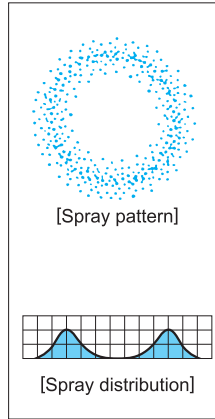


Extremely Fine Fog and Ultra-small Capacity Hollow Cone Spray Nozzles

KB



[Features]

- Ultra-small capacity hollow cone spray nozzle with the finest atomization among hydraulic nozzles.
- Capable of generating extremely fine spray.
- The whirl chamber is formed by a ceramic orifice and closer,^(*) which provides excellent wear resistance.

[Standard Pressure]

0.7 MPa

[Applications]

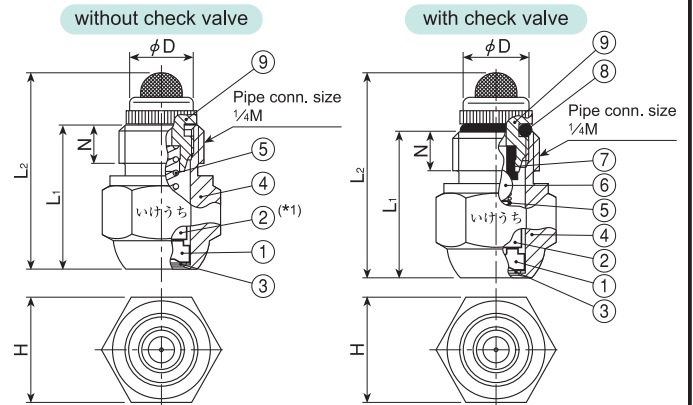
Humidifying: Air handling units, green houses
Cooling: Gas, thin plates, poultry
Spraying: Alcohol, chemicals

Hollow Cone

KB series

KB series (with ceramic orifice inserted)	
Structure	<ul style="list-style-type: none"> ● Spray orifice and closer are made of ceramics. ● Male parallel pipe thread (G$\frac{1}{4}$B; PF$\frac{1}{4}$M). ● All models equipped with built-in strainers.
Material	<ul style="list-style-type: none"> ● Spray orifice & closer: ceramic ● Metal parts: S303 or B (brass)

Series	Dimensions (mm)					Mass (g)	
	L ₁	L ₂	H	ϕ D	N	S303	B
KB (w/o check valve)	22.5	31	17 (S303) 16 (B)	10.5	6	24.8	25
KB**CV (w/ check valve)	22.5	32	17 (S303) 16 (B)	10.5	6	25.3	25.5



- ①Ceramic orifice ②Ceramic closer^(*) ③Packing (PTFE) ④Body
⑤Spring ⑥Ball (S304) ⑦Packing (NBR) ⑧O-ring (NBR)
⑨Strainer (S303+S304 or B+S304)

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

*1) In our newly-designed KB (with code N) nozzles (see p.47), the closer is made of polyester elastomer, not ceramic.

Spray Angle Code	Spray Capacity Code (*2)	Spray Angle (°)			Spray Capacity (ℓ/hr)										Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size
		0.3 MPa	0.7 MPa	2 MPa	0.3 MPa	0.4 MPa	0.5 MPa	0.6 MPa	0.7 MPa	1 MPa	1.2 MPa	1.5 MPa	2 MPa				
80	063N	65	80	80	1.36	1.55	1.72	1.86	2.00	2.35	2.56	2.83	3.22	45	0.20	200	
	071	—	80	80	—	1.70	1.90	2.08	2.25	2.69	2.95	3.29	3.81				0.15
	08	—	80	80	—	1.97	2.20	2.41	2.60	3.11	3.40	3.80	4.40	5	0.15	200	
	09	—	80	80	—	2.23	2.49	2.73	2.95	3.53	3.86	4.32	4.99				0.15
	10N	65	80	80	2.19	2.51	2.78	3.03	3.25	3.84	4.18	4.63	5.30	60	0.25	200	
	125N	65	80	80	2.77	3.16	3.51	3.82	4.10	4.84	5.27	5.84	6.68				60
	14	—	80	80	—	3.48	3.89	4.26	4.60	5.50	6.02	6.73	7.78	50	0.15	200	
	16N	65	80	80	3.51	4.02	4.47	4.88	5.25	6.22	6.79	7.55	8.66				0.35
	20N	65	80	80	4.41	5.06	5.62	6.13	6.60	7.82	8.53	9.49	10.9	0.40	150		
	22N	65	80	80	4.84	5.55	6.18	6.74	7.25	8.59	9.37	10.4	12.0			5	0.40
	25	70	80	80	5.40	6.24	6.97	7.64	8.25	9.87	10.8	12.1	14.0	0.25	150		
	28	70	80	80	6.05	6.99	7.82	8.56	9.25	11.1	12.1	13.5	15.7			0.30	150
	32	70	80	80	6.94	8.01	8.96	9.82	10.6	12.7	13.9	15.5	17.9	75	0.30		
	38	70	80	80	8.25	9.52	10.7	11.7	12.6	15.1	16.5	18.4	21.3			65	0.40
	45	70	80	80	9.79	11.3	12.6	13.9	15.0	17.9	19.6	21.9	25.3	0.40	100		
	50	70	80	80	10.9	12.6	14.0	15.4	16.6	19.9	21.8	24.3	28.1			0.40	100
	56	70	80	80	12.2	14.1	15.7	17.2	18.6	22.3	24.4	27.2	31.5	5	0.40		
	63	72	80	80	13.7	15.8	17.7	19.4	21.0	25.1	27.5	30.7	35.5			0.40	100
	71	72	80	80	15.5	17.8	20.0	21.9	23.6	28.2	30.9	34.6	39.9	0.50	100		
	80	72	80	80	17.5	20.2	22.6	24.7	26.7	31.9	35.0	39.0	45.1			0.50	100
90	73	80	80	19.6	22.7	25.4	27.8	30.0	35.9	39.3	43.9	50.8	110	0.50	100		
100	73	80	80	21.8	25.2	28.2	30.9	33.3	39.9	43.7	48.8	56.4				90	0.50
1250	73	80	80	27.2	31.5	35.2	38.5	41.6	49.8	54.5	60.9	70.4	0.50	100			
180	74	80	80	39.2	45.3	50.6	55.5	59.9	71.6	78.5	87.6	101			5	0.60	100
200	74	80	80	43.6	50.4	56.3	61.7	66.6	79.7	87.3	97.5	113	0.60	100			
320	75	80	80	69.7	80.5	90.0	98.6	107	127	140	156	180			210	0.60	100
60	063	—	60	60	—	1.51	1.69	1.85	2.00	2.39	2.62	2.93	3.38	45			
	14	—	60	60	—	3.48	3.89	4.26	4.60	5.50	6.02	6.73	7.78		5	0.15	200
	32	—	60	60	—	8.01	8.96	9.82	10.6	12.7	13.9	15.5	17.9	0.30			
	56	50	60	60	12.2	14.1	15.7	17.2	18.6	22.3	24.4	27.2	31.5		90	0.40	100
	140	53	60	60	30.5	35.2	39.4	43.2	46.6	55.7	61.0	68.2	78.8	130			
	280	54	60	60	61.0	70.5	78.8	86.4	93.2	112	122	136	158		190	0.60	100

*2) Spray Capacity Code with N is our newly-designed KB series. See page 47 for the features.

[Note]

The spray capacity of KB series nozzles is shown as ℓ/hr. The spray capacity code does not correspond with the spray capacity at the standard pressure.

Features of newly-designed KB (with code "N") series

● **Anti-clogging design**

- Larger orifice diameter (1.3–2.6 times) compared with conventional KB.
- Strongly clog-resistant and extremely-fine spray.

● **Available in wide range from low (0.2 MPa) to high (10 MPa) pressure**

- Capable of spraying from 0.2 MPa: Able to spray at low capacity.
- Designed to withstand pressures up to 10 MPa: Suitable for even finer atomization.*

*When spraying at pressure of 2 MPa and above, use S303 nozzles.

■ **Spray capacity of KB (with code "N") series at high pressure (3–10 MPa)**

Spray Angle Code	Spray Capacity Code	Spray Angle (°)	Spray Capacity (ℓ/hr)				Mean Drop. Dia. at 10 MPa (μm)
			3 MPa	5 MPa	7 MPa	10 MPa	
80	063N	80	3.88	4.89	5.70	6.70	33
	10N		6.40	8.11	9.48	11.2	
	125N		8.07	10.2	12.0	14.1	5
	16N		10.5	13.4	15.7	18.6	
	20N		13.2	16.8	19.8	23.4	
22N	14.5	18.5	21.7	25.7	40		

Check Valve

For drip-free shut-off, KB nozzles with check valves are available.

The standard operating pressure for check valve is 0.4 MPa. Supply pressure minus the operating pressure of the check valve (0.4 MPa) is the atomizing pressure. KB series nozzles with check valves are not guaranteed for spray angle and spray capacity.

How to order


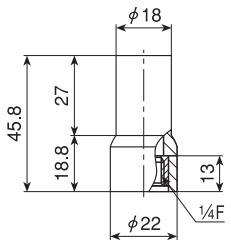

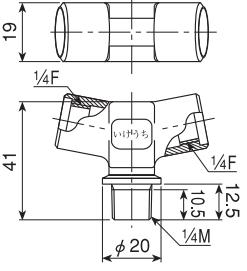

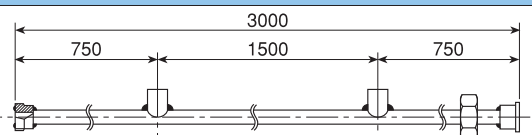
Please inquire or order for a specific nozzle using this coding system.

〈Example〉...1/4MKB80071S303CV-RW

1/4 MKB 80 071 S303 CV -RW

Spray Angle Code	Spray Capacity Code	Material	Check Valve
80	063N	S303	CV (with Check Valve)
60	}	B	- (without Check Valve)
	320		

Related Products for KB series

Series	Appearance	Structure	Features
Fitting for PVC pipe 13AKB adaptor PVC			<ul style="list-style-type: none"> • Fitting for KB to 13A (1/2") Tee. • Material: PVC
Two-way adaptor			<ul style="list-style-type: none"> • Adaptor for connecting 2 pcs. of KB. Three types of threads for pipe connection (male taper thread, male parallel thread, or M15x1) are available. • Material: Chrome-plated brass
Spray header			<ul style="list-style-type: none"> • Stainless steel header with two-way adaptors. • Length of header: 3 m or 4 m. Please contact us for details.

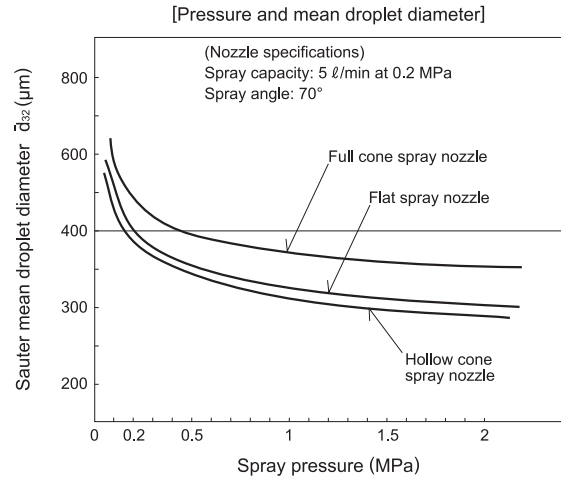
Effective Use of Hollow Cone Spray Nozzles

Mean Droplet Diameter

If spray pressure, spray capacity and spray angle are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among all hydraulic nozzles.

Reducing the mean droplet diameter increases the total surface area of the spray liquid which has a great effect on transport phenomena of materials, such as chemical reaction, absorption, adsorption, etc.

Hollow cone spray nozzles are suitable for cooling and washing gases, humidifying and chemical reactions.



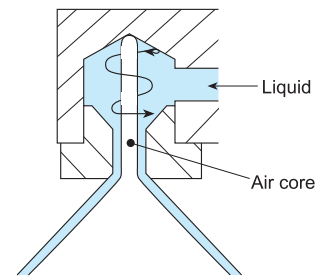
Free Passage Diameter

Free passage diameter shows the approximate value of the smallest dimension of liquid passage in the nozzle. Among hollow cone spray nozzles, **AAP** and **TAA series** nozzles have no obstructions inside and minimize clogging problems.

Wear Resistance

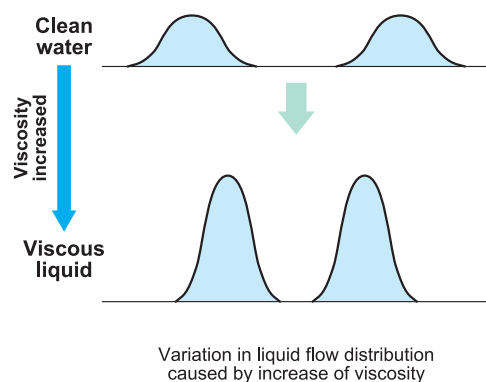
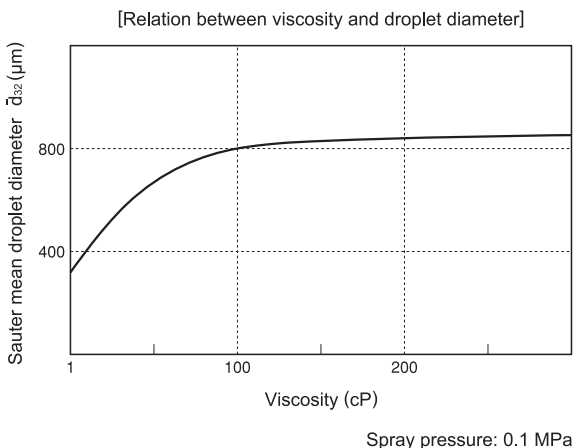
In the tangential hollow cone spray nozzles an air core is generated in the center of the vortex current, which causes wear at the end of the air core when the spraying liquid contains slurry.

In order to maintain optimum nozzle performance, the nozzle material is very important. That is why IKEUCHI's hollow cone spray nozzles are made of highly wear-resistant ceramics and SiC, etc.



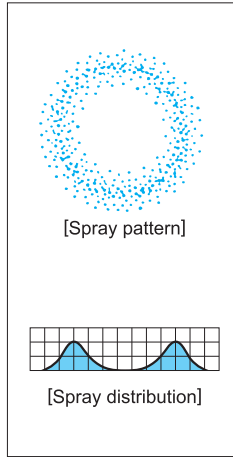
Viscosity

As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



Extremely Fine Fog and Ultra-small Capacity Hollow Cone Spray Nozzles

KBN



[Features]

- Ultra-small capacity hollow cone spray nozzle with the finest atomization among hydraulic nozzles.
- Minimal clogging with free passage diameter 1.3–2.6 times bigger than that of conventional nozzles.
- High-purity alumina ceramic tip provides stable performance with longer life even under high pressure conditions.

[Standard Pressure]

1 MPa

[Applications]

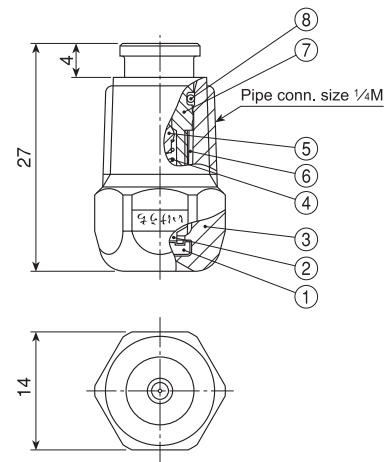
- Cooling: Poultry farms, Outside cooling
 Humidifying: Air handling units, greenhouses
 Spraying: Alcohol, disinfectant
 Others: Dust suppression, irrigation for greenhouse

Hollow Cone

KBN series

KBN series (with ceramic orifice inserted)	
Structure	<ul style="list-style-type: none"> ● One-piece structure with one-shot injection molded ceramic orifice. ● Thread is R$\frac{1}{4}$(PT$\frac{1}{4}$ male) or NPT $\frac{1}{4}$ male. ● All models equipped with strainer and check valve.
Material	<ul style="list-style-type: none"> ● Body: PA (polyamide) ● Spray orifice: ceramic ● Closer: polyester elastomer
Mass	● 4 g

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



- ①Ceramic orifice ②Closer ③Body ④Spring (S304) ⑤Poppet (NBR)
 ⑥Strainer screen (S316) ⑦Strainer holder (PP) ⑧O-ring (NBR)

Spray Angle Code	Spray Capacity Code	Spray Angle (°)				Spray Capacity (ℓ/hr)										Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size	Nozzle Body Color
		0.5 MPa	1 MPa	1.3 MPa	2 MPa	0.5 MPa	0.6 MPa	0.8 MPa	1 MPa	1.3 MPa	2 MPa	3.5 MPa	5 MPa	7 MPa					
80	063	50	80	80	80	1.13	1.36	1.72	2.00	2.35	2.99	4.05	4.75	5.58	35	0.2	200	Red	
	125	60	80	80	80	2.29	2.77	3.51	4.10	4.84	6.20	8.43	9.94	11.7	50	0.3	100	Green	
	22	65	80	80	80	3.99	4.84	6.18	7.25	8.59	11.1	15.0	18.0	21.3	60	0.4	100	Purple	

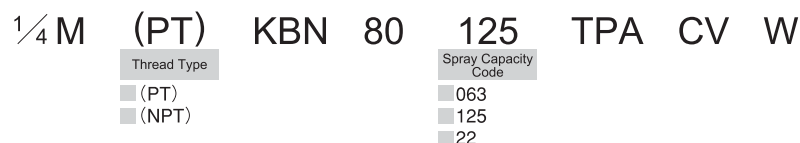
[Note]

1. The spray capacity of KBN series nozzle is shown as ℓ/hr.
2. Check valve which closes and opens at 0.3 MPa is built into the nozzle.
3. KBN series nozzles with check valves are not guaranteed for spray angle and spray capacity.

How to order

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

<Example>... $\frac{1}{4}$ M(PT)KBN80125TPACVW



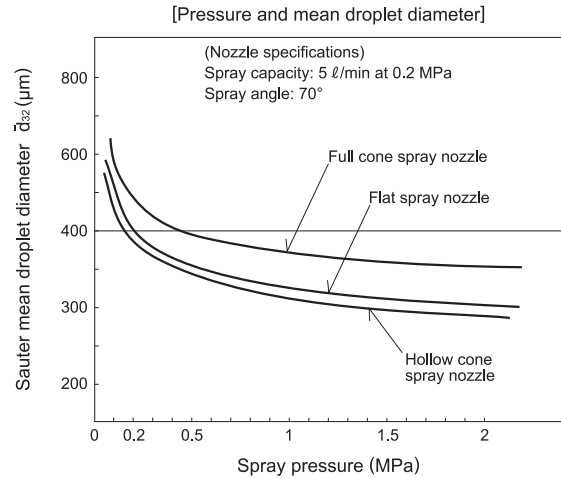
Effective Use of Hollow Cone Spray Nozzles

Mean Droplet Diameter

If spray pressure, spray capacity and spray angle are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among all hydraulic nozzles.

Reducing the mean droplet diameter increases the total surface area of the spray liquid which has a great effect on transport phenomena of materials, such as chemical reaction, absorption, adsorption, etc.

Hollow cone spray nozzles are suitable for cooling and washing gases, humidifying and chemical reactions.



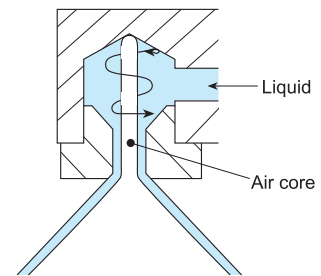
Free Passage Diameter

Free passage diameter shows the approximate value of the smallest dimension of liquid passage in the nozzle. Among hollow cone spray nozzles, **AAP** and **TAA series** nozzles have no obstructions inside and minimize clogging problems.

Wear Resistance

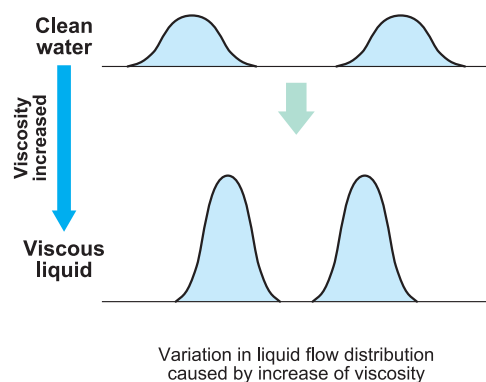
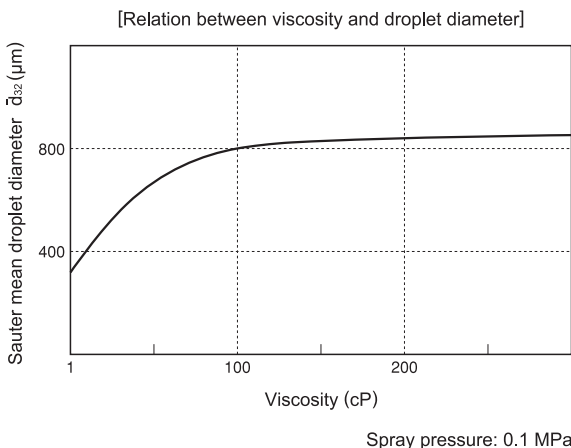
In the tangential hollow cone spray nozzles an air core is generated in the center of the vortex current, which causes wear at the end of the air core when the spraying liquid contains slurry.

In order to maintain optimum nozzle performance, the nozzle material is very important. That is why IKEUCHI's hollow cone spray nozzles are made of highly wear-resistant ceramics and SiC, etc.



Viscosity

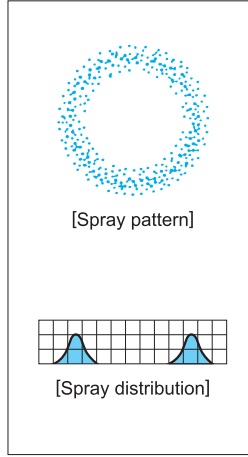
As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



Semi-fine Atomization and Small Capacity Hollow Cone Spray Nozzles



Hollow Cone



[Features]

- Small capacity hollow cone spray nozzle.
- Semi-fine atomization.
- The whirl chamber is formed by a ceramic orifice and closer, which provides excellent wear-resistance.

[Standard Pressure]

0,3 MPa

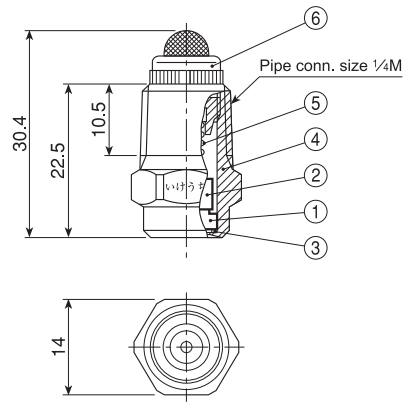
[Applications]

- Humidifying: Air handling units
- Cooling: Gas, metals
- Spraying: Chemicals

K series

K series (with ceramic orifice inserted)	
Structure	<ul style="list-style-type: none"> ● Spray orifice and closer are made of ceramics. ● Each part can be disassembled. ● All models equipped with built-in strainers.
Material	<ul style="list-style-type: none"> ● Spray orifice & closer: ceramic ● Metal parts: S303 or B (brass)
Mass	<ul style="list-style-type: none"> ● S303: 17,5 g ● B (brass): 18,5 g

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



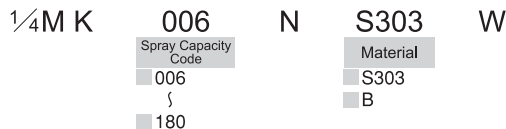
- ① Ceramic orifice
- ② Ceramic closer
- ③ Packing (PTFE)
- ④ Body
- ⑤ Spring (S316)
- ⑥ Strainer (S303+S304 or B+S304)

Spray Capacity Code	Spray Angle (°)			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size		
	0.15 MPa	0.3 MPa	0.7 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa	2.5 MPa					
006	—	80	80	—	—	0.06	0.08	0.09	0.11	0.13	0.15	0.16	80	0.4	150		
008	—	80	80	—	—	0.08	0.10	0.12	0.14	0.17	0.20	0.22		0.4	150		
010	—	80	80	—	—	0.10	0.13	0.15	0.18	0.22	0.25	0.27		0.5	100		
012	—	80	80	—	—	0.12	0.15	0.18	0.21	0.26	0.30	0.33		0.5	100		
015	—	80	80	—	0.12	0.15	0.19	0.22	0.27	0.32	0.37	0.41		}	0.6	100	
020	70	80	80	0.14	0.16	0.20	0.26	0.30	0.35	0.43	0.49	0.55			0.7	50	
025	70	80	80	0.18	0.21	0.25	0.32	0.37	0.44	0.54	0.62	0.69		200	0.7	50	
030	70	80	80	0.22	0.25	0.30	0.38	0.45	0.53	0.65	0.74	0.82			0.9	50	
040	70	80	80	0.29	0.33	0.40	0.51	0.60	0.71	0.86	0.99	1.10			}	0.9	50
050	70	80	80	0.36	0.41	0.50	0.64	0.75	0.89	1.08	1.23	1.37				1.0	50
060	70	80	80	0.43	0.49	0.60	0.77	0.90	1.06	1.29	1.48	1.65	220		1.0	50	
070	70	80	80	0.50	0.58	0.70	0.89	1.05	1.24	1.51	1.73	1.92			1.0	50	
080	70	80	80	0.58	0.66	0.80	1.02	1.20	1.42	1.72	1.97	2.20			}	1.2	50
100	70	80	80	0.72	0.82	1.00	1.28	1.50	1.77	2.15	2.47	2.74				1.3	50
120	70	80	80	0.86	0.99	1.20	1.53	1.80	2.13	2.58	2.96	3.29			380	1.3	50
140	70	80	80	1.01	1.15	1.40	1.79	2.10	2.48	3.01	3.46	3.84				1.5	50
160	70	80	80	1.15	1.32	1.60	2.04	2.40	2.84	3.44	3.95	4.39		1.5		50	
180	70	80	80	1.29	1.48	1.80	2.30	2.69	3.19	3.87	4.44	4.94		1.7		50	

How to order

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

(Example) ...1/4MK006NS303W



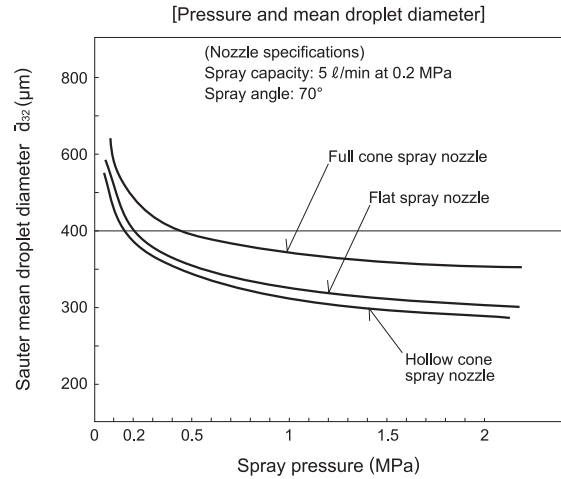
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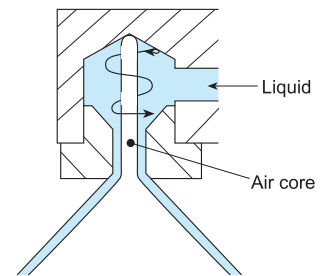
Free Passage Diameter

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Wear Resistance

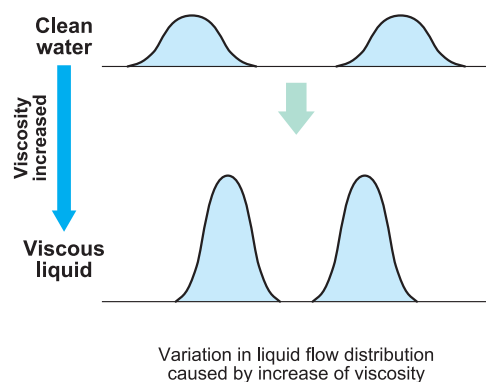
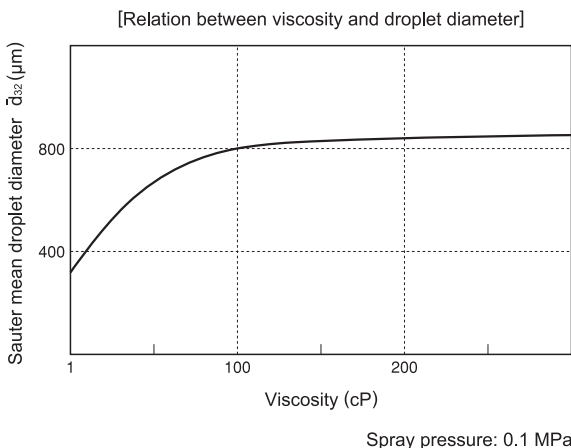
In the tangential hollow cone spray nozzles an air core is generated in the center of the vortex current, which causes wear at the end of the air core when the spraying liquid contains slurry.

In order to maintain optimum nozzle performance, the nozzle material is very important. That is why IKEUCHI's hollow cone spray nozzles are made of highly wear-resistant ceramics and SiC, etc.



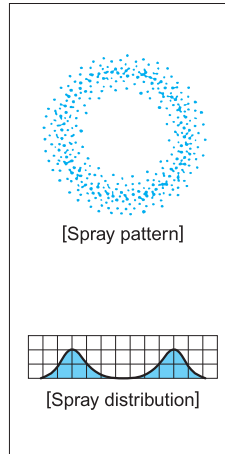
Viscosity

As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



Semi-fine Atomization and Small Capacity Hollow Cone Spray Nozzles

KKBP



[Features]

- Small capacity hollow cone spray nozzle.
- Unique whirler design to make free passage diameter large and minimize clogging.
- Semi-fine atomization.
- Compact, lightweight design with low number of components.
- Maintenance is easy as whirler is detachable.

[Standard Pressure]

0,3 MPa

[Applications]

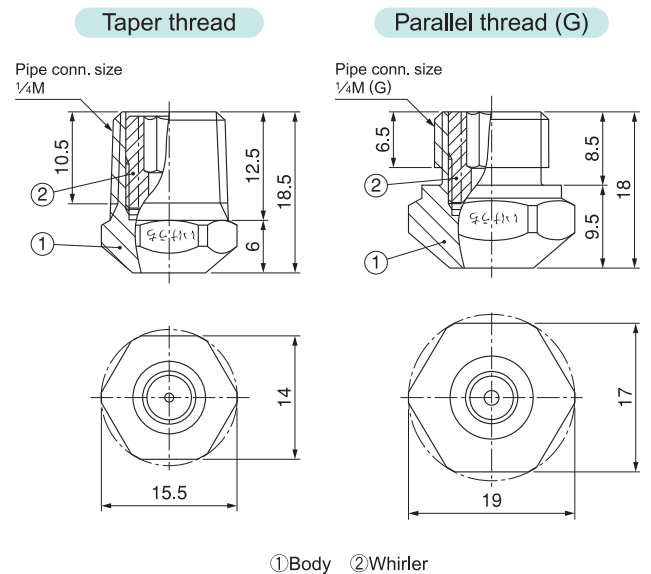
- Humidifying: Air handling units
 Cooling: Gas, metals
 Spraying: Chemicals
 Snow making (for snow machines)

Hollow Cone

KKBP series

KKBP series	
Structure	<ul style="list-style-type: none"> • Comprises nozzle body and whirler. • Thread is male taper pipe thread (R$\frac{1}{4}$) or male parallel pipe thread (G$\frac{1}{4}$B).
Material	<ul style="list-style-type: none"> • Body: S303 • Whirler: S316L equivalent • Optional material (body only): S316, S316L, Brass* (*Brass body is available only with taper pipe thread.)
Mass	<ul style="list-style-type: none"> • Taper pipe thread type: 15 g • Parallel pipe thread type: 20 g

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

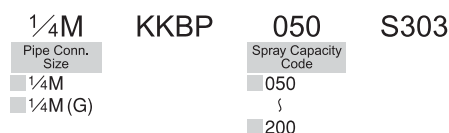


Spray Capacity Code	Spray Angle (°)			Spray Capacity (ℓ/min)								Mean Drop Dia. (μm)	Free Pass. Dia. (mm)
	0.2 MPa	0.3 MPa	1.0 MPa	0.2 MPa	0.3 MPa	0.5 MPa	1 MPa	1.5 MPa	2 MPa	3 MPa	5 MPa		
050	63	65	68	0.41	0.50	0.64	0.89	1.08	1.24	1.51	1.93	160	1.0
060	65	68	70	0.49	0.60	0.77	1.07	1.30	1.49	1.82	2.32		
070	60	63	65	0.58	0.70	0.89	1.25	1.52	1.74	2.12	2.71		
080	63	65	68	0.66	0.80	1.02	1.43	1.73	1.99	2.42	3.09	250	1.4
100	55	58	60	0.82	1.00	1.28	1.78	2.17	2.49	3.03	3.87		
120	58	60	63	0.99	1.20	1.53	2.14	2.60	2.99	3.63	4.64	}	1.6
140	55	58	60	1.15	1.40	1.79	2.50	3.04	3.49	4.24	5.41		
160	55	58	60	1.32	1.60	2.05	2.85	3.47	3.98	4.84	6.19	}	1.8
180	50	53	55	1.48	1.80	2.30	3.21	3.90	4.48	5.45	6.96		
200	53	55	58	1.65	2.00	2.56	3.57	4.34	4.98	6.05	7.73		1.8

How to order

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

<Example> ... $\frac{1}{4}$ MKKBP050S303



* In case parallel thread type is required, please specify the Pipe Connection Size as $\frac{1}{4}$ M(G).

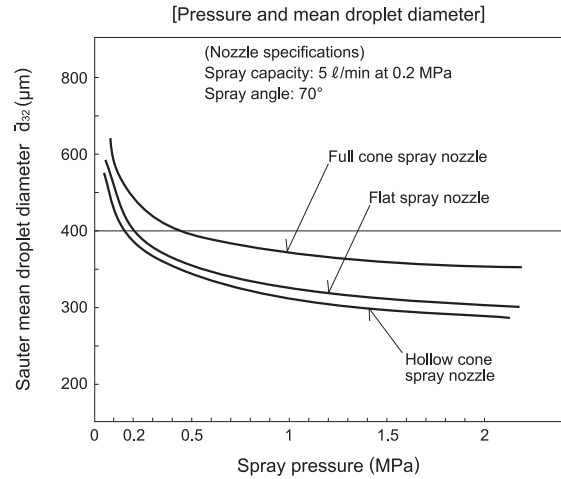
Effective Use of Hollow Cone Spray Nozzles

Mean Droplet Diameter

If spray pressure, spray capacity and spray angle are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among all hydraulic nozzles.

Reducing the mean droplet diameter increases the total surface area of the spray liquid which has a great effect on transport phenomena of materials, such as chemical reaction, absorption, adsorption, etc.

Hollow cone spray nozzles are suitable for cooling and washing gases, humidifying and chemical reactions.



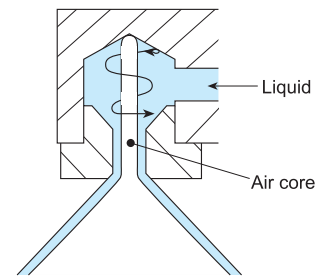
Free Passage Diameter

Free passage diameter shows the approximate value of the smallest dimension of liquid passage in the nozzle. Among hollow cone spray nozzles, **AAP** and **TAA series** nozzles have no obstructions inside and minimize clogging problems.

Wear Resistance

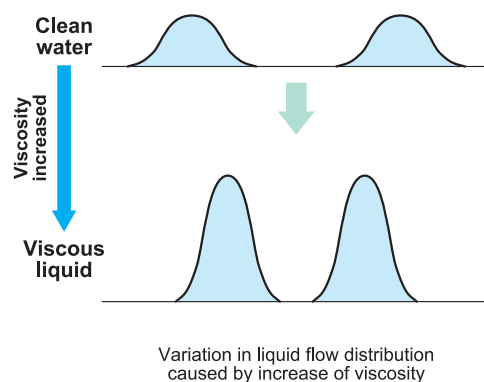
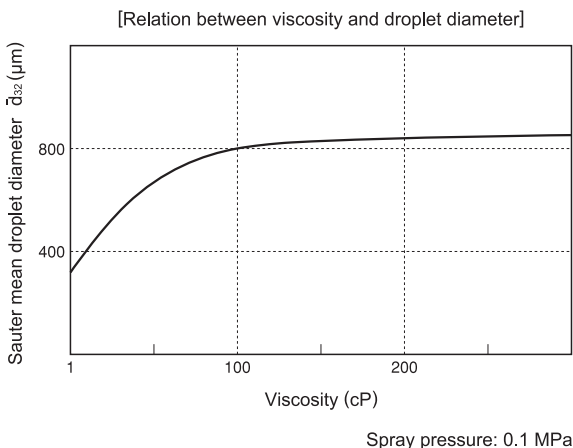
In the tangential hollow cone spray nozzles an air core is generated in the center of the vortex current, which causes wear at the end of the air core when the spraying liquid contains slurry.

In order to maintain optimum nozzle performance, the nozzle material is very important. That is why IKEUCHI's hollow cone spray nozzles are made of highly wear-resistant ceramics and SiC, etc.



Viscosity

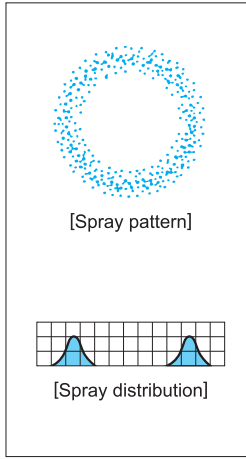
As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



Small Capacity Hollow Cone Spray Nozzles

KD

Hollow Cone



[Features]

- Small capacity hollow cone spray nozzle. Three-piece structure.
- Combines compact design and semi-fine atomization capability.
- The whirl chamber is formed by a ceramic orifice and whirler, which provides excellent wear-resistance.

[Standard Pressure]

0,3 MPa

[Applications]

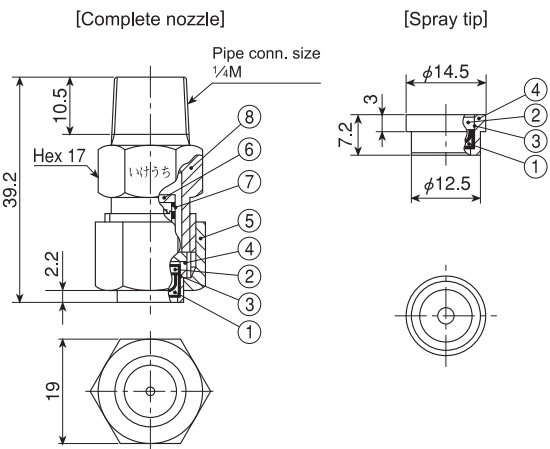
Cooling: Gas
Spraying: Chemicals, dust suppression

KD series

KD series (with ceramic orifice inserted)	
Structure	<ul style="list-style-type: none"> • Spray orifice and whirler are made of ceramics. • Comprises three parts: Spray tip, cap, and adaptor. • Worn-out tip can be replaced separately. • Removable strainer is fitted and supplied as standard part with small capacity nozzle (KD03, KD033).
Material	<ul style="list-style-type: none"> • Spray orifice & whirler: ceramic • Metal parts: S303 or B (brass) • Optional material: S316 or others
Mass	<ul style="list-style-type: none"> • Complete nozzle S303: 46 g B (brass): 49 g • Spray tip S303: 3 g B (brass): 3 g

(When with a strainer, add 2-5 g to the mass for a complete nozzle and 2 mm to the total length.)

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



- ① Ceramic orifice ② Ceramic whirler ③ Adhesive: Araldite®
④ Tip retainer ⑤ Cap ⑥ Strainer holder ⑦ Strainer screen (S316)
⑧ Adaptor

Spray Capacity Code	Pipe Conn. Size	Spray Angle (°)			Spray Capacity (ℓ/min)									Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
		0.15 MPa	0.3 MPa	0.7 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	1.5 MPa	2 MPa		
03	●	—	80	85	—	—	0.25	0.30	0.38	0.44	0.52	0.63	0.72	130	0.7
033	●	—	80	88	—	—	0.27	0.33	0.42	0.49	0.58	0.69	0.79		0.7
037	○	—	70	75	—	—	0.31	0.37	0.47	0.55	0.64	0.77	0.88	∫	1.0
042	○	90	93	97	—	0.30	0.35	0.42	0.53	0.62	0.73	0.88	1.00		0.7
057	○	78	85	90	—	0.41	0.47	0.57	0.72	0.84	0.99	1.19	1.36		1.1
068	○	90	95	99	—	0.49	0.56	0.68	0.86	1.01	1.18	1.42	1.62	200	1.1
084	○	90	95	103	0.50	0.61	0.70	0.84	1.05	1.21	1.42	1.69	1.92	∫	1.1
116	○	66	70	72	0.70	0.84	0.96	1.16	1.45	1.68	1.96	2.34	2.65	260	1.3
146	○	74	78	80	0.88	1.06	1.21	1.46	1.85	2.16	2.54	3.05	3.49	310	1.8
176	○	71	73	75	1.06	1.27	1.46	1.76	2.22	2.60	3.06	3.68	4.20		1.7
182	○	81	87	91	1.10	1.32	1.51	1.82	2.30	2.69	3.17	3.81	4.34		1.8
211	○	83	88	92	1.27	1.53	1.75	2.11	2.67	3.12	3.67	4.41	5.04	∫	1.8
224	○	75	80	82	1.34	1.62	1.85	2.24	2.83	3.31	3.90	4.69	5.35		1.7
262	○	75	80	83	1.57	1.90	2.17	2.62	3.31	3.87	4.56	5.48	6.25		1.7
316	○	93	97	97	1.90	2.29	2.62	3.16	3.99	4.67	5.50	6.61	7.54		1.8
394	○	83	87	91	2.36	2.85	3.26	3.94	4.98	5.82	6.86	8.24	9.40	420	1.7

●.....With strainer (#50 mesh only) ○.....Without strainer

How to order

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

① Complete nozzle

<Example>...¼MKD03S303W

¼MKD	03	S303	W
<small>Spray Capacity Code</small>	<small>Material</small>	<small>Strainer</small>	
03	S303	W (with Strainer)	
∫	B	— (without Strainer)	
394			

② Spray tip only

<Example>...¼KD03S303

¼KD	03	S303
<small>Spray Capacity Code</small>	<small>Material</small>	
03	S303	
∫	B	
394		

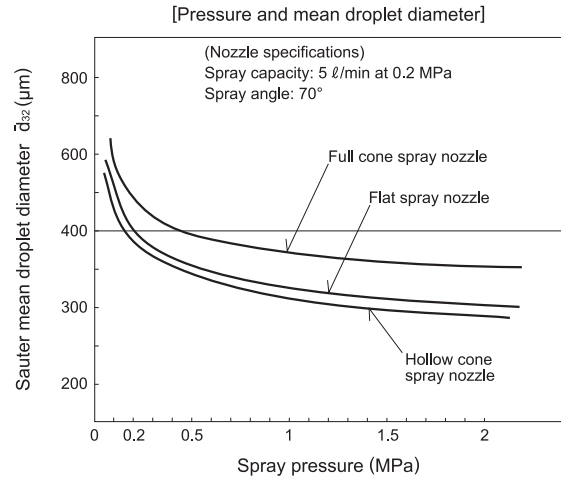
Effective Use of Hollow Cone Spray Nozzles

Mean Droplet Diameter

If spray pressure, spray capacity and spray angle are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among all hydraulic nozzles.

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Hollow cone spray nozzles are suitable for cooling and washing gases, humidifying and chemical reactions.



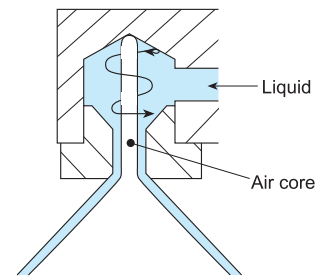
Free Passage Diameter

Free passage diameter shows the approximate value of the smallest dimension of liquid passage in the nozzle. Among hollow cone spray nozzles, **AAP** and **TAA series** nozzles have no obstructions inside and minimize clogging problems.

Wear Resistance

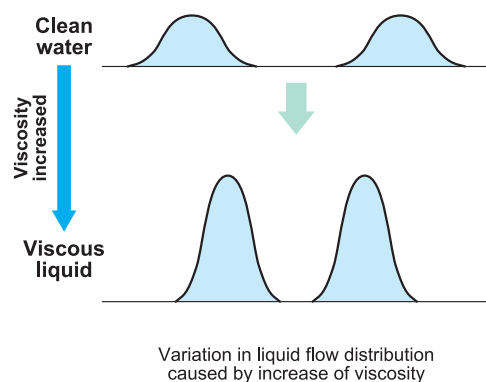
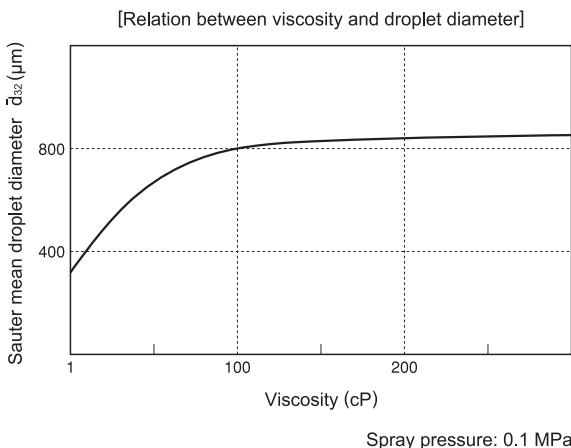
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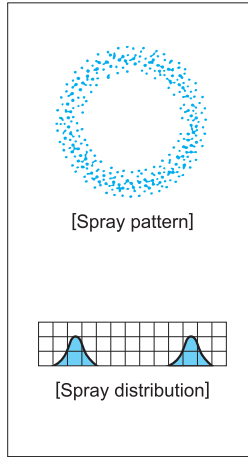
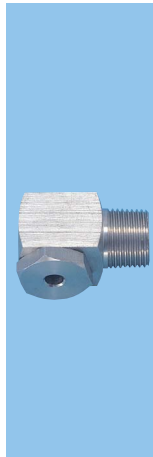
Viscosity

As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



Medium Capacity Hollow Cone Spray Nozzles

AAP



[Features]

- Hollow cone spray nozzle with relatively fine atomization. Stable spray pattern at both low and high pressure.
- No-whirler design minimizes clogging.
- Spraying axis 90° from the axis of the nozzle inlet.

[Standard Pressure]

0.2 MPa

[Applications]

- Cleaning: Gas, air, machines, pre-painting treatment
- Cooling: Gas, air handling unit, roofs, machineries, foods, warm water
- Spraying: Aeration, humidification

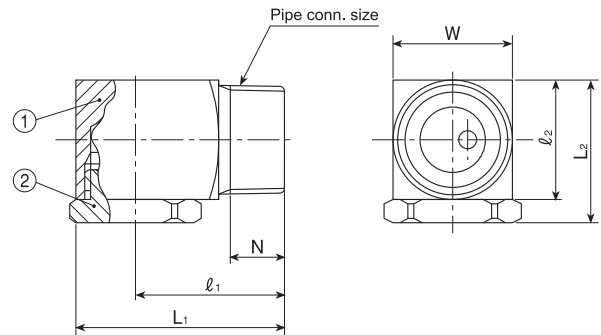
Hollow Cone

AAP series

AAP series	
Structure	<ul style="list-style-type: none"> • Comprises nozzle body and orifice cap. • Orifice cap is screwed into nozzle body.
Material	<ul style="list-style-type: none"> • Body: S304 • Orifice cap: S303 • Optional material: S316, S316L, B (brass)

Pipe conn. size	Dimensions (mm)						Mass (g)
	L ₁	L ₂	ℓ ₁	ℓ ₂	W	N	
¼ M	32	20.5	23	16	16	10.5	49
⅜ M	36	23.5	26	19	19	11	72
½ M	46	31	33.5	25	25	14	160

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



① Body (S304) ② Orifice cap (S303)

Spray Capacity Code	Pipe Conn. Size			Spray Angle (°)			Spray Capacity (ℓ/min)						Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	
	¼ M	⅜ M	½ M	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
	01	○			71	75	77	0.40	0.51	0.72	0.87	1.00			1.22
02	○			71	75	77	0.80	1.03	1.43	1.74	2.00	2.43	3.11		
03	○			71	75	77	1.21	1.54	2.15	2.61	3.00	3.65	4.66	∩	3.2
04	○			76	80	82	1.61	2.05	2.87	3.48	4.00	4.86	6.21		
05	○			76	80	82	2.01	2.57	3.58	4.35	5.00	6.08	7.77	500	4.3
06		○		76	80	82	2.41	3.08	4.30	5.22	6.00	7.29	9.32		
07		○		76	80	82	2.81	3.59	5.02	6.10	7.00	8.51	10.9	∩	5.0
08		○		76	80	82	3.21	4.11	5.73	6.97	8.00	9.72	12.4		
10		○		76	80	83	4.02	5.14	7.17	8.71	10.0	12.2	15.5	650	5.8
12		○		76	80	83	4.82	6.16	8.60	10.4	12.0	14.6	18.6		
14			○	76	80	83	5.62	7.19	10.0	12.2	14.0	17.0	21.7	∩	6.8
18			○	76	80	83	7.23	9.24	12.9	15.7	18.0	21.9	28.0		
23			○	76	80	83	9.24	11.8	16.5	20.0	23.0	28.0	35.7	800	8.0

How to order

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

〈Example〉...¼MAAP01S303

¼ M	AAP	01	S303
<small>Pipe Conn. Size</small>		<small>Spray Capacity Code</small>	<small>Material</small>
■ ¼ M		■ 01	■ S303
■ ⅜ M		∩	
■ ½ M		■ 23	

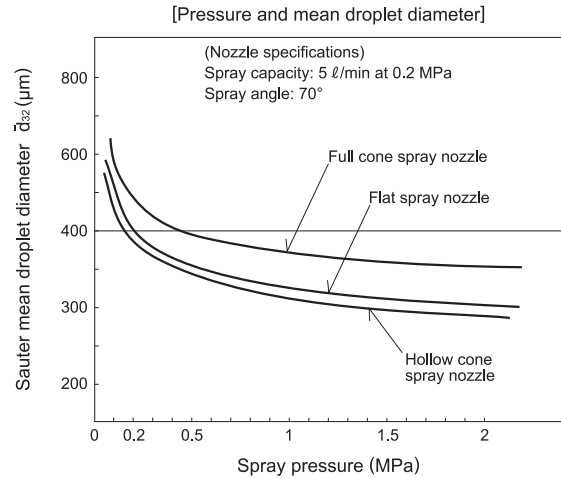
Effective Use of Hollow Cone Spray Nozzles

Mean Droplet Diameter

If spray pressure, spray capacity and spray angle are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among all hydraulic nozzles.

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Hollow cone spray nozzles are suitable for cooling and washing gases, humidifying and chemical reactions.



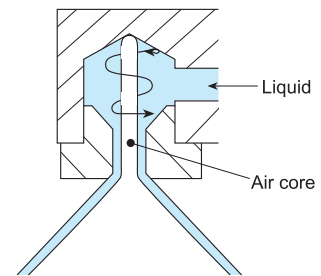
Free Passage Diameter

Free passage diameter shows the approximate value of the smallest dimension of liquid passage in the nozzle. Among hollow cone spray nozzles, **AAP** and **TAA series** nozzles have no obstructions inside and minimize clogging problems.

Wear Resistance

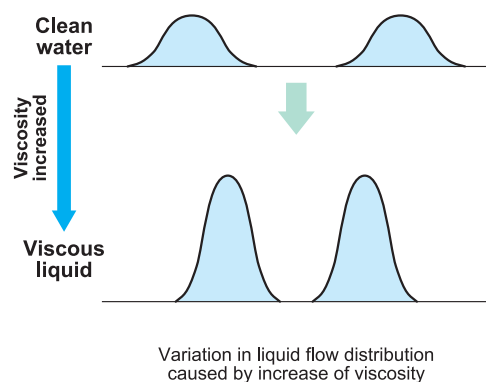
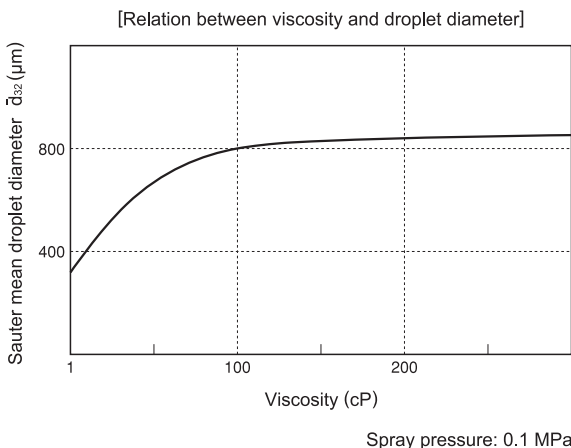
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Viscosity

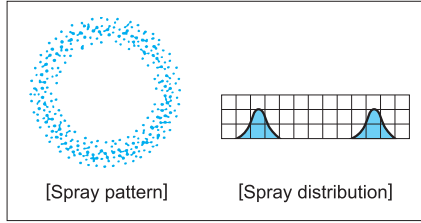
As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



Alumina Ceramic and Medium Capacity Hollow Cone Spray Nozzles

AP-AL92

Hollow Cone



[Features]

- Hollow cone spray nozzle made of alumina ceramic having excellent wear-resistance. Relatively fine atomization.
- Stable spray pattern both at low and high pressure.
- No-whirler design minimizes clogging.
- Spraying axis 90° from the axis of the nozzle inlet.

[Standard Pressure]

0.2 MPa

[Applications]

- Cleaning: Gas, air, machines, pre-painting treatment
 Cooling: Gas, air handling unit, roofs, machinery, foods, warm water
 Spraying: Aeration, humidification

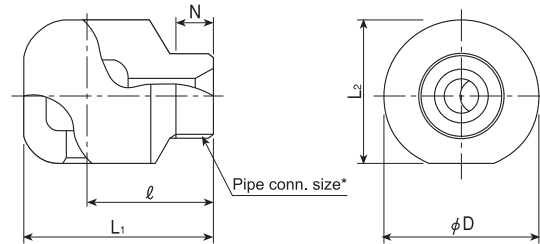
AP-AL92 series

AP-AL92 series	
Structure	<ul style="list-style-type: none"> ● Alumina ceramic one-piece structure. ● No obstructions in nozzle interior.
Material	● 92% Alumina

* If installed into a metal header, this nozzle should be used with a socket made of S316, shown on page 85 (otherwise, the thread may be damaged). Please refer to page 85.

Pipe conn. size*	Dimensions (mm)					Mass (g)
	L ₁	L ₂	ℓ	φD	N	
½ M	48.5	36	33.5	38	14	120
¾ M	59	44	39	46	15	200
1M	74	52.5	50	56	18	390
1½M	105	81.5	70	85	20	1,400
2M	127	99	82	104	24	2,100
2½M	162	123.5	102	128	29	4,500
3M	205	150	135	160	31	8,900

[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.



* When used with our S316 socket, socket thread for pipe connection is female thread. Drawing for nozzle with socket is available on request. (The above drawing is nozzle only)

Spray Capacity Code	Pipe Conn. Size							Spray Angle (°)			Spray Capacity (ℓ/min)						Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	
	½M	¾M	1M	1½M	2M	2½M	3M	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
14	○							76	80	83	5.62	7.19	10.0	12.2	14.0	17.0	21.7	580	6.8
16	○							76	80	83	6.43	8.22	11.5	13.9	16.0	19.4	24.9	5	7.2
18	○							76	80	83	7.23	9.24	12.9	15.7	18.0	21.9	28.0	5	7.5
20	○							76	80	83	8.03	10.3	14.0	17.4	20.0	24.3	31.1	5	7.5
23	○							76	80	83	9.24	11.8	16.5	20.0	23.0	28.0	35.7	800	8.0
26		○						76	80	83	10.4	13.4	18.6	22.6	26.0	31.6	40.4	670	9.2
30		○						76	80	83	12.1	15.4	21.5	26.1	30.0	36.5	46.6	5	9.9
35		○						76	80	83	14.1	18.0	25.1	30.5	35.0	42.5	54.4	5	10.3
40		○						76	80	83	16.1	20.5	28.7	34.8	40.0	48.6	62.1	850	10.5
45			○					81	85	89	18.1	23.1	32.2	39.2	45.0	54.7	69.9	750	12.1
50			○					81	85	89	20.1	25.7	35.8	43.5	50.0	60.8	77.7	5	12.3
55			○					81	85	89	22.1	28.2	39.4	47.9	55.0	66.8	85.4	5	13.1
60			○					81	85	89	24.1	30.8	43.0	52.2	60.0	72.9	93.2	5	13.7
70			○					81	85	89	28.1	35.9	50.2	61.0	70.0	85.1	109	1,000	15.0
80				○				81	85	89	32.1	41.1	57.3	69.7	80.0	97.2	124	1,000	15.3
100				○				81	85	89	40.2	51.4	71.7	87.1	100	122	155	5	16.2
120				○				81	85	89	48.2	61.6	86.0	104	120	146	186	5	16.6
150				○				81	85	89	60.3	77.0	107	131	150	182	233	5	18.0
200					○			81	85	89	80.3	103	143	174	200	243	311	1,400	22.5
250					○			81	85	89	100	128	179	218	250	304	388	1,400	24.3
300						○		81	85	89	121	154	215	261	300	365	466	1,500	28.8
400						○		81	85	89	161	205	287	348	400	486	621	5	30.6
500							○	81	85	89	201	257	358	435	500	608	777	5	36.9
600							○	81	85	89	241	308	430	522	600	729	932	1,800	39.6

How to order

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

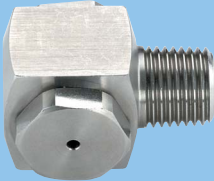
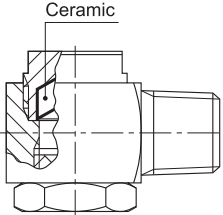
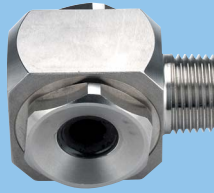
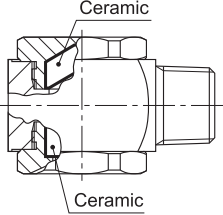
〈Example〉...1½MAP14AL92

<p>1½M</p> <p>Pipe Conn. Size</p> <p>1½M</p> <p>∫</p> <p>3M</p>	<p>AP</p>	<p>14</p> <p>Spray Capacity Code</p> <p>14</p> <p>∫</p> <p>600</p>	<p>AL92</p>
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Hollow Cone

Related Products

Hollow cone spray nozzles are superior in atomizing performance. On the other hand, the wear at the bottom of the nozzle is increased by an air core generated inside the nozzle. For spraying slurry, wear resistance of nozzles must be considered. For such applications, **AP series** hollow cone spray nozzles with highly wear-resistant ceramics are available. Please inquire with us for details.

Series	Appearance	Structure	Features	Applications
AP			Hollow cone spray nozzle with ceramic bottom.	Spraying slurry
AP (with ceramic orifice inserted)			Hollow cone spray nozzle with ceramic bottom and ceramic orifice.	Spraying slurry

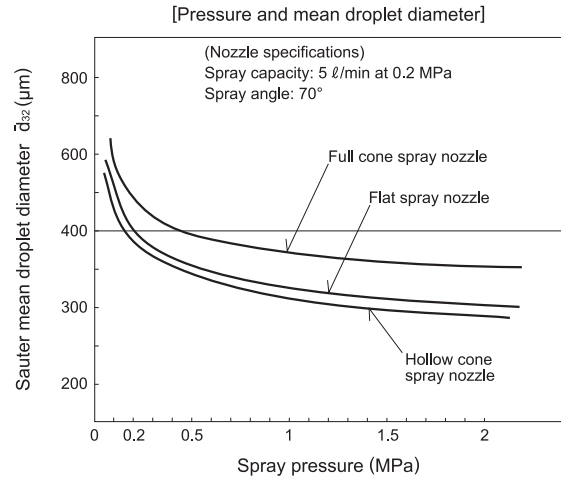
Effective Use of Hollow Cone Spray Nozzles

Mean Droplet Diameter

If spray pressure, spray capacity and spray angle are kept the same, the mean droplet diameter of a hollow cone spray nozzle is the smallest among all hydraulic nozzles.

Reducing the mean droplet diameter increases the total surface area of the spray liquid which has a great effect on transport phenomena of materials, such as chemical reaction, absorption, adsorption, etc.

Hollow cone spray nozzles are suitable for cooling and washing gases, humidifying and chemical reactions.



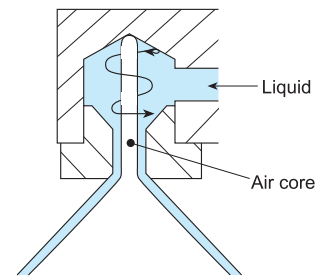
Free Passage Diameter

Free passage diameter shows the approximate value of the smallest dimension of liquid passage in the nozzle. Among hollow cone spray nozzles, **AAP** and **TAA series** nozzles have no obstructions inside and minimize clogging problems.

Wear Resistance

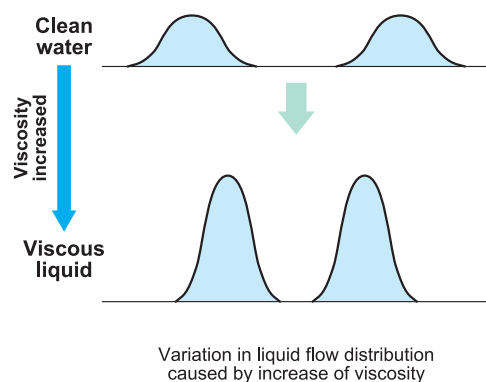
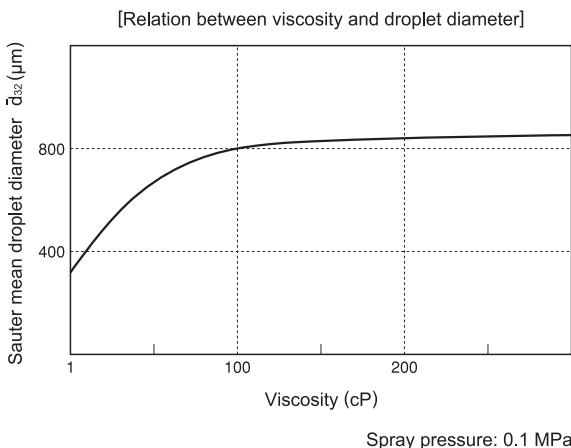
In the tangential hollow cone spray nozzles an air core is generated in the center of the vortex current, which causes wear at the end of the air core when the spraying liquid contains slurry.

In order to maintain optimum nozzle performance, the nozzle material is very important. That is why IKEUCHI's hollow cone spray nozzles are made of highly wear-resistant ceramics and SiC, etc.



Viscosity


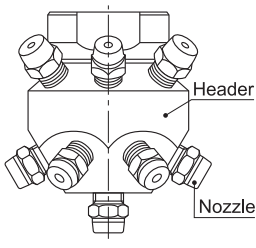
As the viscosity of liquid increases, the spray capacity of hollow cone spray nozzles increases but the spray angle decreases. Also, the mean droplet diameter becomes larger. Because viscous liquid increases the resistance inside the pipe, the liquid pressure drop must be also taken into consideration.



7-head Full Cone Spray Nozzles / Standard type
7JJXP series

Related Products

13JJXP series (13-head Full Cone Spray Nozzles)

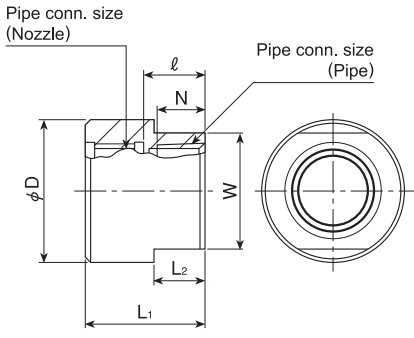
Series	Appearance	Structure	Features	Applications
13JJXP			<ul style="list-style-type: none"> • Full cone spray pattern with uniform spray distribution. • 13 pcs. of JJXP series full cone spray nozzles are screwed into a very compact header. • Spray droplet diameter is smaller than those of other single-head full cone spray nozzles having the same spray capacity. 	<ul style="list-style-type: none"> • Gas cooling • Moisture control

Cone Spray

Socket for Alumina Nozzles

Optional socket available for alumina nozzles (AP-AL92, JUXP-AL92, AJP-AL92 series).

Material of socket: S316



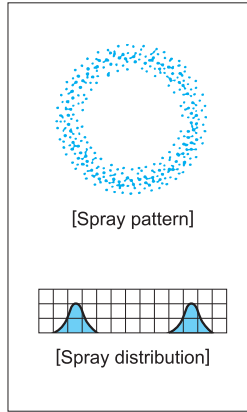
Nominal diameter	Pipe conn. size		Dimensions (mm)							Mass (g)
	Nozzle	Pipe	L ₁	L ₂	l	W	φD	N		
1/2	1/2	1/2	34	10	18	27	30	14	120	
3/4	3/4	3/4	39	14	21	35	40	15	230	
3/4x1	1	3/4	41	18	21	41	50	15	200	
1	1	1	43	18	23	41	50	17	400	
1x1 1/2	1 1/2	1	47	24	24	60	70	17	560	
1 1/2	1 1/2	1 1/2	50	24	27	60	70	19	840	
1 1/2x2	2	1 1/2	54	27	27	70	80	19	680	
2	2	2	58	27	31	70	80	23	1,100	
2x2 1/2	2 1/2	2	62	30	31	90	100	23	1,400	
2 1/2	2 1/2	2 1/2	66	30	35	90	100	27	2,000	
2 1/2x3	3	2 1/2	71	35	36	100	110	27	1,500	
3	3	3	75	35	40	100	110	30	2,200	

* Thread for connecting pipe is female taper thread.

Flange-type, Large Capacity Hollow Cone Spray Nozzles

TAA

Hollow Cone



[Features]

- Stable spray pattern under low pressures owing to the involute vortex chamber design.
- Made of highly wear-resistant SiC (silicon nitride bonded silicon carbide).
- Flanged connection.
- Lightweight as made in all SiC (less than half of metal nozzle).

[Standard Pressure]

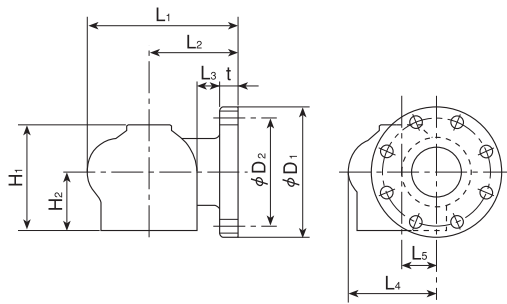
0.07 MPa

[Applications]

- Absorption tower of flue gas desulfurization equipment
- Spraying slurry

TAA series

TAA series														
Structure	<ul style="list-style-type: none"> • One-piece cast-molded ceramics. • Flanged connection. 													
Material	<ul style="list-style-type: none"> • SiC (silicon nitride bonded silicon carbide) • Optimal material: SiSiC (sintered reaction-bonded silicon carbide) 													
Flange Size	Spray capacity code	Dimensions (mm)										Flange (JIS 10k)	Mass (g)	
		L ₁	L ₂	L ₃	L ₄	L ₅	H ₁	H ₂	φD ₁	φD ₂	t			Qty. of bolt holes
2T	200	151	99	37	74	28	102	57	155	120	22	4	19	1,800
	300	169	106	37	90	35	112	62	155	120	22	4	19	2,000
3T	400	184	114	37	100	38	129	71	185	150	24	8	19	3,100
	500	202	122	37	116	45	145	82	185	150	24	8	19	3,700
	650	210	125	36	124	49	150	85	185	150	24	8	19	4,000
	800	210	125	36	124	49	150	85	185	150	24	8	19	4,000
4T	1000	253	154	55	143	56	177	100	210	175	24	8	19	6,000
	1200	271	161	55	159	63	187	105	210	175	24	8	19	6,800



[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

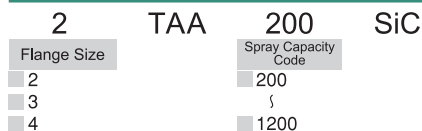
Spray Capacity Code	Flange Size			Spray Angle (°)			Spray Capacity (ℓ/min)					Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)
	2T	3T	4T	0.03 MPa	0.07 MPa	0.1 MPa	0.03 MPa	0.05 MPa	0.07 MPa	0.1 MPa	0.15 MPa		
200	○			62	67	69	133	170	200	237	288	1,800	28
300	○			62	67	69	199	255	300	356	432	2,100	33
400		○		62	67	69	266	340	400	474	576	2,100	38
500		○		62	67	69	332	425	500	592	720	2,100	41
650		○		62	67	69	432	552	650	770	936	3,600	50
800		○		75	80	82	532	680	800	950	1,154	3,600	57
1000			○	75	80	82	665	850	1,000	1,187	1,442	3,600	63
1200			○	75	80	82	798	1,020	1,200	1,424	1,731	3,800	68

[Note] 1. Since TAA of SiC series nozzles are die-cast molded, the spray capacity is guaranteed within ±10% and the spray angle within ±7° under standard pressure.
2. Bolt tightening torque for connecting the flange must not exceed 30 N-m per bolt.

How to order

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

<Example>...2TAA200SiC



Related Products

Also available are TWAA series nozzles for two-direction spray and TAA series nozzles made of chemical-resistant PP.

Series	Appearance	Structure	Features	Series	Appearance	Structure	Features
TWAA-SiC			<ul style="list-style-type: none"> • Two-direction (180° opposite direction) jet type made of SiC Ceramic. 	TAA-PP			<ul style="list-style-type: none"> • Hollow cone spray nozzle made of PP. • Chemical-resistant and lightweight.

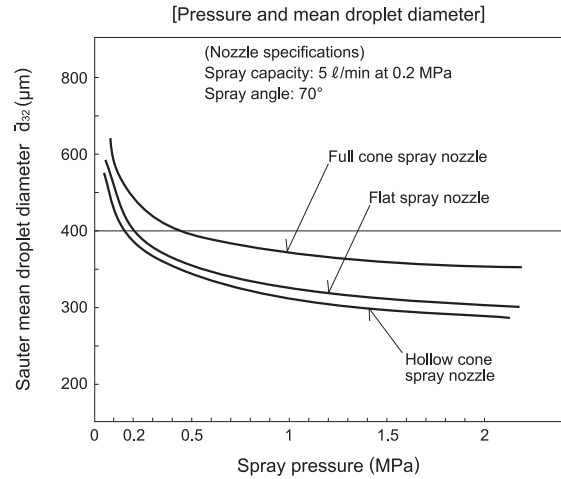
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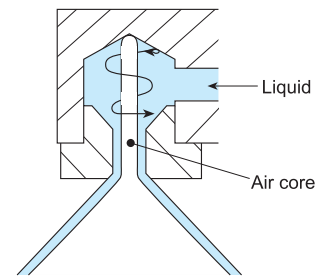
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