

Liquid Crystal Displays

Color Filters

Lead Frames

TAB

BGA

Printed Circuit Boards

Cathode Ray Tubes

Copper Foils

Packaging

Photo Processing Products

Other Electronic Products

Electronic Products

	<u>Spray nozzles with outstanding wear-resistance</u>
Polishing	· UVVP series (Flat spray, Made of UPE) P.17 · VVP-U series (Flat spray, Urethane rubber orifice inserted) P.17
	<u>Spray nozzles for precision developing</u>
Developing	· ISJXX series (Full cone spray, Quick detachable type) P.7 · JJXP-HTPVC series (Full cone spray, Made of HTPVC) P.9 · JJXP-PVDF series (Full cone spray, Made of PVDF) P.9 · SSXP-HTPVC series (Square full cone spray, Made of HTPVC) P.10 · SSRP series (Square full cone spray, Made of PVDF) P.10 · ISVV series (Flat spray, Quick detachable type) P.13 · LYYP series (Wide-angle flat spray, Ultra-low operating pressure) P.22 · YYP series (Wide-angle flat spray) P.23 · BIM series (Pneumatic fine mist nozzle) P.28 · SLNH series (SLIT-LAMINAR nozzle) P.31
	<u>Spray nozzles for high-efficient fine etching and easy maintenance</u>
Etching	· SNAPJet series (Full cone spray, Quick detachable type) P.5 · ISJXX, ISJXX-Y series (Full cone spray, Quick detachable type) P.7 · JJXP-HTPVC series (Full cone spray, Made of HTPVC) P.9 · JJXP-PVDF series (Full cone spray, Made of PVDF) P.9 · SSXP-HTPVC series (Square full cone spray, Made of HTPVC) P.10 · SSRP series (Square full cone spray, Made of PVDF) P.10 · JGRP series (Small capacity full cone spray, Made of PTFE or PVDF) P.11 · ISVV series (Flat spray, Quick detachable type) P.13 · BIM series (Pneumatic fine mist nozzle) P.28 · SLNH series (SLIT-LAMINAR nozzle) P.31 · EJX series (Ejector nozzle for solution agitation) P.32
	<u>Spray nozzles for highly chemical-resistance</u>
Stripping	· ISJXX series (Full cone spray, Quick detachable type) P.7 · AJP-PPS series (Full cone spray, Minimal clogging) P.12 · ISVV series (Flat spray, Quick detachable type) P.13 · VP, VVP series (Standard flat spray) P.15
	<u>Spray nozzles for precision cleaning</u>
Cleaning	· ISJXX series (Full cone spray, Quick detachable type) P.7 · JJXP-HTPVC series (Full cone spray, Made of HTPVC) P.9 · JJXP-PVDF series (Full cone spray, Made of PVDF) P.9 · SSXP-HTPVC series (Square full cone spray, Made of HTPVC) P.10 · JGRP series (Small capacity full cone spray, Made of PTFE or PVDF) P.11 · AJP-PPS series (Full cone spray, Minimal clogging) P.12 · ISVV series (Flat spray, Quick detachable type) P.13 · VP series (Flat spray, Ceramic orifice inserted) P.15 · VEP series (Even flat spray, Ceramic orifice inserted) P.19 · DSP series (Flat spray, Strong spray impulse) P.21 · LYYP series (Wide-angle flat spray, Ultra-low operating pressure) P.22 · YYP series (Wide-angle flat spray) P.23 · VZ series (Wide-angle flat spray of air and steam) P.25 · CP series (High impact solid stream) P.27 · BIM series (Pneumatic fine mist nozzle) P.28 · VVEA series (High-impact cleaning pneumatic nozzle) P.29 · EJX series (Ejector nozzle for solution agitation) P.32
Air blow-off Drying	<u>Air blow-off nozzle</u> · TAIFUJet® (High impact air nozzle) P.26 · SLNHA series (SLIT-LAMINAR nozzle) P.31
Fluxing	<u>Pneumatic spray nozzles for uniform spraying</u> · BIM series (Pneumatic fine mist nozzle) P.28

Guarantee of Spray Nozzles

All IKEUCHI's precision-made hydraulic nozzles are guaranteed for the spray capacities and spray angles. This guarantee covers metal, plastic and ceramic nozzles.

■ Spray Capacity

Spray capacities shown in this catalog are based on city water of room temperature and all spray nozzles are guaranteed for the spray capacity within $\pm 5\%$ under the standard pressure.

■ Spray Angle

Based on city water of room temperature, all spray nozzles are guaranteed for the spray angle within $\pm 5^\circ$ under the standard pressure.

[Note]

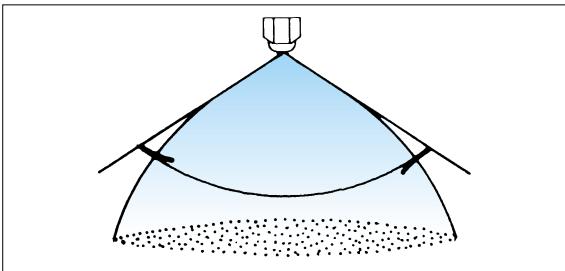
The standard pressure is defined as a design pressure based on usual liquid pressure in common use. The nozzles are designed to provide the specified spray angle, spray capacity, optimum spray pattern and spray distribution at each standard pressure. The figures in this catalog are based on city water of room temperature and the liquid pressure is the one at the immediate upstream of the nozzle.

Fundamentals for Selecting Spray Nozzles

The following elements are fundamentals for selecting spray nozzles. For details, refer to the technical data at the end of this catalog.

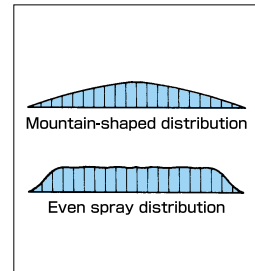
■ Spray angle

The spray angle is measured at the top of the spray made by straight outside part of the spray.



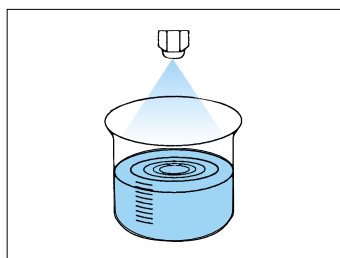
■ Spray distribution

The spray distribution means the spray flow distribution in the direction of spray width.



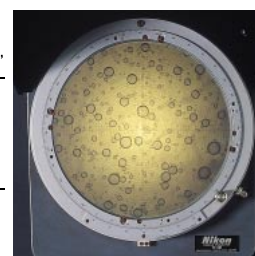
■ Spray capacity

The spray capacity increases as the specific gravity of the liquid to be sprayed becomes lighter and the spray pressure becomes higher.



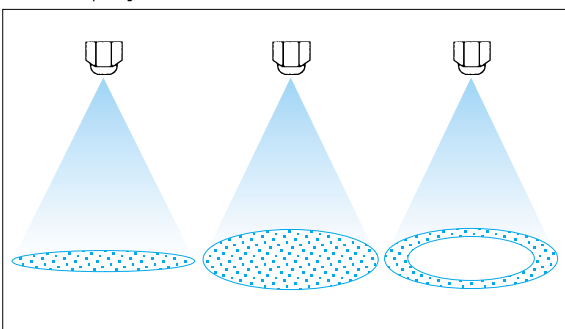
■ Spray droplet diameter

Mean droplet diameter, which is an important element in selecting nozzles and designing nozzle-related equipment, varies depending on the type of the spray nozzles, liquid pressure and spray capacity.

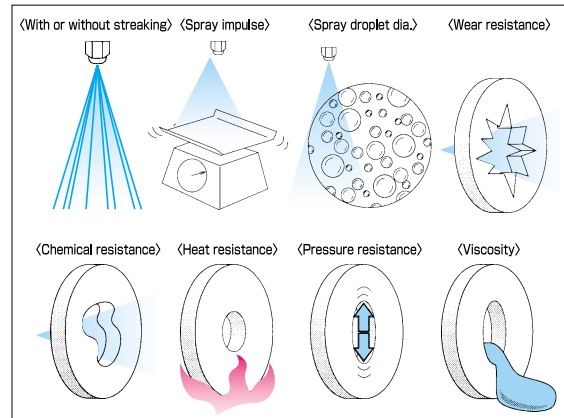


■ Spray pattern

The spray pattern means the cross sectional shape of the spray.



■ Other Elements



How to Read the Charts



Spray pattern of the nozzle of this page is shown here.

for manufacturing of electronic products

VP·VVP series

Cleaning by pure water

Stripping

Suitable applications in manufacturing of electronic products

Spray pattern and spray distribution



High-precision and Low-price One-piece Structure Standard Flat Spray Nozzles

Ideal for cleaning by pure water. CERTIM®, plastic nozzle with one-shot injection molded ceramic orifice, combines high precision with low price.

Suitable for Multiple-nozzle Arrangement

Tapered spray pattern edges provide uniform spray distribution in multiple-nozzle arrangement.

The photo of spray at the standard pressure



Flat spray pattern with stable distribution having tapered spray pattern edges

[Spray Pattern]

[Spray Distribution]

Spray angle code at the standard pressure (115°)

Spray capacity code at the standard pressure (0.3 ℓ/min)

Series (VV-series)

Type & Size of pipe connection : 1/4M...1/4" Male thread (PT), R1/4 1/4F...1/4" Female thread (PT), Rc1/4

●○ shows availability of the item
●=With strainer
○=Without strainer

Plastic nozzle with ceramic orifice injection molded

Spray angle at the specified pressure (124° at 0.7MPa)

At 0.05MPa, sufficient spray pattern is not available

Calculated spray capacity at the specified pressure (0.21 ℓ/min at 0.15MPa)

Sprayer mean droplet diameter measured by Immersion sampling method

Sprayer pattern of the nozzle of this page is shown

Sprayer capacity at the standard pressure (0.30 ℓ/min at 0.3MPa)

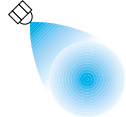
Minimum passage diameter

Mesh number of strainer

Spray Angle Code	Spray Capacity Code	VVP (Metal make)		VVP (PP)		VP (Ceramic orifice)		Spray Angle		Spray Capacity (ℓ/min)										Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size			
		1/8M	1/4M	1/8M	1/4M	1/8M	1/4M	CER-TIM® 1/8M	CER-TIM® 1/4M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa				1 MPa	2 MPa	
03						●	●	○	○	101	115	124		0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	140	0.2	200	
04						●	●	○	○	102	115	124		0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	160	0.2	200	
05		●	●	○	○	●	●	○	○	102	115	124		0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	160	0.3	150	
07		●	●	○	○	●	●	○	○	103	115	124		0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	160	0.3	150	
10		●	●	○	○	●	●	○	○	103	115	124	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	160	0.4	150	
15		●	●	○	○	●	●	○	○	104	115	123	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	270	0.5	100	
20		●	●	○	○	●	●	○	○	104	115	123	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	270	0.6	100	
30		●	●	○	○	●	●	○	○	105	115	122	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	160	0.8	50	
40		●	●	○	○	●	●	○	○	106	115	122	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	160	0.8	50	
60		○	○							107	115	121	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	1.0	—	—	
80		○	○							107	115	121	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	1.2	—	—	
100		○	○							107	115	120	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	1.4	—	—	
200										108	115	120	8.16	11.5	14.1	16.3	20.0	25.8	30.6	35.5	51.6	50	2.4	—	—

Contents

	Spray Pattern & Spray Distribution	Series	Page
Full Cone Spray		<ul style="list-style-type: none"> · SNAPJet series..... Quick detachable, High-efficient etching nozzle · ISJXX, ISJXX-Y series..... Full cone spray, Quick detachable type · JJXP-HTPVC series..... Etching nozzle with detachable whirler · JJXP-PVDF series..... Compact nozzle made of PVDF · SSXP-HTPVC series..... Square full cone spray nozzle made of HTPVC · SSRP series..... Square full cone spray nozzle made of PVDF · JJRP-PTFE, PVDF series..... Compact nozzle made of PTFE, PVDF · AJP-PPS series..... Full cone spray, Minimal clogging 	5~6 7~8 9 9 10 10 11 12
Flat Spray		<ul style="list-style-type: none"> · ISVV series..... Flat spray, Quick detachable type · VP, VVP series..... Standard flat spray · UVVP, VVP-U series..... Polishing nozzle with highly wear-resistance · VEP series..... Even flat spray nozzle · DSP series..... High-pressure flat spray nozzle · LYYF series..... Ultra low-pressure flat spray nozzle · YYP series..... Wide-angle flat spray nozzle · VZ series..... Air and steam spray nozzle 	13~14 15~16 17~18 19~20 21 22 23~24 25
Solid Stream		<ul style="list-style-type: none"> · TAIFUJet®..... High impact air nozzle · CP series..... Standard solid stream jet 	26 27
Others		<ul style="list-style-type: none"> · BIM series..... Pneumatic fine mist nozzle · VVEA series..... High-impact cleaning pneumatic nozzle · SLNH / SLNHA series..... SLIT-LAMINAR nozzle · EJX series..... Ejector nozzle for solution agitation · Technical data on spray nozzles 	28 29~30 31 32 33~38



for manufacturing of electronic products

SNAPJet series

Shadow mask etching

Lead frame etching

High-efficient etching for such as PCB and TAB



Suitable for Extremely Fine Wet Etching
Mountain-shaped distribution and high spray impulse achieve high-efficient etching. High-precision of spray angle $\pm 5^\circ$ and spray capacity $\pm 5\%$ are guaranteed.

Excellent Uniform Flow Distribution
Uniform etching effect in any production lines because the distortion of spray distribution is minimized even if spray pressure is modulated.

Easy Maintenance
Quick detachable type suitable for easy disassembling in periodical maintenance. Whirler inside the nozzle is also removable.

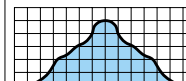
Suitable for High Speed Etching
Also available in Titanium for high-temperature and high-pressure condition.



Full cone spray pattern with a round impact area and strong spray distribution at center



[Spray Pattern]

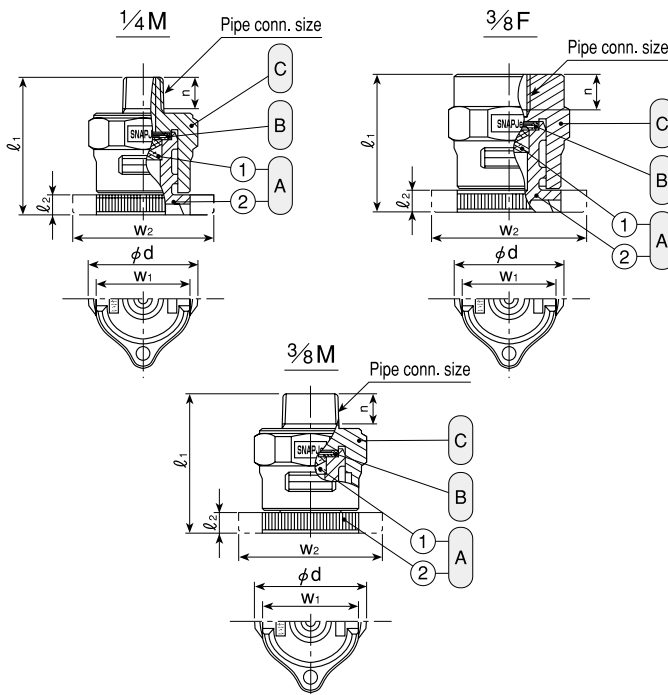


[Spray Distribution]

SNAPJet series

Series	Pipe Conn. Size	Dimensions (mm)						Mass (g)
		l_1	l_2	ϕd	w_1	w_2	n	
SNAPJet	$\frac{1}{4}M$	44	6.5	35	30	45	10	30
	$\frac{3}{8}F$	44	6.5	35	30	45	11	40
	$\frac{3}{8}M$	44	6.5	35	30	45	10	35

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Structure ■ Two-piece structure comprised of adaptor and nozzle with whirler. Nozzle is removable only by turning 90° .

Material ■ PPS (Polyphenylene sulfide)
Optional material : Nozzle body made of TN

Ⓐ Nozzle ① Whirler ② Body Ⓑ Packing-EPDM Ⓒ Adaptor-PPS

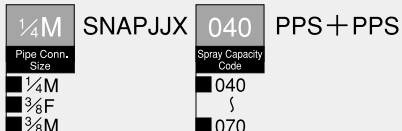
Spray Capacity Code	Pipe Conn. Size (Adaptor)			Spray Angle			Spray Capacity (ℓ /min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	$\frac{1}{4}M$	$\frac{3}{8}F$	$\frac{3}{8}M$	0.05 MPa	0.2 MPa	0.5 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa		
040	○	○	○	54°	65°	64°	2.10	2.90	3.50	4.00	4.79	6.01	6.98	380	1.6
050	○	○	○	54°	65°	64°	2.62	3.62	4.37	5.00	5.99	7.51	8.73		2.0
060	○	○	○	59°	70°	69°	3.15	4.35	5.25	6.00	7.18	9.02	10.5		2.4
070	○	○	○	64°	75°	74°	3.67	5.07	6.12	7.00	8.38	10.5	12.2	520	2.4

How to order

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

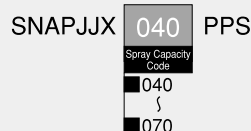
① Complete unit

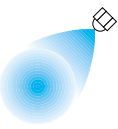
(Example) $\frac{1}{4}M$ SNAPJXX040PPS + PPS



② Nozzle only

(Example) $\frac{1}{4}M$ SNAPJXX040PPS





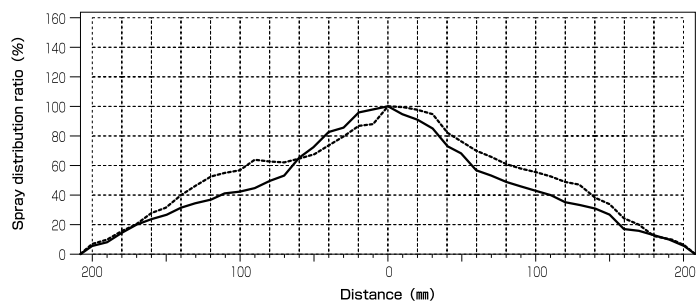
Data of spraying ferric chloride by SNAPJet

Spray distribution of SNAPJet is very stable and it does not vary much even if spray pressure varies and there is not much deviation of parallel or vertical conical pattern. Therefore stable etching is possible even object of etching changes or there is change in spray pressure.

Nozzle	1/4M SNAP JJX
Liquid	FeCl ₃
Temperature	12°C
Density	1.44g/cm ³
Spray height	200mm

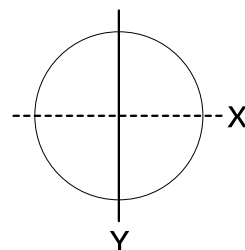
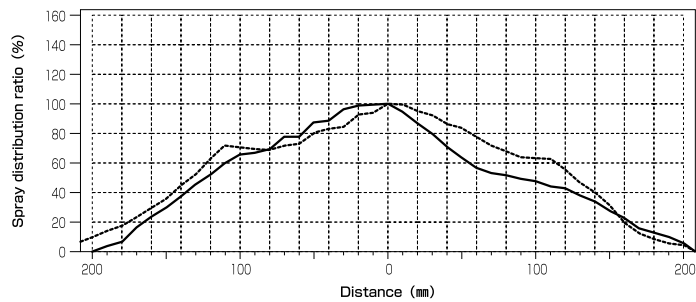
<Spray Condition>

- Spray pressure···0.2MPa
- Spray angle·····76°
- Spray capacity···7.25 ℓ/min

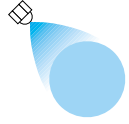


<Spray Condition>

- Spray pressure···0.5MPa
- Spray angle·····77°
- Spray capacity···11.0 ℓ/min



Solid line (—) and dotted line (- - -) show distributions at each direction X and Y.



for manufacturing of electronic products

ISJJX series Patent pending

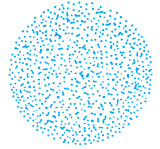


Easy Maintenance
Easy installation and removal for periodical maintenance. Whirler is also detachable easily.

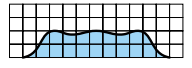
Color Identification
Nozzle bodies are color-coded by spray capacity for easy identification.



Full cone spray pattern with a round impact area and uniform distribution



[Spray Pattern]



[Spray Distribution]

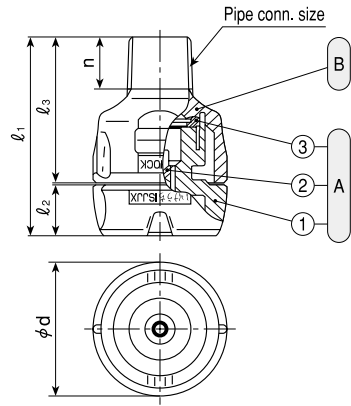
ISJJX series

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)
		l_1	l_2	l_3	n	ϕd	
ISJJX	1/8M	37	10	26.5	7	26	6
	1/4M	40	10	29.5	10.5	26	7
	3/8M	40	10	29.5	11	26	8

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ Two-piece structure comprised of nozzle and adaptor.
■ Easy installation and removal by turning a nozzle 90° by hand.

Material ■ Nozzle body & Whirler : PP (Polypropylene)
Adaptor : FRPP (Glass-fibre reinforced polypropylene)
Packing : EPDM
* Packing in FKM available upon request.



①Nozzle (①Body ②Whirler ③Packing-EPDM)
④Adaptor

Spray Capacity Code	Pipe Conn. Size			Spray Angle			Spray Capacity (ℓ/min)								Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Color of Nozzle Body	
	1/8M	1/4M	3/8M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa				
010	○	○	○	60°	65°	55°	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	290	0.8	Red	
015	○	○	○	60°	65°	55°	—	0.79	1.09	1.32	1.50	1.77	2.18	2.50				1.0
020	○	○	○	60°	65°	55°	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34				1.5
025	○	○	○	60°	65°	55°	—	1.32	1.82	2.20	2.50	2.95	3.62	4.17	520	1.5	Yellow	
030	○	○	○	60°	65°	55°	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00				1.5
040	○	○	○	60°	65°	55°	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67				2.0
050	○	○	○	65°	70°	60°	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34	520	2.0	Cyan	
060	○	○	○	70°	75°	65°	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0				2.0

How to order

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

① Complete unit

(Example) ... 1/8MISJJX040 (EPDM) PP + FRPP

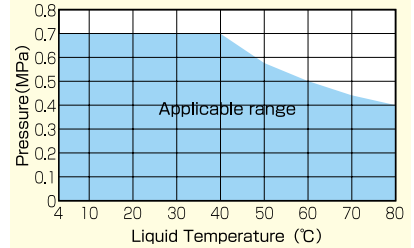
1/8M	ISJJX	040	(EPDM)	PP + FRPP
Pipe Conn. Size	Spray Capacity Code	Material of Packing		
1/8M	010	EPDM		
1/4M	020	FKM		
3/8M	060			

② Nozzle only

(Example) ... ISJJX040PP (EPDM)

ISJJX	040	PP	(EPDM)
Spray Capacity Code	Material of Packing		
010	EPDM		
020	FKM		
060			

[Chart of working pressure]



※Use under the applicable pressure indicated in the above chart.

Lead frame etching

High-efficient etching for such as PCB and TAB



Small capacity etching nozzles with same concept as high-efficient etching nozzle SNAPJet series.

Suitable for High-efficient Wet Etching

Mountain-shaped distribution and high spray impulse achieve high-efficient etching. High-precision of spray angle $\pm 5^\circ$ and spray capacity $\pm 5\%$ are guaranteed.

Excellent Uniform Flow Distribution

Uniform etching effect and the distortion of spray distribution is minimized even if spray pressure is modulated.

Easy Maintenance

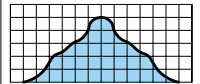
Quick detachable type suitable for easy disassembling in periodical maintenance. Whirler inside the nozzle is also detachable.



Full cone spray pattern with a round impact area and strong spray distribution at center



[Spray Pattern]

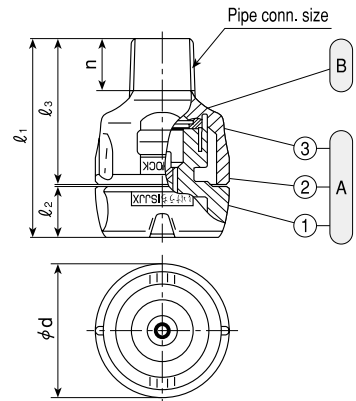


[Spray Distribution]

ISJJX-Y series

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)
		l_1	l_2	l_3	n	ϕd	
ISJJX	1/8M	37	10	26.5	7	26	6
	1/4M	40	10	29.5	10.5	26	7
	3/8M	40	10	29.5	11	26	8

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Ⓐ Nozzle (① Body ② Whirler ③ Packing-EPDM)
Ⓑ Adaptor

- Structure** ■ Two-piece structure comprised of nozzle and adaptor.
 ■ Easy installation and removal by turning a nozzle 90° by hand.

- Material** ■ Nozzle body & Whirler : PP (Polypropylene)
 Adaptor : FRPP (Glass-fibre reinforced polypropylene)
 (* Material of whirler for O40Y, O50Y : PPS)
 Packing : EPDM
 * Packing in FKM available upon request.

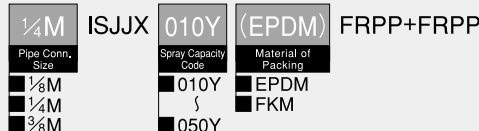
Spray Capacity Code	Pipe Conn. Size			Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Color of Nozzle Body
	1/8M	1/4M	3/8M	0.05 MPa	0.2 MPa	0.5 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa			
010Y	○	○	○	54°	65°	64°	0.53	0.73	0.88	1.00	1.18	1.45	1.67	290	0.8	Red
015Y	○	○	○	54°	65°	64°	0.79	1.09	1.32	1.50	1.77	2.18	2.50			
020Y	○	○	○	54°	65°	64°	1.06	1.46	1.75	2.00	2.36	2.91	3.34			
025Y	○	○	○	54°	65°	64°	1.32	1.82	2.20	2.50	2.95	3.62	4.17			
030Y	○	○	○	54°	65°	64°	1.59	2.18	2.63	3.00	3.54	4.36	5.00			
040Y	○	○	○	54°	65°	64°	2.10	2.90	3.50	4.00	4.79	6.01	6.98	520	1.6	Orange
050Y	○	○	○	54°	65°	64°	2.62	3.62	4.37	5.00	5.99	7.51	8.73			

How to order

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

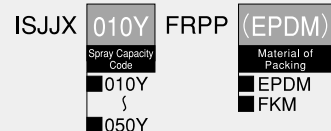
① Complete unit

(Example) ...1/4MISJJX010Y (EPDM) FRPP+FRPP



② Nozzle only

(Example) ...ISJJX010YFRPP (EPDM)



JJXP-HTPVC series



Etching Cleaning by pure water Developing

Chemical-resistant Material
Made of HTPVC with chemical resistance to solutions such as etchants.

Easy Maintenance
X-shaped whirler is removable for easy maintenance.

Low Price
Injection molded spray nozzle with limited spray angle and capacity.



Full cone spray pattern with a round impact area and uniform distribution

[Spray Pattern]

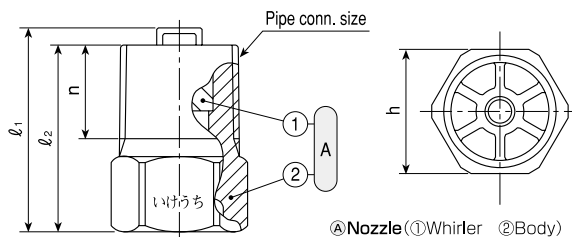
[Spray Distribution]

JJXP-HTPVC series

Series	Pipe Conn. Size	Dimensions (mm)				Mass (g)
		ℓ ₁	ℓ ₂	h	n	
JJXP-HTPVC	1/4M	23	21	14	10.5	2.5

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ One-piece structure with removable X-shaped whirler.
Material ■ HTPVC (Heat-treated polyvinyl chloride)



JJXP-PVDF series



Etching Cleaning by pure water Developing

Chemical-resistant Material
Made of highly chemical-resistant PVDF (Polyvinylidene fluoride).

Low Price
Injection molded spray nozzle with limited spray angle and capacity.



Full cone spray pattern with a round impact area and uniform distribution

[Spray Pattern]

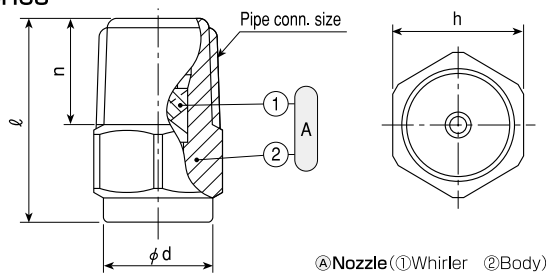
[Spray Distribution]

JJXP-PVDF series

Series	Pipe Conn. Size	Dimensions (mm)				Mass (g)
		ℓ	h	φd	n	
JJXP-PVDF	1/8M	18	12	11.5	8	2
	1/4M	22	14	11.5	11.5	4.1

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ One-piece structure with X-shaped whirler.
Material ■ PVDF (Polyvinylidene fluoride)



Series	Spray Capacity Code	Pipe Conn. Size		Spray Angle			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
		1/8M	1/4M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
JJXP-HTPVC	040	○	○	60°	65°	55°	—	2.12	2.91	3.51	4.00	4.72	5.81	6.67	7.72	380	2.2
	050	○	○	65°	70°	60°	—	2.65	3.64	4.38	5.00	5.90	7.27	8.34	9.64	5	2.2
	060	○	○	70°	75°	65°	2.51	3.18	4.37	5.26	6.00	7.08	8.72	10.0	11.6	520	2.2
JJXP-PVDF	010	○	○	60°	65°	55°	—	0.53	0.73	0.88	1.00	1.18	1.45	1.67	1.93	290	0.8
	015	○	○	60°	65°	55°	—	0.79	1.09	1.32	1.50	1.77	2.18	2.50	2.89	5	1.0
	020	○	○	60°	65°	55°	—	1.06	1.46	1.75	2.00	2.36	2.91	3.34	3.86	5	1.5
	025	○	○	60°	65°	55°	—	1.32	1.82	2.20	2.50	2.95	3.62	4.17	4.82	5	1.5
	030	○	○	65°	65°	55°	—	1.59	2.18	2.63	3.00	3.54	4.36	5.00	5.79	410	1.5

How to order

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

① JJXP-HTPVC
(Example) ... 1/4MJJXP040HTPVC

1/4MJJXP **040** HTPVC

Spray Capacity Code
 ■ 040
 ■ 050
 ■ 060

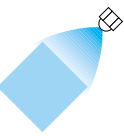
② JJXP-PVDF
(Example) ... 1/8MJJXP010PVDF

1/8MJJXP **010** PVDF

Pipe Conn. Size
 ■ 1/8M
 ■ 1/4M

Spray Capacity Code
 ■ 010
 ■ 015
 ■ 020
 ■ 025
 ■ 030

SSXP-HTPVC series



Etching **Cleaning by pure water** **Developing**

Square Spray Pattern
Square full cone spray pattern gives no gap in multiple-nozzle arrangement.

Chemical-resistant Material
Made of HTPVC with chemical resistance to solutions such as etchants.

Low Price
Injection molded spray nozzle with limited spray angle and capacity.



Full cone spray pattern with a square impact area and uniform distribution

[Spray Pattern]

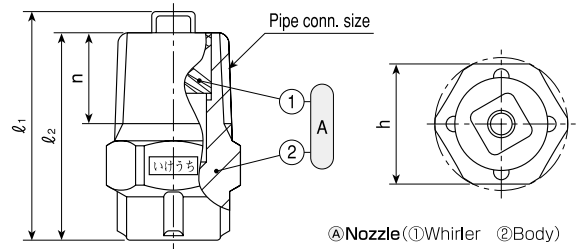
[Spray Distribution]

SSXP-HTPVC series

Series	Pipe Conn. Size	Dimensions (mm)				Mass (g)
		ℓ ₁	ℓ ₂	h	n	
SSXP-HTPVC	¼M	26.5	24	14	10.5	3.1

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ One-piece structure with removable X-shaped whirler.
Material ■ HTPVC (Heat-treated polyvinyl chloride)



Series	Spray Capacity Code	Pipe Conn. Size	Spray Angle			Spray Capacity (ℓ/min)								Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
			0.05 MPa	0.2 MPa	0.5 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
SSXP-HTPVC	1.5 ⁶⁵ 4.5	¼M	56°	65°	65°	2.72	3.74	4.50	5.14	6.06	7.46	8.56	9.90	450	2.2

(Note) Standard pressure for SSXP-HTPVC is 0.15MPa.

Affiliated Products SSRP series



Etching **Developing**

Square Spray Pattern
Square full cone spray pattern gives no gap in multiple-nozzle arrangement.

Small Capacity
Disc whirler is designed to generate soft touch spray at small capacity.

Full cone spray pattern with a square impact area

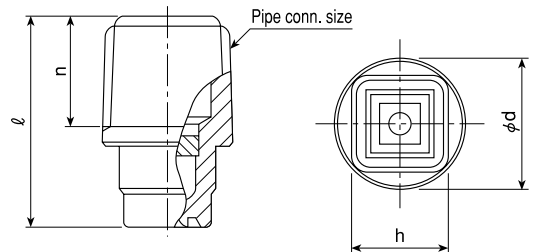
[Spray Pattern]

SSRP series

Series	Pipe Conn. Size	Dimensions (mm)				Mass (g)
		ℓ	h	n	φd	
SSRP-PVDF	¼M	22	10	11.5	13.5	4.7

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ One-piece structure with disc whirler.
Material ■ PVDF (Polyvinylidene fluoride)



※SSRP series is customized in accordance with liquid sprayed. Please contact us for details.

How to order

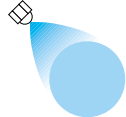
Please inquire or order for a specific nozzle on this coding system.

① SSXP-HTPVC

¼MSSXP1.5 ⁶⁵/_{4.5} HTPVC

② SSRP

Contact us for details.



for manufacturing of electronic products

JJRP series

QDR cleaning by pure water Etching



Spray Nozzles for Ultra-pure Water and Chemical-resistance

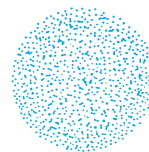
Excellent wear-resistant PTFE (Polytetrafluoroethylene) nozzles and injection molded PVDF (Polyvinylidene fluoride) nozzles are available.

Excellent Spray Distribution

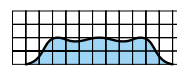
Disc whirler is designed to provide uniform distribution at small capacity.



Full cone spray pattern with a round impact area and uniform distribution



[Spray Pattern]

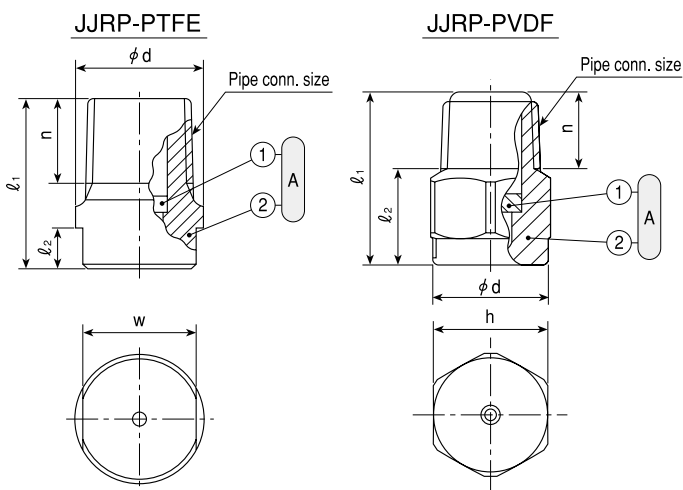


[Spray Distribution]

JJRP series

Series	Pipe Conn. Size	Dimensions (mm)						Mass (g)
		ℓ_1	ℓ_2	w	ϕd	h	n	
JJRP-PTFE	1/8M	16	4	10	12	12	7	2
	1/4M	21	5	14	16	16	10.5	5
JJRP-PVDF	1/8M	18	10	—	12	11.5	8	2
	1/4M	22	10.5	—	14	12	11.5	4.1

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Ⓐ Nozzle ① Whirler ② Body

Structure ■ One-piece structure with disc whirler.

Material ■ PTFE (Polytetrafluoroethylene)
PVDF (Polyvinylidene fluoride)

Spray Capacity Code	JJRP (PTFE)		JJRP (PVDF)		Spray Angle			Spray Capacity (ℓ/min)								Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	1/8M	1/4M	1/8M	1/4M	0.15 MPa	0.2 MPa	0.5 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa		
005	○		○	○	56°	60°	60°	—	0.36	0.44	0.50	0.59	0.74	0.85	0.99	260	0.4
007	○		○	○	60°	65°	62°	—	0.51	0.61	0.70	0.83	1.03	1.19	1.39		0.6
010	○				63°	65°	62°	—	0.73	0.88	1.00	1.19	1.48	1.70	1.98		0.8
015	○				64°	70°	72°	0.79	1.09	1.31	1.50	1.78	2.22	2.56	2.98	∩	1.0
020	○				64°	70°	72°	1.06	1.45	1.75	2.00	2.38	2.95	3.41	3.97		1.2
030	○				75°	80°	78°	1.58	2.18	2.63	3.00	3.56	4.43	5.11	5.95	410	1.3
040		○			67°	70°	65°	2.11	2.91	3.50	4.00	4.75	5.91	6.82	7.93	380	1.4
050		○			76°	80°	70°	2.64	3.63	4.38	5.00	5.94	7.38	8.52	9.92	∩	1.6
060		○			88°	90°	80°	3.17	4.36	5.26	6.00	7.13	8.86	10.2	11.9	520	1.6

How to order

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

① JJRP-PTFE
(Example) ...1/8MJJRP005PTFE

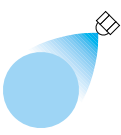
1/8M JJRP 005 PTFE

Pipe Conn. Size: 1/8M, 1/4M
Spray Capacity Code: 005, ∩, 060

② JJRP-PVDF
(Example) ...1/8MJJRP007PVDF

1/8M JJRP 007 PVDF

Pipe Conn. Size: 1/8M, 1/4M
Spray Capacity Code: 005, 007



AJP series World-widely patent registered

- Stripping
- Cleaning

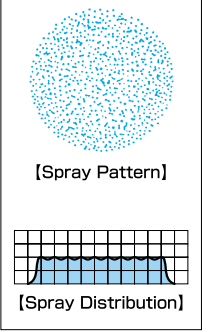


Minimal Clogging
Simple structure without a whirler achieves maximum free passage and clogging is minimized. Ideal for applications where re-circulated water is being used or clogging is a concern.

Chemical-resistance
Made of highly chemical- and heat-resistant PPS (Polyphenylene sulfide).



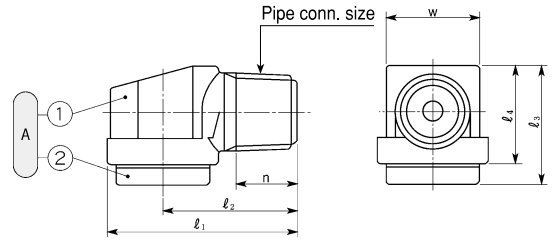
Full cone spray pattern with a round impact area and uniform distribution



AJP series

Series	Pipe Conn. Size	Dimensions (mm)						Mass (g)
		l_1	l_2	l_3	l_4	w	n	
AJP	1/4M	32.5	23	20.5	17	16	10.5	6.8
	3/8M	37	26	23	20	19	11.0	10.3

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Structure ■ One-piece structure with orifice cap electrodeposited to body. No obstacle inside.

Material ■ PPS (Polyphenylene sulfide)

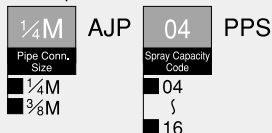
Ⓐ Nozzle (① Body ② Cap)

Spray Capacity Code	Pipe Conn. Size		Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)		
	1/4M	3/8M	0.05 MPa	0.2 MPa	0.5 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa				
04	○		65°	75°	68°	1.59	2.04	2.86	3.48	4.00	4.70	5.77	640	2.2		
05	○		65°	75°	68°	1.99	2.55	3.57	4.35	5.00	5.88	7.21				
06	○		70°	80°	73°	2.39	3.06	4.28	5.22	6.00	7.06	8.66				
07	○		70°	80°	73°	2.79	3.57	5.00	6.09	7.00	8.35	10.4				
08		○	70°	80°	73°	3.18	4.08	5.71	6.96	8.00	9.54	11.9			750	3.2
10		○	70°	80°	73°	3.98	5.10	7.14	8.70	10.0	11.9	14.9				
12		○	75°	85°	78°	4.78	6.12	8.57	10.4	12.0	14.3	17.9				
14		○	75°	85°	78°	5.57	7.14	10.0	12.2	14.0	16.7	20.8				
16		○	75°	85°	78°	6.37	8.16	11.4	13.9	16.0	19.1	23.8				

How to order

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

(Example) ...1/4MAJP04PPS





for manufacturing of electronic products

ISVV series Patent pending

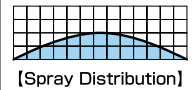


Easy Maintenance
Easy installation and removal for periodical maintenance.

Color Identification
Nozzle bodies are color-coded by spray capacity for easy identification.



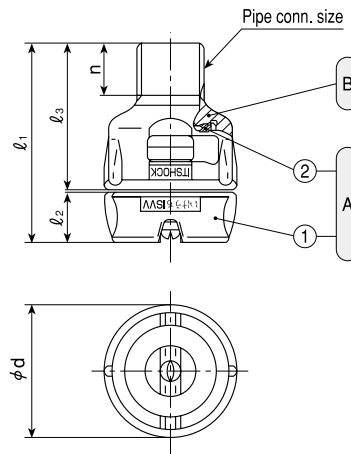
Flat spray pattern with stable distribution having tapered spray pattern edges



ISVV series

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)
		l ₁	l ₂	l ₃	n	φd	
ISVV	1/8M	37	10	26.5	7	26	6
	1/4M	40	10	29.5	10.5	26	7
	3/8M	40	10	29.5	11	26	8

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Structure ■ Two-piece structure comprised of nozzle and adaptor.
■ Easy installation and removal by turning a nozzle 90° by hand.

Material ■ Nozzle body & Whirler : PP (Polypropylene)
Adaptor : FRPP (Glass-fibre reinforced polypropylene)
Packing : EPDM
* Packing in FKM available upon request.

Ⓐ Nozzle (①Body ②Packing-EPDM)
Ⓑ Adaptor

Spray Angle Code	Spray Capacity Code	Pipe Conn. Size			Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Color of Nozzle Body
		1/8M	1/4M	3/8M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa			
115°	05	○	○	○	102°	115°	124°	—	0.29	0.35	0.41	0.50	0.65	0.76	}	}	0.3
	07	○	○	○	103°	115°	124°	—	0.40	0.49	0.57	0.70	0.90	1.07			0.3
	10	○	○	○	103°	115°	124°	0.41	0.58	0.71	0.82	1.00	1.29	1.53			0.4
	15	○	○	○	104°	115°	123°	0.61	0.87	1.06	1.23	1.50	1.94	2.29			0.5
	20	○	○	○	104°	115°	123°	0.82	1.15	1.41	1.63	2.00	2.58	3.06			0.6
	30	○	○	○	105°	115°	122°	1.23	1.73	2.12	2.45	3.00	3.88	4.58			0.8
	40	○	○	○	106°	115°	122°	1.63	2.31	2.83	3.27	4.00	5.16	6.11			0.8
50	○	○	○	106°	115°	122°	2.04	2.89	3.54	4.08	5.00	6.46	7.64	0.9			
90°	05	○	○	○	77°	90°	100°	—	0.29	0.35	0.41	0.50	0.65	0.76	}	}	0.3
	07	○	○	○	78°	90°	100°	—	0.40	0.49	0.57	0.70	0.90	1.07			0.4
	10	○	○	○	78°	90°	99°	0.41	0.58	0.71	0.82	1.00	1.29	1.53			0.5
	15	○	○	○	79°	90°	99°	0.61	0.87	1.06	1.23	1.50	1.94	2.29			0.6
	20	○	○	○	79°	90°	98°	0.82	1.15	1.41	1.63	2.00	2.58	3.06			0.7
	30	○	○	○	80°	90°	97°	1.23	1.73	2.12	2.45	3.00	3.88	4.58			0.9
	40	○	○	○	81°	90°	97°	1.63	2.31	2.83	3.27	4.00	5.16	6.11			1.1
50	○	○	○	81°	90°	97°	2.04	2.89	3.54	4.08	5.00	6.46	7.64	1.2			





Spray Angle Code	Spray Capacity Code	Pipe Conn. Size			Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Color of Nozzle Body	
		1/8M	1/4M	3/8M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa				
65°	05	○	○	○	52°	65°	74°	—	0.29	0.35	0.41	0.50	0.65	0.76	}	190	0.4	
	07	○	○	○	53°	65°	74°	—	0.40	0.49	0.57	0.70	0.90	1.07				
	10	○	○	○	54°	65°	73°	0.41	0.58	0.71	0.82	1.00	1.29	1.53				
	15	○	○	○	54°	65°	73°	0.61	0.87	1.06	1.23	1.50	1.94	2.29				
	20	○	○	○	55°	65°	72°	0.82	1.15	1.41	1.63	2.00	2.58	3.06				
	30	○	○	○	56°	65°	72°	1.23	1.73	2.12	2.45	3.00	3.88	4.58				
	40	○	○	○	56°	65°	71°	1.63	2.31	2.83	3.27	4.00	5.16	6.11				
	50	○	○	○	57°	65°	71°	2.04	2.89	3.54	4.08	5.00	6.46	7.64				
50°	05	○	○	○	38°	50°	59°	—	0.29	0.35	0.41	0.50	0.65	0.76	}	210	0.4	
	07	○	○	○	38°	50°	58°	—	0.40	0.49	0.57	0.70	0.90	1.07				
	10	○	○	○	40°	50°	58°	0.41	0.58	0.71	0.82	1.00	1.29	1.53				
	15	○	○	○	40°	50°	57°	0.61	0.87	1.06	1.23	1.50	1.94	2.29				
	20	○	○	○	41°	50°	57°	0.82	1.15	1.41	1.63	2.00	2.58	3.06				
	30	○	○	○	42°	50°	56°	1.23	1.73	2.12	2.45	3.00	3.88	4.58				
	40	○	○	○	42°	50°	56°	1.63	2.31	2.83	3.27	4.00	5.16	6.11				
	50	○	○	○	43°	50°	55°	2.04	2.89	3.54	4.08	5.00	6.46	7.64				

How to order

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

① Complete unit

⟨Example⟩...1/8MISVV11505PP+FRPP

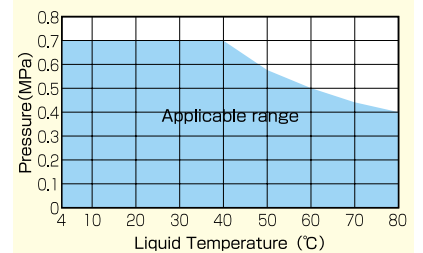
1/8M	ISVV	115	05	(EPDM)	PP+FRPP
Pipe Conn. Size	Spray Angle Code	Spray Capacity Code	Material of Packing		
1/8M	115°	05	EPDM		
1/4M	50°	50	FKM		
3/8M					

② Nozzle only

⟨Example⟩...ISVV11505PP(EPDM)

ISVV	115	05	PP	(EPDM)
Spray Angle Code	Spray Capacity Code	Material of Packing		
115°	05	EPDM		
50°	50	FKM		

[Chart of working pressure]



※Use under the applicable pressure indicated in the above chart.

VP·VVP series

Cleaning by pure water

Stripping



**High-precision and Low-price
One-piece Structure
Standard Flat Spray Nozzles**

Ideal for cleaning by pure water. CERTIIM®, plastic nozzle with one-shot injection molded ceramic orifice, combines high precision with low price.

Suitable for Multiple-nozzle Arrangement

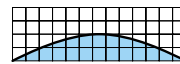
Tapered spray pattern edges provide uniform spray distribution in multiple-nozzle arrangement.



Flat spray pattern with stable distribution having tapered spray pattern edges



[Spray Pattern]



[Spray Distribution]

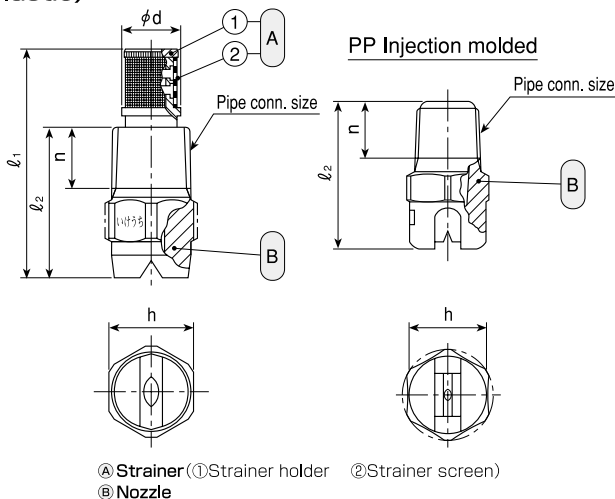
VVP series (Metal or Plastic)

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)	
		l_1	l_2	h	ϕd	n	S303	PP
VVP	1/8M	31.5	19	12	7.5	7	10	—
	1/4M	40	26	14	10	10.5	21	—
VVP (Injection molded)	1/8M	—	22	12	—	8.5	—	1.1
	1/4M	—	27	14	—	11.5	—	2.2

※Mass of strainer is 2-5 g.
(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ All metal or plastic.
 ■ Simple one-piece structure to be screwed into pipe.
 ■ Detachable strainer is fitted and supplied as standard part with small capacity nozzle (metal nozzle only).

Material ■ S303 (Stainless steel 303)
 ■ Injection-molded PP (Polypropylene)
 ■ Optional material : S316, PVC, PVDF or others



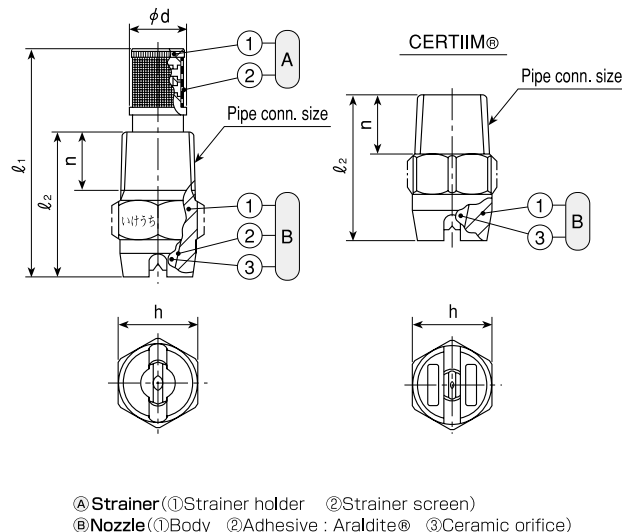
VP series (with ceramic orifice inserted)

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)	
		l_1	l_2	h	ϕd	n	S303	CERTIIM®
VP	1/8M	30	16.5	12	7.5	6.5	8	—
	1/4M	40	26	14	10	10.5	20	—
	CERTIIM® 1/8M	—	22	12	—	8.5	—	2.1
	CERTIIM® 1/4M	—	26	14	—	10.5	—	6

※Mass of strainer is 2-5 g.
(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ Ceramic orifice inserted and adhered into metal or plastic body.
 ■ Simple one-piece structure to be screwed into pipe.
 ■ Detachable strainer is fitted and supplied as standard part with small capacity nozzle (metal nozzle only).
 ■ CERTIIM® is a plastic nozzle having one-shot injection molded ceramic orifice.

Material ■ Spray orifice : Ceramics
 ■ Metal parts : S303 (Stainless steel 303)
 ■ CERTIIM®'s plastic body : PVDF (Polyvinylidene fluoride)
 ■ Optional material : S316 or others





Spray Angle	Spray Capacity Code	VVP (Metal make)		VVP (PP)		VP (Ceramic orifice)				Spray Angle			Spray Capacity (ℓ/min)								Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size	
		1/8M	1/4M	1/8M	1/4M	1/8M	1/4M	CER-TIIM® 1/8M	CER-TIIM® 1/4M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa				2 MPa
115°	03				○	●	●	○	○	101°	115°	124°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	140	0.2	200
	04				○	●	●	○	○	102°	115°	124°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	160	0.2	200
	05	●	●		○	●	●	○	○	102°	115°	124°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	160	0.3	150
	07	●	●		○	●	●	○	○	103°	115°	124°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	170	0.3	150
	10	●	●		○	●	●	○	○	103°	115°	124°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	280	0.4	150
	15	●	●		○	●	●	○	○	104°	115°	123°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	540	0.5	100
	20	●	●		○	●	●	○	○	104°	115°	123°	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	270	0.6	100
	30	●	●		○	●	●	○	○	105°	115°	122°	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	—	0.8	50
	40	●	●		○	●	●	○	○	106°	115°	122°	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	0.8	50
	60	○	○		○	○	○	○	○	107°	115°	121°	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	—	1.0	—
	80	○	○		○	○	○	○	○	107°	115°	121°	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	1.2	—
	100	○	○		○	○	○	○	○	107°	115°	120°	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	—	1.4	—
200	○	○		○	○	○	○	○	109°	115°	120°	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	—	2.4	—	
90°	02				○	●	●	○	○	76°	90°	100°	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	145	0.2	200
	03				○	●	●	○	○	76°	90°	100°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	150	0.2	200
	04				○	●	●	○	○	77°	90°	100°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	150	0.3	150
	05	●	●		○	●	●	○	○	77°	90°	100°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	170	0.3	150
	07	●	●		○	●	●	○	○	78°	90°	100°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	180	0.4	150
	10	●	●		○	●	●	○	○	78°	90°	99°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	—	0.5	100
	15	●	●		○	●	●	○	○	79°	90°	99°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	—	0.6	100
	20	●	●		○	●	●	○	○	79°	90°	98°	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	—	0.7	50
	30	●	●		○	●	●	○	○	80°	90°	97°	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	—	0.9	50
	40	○	○		○	○	○	○	○	81°	90°	97°	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	1.1	—
	50	○	○		○	○	○	○	○	81°	90°	97°	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	—	1.2	—
	60	○	○		○	○	○	○	○	82°	90°	96°	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	—	1.3	—
	80	○	○		○	○	○	○	○	82°	90°	96°	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	1.5	—
	100	○	○		○	○	○	○	○	82°	90°	96°	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	—	1.8	—
	120	○	○		○	○	○	○	○	83°	90°	95°	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	—	1.9	—
	140	○	○		○	○	○	○	○	83°	90°	95°	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1	—	2.1	—
170	○	○		○	○	○	○	○	83°	90°	95°	6.94	9.82	12.0	13.9	17.0	22.0	26.0	31.1	43.9	—	2.3	—	
200	○	○		○	○	○	○	○	84°	90°	95°	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	—	2.4	—	
80°	02				○	●	●	○	○	67°	80°	90°	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	150	0.2	200
	03				○	●	●	○	○	67°	80°	90°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	—	0.3	150
	04				○	●	●	○	○	67°	80°	90°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	—	0.3	150
	05	●	●		○	●	●	○	○	67°	80°	90°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	180	0.3	150
	07	●	●		○	●	●	○	○	68°	80°	89°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	—	0.4	150
	10	●	●		○	●	●	○	○	68°	80°	89°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	—	0.5	100
	15	●	●		○	●	●	○	○	69°	80°	88°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	—	0.7	50
	20	●	●		○	●	●	○	○	69°	80°	88°	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	—	0.8	50
	30	○	○		○	○	○	○	○	70°	80°	87°	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	—	1.0	—
	40	○	○		○	○	○	○	○	71°	80°	87°	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	1.2	—
	50	○	○		○	○	○	○	○	71°	80°	86°	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	—	1.4	—
	60	○	○		○	○	○	○	○	72°	80°	86°	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	—	1.5	—
	80	○	○		○	○	○	○	○	72°	80°	86°	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	1.7	—
	100	○	○		○	○	○	○	○	72°	80°	85°	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	—	2.0	—
	120	○	○		○	○	○	○	○	73°	80°	85°	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	—	2.3	—
	200	○	○		○	○	○	○	○	74°	80°	85°	8.16	11.5	14.1	16.3	20.0	25.8	30.6	36.5	51.6	—	2.8	—
65°	02				○	●	●	○	○	52°	65°	75°	—	0.12	0.14	0.16	0.20	0.26	0.31	0.37	0.52	155	0.2	200
	03				○	●	●	○	○	52°	65°	75°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	160	0.3	150
	04				○	●	●	○	○	52°	65°	75°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	—	0.3	150
	05	●	●		○	●	●	○	○	52°	65°	74°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	190	0.4	150
	07	●	●		○	●	●	○	○	53°	65°	74°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	—	0.5	100
	10	●	●		○	●	●	○	○	54°	65°	73°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	—	0.6	100
	15	●	●		○	●	●	○	○	54°	65°	73°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	—	0.8	50
	20	●	●		○	●	●	○	○	55°	65°	72°	0.82	1.15	1.41	1.63	2.00	2.58	3.06	3.65	5.16	—	0.9	50
	30	○	○		○	○	○	○	○	56°	65°	72°	1.23	1.73	2.12	2.45	3.00	3.88	4.58	5.48	7.75	—	1.1	—
	40	○	○		○	○	○	○	○	56°	65°	71°	1.63	2.31	2.83	3.27	4.00	5.16	6.11	7.30	10.3	—	1.3	—
	50	○	○		○	○	○	○	○	57°	65°	71°	2.04	2.89	3.54	4.08	5.00	6.46	7.64	9.13	12.9	—	1.5	—
	60	○	○		○	○	○	○	○	57°	65°	71°	2.45	3.46	4.24	4.90	6.00	7.75	9.17	11.0	15.5	—	1.6	—
	80	○	○		○	○	○	○	○	58°	65°	71°	3.27	4.62	5.66	6.53	8.00	10.3	12.2	14.6	20.6	—	1.9	—
	100	○	○		○	○	○	○	○	58°	65°	70°	4.08	5.77	7.07	8.17	10.0	12.9	15.3	18.3	25.8	—	2.1	—
	120	○	○		○	○	○	○	○	58°	65°	70°	4.90	6.93	8.49	9.80	12.0	15.5	18.3	21.9	31.0	—	2.3	—
	140	○	○		○	○	○	○	○	59°	65°	69°	5.72	8.08	9.90	11.4	14.0	18.1	21.4	25.6	36.1			



for manufacturing of electronic products

UVVP • VVP-U series



Polishing



Polishing Nozzles for PCB

UVVP series made of Ultra molecular polyethylene and VVP-U series with Urethane rubber orifice inserted in S303 body feature high chemical resistance and keep stable spray condition for a long time as polishing nozzles.



Flat spray pattern with stable distribution having tapered spray pattern edges



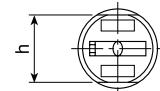
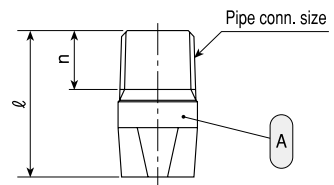
[Spray Pattern]



[Spray Distribution]

UVVP series

Series	Pipe Conn. Size	Dimensions (mm)			Mass (g)
		ℓ	h	n	
UVVP	¼M	26	12	10.5	2.5



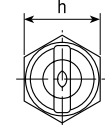
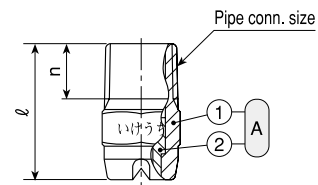
Ⓐ Nozzle

Structure ■ UPE made.
 ■ Simple one-piece structure to be screwed into pipe.

Material ■ UPE (Ultra molecular polyethylene)

VVP-U series

Series	Pipe Conn. Size	Dimensions (mm)			Mass (g)
		ℓ	h	n	
VVP-U	¼M	26	14	10.5	2.2



Ⓐ Nozzle (①Body ②Urethane rubber orifice)

Structure ■ One-piece structure with urethane orifice inserted.
 ■ Simple one-piece structure to be screwed into pipe.

Material ■ Spray orifice : Urethane, Metal parts : S303 (Stainless steel 303)

Spray Angle Code	Spray Capacity Code	UVVP (UPE)	VVP-U (US303)	Spray Angle			Spray Capacity (ℓ/min)						Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
		¼M	¼M	0.15 MPa	0.3 MPa	0.5 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa		
65°	40	○	○	56°	65°	70°	1.63	2.31	2.83	3.27	4.00	5.16	300	1.3
	50	○	○	57°	65°	70°	2.04	2.89	3.54	4.08	5.00	6.46	360	

How to order

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

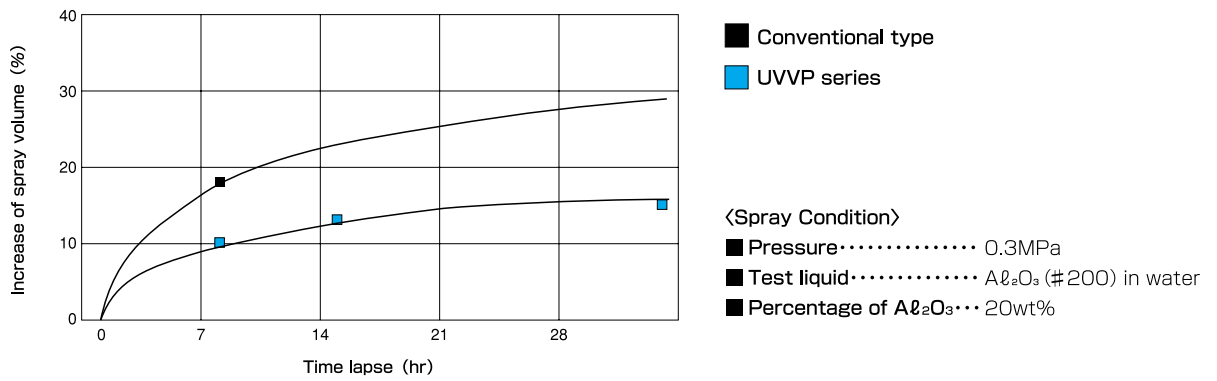
① UVVP
 (Example) ...¼MUVVP6540UPE
 ¼MUVVP65 40 UPE
 Spray Capacity Code
 ■ 40
 ■ 50

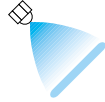
② VVP-U
 (Example) ...¼MVVP6540U-S303
 ¼MVVP65 40 U-S303
 Spray Capacity Code
 ■ 40
 ■ 50



UPE flat spray nozzle / Comparison of wear-resistance

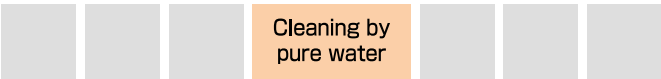
The comparison of wear-resistance between UVVP flat spray nozzle and our conventional type are shown as follows.



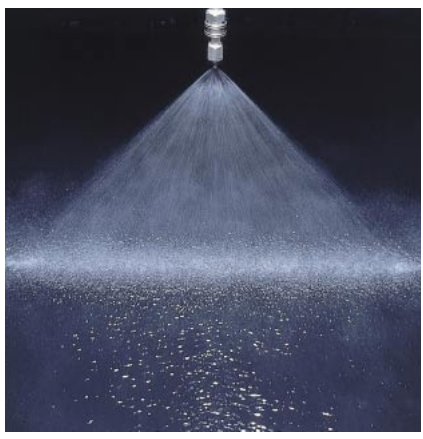


for manufacturing of electronic products

VEP series



Cleaning by pure water

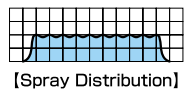


Even Flat Distribution
Suitable for the application for cleaning uniformly throughout spray area by a nozzle.

Low-price and High-precision
CERTIIM®, plastic nozzle with one-shot injection molded ceramic orifice, combines high precision with low price.



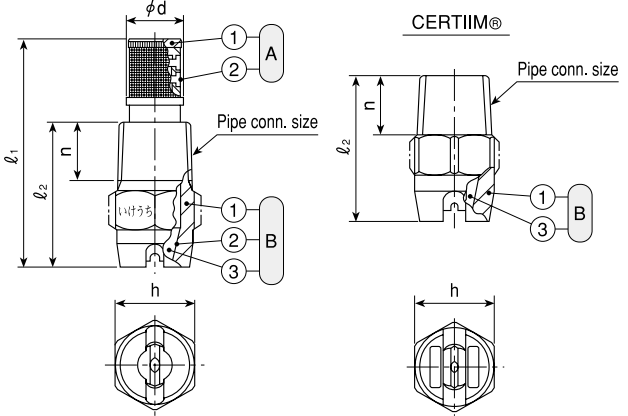
Even flat spray pattern with uniform distribution across the entire spray area



VEP series (with ceramic orifice inserted)

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)	
		ℓ ₁	ℓ ₂	h	φd	n	S303	CERTIIM®
VEP	1/8M	30	16.5	12	7.5	6.5	7.9	—
	1/4M	40	26	14	10	10.5	17	—
	CERTIIM® 1/8M	—	22	12	—	8.5	—	2.1
	CERTIIM® 1/4M	—	26	14	—	10.5	—	6

※Weight of strainer is 2-5 g.
(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Structure ■ One-piece structure with ceramic orifice.
■ CERTIIM® is a plastic nozzle having one-shot injection molded ceramic orifice.

Material ■ Spray orifice : Ceramics
■ Metal parts : S303(Stainless steel 303)
CERTIIM®'s plastic body : PVDF(Polyvinylidene fluoride)
Optional material : S316 or others

Ⓐ Strainer (① Strainer holder ② Strainer screen)
Ⓑ Nozzle (① Body ② Adhesive : Araldite® ③ Ceramic orifice)

Spray Angle Code	Spray Capacity Code	Pipe Conn. Size				Spray Angle			Spray Capacity (ℓ/min)										Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size	
		1/8M	1/4M	CERTIIM® 1/8M	CERTIIM® 1/4M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	3 MPa				5 MPa
115°	19	●	○	○	○	104°	115°	122°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	240	0.5	100
	23	●	○	○	○	105°	115°	122°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39	240	0.6	100
	31	●	○	○	○	105°	115°	122°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7	240	0.6	100
	36	●	○	○	○	105°	115°	122°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	240	0.7	50
	39	●	○	○	○	105°	115°	122°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	240	0.7	50
	59	●	○	○	○	105°	115°	122°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	240	0.9	50
	78	○	○	○	○	106°	115°	121°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	240	1.0	—
	117	○	○	○	○	106°	115°	120°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	240	1.2	—
	157	○	○	○	○	106°	115°	120°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	480	1.4	—

●With strainer ○Without strainer



Spray Angle Code	Spray Capacity Code	Pipe Conn. Size				Spray Angle			Spray Capacity (ℓ/min)										Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size																																								
		1/8M	1/4M	CERTIIM® 1/8M	CERTIIM® 1/4M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	3 MPa				5 MPa																																							
90°	03	●		○		78°	90°	101°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	0.95	1.22	140	0.2	200																																							
	04	●		○		79°	90°	101°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	1.26	1.63				250	0.2	200																																				
	05	●		○		79°	90°	101°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	1.58	2.04							5	0.3	150																																	
	07	●		○		80°	90°	101°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	2.21	2.86										5	0.3	150																														
	10	●		○		80°	90°	100°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	3.16	4.08													5	0.4	150																											
	15	●		○		82°	90°	100°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	4.74	6.12																5	0.4	150																								
	19		●		○	82°	90°	98°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76																			250	0.7	50																					
	23		●		○	82°	90°	98°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39																						250	0.7	50																		
	31		●		○	83°	90°	97°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7																									250	0.9	50															
	36		○		○	83°	90°	97°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6																												250	1.0	—												
	39		○		○	83°	90°	97°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9																															250	1.0	—									
	59		○		○	83°	90°	97°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1																																		250	1.2	—						
	78		○		○	84°	90°	97°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8																																					250	1.4	—			
	117		○		○	84°	90°	96°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8																																								250	1.7	—
	157		○		○	84°	90°	96°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1																																										
80°	19		●		○	72°	80°	84°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	260	0.7	50																																							
	23		●		○	72°	80°	84°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39				260	0.8	50																																				
	31		●		○	72°	80°	84°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7							260	0.9	50																																	
	36		○		○	72°	80°	84°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6										260	1.0	—																														
	39		○		○	73°	80°	84°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9													260	1.0	—																											
	59		○		○	74°	80°	84°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1																260	1.3	—																								
	78		○		○	74°	80°	84°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8																			260	1.6	—																					
	117		○		○	75°	80°	84°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8																						260	1.9	—																		
	157		○		○	76°	80°	84°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1																									480	2.4	—															
65°	03	●		○		54°	65°	76°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	0.95	1.22	150	0.3	150																																							
	04	●		○		54°	65°	76°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	1.26	1.63				150	0.3	150																																				
	05	●		○		54°	65°	75°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	1.58	2.04							150	0.4	150																																	
	07	●		○		55°	65°	75°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	2.21	2.86										150	0.4	150																														
	10	●		○		56°	65°	74°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	3.16	4.08													150	0.5	100																											
	15	●		○		56°	65°	74°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	4.74	6.12																150	0.5	100																								
	19		●		○	57°	65°	73°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76																			270	0.8	50																					
	23		●		○	57°	65°	73°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39																						270	0.9	50																		
	31		○		○	57°	65°	73°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7																									270	1.1	—															
	36		○		○	57°	65°	73°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6																												270	1.2	—												
	39		○		○	57°	65°	73°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9																															270	1.3	—									
	59		○		○	58°	65°	72°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1																																		270	1.4	—						
	78		○		○	58°	65°	72°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8																																					270	1.8	—			
	117		○		○	58°	65°	69°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8																																								270	2.3	—
	157		○		○	58°	65°	69°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1																																										

● With strainer ○ Without strainer

How to order

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

(Example) ...1/4MVEP11519S303W

1/4M Pipe Conn. Size	VEP	115 Spray Angle Code	19 Spray Capacity Code	S303 Material	W Strainer
1/8M		115°	03	S303	W(with Strainer)
1/4M		65°	157	TPVDF (CERTIIM®)	—(without Strainer)

DSP series

Through-hole cleaning

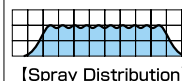
High pressure cleaning



Powerful Cleaning Nozzle
 World uncommon flat spray nozzles for powerful cleaning and descaling.
 Producing a thin flat spray pattern like a sharp razor blade, DSP nozzles give more powerful cleaning effects than any other flat spray nozzles.



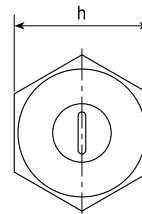
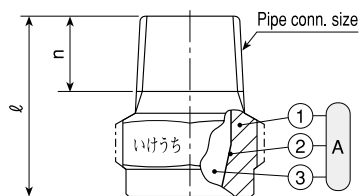
Flat spray pattern with very strong spray impulse for powerful cleaning



DSP series

Series	Pipe Conn. Size	Dimensions (mm)			Mass (g)
		ℓ	h	n	
DSP	1/8M	16.5	12	7	7

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Structure ■ One-piece structure with ceramic orifice.
 ■ Opening of ceramic orifice is circular from inlet to throat and it gradually contracts to longer rectangle towards outlet.

Material ■ Spray orifice : Ceramics
 ■ Metal parts : S303 (Stainless steel 303)

Ⓐ Nozzle (①Body ②Adhesive : Araldite® ③Ceramic orifice)

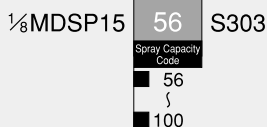
Spray Angle Code	Spray Capacity Code	Pipe Conn. Size	Spray Angle			Spray Capacity (ℓ/min)										Free Pass. Dia. (mm)
			1/8M	3 MPa	5 MPa	10 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa	15 MPa	
15°	56	○	14°	15°	15°	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	11.2	0.4
	64	○	14°	15°	15°	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	12.8	0.4
	72	○	14°	15°	15°	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	14.4	0.4
	80	○	14°	15°	15°	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	16.0	0.4
	88	○	14°	15°	15°	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	17.6	0.4
	96	○	14°	15°	15°	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	19.1	0.5
	104	○	14°	15°	15°	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	20.8	0.5
	112	○	14°	15°	15°	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	22.4	0.5
	120	○	14°	15°	15°	9.26	10.0	10.7	11.4	12.0	13.7	15.2	17.0	20.8	24.0	0.6
	128	○	14°	15°	15°	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	25.6	0.6
	144	○	14°	15°	15°	11.1	12.0	12.9	13.6	14.4	16.4	18.2	20.3	24.9	28.8	0.7
	160	○	14°	15°	15°	12.4	13.4	14.3	15.2	16.0	18.2	20.2	22.6	27.7	32.0	0.8

(Note) Please use clean water, or a small orifice nozzle may be clogged.

How to order

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

(Example) ...1/8MDSP1556S303





LYYP series Patent pending

Developing
Cleaning by pure water



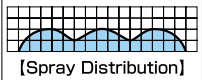
Uniform Spray Distribution at Ultra-low Pressure
 Capable of low operating pressures (0.015MPa).

Suitable for Precision Developing
 Low spray impact causes no bubbles or foam on the spray surface.
 Made of highly chemical-resistant material.

Ultra Low Spray Impulse
 Spray impulse is so low that there is no damage to objects.



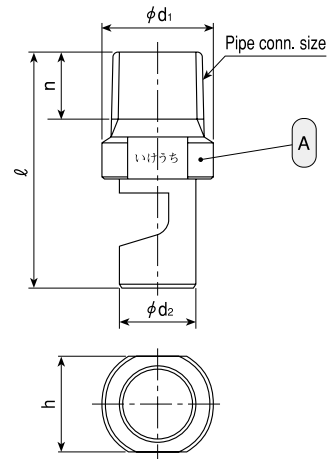
Wide-angle flat spray pattern at ultra-low pressure



LYYP series

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)
		ℓ	h	n	φd ₁	φd ₂	
LYYP	1/8M	23	10	7	12	8	1.5

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Ⓐ Nozzle

Structure ■ One-piece structure, all plastic.

Material ■ PVC (Polyvinyl chloride)
 ■ Optional material : S316 or PCTFE

Spray Capacity Code	Pipe Conn. Size	Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
		0.01 MPa	0.015 MPa	0.02 MPa	0.008 MPa	0.01 MPa	0.012 MPa	0.015 MPa	0.02 MPa	0.03 MPa	0.04 MPa		
02	1/8M	—	70°	77°	—	—	0.18	0.20	0.23	0.28	0.33	850	0.9
025		67°	80°	87°	—	0.20	0.22	0.25	0.29	0.35	0.41		
03		77°	90°	97°	0.22	0.24	0.27	0.30	0.35	0.42	0.49		
035		87°	100°	107°	0.26	0.29	0.31	0.35	0.40	0.49	0.57		
04		88°	100°	108°	0.29	0.33	0.36	0.40	0.46	0.57	0.65		
05		97°	110°	117°	0.37	0.41	0.45	0.50	0.58	0.71	0.82		
06		107°	120°	127°	0.44	0.49	0.54	0.60	0.69	0.85	0.98		
07		107°	120°	127°	0.51	0.57	0.63	0.70	0.81	0.99	1.14		
08		108°	120°	128°	0.58	0.65	0.72	0.80	0.92	1.13	1.31		
10		108°	120°	128°	0.73	0.82	0.89	1.00	1.15	1.41	1.63		

How to order

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

〈Example〉...1/8MLYYP02PVC

1/8MLYYP 02 PVC

Spray Capacity Code
02
 {
10

YYP series

Developing

Cleaning by pure water



Wide-angle flat spray pattern /
Spraying at an angle of 75° to
the axis of the nozzle

[Spray Pattern]



Wide-angle Spray at Low Pressure

Capable of generating wide-angle flat spray at low liquid pressure.

Low Spray Impulse

Low spray impulse compared with other flat spray nozzles.

Minimal Clogging

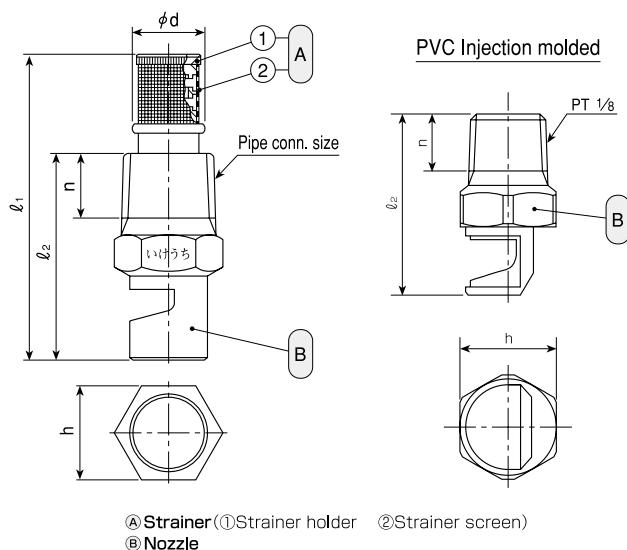
Large free passage diameter for minimal clogging.

YYP series

Series	Pipe Conn. Size	Spray Capacity Code	Dimensions (mm)					Mass (g)	
			ℓ ₁	ℓ ₂	h	φd	n	S303	PVC
YYP	1/8M	03~13	35.5	23	10	7.5	7	7.5	—
	1/8M	16~60	—	25	10	—	7	9.3	—
	1/4M	—	—	34	14	—	10.5	28	—
YYP (Injection molded)	1/8M	—	—	22.5	12	—	7	—	1.8

※Weight of strainer is 2-5 g.

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Structure ■ One-piece structure of all metal or plastic.

Material ■ S303 (Stainless steel 303)
Injection-molded PVC (Polyvinyl chloride)
■ Optional material : S316 or others

Ⓐ Strainer (① Strainer holder ② Strainer screen)
Ⓑ Nozzle

Spray Capacity Code	YYP (Metal·Plastic)		YYP (Injection molded)	Spray Angle			Spray Capacity (ℓ/min)							Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size		
	1/8M	1/4M	1/8M	0.05 MPa	0.15 MPa	0.4 MPa	0.03 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa					
03	●		○※1	—	100°	117°	—	—	0.25	0.30	0.35	0.42	0.55	190	0.6	100		
04	●		○	—	120°	137°	—	—	0.33	0.40	0.46	0.56	0.73				0.7	50
05	●		○	—	130°	146°	—	—	0.41	0.50	0.58	0.71	0.91				0.8	50
07	○		○	—	130°	145°	—	—	0.57	0.70	0.81	0.99	1.28	∩	1.0	—		
10	○		○	103°	130°	144°	—	0.58	0.82	1.00	1.15	1.41	1.83				1.1	—
13	○		○	108°	130°	144°	—	0.75	1.06	1.30	1.50	1.84	2.37	280	1.5	—		
16	○		○	110°	130°	143°	—	0.92	1.31	1.60	1.85	2.26	2.92				1.7	—
20	○		○	116°	135°	147°	0.89	1.15	1.63	2.00	2.31	2.83	3.65	∩	2.0	—		
25	○		○	117°	135°	146°	1.12	1.44	2.04	2.50	2.89	3.54	4.56				1.8	—
30	○		○	118°	135°	146°	1.34	1.73	2.45	3.00	3.46	4.24	5.48	∩	2.4	—		
40	○		○	119°	135°	145°	1.79	2.31	3.27	4.00	4.62	5.66	7.30				2.6	—
50	○		○	120°	135°	145°	2.24	2.89	4.08	5.00	5.77	7.07	9.13	470	2.8	—		
60	○		○	121°	135°	144°	2.68	3.46	4.90	6.00	6.93	8.49	11.0				3.1	—
70		○		125°	140°	149°	3.13	4.04	5.72	7.00	8.08	9.90	12.8	480	3.6	—		
100		○		128°	140°	148°	4.47	5.77	8.16	10.0	11.5	14.1	18.3				3.6	—
140		○		130°	140°	147°	6.26	8.08	11.4	14.0	16.2	19.8	25.6	610	4.3	—		

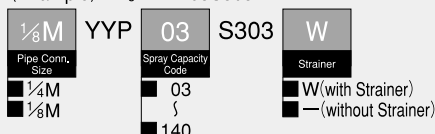
● With strainer ○ Without strainer

※1……Spray angles of injection molded spray nozzle whose spray capacity code is 03 are 115° at 0.15MPa and 135° at 0.4MPa.

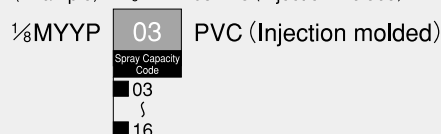
How to order

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

① YYP (metal · plastic)
(Example) ... 1/8MYYP03S303W



② YYP (Injection molded)
(Example) ... 1/8MYYP03PVC (Injection molded)

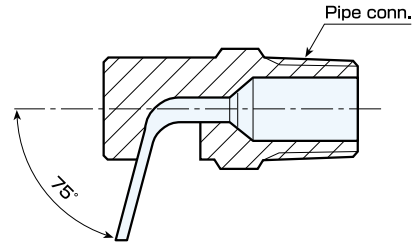
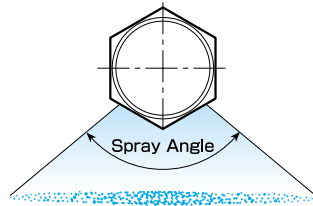




Technical data of LYYP · YYP series

Spray Angle and Deflection Angle

Wide-angle flat spray nozzles spray at an angle of 75° to the axis of the nozzle.
For installation the deflection angle of 75° must be taken into consideration.



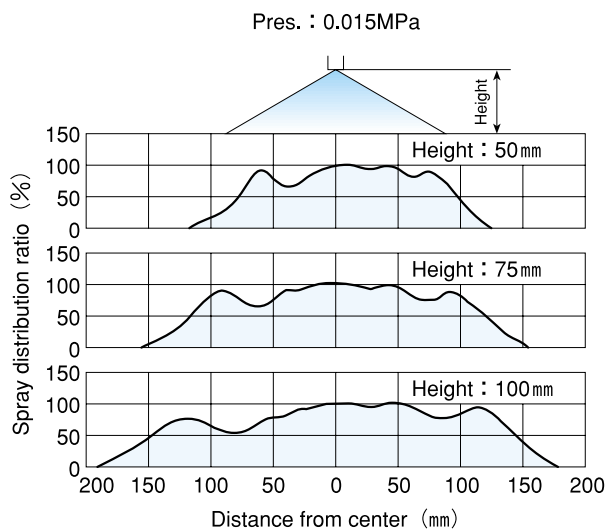
Free Passage Diameter

The free passage diameter shows the approximate diameter of the spray orifice.
Wide-angle flat spray nozzles have the largest free passage diameters among all the flat spray nozzles having the same spray capacity and are suitable for spraying water of which quality is not so good.

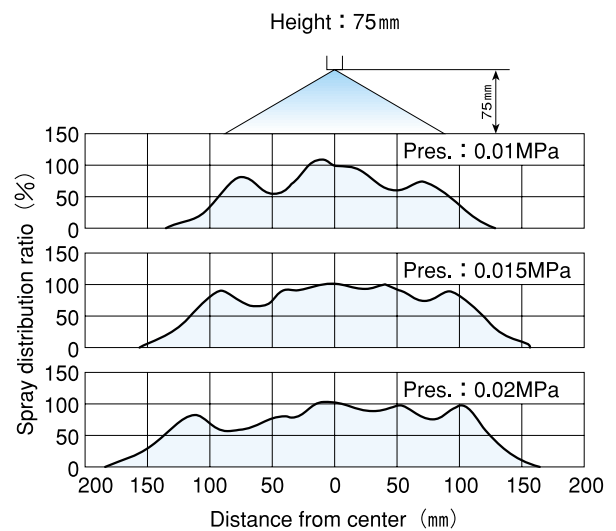
Spray Distribution of Wide-angle Flat Spray Nozzle for Ultra-low Pressure Spraying

The variation in spray distribution is minimal despite the spray height and spray pressure.

■ 1/8MLYYP07PVC



Relation between spray height and spray distribution



Relation between spray pressure and spray distribution

VZ series

Drying

Air blow-off

Air knife



For showing spray pattern water is sprayed.

Wide Spray Angle for Wide Coverage
Spray angle is 90° and covers wide area.

Three-piece Structure
Spray capacity is adjustable by exchanging a spray tip.



Flat spray nozzle for spraying gas such as air, N₂ etc.

VZ series

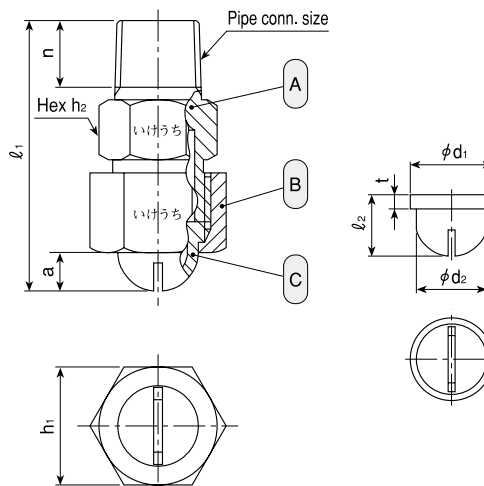
< Complete nozzle >

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)
		ℓ ₁	h ₁	h ₂	a	n	
VZ	¼M	43	19	17	6.5	10.5	44

< Spray tip >

Series	Pipe Conn. Size of Complete Nozzle	Dimensions (mm)				Mass (g)
		ℓ ₂	φd ₁	φd ₂	t	
VZ	¼M	11	14.5	12.5	2.5	4.7

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



Ⓐ Adaptor Ⓑ Cap Ⓒ Spray tip

- Structure**
- Three-piece structure of all metal.
 - Comprises three parts : Spray tip, cap and adaptor. Worn-out spray tip can be replaced separately.
 - Cap and adaptor are exchangeable with those of three-piece structure standard flat spray nozzle for liquid.

- Material**
- S303 (Stainless steel 303)
 - Optional material : S316 or others

Spray Angle Code (at 3kg/cm ²)	Spray Capacity Code	Pipe Conn. Size	Air Capacity (Nℓ/min)							Steam Capacity (kg/hr.)					Free Pass. Dia. (mm)
			0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	
90°	150	○	55.7	77.6	116	154	230	307	2.62	3.56	5.27	6.97	10.3	13.7	0.2
	200	○	73.1	102	152	202	302	402	3.44	4.67	6.92	9.14	13.6	17.9	0.3
	250	○	90.5	126	188	250	374	498	4.26	5.78	8.57	11.3	16.8	22.2	0.4
	300	○	108	150	224	298	446	594	5.08	6.90	10.2	13.5	20.0	26.5	0.5
	350	○	125	175	261	346	518	690	5.90	8.00	11.9	15.7	23.2	30.7	0.6
	400	○	143	199	297	394	590	786	6.72	9.12	13.5	17.9	26.5	35.0	0.7
	450	○	160	223	333	443	662	882	7.54	10.2	15.2	20.0	29.7	39.3	0.8
	500	○	177	247	369	491	734	977	8.36	11.3	16.8	22.2	32.9	43.5	0.9

How to order

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

① Complete nozzle
<Example>...¼MVZ150S303

¼MVZ **150** S303
 Spray Capacity Code
 ■ 150
 }
 ■ 500

② Spray tip only
<Example>...¼VZ150S303

¼VZ **150** S303
 Spray Capacity Code
 ■ 150
 }
 ■ 500



TAIFUJet® Patent pending

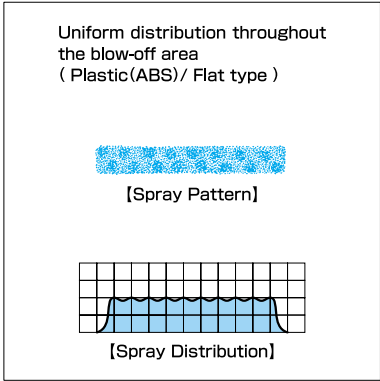
- Drying
- Air blow-off



Amplify Compressed Air
Take in surrounding air through holes around nozzle edge, and spout out double volume of air supplied. Ideal for air blow-off application for PCB. (Plastic(ABS)/ Flat type)

Uniform Spray Impulse Distribution
Achieve uniform and efficient air blow and lower air consumption.

Reduce Noise Level
Designed to reduce noise level for improving working environments.

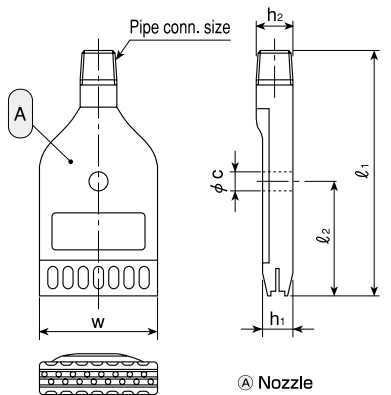
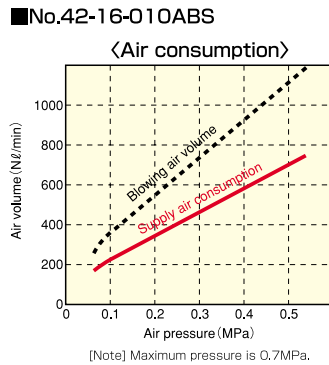


TAIFUJet® [Plastic(ABS)/ Flat type]

Series	Pipe Conn. Size	Dimensions (mm)						Mass (g)
		l ₁	l ₂	w	h ₁	h ₂	φc	
TAIFUJet® No.42-16-010ABS	¼M	90	42	42	11	14	7	30

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Material ■ ABS (Acrylonitrile butadiene styrene)
■ Optional material : PPS (Polyphenylene sulfide)

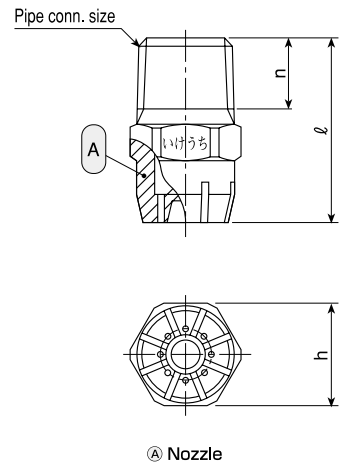
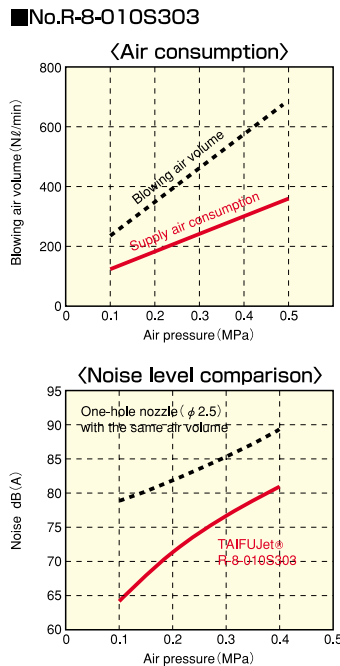


TAIFUJet® [Stainless-steel / Round type]

Series	Pipe Conn. Size	Dimensions (mm)			Mass (g)
		ℓ	h	n	
TAIFUJet® No.R-8-010S303	¼M	25	14	9.5	15

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Material ■ SUS303(Stainless steel 303)



How to order

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

① Plastic air nozzle (ABS), Flat type
TAIFUJet® No.42 — 16 — 010ABS

② Stainless-steel air nozzle, Round type
TAIFUJet® No.R — 8 — 010S303

CP series

High pressure cleaning

Solid Stream Jet for Powerful Cleaning

Interior design featuring minimal pressure drop generates stabilized straight streamline.

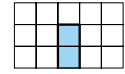
Orifice with Great Wear-Resistance

Ceramic-orifice inserted CP nozzle have more than 20 times wear-resistance than stainless steel tip nozzle.



Highest impact solid stream nozzle.

[Spray Pattern]



[Spray Distribution]

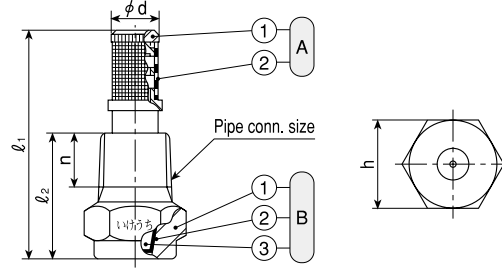
CP series

Series	Pipe Conn. Size	Dimensions (mm)					Mass (g)
		l ₁	l ₂	h	n	φd	
CP	1/8M	29.5	16.5	12	7	5.5	7.1

※Mass of strainer is 2-5 g.
(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Structure ■ One-piece structure with ceramic orifice inserted.

Material ■ Spray orifice : Ceramics
 ■ Metal parts : S303 (Stainless steel 303)
 ■ Optional material : S316 or others



Ⓐ Strainer (① Strainer holder ② Strainer screen)
 Ⓑ Nozzle (① Body ② Adhesive : Araldite® ③ Ceramic orifice)

Spray Capacity Code	Pipe Conn. Size	Spray Capacity (ℓ/min)												Orifice Diameter (mm)	Strainer Mesh Size
		1/8M	1 MPa	2 MPa	2.5 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa		
25	●	1.43	2.02	2.25	2.47	2.67	2.85	3.03	3.19	3.64	4.03	4.51	5.52	0.8	50
31	●	1.78	2.52	2.82	3.09	3.34	3.57	3.78	3.99	4.55	5.05	5.64	6.91	0.9	50
37	●	2.14	3.03	3.39	3.71	4.01	4.28	4.54	4.79	5.46	6.06	6.77	8.30	1.0	—
43	○	2.50	3.54	3.96	4.33	4.68	5.00	5.30	5.59	6.37	7.06	7.91	9.67	1.1	—
49	○	2.86	4.04	4.52	4.94	5.34	5.71	6.06	6.38	7.28	8.07	9.04	11.1	1.2	—
56	○	3.22	4.54	5.08	5.56	6.01	6.42	6.81	7.18	8.19	9.08	10.2	12.4	1.2	—
62	○	3.57	5.05	5.65	6.18	6.68	7.14	7.57	7.98	9.10	10.1	11.3	13.8	1.3	—
68	○	3.93	5.55	6.21	6.80	7.35	7.85	8.33	8.79	10.0	11.1	12.4	15.2	1.4	—
74	○	4.29	6.06	6.78	7.42	8.01	8.56	9.09	9.58	10.9	12.1	13.6	16.6	1.4	—
80	○	4.65	6.56	7.35	8.04	8.68	9.28	9.85	10.4	11.8	13.1	14.7	18.0	1.5	—
87	○	5.00	7.07	7.91	8.66	9.35	10.0	10.6	11.2	12.8	14.1	15.8	19.4	1.6	—
93	○	5.36	7.58	8.48	9.28	10.0	10.7	11.4	12.0	13.7	15.2	17.0	20.8	1.6	—
99	○	5.72	8.08	9.04	9.89	10.7	11.4	12.1	12.8	14.6	16.2	18.1	22.1	1.7	—
111	○	6.43	9.09	10.2	11.1	12.0	12.9	13.6	14.4	16.4	18.2	20.3	24.9	1.8	—
124	○	7.15	10.1	11.3	12.4	13.4	14.3	15.1	16.0	18.2	20.2	22.6	27.7	1.9	—
136	○	7.85	11.1	12.4	13.6	14.7	15.7	16.7	17.6	20.0	22.2	24.8	30.4	2.0	—
148	○	8.57	12.1	13.6	14.8	16.0	17.1	18.2	19.2	21.8	24.2	27.1	33.2	2.0	—
161	○	9.28	13.1	14.7	16.1	17.4	18.6	19.7	20.8	23.7	26.2	29.3	35.9	2.1	—
173	○	9.99	14.1	15.8	17.3	18.7	20.0	21.2	22.4	25.5	28.3	31.6	38.7	2.2	—
186	○	10.7	15.2	16.9	18.6	20.0	21.4	22.7	24.0	27.3	30.3	33.9	41.5	2.3	—
198	○	11.4	16.2	18.1	19.8	21.4	22.8	24.2	25.5	29.1	32.3	36.1	44.2	2.4	—
210	○	12.1	17.2	19.2	21.0	22.7	24.3	25.7	27.1	30.9	34.3	38.4	47.0	2.4	—

● With strainer ○ Without strainer

Affiliated products CP with small orifice diameter

Orifice Diameter Code	Pipe Conn. Size	Spray Capacity (ℓ/min)												Orifice Diameter (mm)	Strainer Mesh Size
		1/8M	1 MPa	2 MPa	2.5 MPa	3 MPa	3.5 MPa	4 MPa	4.5 MPa	5 MPa	6.5 MPa	8 MPa	10 MPa		
φ 0.1	●	0.020	0.028	0.031	0.034	0.037	0.039	0.042	0.044	0.050	0.056	0.062	0.076	0.1	200
φ 0.15	●	0.044	0.063	0.070	0.077	0.083	0.089	0.094	0.099	0.113	0.126	0.141	0.172	0.15	200
φ 0.2	●	0.08	0.11	0.13	0.14	0.15	0.16	0.17	0.18	0.20	0.22	0.25	0.31	0.2	200
φ 0.25	●	0.12	0.18	0.20	0.22	0.23	0.25	0.26	0.28	0.32	0.35	0.39	0.48	0.25	200
φ 0.3	●	0.18	0.25	0.28	0.31	0.33	0.36	0.38	0.40	0.46	0.51	0.56	0.69	0.3	150
φ 0.4	●	0.32	0.45	0.50	0.55	0.59	0.63	0.67	0.71	0.81	0.90	1.00	1.23	0.4	150
φ 0.5	●	0.50	0.70	0.79	0.86	0.93	0.99	1.05	1.11	1.27	1.40	1.57	1.92	0.5	100
φ 0.6	●	0.72	1.01	1.13	1.24	1.34	1.43	1.52	1.60	1.83	2.02	2.26	2.77	0.6	100
φ 0.7	●	0.97	1.37	1.53	1.68	1.81	1.94	2.06	2.17	2.47	2.74	3.07	3.76	0.7	50
φ 0.8	●	1.27	1.80	2.01	2.20	2.38	2.54	2.69	2.84	3.24	3.59	4.02	4.92	0.8	50

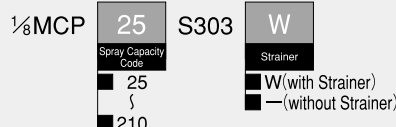
● With strainer

※ The above nozzles are manufactured for designated orifice diameters therefore spray capacity is not guaranteed.

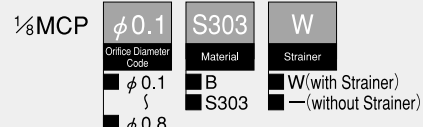
How to order

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

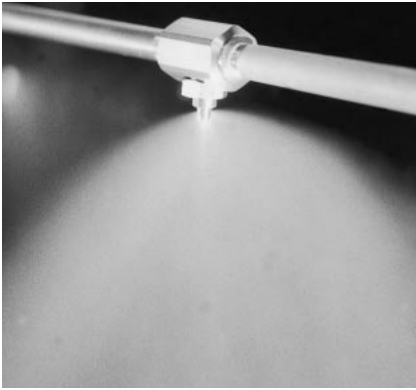
① Standard CP
 (Example) ...1/8MCP25S303W



② CP with small orifice diameter
 (Example) ...1/8MCPφ0.1S303W



BIM series Patent registered



<Integrated multiple-nozzle header>

IKEUCHI's BIM series pneumatic spray nozzles meet conditions that every pneumatic spray nozzles are required, and BIM nozzles are ideal for electronic production in developing process or precision cleaning process of interstices.

High Quality

State of art of IKEUCHI's advanced atomization technology. Unprecedented high quality and high efficiency pneumatic nozzle.

High Reliability

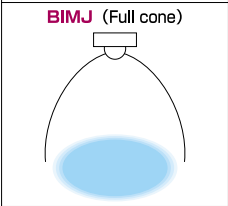
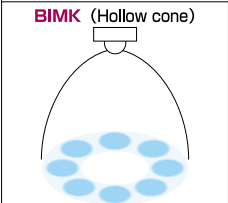
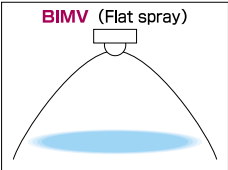
IKEUCHI's unique design minimizes clogging and offers longer life.

Wide Selection

Spray pattern available in three types, flat spray (BIMV nozzles), hollow cone spray (BIMK) and full cone spray (BIMJ). Assembly units such as spray headers and other ancillary device for various usage are also available.

Low Price

Assembled by fewer components compared with other pneumatic spray nozzles for easy maintenance and lower price.



Mist Cleaning

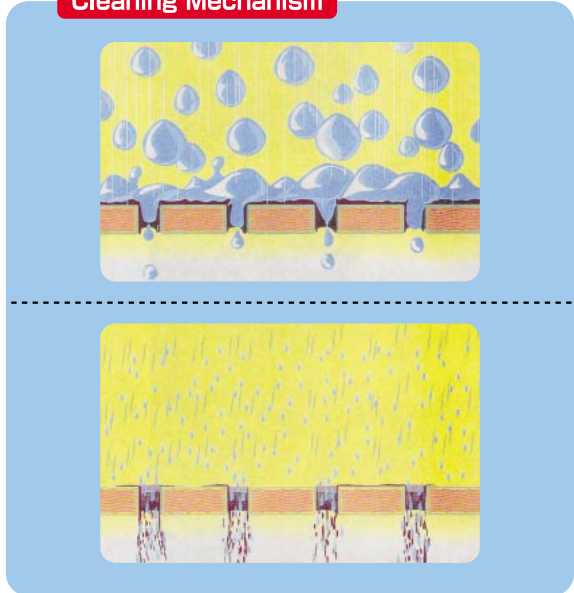
New cleaning method in cleaning process of photo-processing products.
 Large droplets of conventional cleaning method by using hydraulic nozzles can not clean fine interstices.
 Very fine mist of high velocity produced by pneumatic nozzles will powerfully wash out dirt in interstices and wall surfaces.

■ Features of Mist Cleaning

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

BIM series achieves optimal precision cleaning only with one-fifth the water required for hydraulic spray nozzles.

Cleaning Mechanism



VVEA series Patent pending

Precision cleaning



High-Impact Cleaning Pneumatic Nozzle

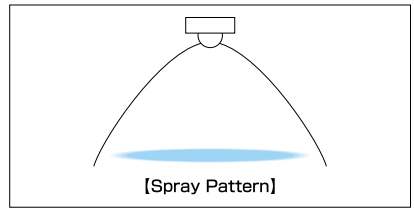
Developed for precision cleaning process. Powerful and uniform spray impulse with thin spray pattern is ideal for cleaning of LCD.

Large Turndown Ratio, Uniform Distribution

Large turndown ratio with stable spray angle and distribution.

Compact Design

Simple structure assembled with small number of components. Compact design with 34mm in total length (60° type) for installing in narrow space. Spray header with VVEA nozzles is available.

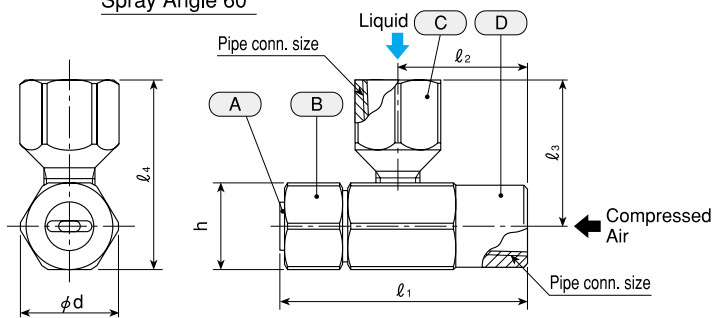


VVEA series

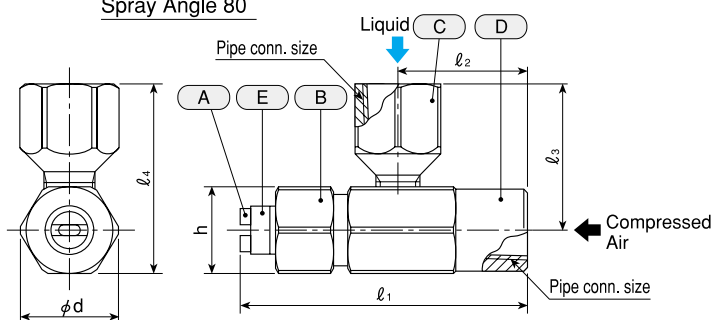
Series	Spray Angle Code	Pipe Conn. Size	Dimensions (mm)						Mass (g)
			l ₁	l ₂	l ₃	l ₄	h	φd	
VVEA	60°	1/8F	34	18	21	28	14	15.5	38
	80°		41						40

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.

Spray Angle 60°



Spray Angle 80°



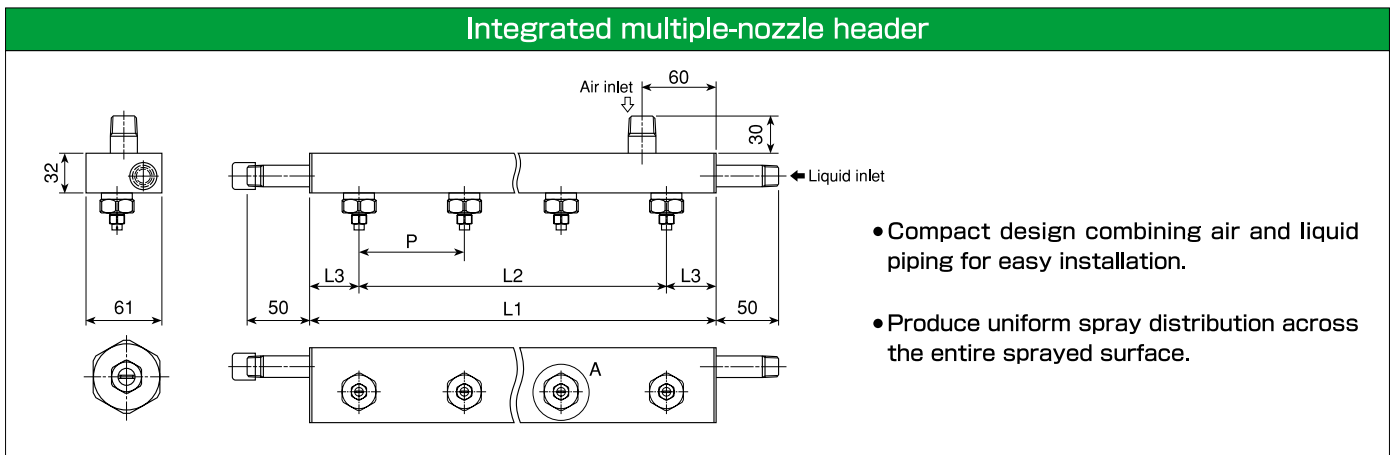
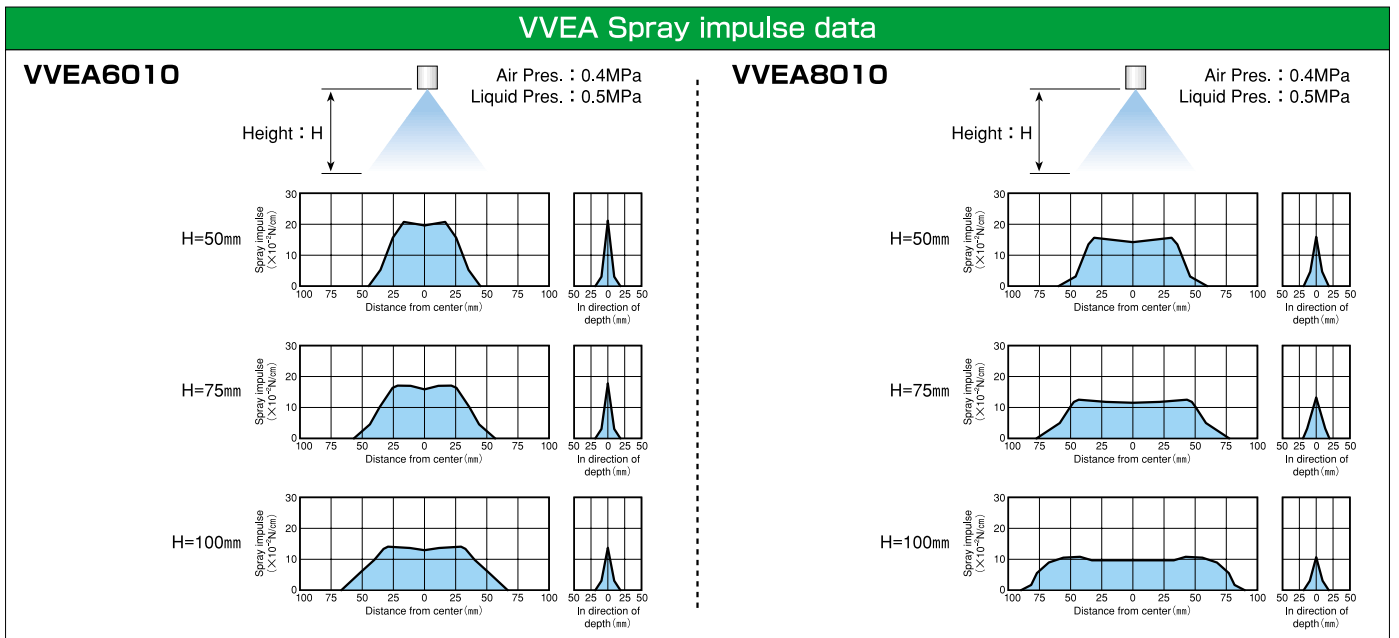
Material ■ S303(Stainless steel 303)

Ⓐ Spray tip Ⓑ Cap Ⓒ Liquid socket Ⓓ Mixing adaptor Ⓔ Sleeve

Nozzle Code	Spray Angle Code	Spray Capacity Code	Air Pressure (MPa)	Spray Capacity (ℓ/min) Air Consumption (Nℓ/min)								Mean Droplet Diameter (μm)※	Free Passage Diameter (mm)		
				Liquid Pressure (MPa)									Spray Tip	Mixing Adaptor	
				0.2		0.3		0.5		0.7				Liquid	Air
8010	80	1.0	0.2	0.54	36	0.90	24	—	—	—	20	1.0	1.1	1.3	
			0.3	0.30	58	0.60	49	1.28	25	1.78	11				
			0.4	—	—	0.39	74	1.00	50	1.50	32				
			0.5	—	—	—	—	0.81	69	1.28	51				
8020	80	2.0	0.2	0.96	44	1.98	18	—	—	30	1.1	1.6	1.6		
			0.3	0.53	81	1.10	59	2.63	19	—				—	
			0.4	—	—	0.53	104	2.00	50	3.50				13	
			0.5	—	—	—	—	1.30	89	2.95				39	
8030	80	3.0	0.2	1.34	50	—	—	—	—	40	1.3	1.9	1.9		
			0.3	0.39	100	1.60	64	—	—	—				—	
			0.4	—	—	0.88	128	3.00	50	—				—	
			0.5	—	—	—	—	2.25	85	4.17				33	

Nozzle Code	Spray Angle Code	Spray Capacity Code	Air Pressure (MPa)	Spray Capacity (ℓ/min) Air Consumption (Nℓ/min)								Mean Droplet Diameter (μm)※	Free Passage Diameter (mm)		
				Liquid Pressure (MPa)									Spray Tip	Mixing Adaptor	
				0.2		0.3		0.5		0.7				Liquid	Air
				Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air				
6010	60	1.0	0.2	0.54	36	0.90	24	—		—		20	1.4	1.1	1.3
			0.3	0.30	58	0.60	49	1.28	25	1.78	11				
			0.4	—		0.39	74	1.00	50	1.50	32				
			0.5	—		—		0.81	69	1.28	51				
6020	60	2.0	0.2	0.96	44	1.98	18	—		—		30	1.5	1.6	1.6
			0.3	0.53	81	1.10	59	2.63	19	—					
			0.4	—		0.53	104	2.00	50	3.50	13				
			0.5	—		—		1.30	89	2.95	39				
6030	60	3.0	0.2	1.34	50	—		—		—		40	1.6	1.9	1.9
			0.3	0.39	100	1.60	64	—		—					
			0.4	—		0.88	128	3.00	50	—					
			0.5	—		—		2.25	85	4.17	33				

※Figures are Sauter mean droplet diameter measured by Laser Doppler particle size analyzer.



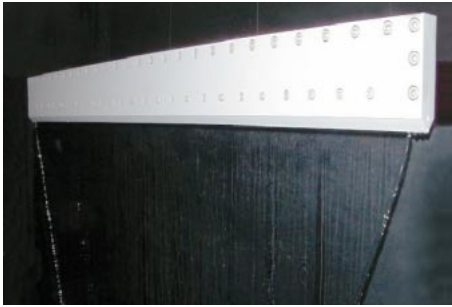
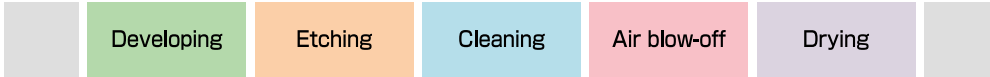
How to order

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

(Example) ... 1/8 VVEA8010S303

1/8 VVEA	80	10	S303
	Spray Angle Code	Spray Capacity Code	
	80°	10	
	60°	20	
		30	

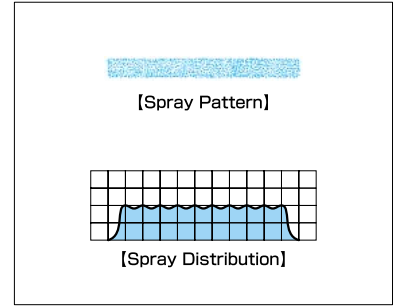
SLNH / SLNHA series Patent pending



Uniform Distribution with Soft Impact
Spray uniformly in width direction with soft spray impact for minimal damage to the products.

Save Liquid Cost
Thinner water curtain spray saves cost of chemicals and water.

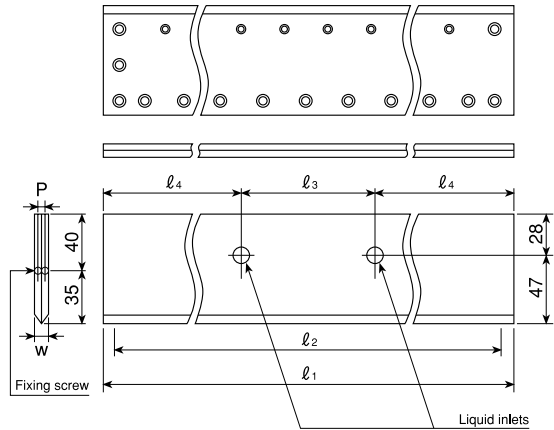
Compact Design
Suitable for downsizing process equipment.



SLNH / SLNHA series

Series	Nozzle code		Effective lamination width(mm), at 10mm height	Number of inlets	Thread size	Dimensions(mm)								Mass (kg)
	Slit length (mm)	Slit opening (mm)				Liquid inlet	Fixing	l ₁	l ₂	l ₃	l ₄	w	P	
SLNH (Liquid spraying)	460	×0.1	410	2	3/8F	M5 (M6)	490	460	120	185	20 (30)	10 (20)	3.8(1.2)	
	600		550	2			630	600	150	240			4.8(1.5)	
	700		650	2			730	700	180	275			5.8(1.8)	
	780		730	2			810	780	200	305			6.2(2)	
	1200		1150	3			1230	1200	135	480			9.5(3)	
SLNH (Liquid spraying)	460	×0.3	410	2	3/8F	M5 (M6)	490	460	120	185	20 (30)	10 (20)	3.8(1.2)	
	600		550	2			630	600	150	240			4.8(1.5)	
	700		650	2			730	700	180	275			5.8(1.8)	
	780		730	2			810	780	200	305			6.2(2)	
	1200		1150	3			1230	1200	135	480			9.5(3)	
SLNHA (Air spraying)	530	×0.1	—	2	3/8F	M5 (M6)	560	530	265	147.5	20 (30)	10 (20)	4.2(1.4)	
	700		—	2			730	700	350	190			5.5(1.8)	
	810		—	2			840	810	400	220			6.3(2)	
	900		—	2			930	900	450	240			7(2.3)	
	1400		—	2			1430	1400	700	365			11(3.5)	

(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes. ※ () =Dimensions of PVC



SLNH1200 (Liquid spraying) has three inlets.

Material ■ S304(Stainless steel 304), PVC(Polyvinyl chloride)

Series	Slit Length x Slit Opening		Spray Capacity (ℓ /min)							
			0.02 MPa	0.03 MPa	0.04 MPa	0.05 MPa	0.06 MPa	0.07 MPa	0.08 MPa	
SLNH (Liquid spraying)	460	×0.1	10.7	13.4	15.7	17.8	19.7	21.4	23.1	
			600	13.9	17.4	20.5	23.2	25.7	27.9	30.1
			700	16.2	20.3	23.9	27.0	29.9	32.6	35.1
			780	18.1	22.7	26.6	30.1	33.3	36.3	39.1
	1200	27.8	34.9	40.9	46.4	51.3	55.9	60.2		
	460	×0.3	32.0	40.1	47.1	53.3	59.0	64.3	69.2	
			600	41.7	52.3	61.4	69.5	77.0	83.8	90.3
			700	48.7	61.0	71.7	81.1	89.8	97.8	105
780			54.2	68.0	79.8	90.4	100	109	117	
1200	83.4	105	123	139	154	168	181			
SLNHA (Air spraying)	530	×0.1	355	472	570	657	736	810	880	
			700	469	623	753	868	972	1070	1160
			810	543	721	871	1000	1130	1240	1350
			900	603	802	968	1120	1250	1380	1490
			1400	938	1250	1510	1740	1940	2140	2330

* The above spray capacity indicates liquid flow rate for SLNH, and air flow rate for SLNHA.

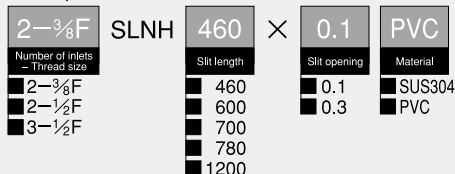
* Measure for air flow rate is ℓ/min at normal condition (0°C, 1atm).

How to order

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

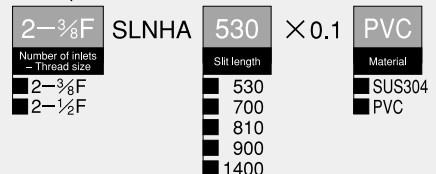
① SLNH (Liquid spraying)

(Example) ...2-3/8FSLNH460×0.1PVC



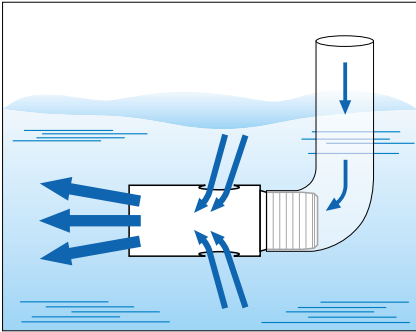
② SLNHA (Air spraying)

(Example) ...2-3/8FSLNHA530×0.1PVC



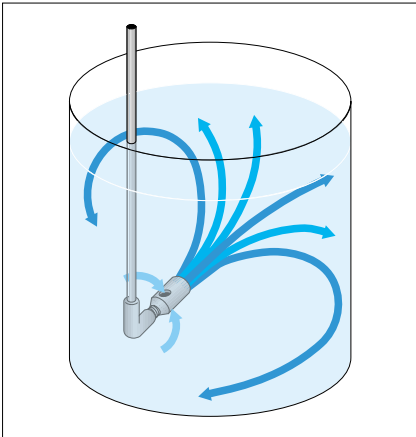
EJX series Patent pending

- Etching
- Cleaning
- Solution agitation



Ejector Nozzle for Solution Agitation
Taking in surrounding liquid, EJX spouts out 3-4 times large volume of the amount supplied. Ideal for agitating solution and submerged etching.

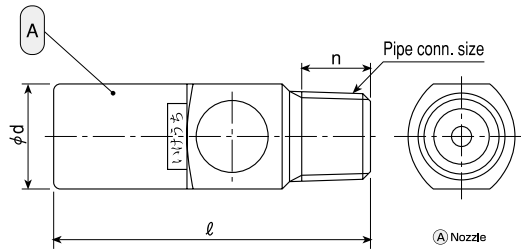
Compact Size, Chemical-resistant Materials
Small size, simple structure suitable for multiple-nozzle arrangement. Available in highly chemical-resistant PP and SUS303.



EJX series

Series	Pipe Conn. Size	Dimensions (mm)			Free Pass. Dia. (mm)	Mass (g)
		ℓ	φd	n		
EJX	1/8M	30	11	7	1.5	1.3
	1/4M	48	16	10.5	2.8	3

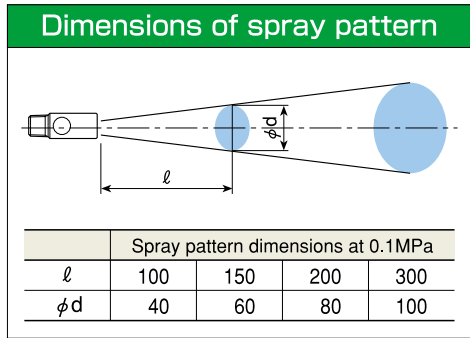
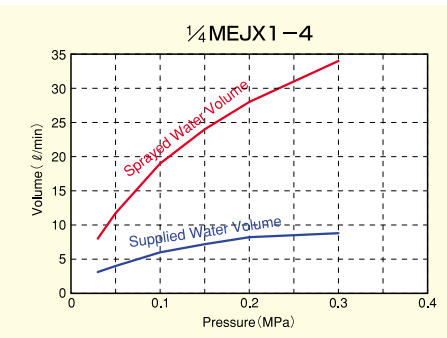
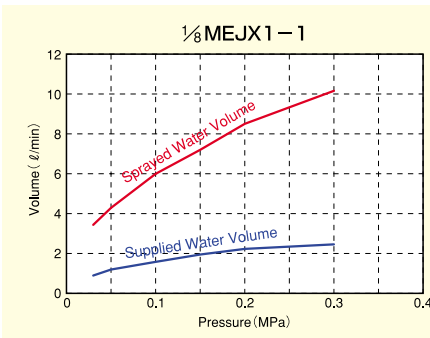
(Note) Appearance and dimensions may be slightly changed depending on materials and nozzle codes.



※The above are dimensions of EJX-PP (dimensions of EJX-S303 differ slightly).

Structure ■ One-piece structure.

Material ■ Injection molded PP, S303 (Stainless steel 303)



How to order

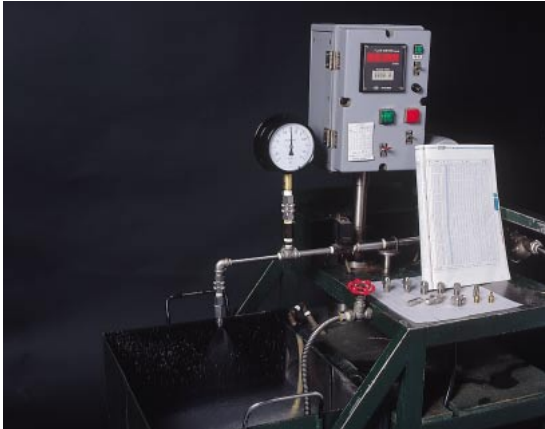
Please inquire or order for a specific nozzle on this coding system.

〈Example〉...1/4MEJX1-4PP-IN

1/4M	EJX	1-4	PP-IN
Pipe Conn. Size		Nozzle Code	Material
■ 1/8M		■ 1-1	■ S303
■ 1/4M		■ 1-4	■ PP-IN

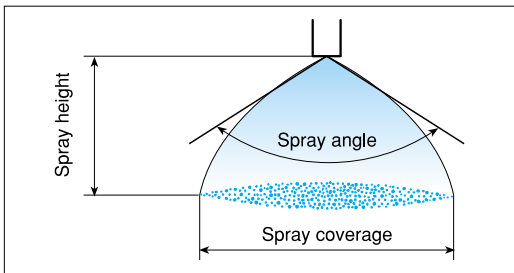
Technical data on spray nozzles

Liquid Pressure



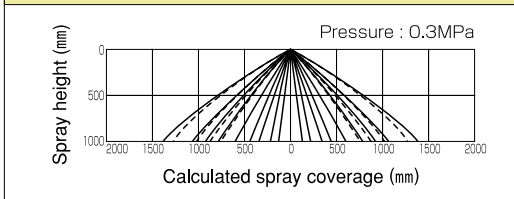
The standard pressure is defined as a design pressure based on usual liquid pressure in common use. The nozzles are designed to provide the specified spray angle, spray capacity, optimum spray pattern and spray distribution at each standard pressure. The standard pressure is indicated in each table. The figures in this catalog are based on city water of room temperature and the liquid pressure is the one at the immediate upstream of the nozzle.

Spray Angle



The spray angle is measured at the top of the pattern made by straight outline of the spray. As the spray flies through the air, droplets gradually lose momentum and the area it can cover decreases. In actual spraying, the coverage varies with spray height.

Spray height and coverage of the standard flat spray nozzle



		Calculated spray coverage (mm)												
Spray Angle		150°	140°	130°	115°	100°	90°	80°	65°	50°	40°	25°	15°	12°
Spray height (mm)	10	74.6	54.9	42.9	31.4	23.8	20	16.8	12.7	9.3	7.3	4.4	2.6	2.1
	20	149	110	85.8	62.8	47.7	40	33.6	25.5	18.7	14.6	8.9	5.3	4.2
	50	373	275	214	157	119	100	83.9	63.7	46.6	36.4	22.2	13.2	10.5
	70	522	385	300	220	167	140	117	89.2	65.3	51.0	31.0	18.4	14.7
	100	746	549	429	314	238	200	168	127	93.3	72.8	44.3	26.3	21.0
	150	1120	824	643	471	358	300	252	191	140	109	66.5	39.5	31.5
	200	1492	1099	858	628	477	400	336	255	187	146	88.7	52.7	42.0
250	1866	1374	1072	785	596	500	420	319	233	182	111	65.8	52.6	

Spray Capacity

■ Spray capacity vs. Liquid density

The spray capacities shown in this catalog are based on city water of room temperature.

The spray capacity is inversely proportional to the square root of liquid density, theoretically speaking. To determine the spray capacity of liquid having density (ρ) other than 1 g/cm³, multiply the spray capacity by conversion factor of $\frac{1}{\sqrt{\rho}}$.

■ Spray capacity vs. Pressure

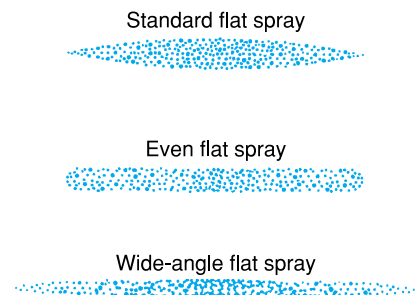
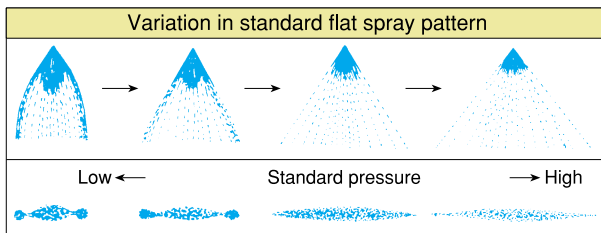
In hydraulic spray nozzles, the spray capacity (Q) increases as the pressure (P) increases. Theoretically, the spray capacity is proportional to the square root of the pressure. To determine the spray capacity at the pressure (Px), not shown in the catalog tables, calculate the capacity (Qx) by using the following equation.

$$Q_x = Q \sqrt{\frac{P_x}{P}}$$

Technical data on spray nozzles

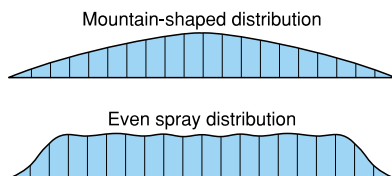
Spray Pattern

The spray pattern means the cross sectional view of spray. Select the suitable spray pattern for each application and achieve the most efficient spray performance. Spray pattern changes gradually as the spray pressure gradually increases from low to high.

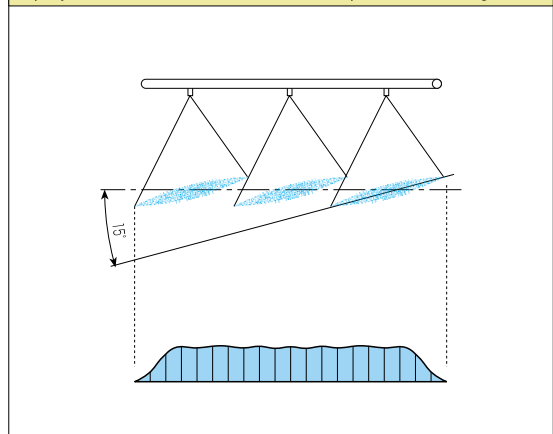


Spray Distribution

The spray distribution means the distribution of spray flow in the spray width direction. Mountain-shaped distribution is useful in producing uniform spray distribution across the entire spray width by overlapping patterns in multiple-nozzle arrangement, while Even spray distribution is suitable for applications like cleaning that require uniform spray impact across the entire spray width. Spray distribution varies according to the spray height and pressure.



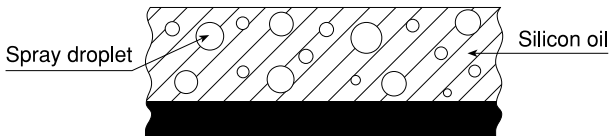
Spray distribution of 1/4MVP9030 in multiple-nozzle arrangement



	Pres. : 0.05MPa	Pres. : 0.2MPa	Pres. : 0.5MPa
VP series Variation in spray distribution of flat spray nozzle			
JJXP series Variation in spray distribution of full cone nozzle			

Technical data on spray nozzles

Spray Droplet Size



How to measure Droplet size

The immersion sampling method and the laser analyzer are used as industrial methods of measuring the spray droplet sizes.

Immersion sampling method

As shown in the diagram, droplets are collected on a glass plate coated with silicone oil and are immediately photographed as high magnification for subsequent scanning. In this method, the collected droplets quickly settle in the silicone oil and do not evaporate even at light while being photographed. Remaining suspended in the silicone oil, they are measured as perfect spheres. On the other hands, ultra-fine droplets, too fine to break the surface tension of the oil, will evaporate without settling. Thus the droplet sizes of the fine and ultra-fine fog measured by the immersion sampling method are shown in larger value than actual one.

Laser analyzer

1. Fraunhofer diffraction method

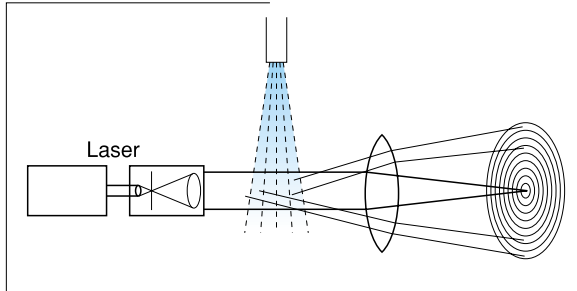
This method applies the fact that when spray particles exist on the laser's optical path, the laser rays are scattered by the edges of those particles and those scattered rays create a diffraction pattern (Fraunhofer diffraction). The diffraction pattern is depending on particle size and distribution. In this method, it is possible to measure all of the particles existing on the laser at the same time, but in the case the particle concentration is too high, the scattered laser can be scattered again by other particles (multiple scattering), which could result in showing the smaller value than the actual droplet size.

2. Doppler particle analyzer

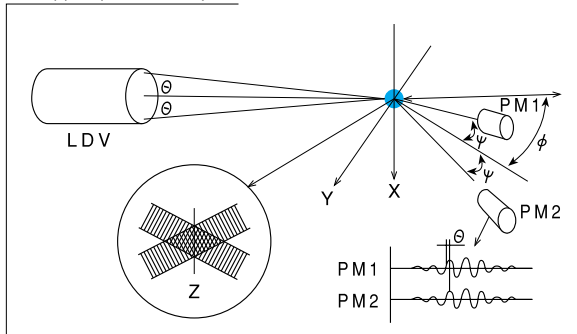
By this analyzer, two lasers are crossed and an interference fringe is formed. Several light sensors from a certain distance detect the laser scattered by the particles passing on this interference fringe, by whose phase difference droplet size is calculated. This method has advantages that the particle concentration does not affect it relatively and that the speed of the particles can be measured at the same time. However, measurement is limited only at a point in the spray.

The spray particle diameters shown in this catalog tables are measured by the immersion sampling methods.

Fraunhofer diffraction method



Doppler particle analyzer



Mean droplet diameter

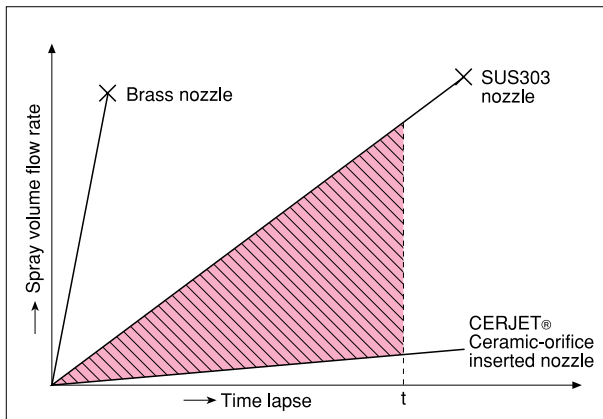
Mean droplet diameter is one of the important factors in selecting nozzles and designing nozzle-related equipment. Commonly used are the following three.

- Sauter Mean Droplet Diameter (\bar{d}_{32}) $\dots \dots \sum n d^3 / \sum n d^2$
- Volume Mean Droplet Diameter (\bar{d}_v) $\dots \dots (\sum n d^3 / \sum n)^{1/3}$
- Mass Median Droplet Diameter ($D_{v,5}$) $\dots \dots \int_0^{D_{v,5}} dv/v = 50\%$

It is usual in chemical processes such as cooling, evaporation, combustion and drying that efficiency is determined by the ratio of volume-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 representative droplet sizes. Sauter Mean Diameter is used in this catalog.

Technical data on spray nozzles

Wear Resistance



Nozzle orifices are always subject to abrasion as they are constantly exposed to the dashing flow of liquid at high speed. If the circulated liquid containing slurry is used they will wear out faster. Ceramic orifice of CERJET® spray nozzle has an outstanding wear-resistance and so hard as Mohs' scale 7 that it can be lasted 20-30 times longer than stainless steel nozzles and several hundred times longer than brass ones.

The sketch shows the increase in flow of each nozzle due to the worn orifice. The shadowed area shows the overly sprayed flow of stainless steel nozzle and if spraying liquid is agricultural chemicals, it could cause chemical antagonism. In high-pressure washing, worn nozzles cause pump pressure drop and washing effect is rapidly lost.

As for flat spray nozzle, abrasion makes its spray angle narrower and spray distribution uneven.

Chemical Resistance

In spraying chemicals or using spray nozzles in corrosive environment, spray nozzles may corrode fast and chemical-resistant materials must be used. Ceramic orifice is highly chemical-resistant and is not attacked by almost all acids and highly corrosive chemicals except fluoric acid and alkali liquids of over pH12. However, for the applications where adhesive or materials of metal body (brass or stainless steel) may corrode, recommendable is CERTIIM® nozzle with ceramic orifice inserted into engineering plastic body by injection molding.

In addition to spray nozzles made of optional materials shown in this catalog, nozzles in other special materials are also available.

Heat Resistance

The temperature that spray nozzles can withstand varies according to the liquid and ambient environmental condition. Nozzles made of special materials are available for use at high temperature.

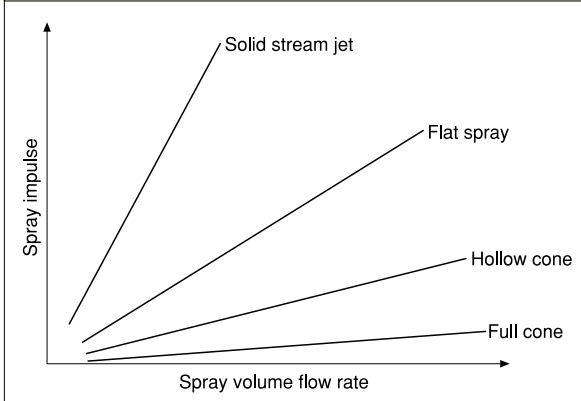
Pressure Resistance

Nozzles are designed carefully so that it can withstand the pressures shown in each table, but depending on the way of system operation, water shock will result in pressure increase of three to five times larger than the spray pressure. For use under high pressure, metal nozzles instead of plastic one are recommendable.

Technical data on spray nozzles

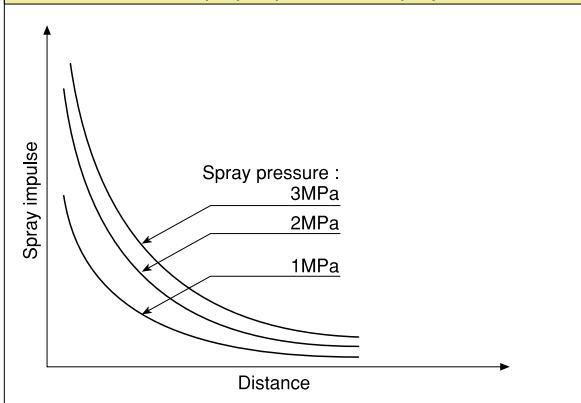
Spray Impulse

Relation between types of nozzles and spray impulse



Spray impulse means the impact force of spray droplets hitting the target surface. Solid stream jet nozzles have the strongest spray impulse, and the wider the spray angle becomes or the larger the spray area becomes, the weaker the spray impulse becomes. Also, the impulse decreases as the distance between the nozzles and the object becomes longer.

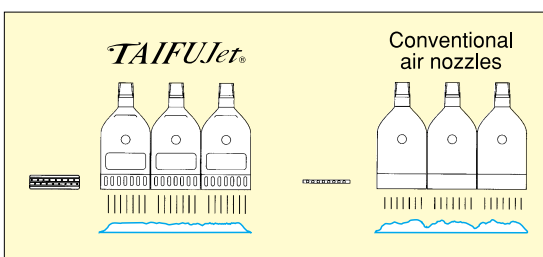
Variation in spray impulse of flat spray nozzle



Viscosity

As the viscosity of the liquid increases, generally spray capacity and angle decreases and spray distribution is not provided well as designated. Viscous liquid increases the resistance inside the pipe and liquid pressure drop must be also taken into consideration.

Spray Impulse of Air Nozzles



For air blow-off application with multiple-nozzle arrangement, uneven air blow causes water residual on the surface, which is typical for conventional air nozzles.

TAIFUJet is designed to solve this problem and produce uniform air blow even in multiple-nozzle arrangement.

Technical data on spray nozzles

Reference Data

Conversion of unit

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^{-1}	3.94×10^{-2}	3.28×10^{-2}
	1×10^6	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

Area	cm^2	m^2	in^2	ft^2
	1	1×10^{-4}	0.155	1.08×10^{-3}
	1×10^4	1	1.55×10^3	10.8
	6.45	6.45×10^{-4}	1	6.94×10^{-3}
	9.30×10^2	9.30×10^{-2}	1.44×10^2	1

Volume	cm^3	ℓ	m^3 (k ℓ)	ft^3	Imperial gal	U.S. gal
	1	1×10^{-3}	1×10^{-6}	3.53×10^{-5}	2.2×10^{-4}	2.64×10^{-4}
	1,000	1	1×10^{-3}	3.53×10^{-2}	0.220	0.264
	1×10^6	1,000	1	353	220	264
	2.83×10^4	28.3	2.83×10^{-2}	1	0.623	0.749
	4.55×10^3	4.55	4.55×10^{-3}	1.60	1	1.2
	3.79×10^3	3.79	3.79×10^{-3}	1.34	0.833	1

Pressure	MPa	bar	kg/cm^2	lb/in^2 (p.s.i.)	atm	mHg	mH ₂ O (mAq)
	0.001	0.01	0.010	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

Others

Viscosity	1P = 100cP 1St = 100cSt
Mass	1kg \doteq 2.205 lb 1lb \doteq 0.454 kg
Temp.	$[^\circ\text{F}] \doteq ([^\circ\text{C}] \times \frac{5}{9}) + 32$ $[^\circ\text{C}] \doteq \frac{5}{9} ([^\circ\text{F}] - 32)$

Water flow and proper pipe size

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

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



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

■**Head office**

Daiichi Kyogyo Bldg., 1-15-15, Awaza, Nishi-ku, Osaka 550-0011, Japan
Tel : +81-6-6538-4015, +81-6-6538-1200 Fax : +81-6-6538-4022
e-mail : overseas@kirinoikeuchi.co.jp
<http://www.kirinoikeuchi.co.jp/eng/>

■**Shanghai Office**

Jin Tai Bldg., 58 Mao Ming Road (south), Shanghai 200020 China
Tel : +86-21-6472-0848, +86-21-6445-0118 Fax : +86-21-6445-5527
<http://www.kirinoikeuchi.com>

■**Affiliated company**

Ikeuchi Taiwan Co., Ltd.
5Fl., No. 11, Lane 27, Sec. 2, Jungshan N. Rd.,
Jungshan Chiu, Taipei, Taiwan 104, R.O.C.
Tel : +886-2-2511-6289 Fax : +886-2-2541-6392

