



POLLUTION CONTROL

Spray Nozzles



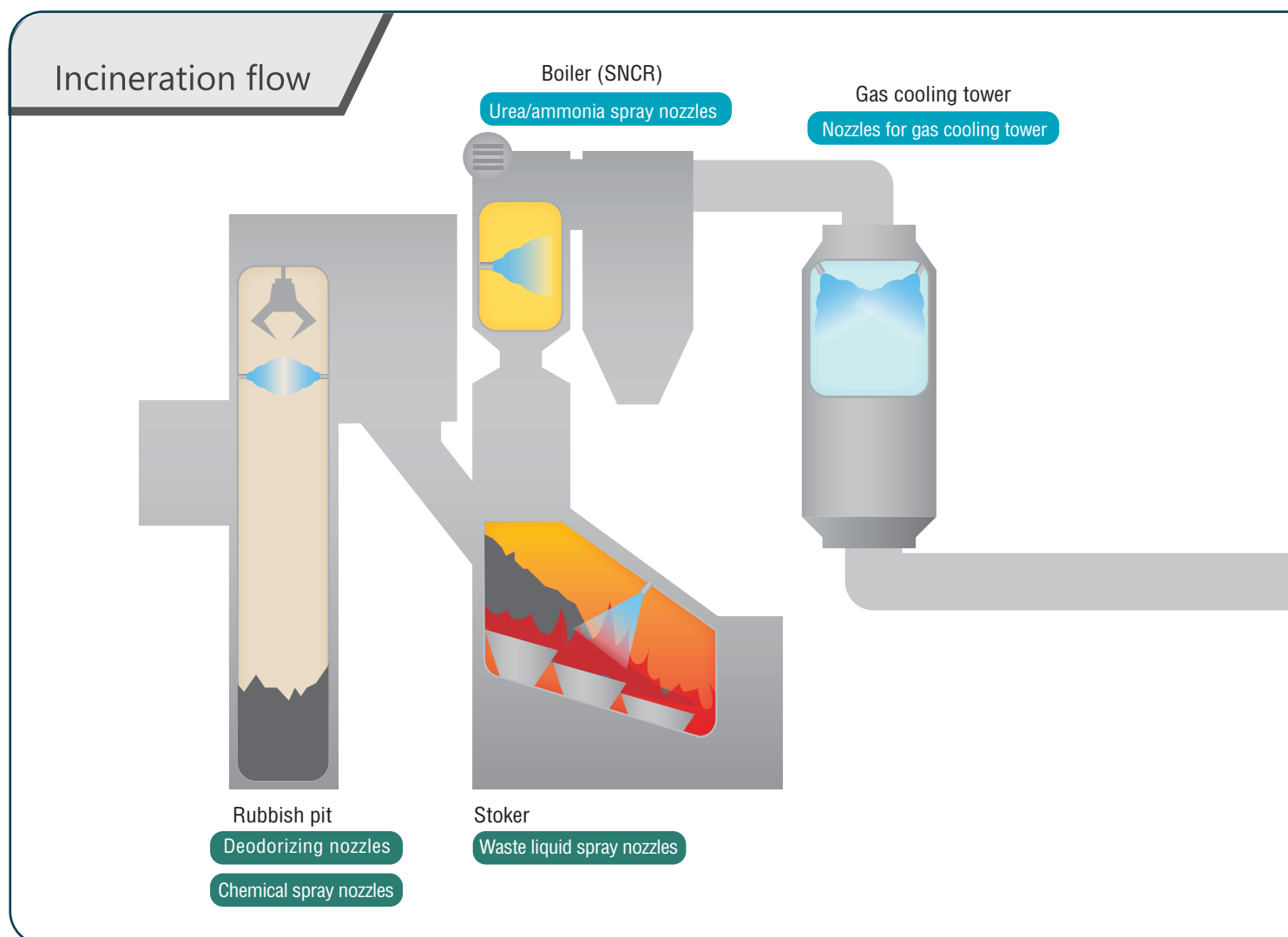
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LEADING GREEN, EVERLOY

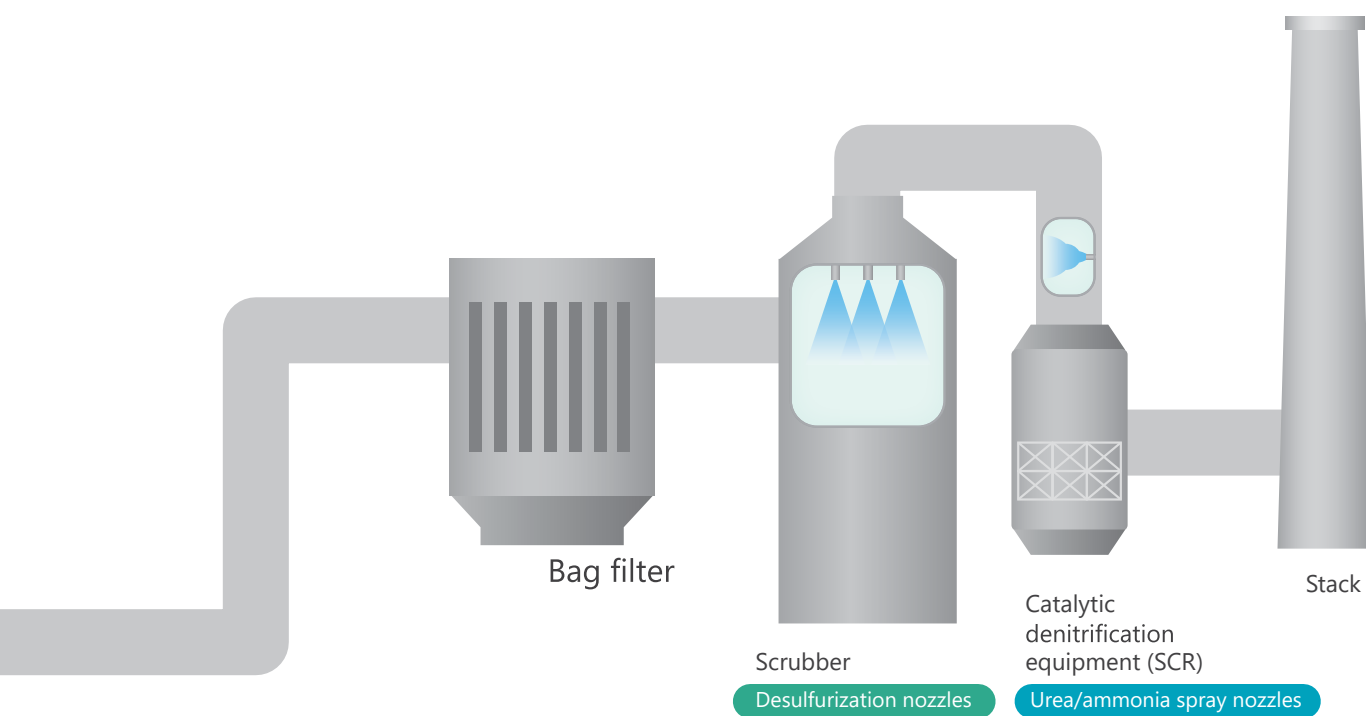
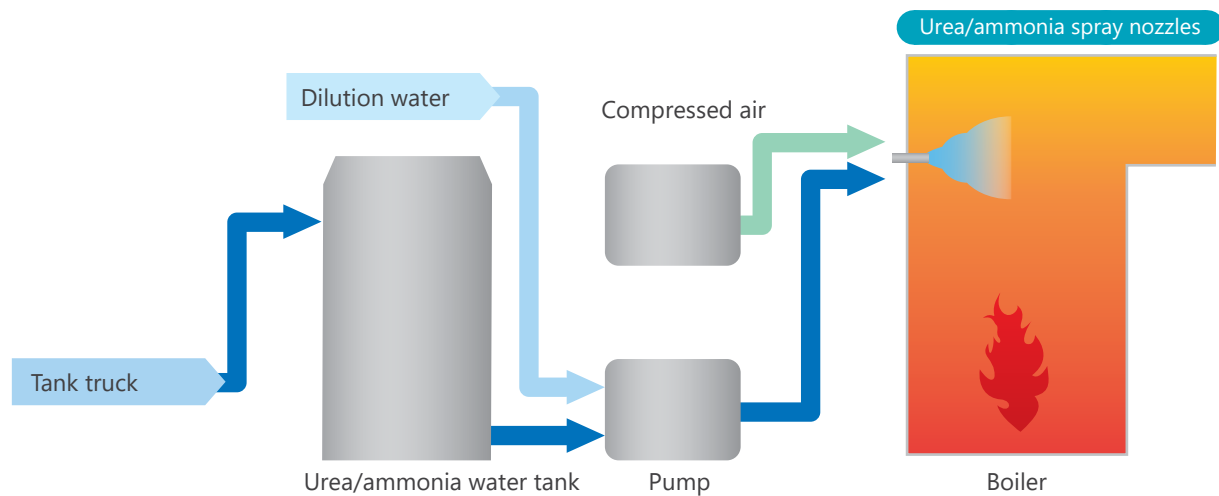
In various countries, more and more protective measures to preserve the environment on this planet are being taken.

A serious social issue is treating and disposing of ever-increasing waste materials, which may emit the harmful dioxin to the atmosphere. To tackle such problems, we have come up with Everloy spray nozzle that are highly rated and in very wide use.

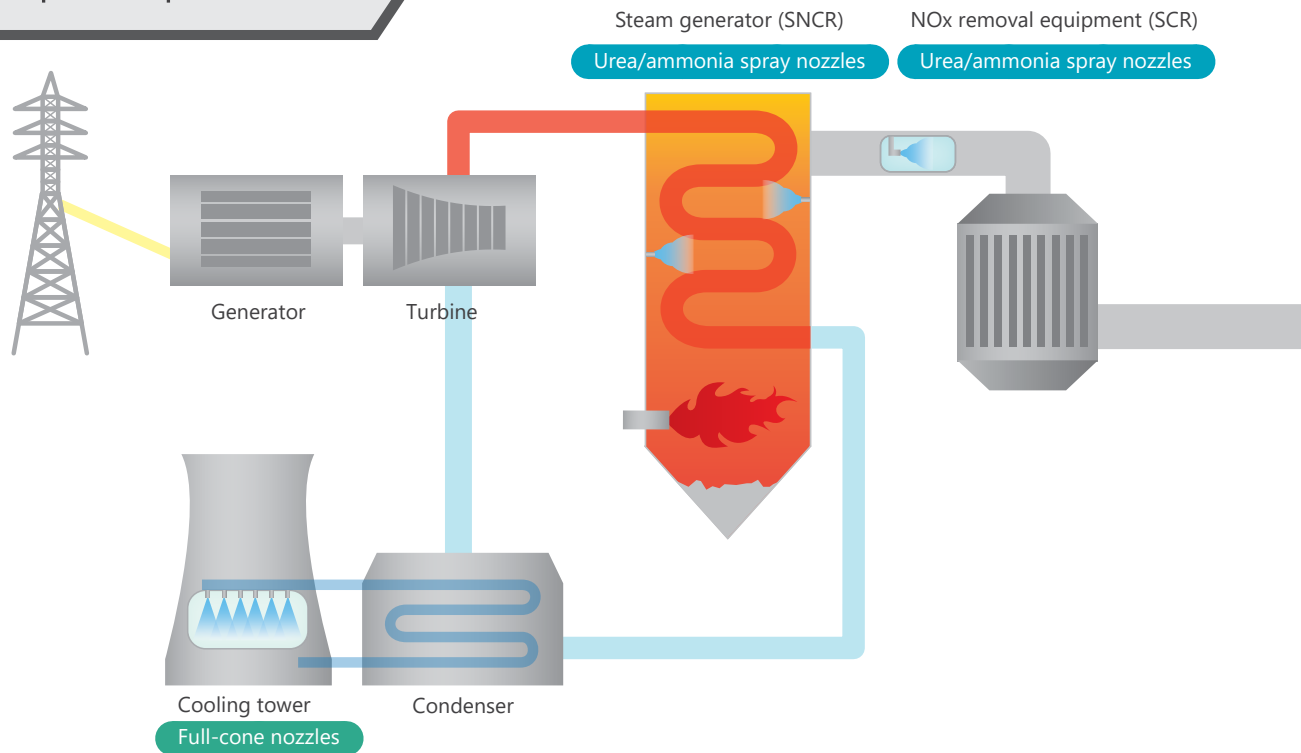
With long years of achievements and top-notch analysis equipment, we are committed to developing and supplying better spray nozzle.



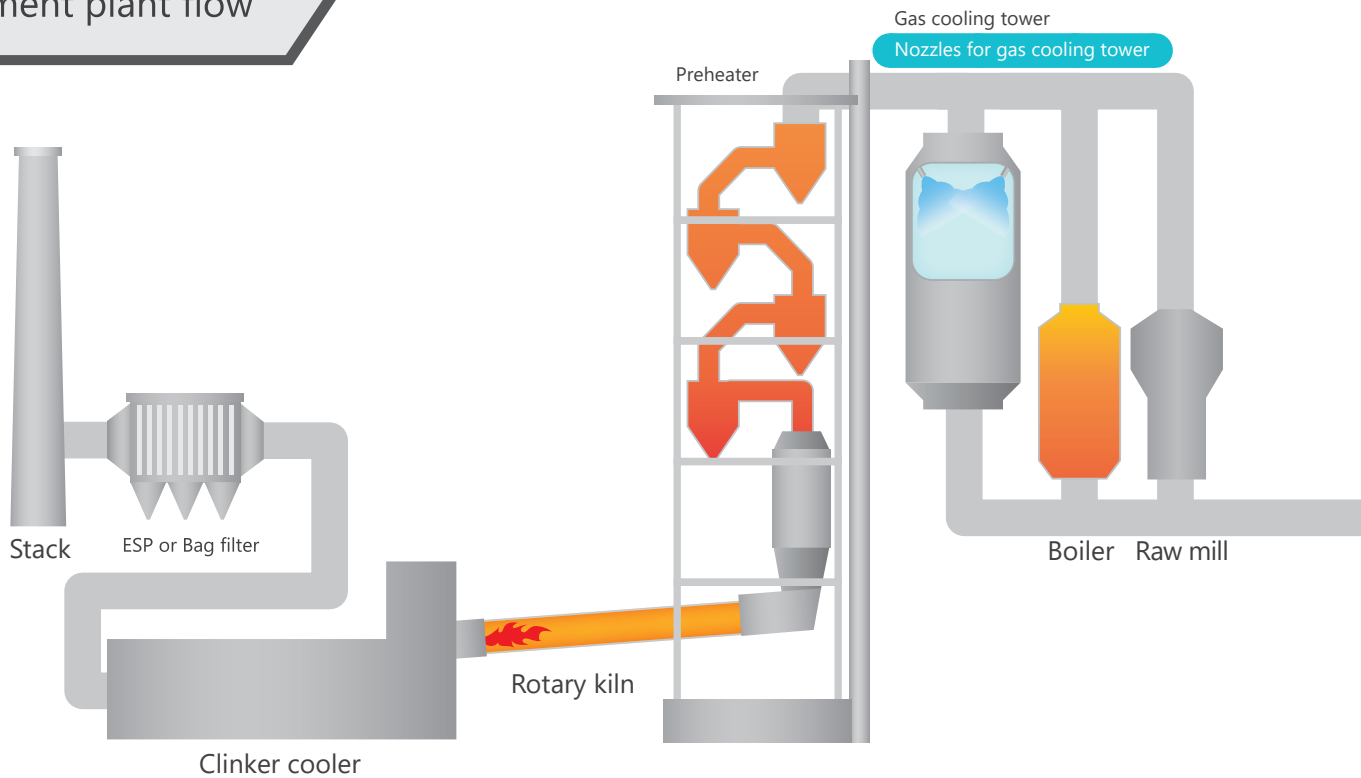
Selective Non-Catalytic Reduction (SNCR) flow

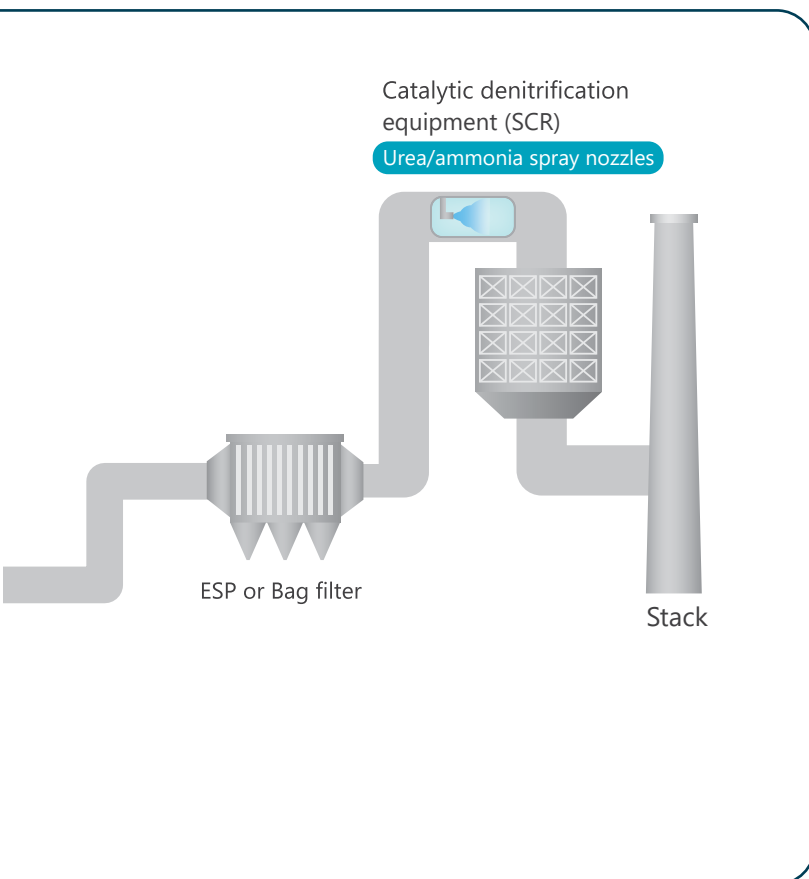
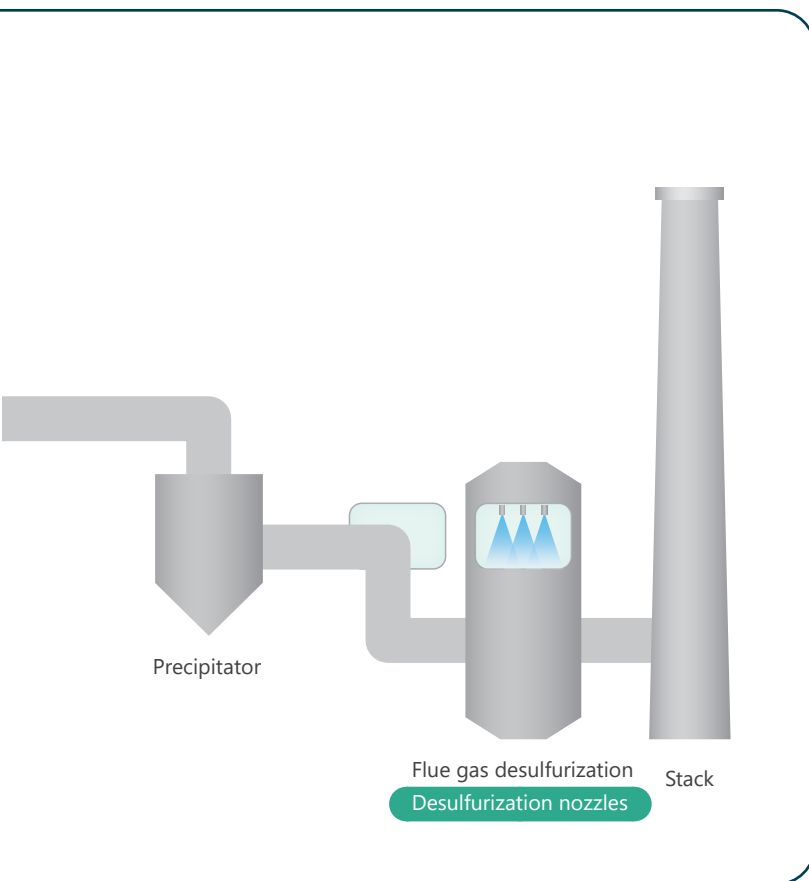


Thermal power plant flow



Cement plant flow





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Urea/ammonia spray nozzles

Air mist nozzle

Features

Simple structure minimizes clogging.

Small mean particle size and less discrepancy.

Water flow rate: 30-500 L/h

Spray pattern: flat pattern, full-cone pattern(Both patterns are interchangeable)

● Flat spray type : KSAMM



● Full-cone spray type : KSAMD



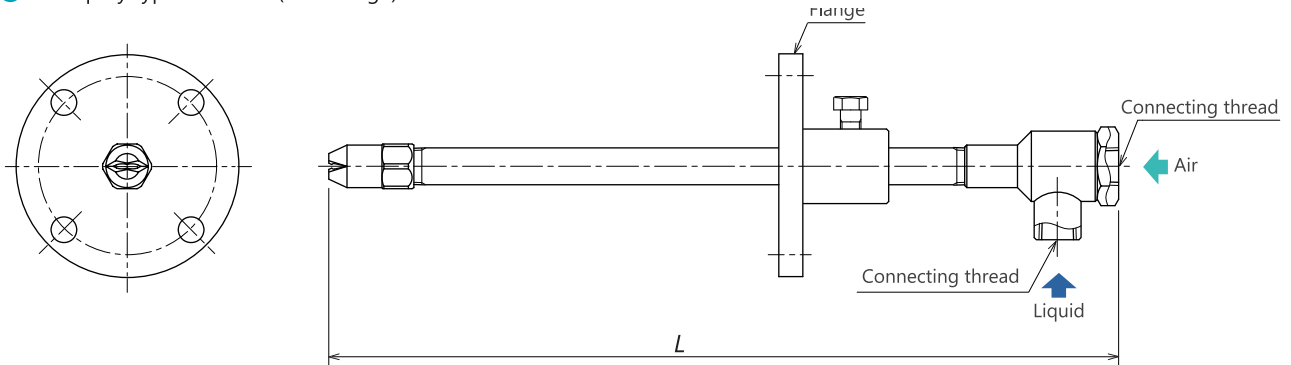
Model number list

Criterion water flow rate [L/h]	Air flow rate [m ³ /h(nor)]	Water flow rate[L/h] at following water pressure[MPa]			Spray angle	Model No. of nozzle tip		Model No. of mixing body
		0.2	0.3	0.4		Flat	Full-cone	
30	4.5	24	30	36	30°	1/4 KSAMM 0430	1/4 KSAMD 09X6-30	1/4 A18 1/4 W10
					60°	1/4 KSAMM 0370	1/4 KSAMD 09X6-60	
					90°	1/4 KSAMM 03125	1/4 KSAMD 09X6-90	
50	7.5	36	50	60	30°	1/4 KSAMM 0738	1/4 KSAMD 105X8-30	1/4 A25 1/4 W14
					60°	1/4 KSAMM 0666	1/4 KSAMD 105X8-60	
					90°	1/4 KSAMM 06115	1/4 KSAMD 105X8-90	
70	10.5	54	70	84	30°	1/4 KSAMM 1039	1/4 KSAMD 13X8-30	1/4 A29 1/4 W16
					60°	KSAMM 0965	1/4 KSAMD 13X8-60	
					90°	1/4 KSAMM 09137	1/4 KSAMD 13X8-90	
100	15.0	72	100	120	30°	1/4 KSAMM 1848	1/4 KSAMD 16X8-30	1/4 A35 1/4 W19
					60°	1/4 KSAMM 1483	1/4 KSAMD 16X8-60	
					90°	1/4 KSAMM 12119	1/4 KSAMD 16X8-90	
150	22.5	120	150	180	30°	1/4 KSAMM 2230	1/4 KSAMD 21X8-30	1/4 A42 1/4 W23
					60°	1/4 KSAMM 2081	1/4 KSAMD 21X8-60	
					90°	1/4 KSAMM 22125	1/4 KSAMD 21X8-90	
200	30	156	200	240	30°	3/8 KSAMM 2736	3/8 KSAMD 22X8-30	3/8 A48 3/8 W27
					60°	3/8 KSAMM 2572	3/8 KSAMD 22X8-60	
					90°	3/8 KSAMM 26102	3/8 KSAMD 22X8-90	
300	45	240	300	372	30°	3/8 KSAMM 3835	3/8 KSAMD 27X8-30	3/8 A62 3/8 W35
					60°	3/8 KSAMM 3775	3/8 KSAMD 27X8-60	
					90°	3/8 KSAMM 37108	3/8 KSAMD 27X8-90	
400	60	312	400	500	30°	3/8 KSAMM 5828	-	3/8 A71 3/8 W40
					60°	3/8 KSAMM 5865	-	
					90°	3/8 KSAMM 54115	-	
500	75	378	500	600	30°	1/2 KSAMM 6929	-	1/2 A80 1/2 W45
					60°	1/2 KSAMM 6965	-	
					90°	1/2 KSAMM 61115	-	

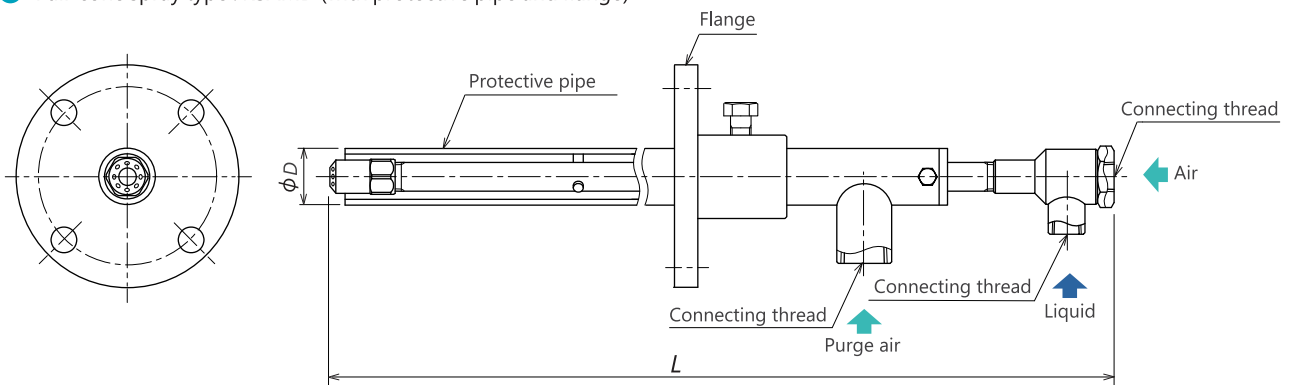
*The criterion water flow rate is a value of air pressure 0.3 MPa or less, water pressure 0.3 MPa or less, and air-water volume ratio 150.

Shapes

● Flat spray type : KSAMM (with flange)



● Full-cone spray type : KSAMD (with protective pipe and flange)



*Dimension L is to be specified by the customer.

*NPT thread is also available.

Size	Liquid Air connecting thread size	Purge air connecting thread size	Outer diameter D [mm]	*Flange		Material
				Without protective pipe	With protective pipe	
1/4	1/4	1/2	27.2	JIS 5K-32A	JIS 5K-50A	JIS SUS316L
3/8	3/8	3/4	34.0			
1/2	1/2	1	42.7			

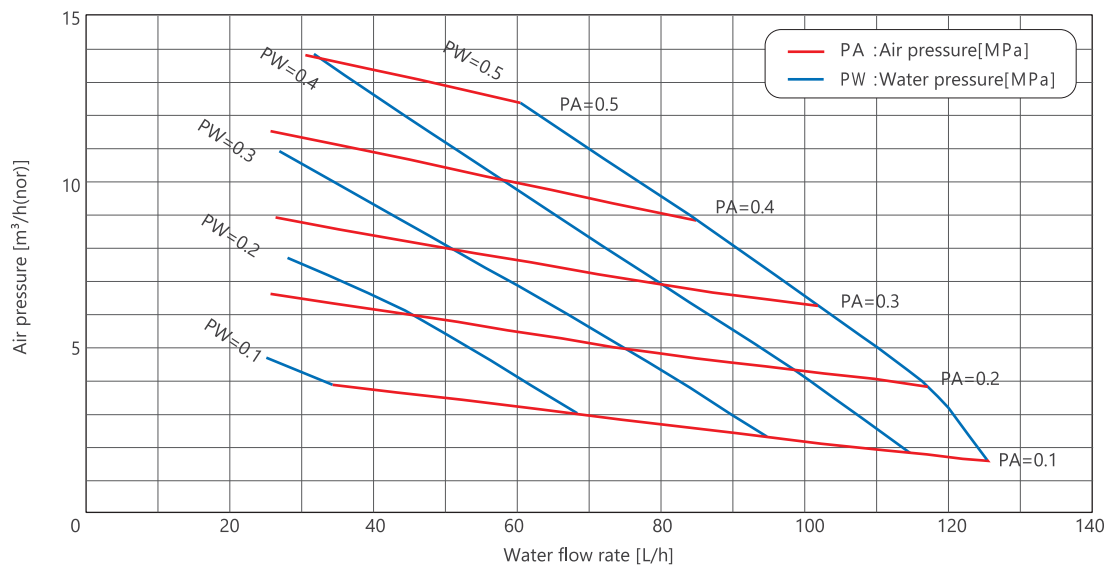
*Overall length and flange size can be customized based on customer's applications.

The materials of the nozzle tip such as C-22, SUS310S, or others are available based on customer's applications.

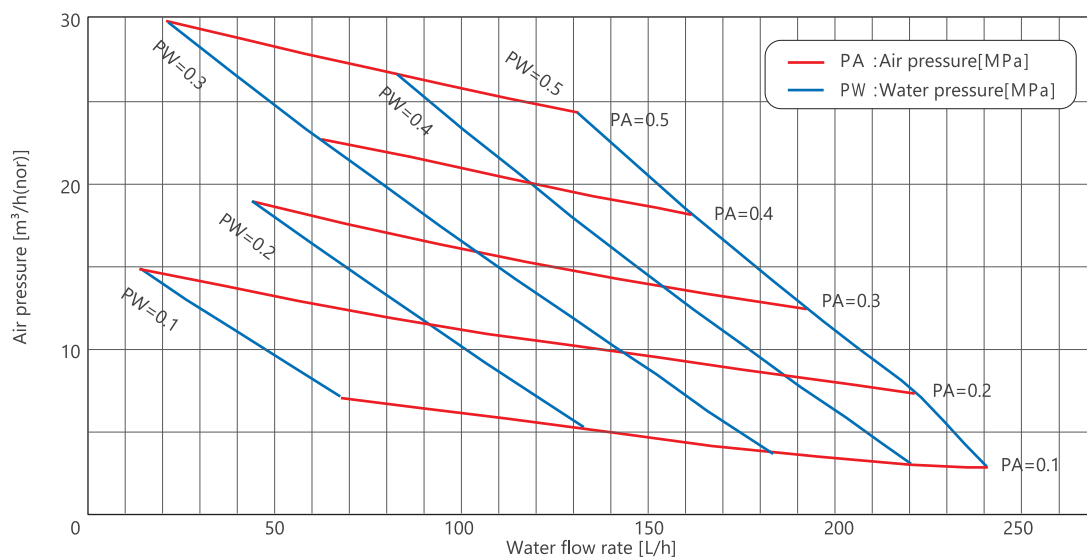
PERFORMANCE DATA

Characteristic curves

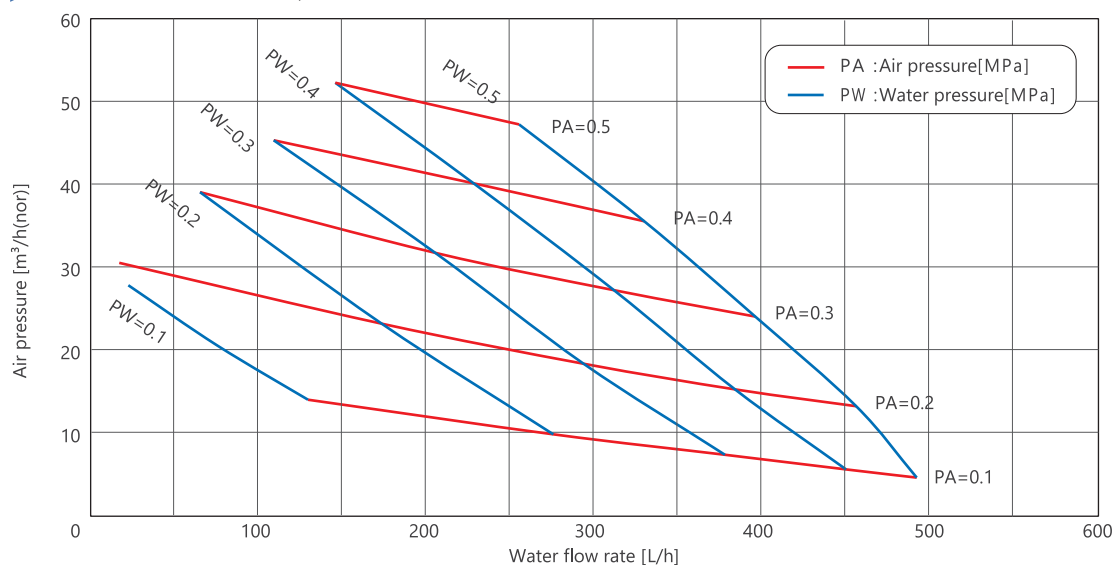
► Criterion water flow rate : 50 L/h



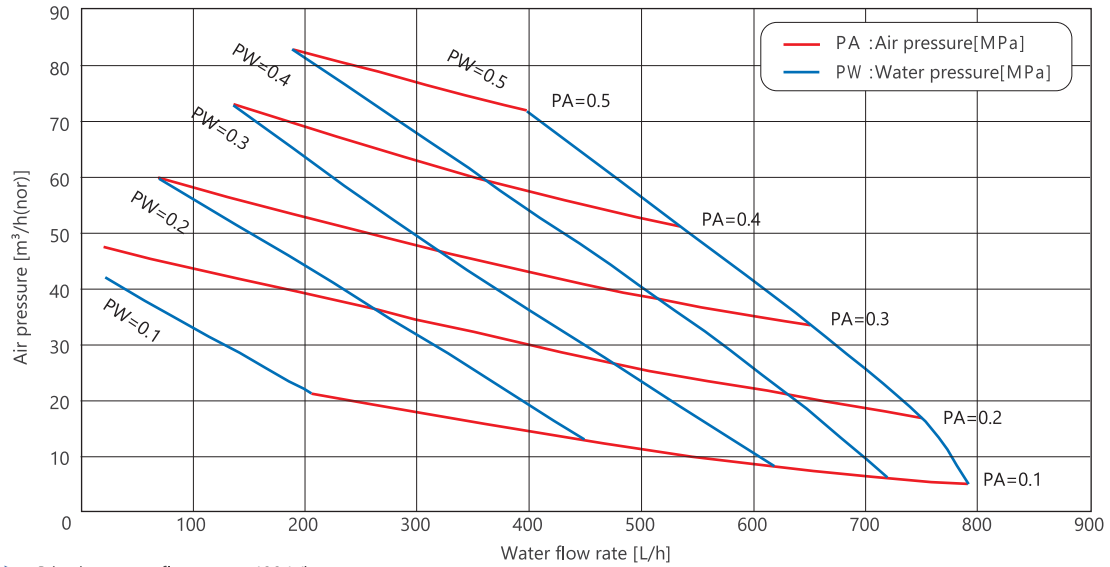
► Criterion water flow rate : 100 L/h



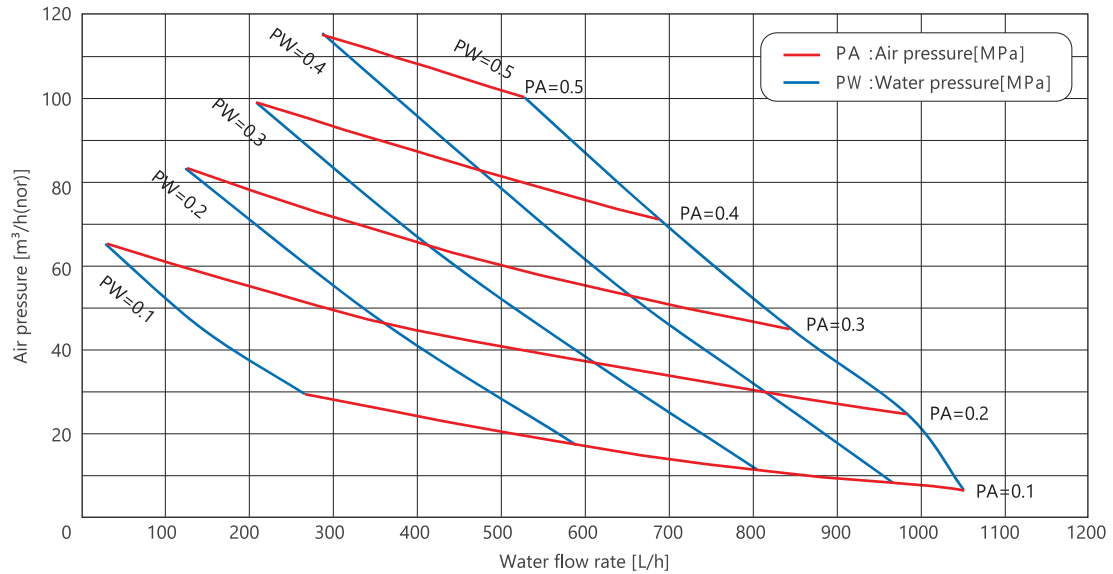
► Criterion water flow rate : 200 L/h



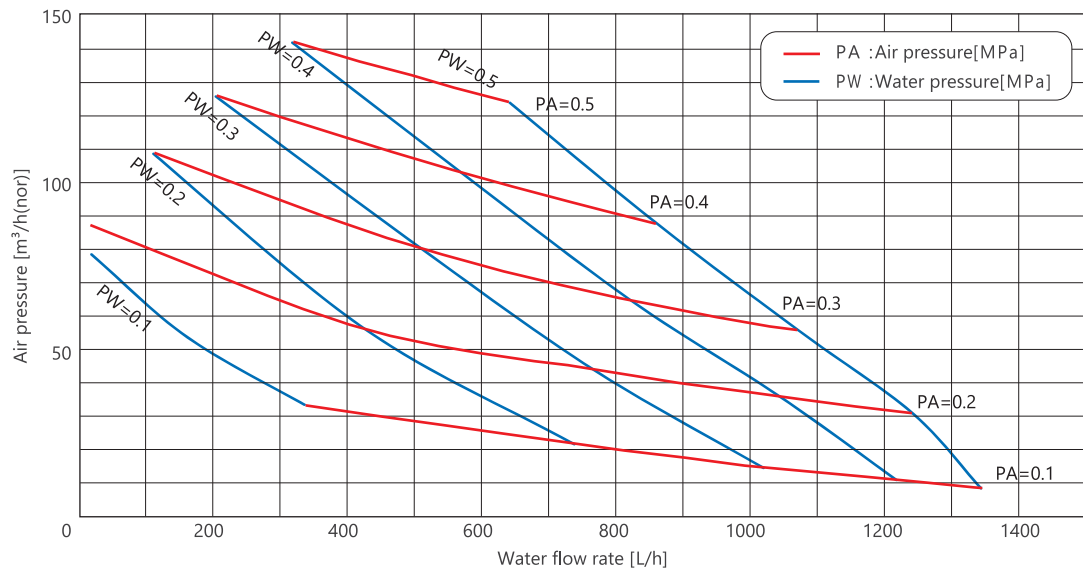
► Criterion water flow rate : 300 L/h



► Criterion water flow rate : 400 L/h



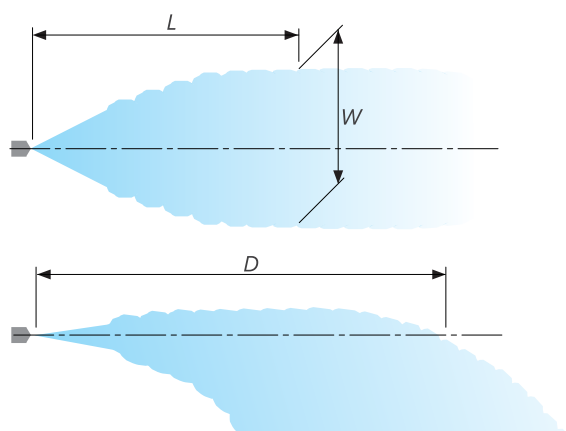
► Criterion water flow rate : 500 L/h



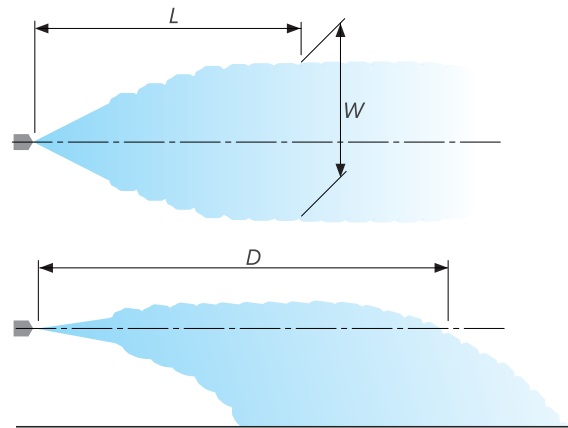
Performance data

Spray pattern

● Flat spray type : KSAMM



Criterion water flow rate [L/h]	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m ³ /h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray angle	Model No.	Spray pattern value [mm]		
								D	L	W
50	0.28	0.28	7.5	50	150	30°	¼ KSAMM 0738	4,700	500	270
									1,000	450
									2,000	750
						60°	¼ KSAMM 0666	3,500	3,000	950
									500	580
									1,000	850
						90°	¼ KSAMM 06115	2,200	2,000	1,000
									3,000	-
									500	1,000
100	0.28	0.28	15.0	100	150	30°	¼ KSAMM 1848	5,500	1,000	1,550
									2,000	2,300
									3,000	-
						60°	¼ KSAMM 1483	5,000	500	1,000
									1,000	850
									2,000	1,100
						90°	¼ KSAMM 12119	3,800	3,000	1,400
									500	1,000
									1,000	1,500
200	0.28	0.28	30.0	200	150	30°	⅜ KSAMM 2736	6,500	2,000	2,500
									3,000	3,500
									500	270
						60°	⅜ KSAMM 2572	5,500	1,000	450
									2,000	800
									3,000	1,000
						90°	⅜ KSAMM 26102	4,500	500	580
									1,000	850
									2,000	1,100

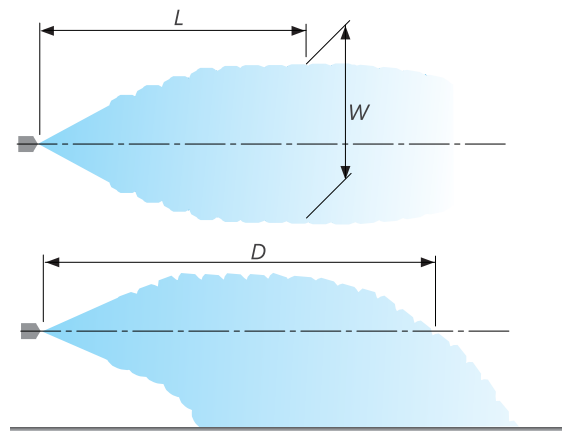


Criterion water flow rate [L/h]	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray angle	Model No.	Spray pattern value [mm]		
								<i>D</i>	<i>L</i>	<i>W</i>
300	0.28	0.28	45	300	150	30°	¾ KSAMM 3835	6,500	500	270
									1,000	450
									2,000	800
									3,000	1,000
						60°	¾ KSAMM 3775	5,500	500	580
									1,000	850
									2,000	1,000
									3,000	1,400
						90°	¾ KSAMM 37108	4,500	500	1,000
									1,000	1,500
									2,000	2,500
									3,000	3,500
400	0.28	0.28	60	400	150	30°	¾ KSAMM 5828	6,500	500	270
									1,000	450
									2,000	800
									3,000	1,000
						60°	¾ KSAMM 5865	5,500	500	580
									1,000	850
									2,000	1,100
									3,000	1,400
						90°	¾ KSAMM 54115	4,500	500	1,000
									1,000	1,500
									2,000	2,500
									3,000	3,500
500	0.28	0.28	75	500	150	30°	½ KSAMM 6929	6,500	500	270
									1,000	450
									2,000	800
									3,000	1,000
						60°	½ KSAMM 6965	5,500	500	580
									1,000	850
									2,000	1,100
									3,000	1,400
						90°	½ KSAMM 61115	4,500	500	1,000
									1,000	1,500
									2,000	2,500
									3,000	3,500

Performance data

Spray pattern

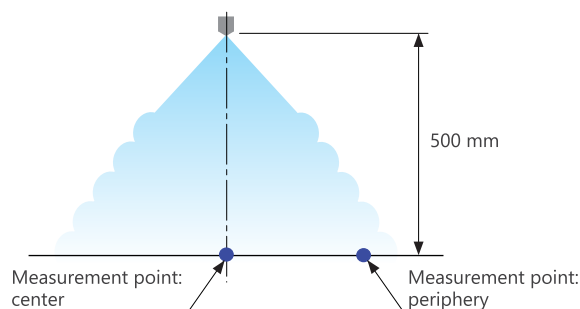
● Full-cone spray type : KSAMD



Criterion water flow rate [L/h]	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray angle	Model No.	Spray pattern value [mm]		
								D	L	W
50	0.28	0.28	7.5	0.83	150	30°	¼ KSAMD 105×8-30	3,000	500	300
									1,000	450
									2,000	750
									3,000	1,000
						60°	¼ KSAMD 105×8-60	2,000	500	550
									1,000	700
									2,000	-
						90°	¼ KSAMD 105×8-90	1,500	3,000	-
									500	1,000
100	0.28	0.28	15.0	1.67	150	30°	¼ KSAMD 16×8-30	5,000	1,000	-
									2,000	-
									3,000	-
									500	1,000
						60°	¼ KSAMD 16×8-60	4,500	1,000	700
									2,000	1,000
									3,000	1,200
						90°	¼ KSAMD 16×8-90	4,000	500	1,000
									1,000	1,100
200	0.28	0.28	30.0	3.33	150	30°	¾ KSAMD 22×8-30	5,500	2,000	1,300
									3,000	1,500
									500	300
									1,000	450
						60°	¾ KSAMD 22×8-60	5,000	2,000	750
									3,000	1,000
									500	550
						90°	¾ KSAMD 22×8-90	4,500	1,000	700
									2,000	1,000

Performance data

Particle size and velocity characteristic



Flat spray type : KSAMM

Criterion water flow rate [L/h]	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray angle	Model No.	Sauter mean diameter [μm]		Mean particle velocity [m/s]	
								center	periphery	center	periphery
50	0.28	0.28	7.5	50	150	30°	¼ KSAMM 0738	58.6	52.7	22.0	6.8
						60°	¼ KSAMM 0666	58.3	50.0	9.2	7.2
						90°	¼ KSAMM 06115	57.8	48.6	4.3	5.6
100	0.28	0.28	15.0	100	150	30°	¼ KSAMM 1848	59.0	53.4	22.7	6.3
						60°	¼ KSAMM 1483	58.5	50.3	10.2	9.0
						90°	¼ KSAMM 12119	57.9	48.3	4.6	5.9
200	0.28	0.28	30.0	200	150	30°	⅓ KSAMM 2736	53.1	62.5	24.6	6.5
						60°	⅓ KSAMM 2572	59.0	50.8	11.6	12.1
						90°	⅓ KSAMM 26102	58.1	49.9	8.4	6.5
300	0.28	0.28	45.0	300	150	30°	⅓ KSAMM 3835	51.0	62.3	30.0	7.1
						60°	⅓ KSAMM 3775	48.4	61.2	17.3	7.5
						90°	⅓ KSAMM 37108	59.8	48.7	10.2	6.7
400	0.28	0.28	60.0	400	150	30°	⅓ KSAMM 5828	51.0	63.0	35.9	7.2
						60°	⅓ KSAMM 5865	48.6	61.3	23.3	7.7
						90°	⅓ KSAMM 54115	59.0	48.8	11.2	6.8
500	0.28	0.28	75.0	500	150	30°	½ KSAMM 6929	51.6	64.3	39.5	7.1
						60°	½ KSAMM 6965	47.2	61.4	29.9	8.0
						90°	½ KSAMM 61115	59.2	47.5	12.6	6.6

Full-cone spray type : KSAMD

Criterion water flow rate [L/h]	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray angle	Model No.	Sauter mean diameter [μm]		Mean particle velocity [m/s]	
								center	periphery	center	periphery
50	0.28	0.28	7.5	50	150	30°	¼ KSAMD 105×8-30	52.4	50.9	14.3	6.4
						60°	¼ KSAMD 105×8-60	47.4	44.6	2.1	3.6
						90°	¼ KSAMD 105×8-90	50.3	41.2	0.6	2.7
100	0.28	0.28	15.0	100	150	30°	¼ KSAMD 16×8-30	55.7	53.1	24.3	8.8
						60°	¼ KSAMD 16×8-60	55.5	43.7	2.8	6.1
						90°	¼ KSAMD 16×8-90	55.3	42.6	0.7	3.3
200	0.28	0.28	30.0	200	150	30°	⅓ KSAMD 22×8-30	57.5	55.3	33.9	10.1
						60°	⅓ KSAMD 22×8-60	59.8	47.9	4.9	6.6
						90°	⅓ KSAMD 22×8-90	59.5	46.0	7.5	6.1
300	0.28	0.28	45.0	300	150	30°	⅓ KSAMD 27×8-30	58.5	54.8	43.1	12.1
						60°	⅓ KSAMD 27×8-60	60.0	45.1	11.3	9.8
						90°	⅓ KSAMD 27×8-90	62.1	47.4	4.9	4.4

Urea/ammonia spray nozzles

Automatic sliding device

This device is for NOx removal nozzle and can protect the nozzle by sliding it to the outside of furnaces.

In addition, remotely controlled, the nozzle is inserted into the furnace in spraying, and slid back outside in not spraying.

Features

With/without protective pipe is available.

The position of the nozzle can be checked by control panel.

Easy to maintain due to simple structure.

The stroke length is adjustable. (Standard: 300mm)



Purge air specification

Air pressure : 0.5-1.0 kPa

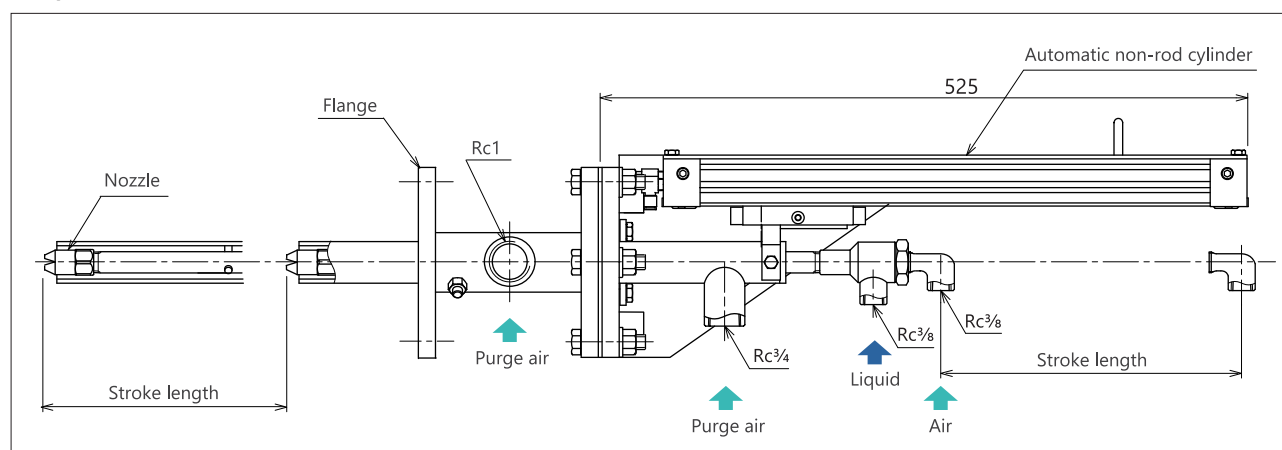
Automatic sliding device specification

Working air pressure: 0.3 - 0.7 MPa

Working voltage: 24V DC

Stroke speed: up to approximately 650 mm/s (adjustable)

Shapes



Operation

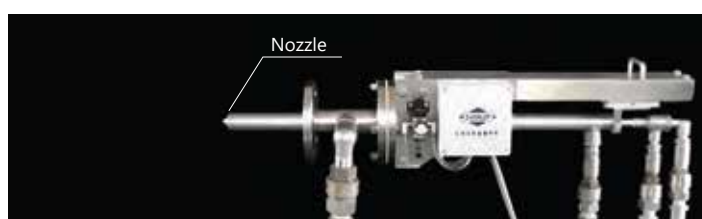
Spraying:

Slide the nozzle to the specified position for spraying.



Stopping:

After stopping spray, nozzle returns to original position.



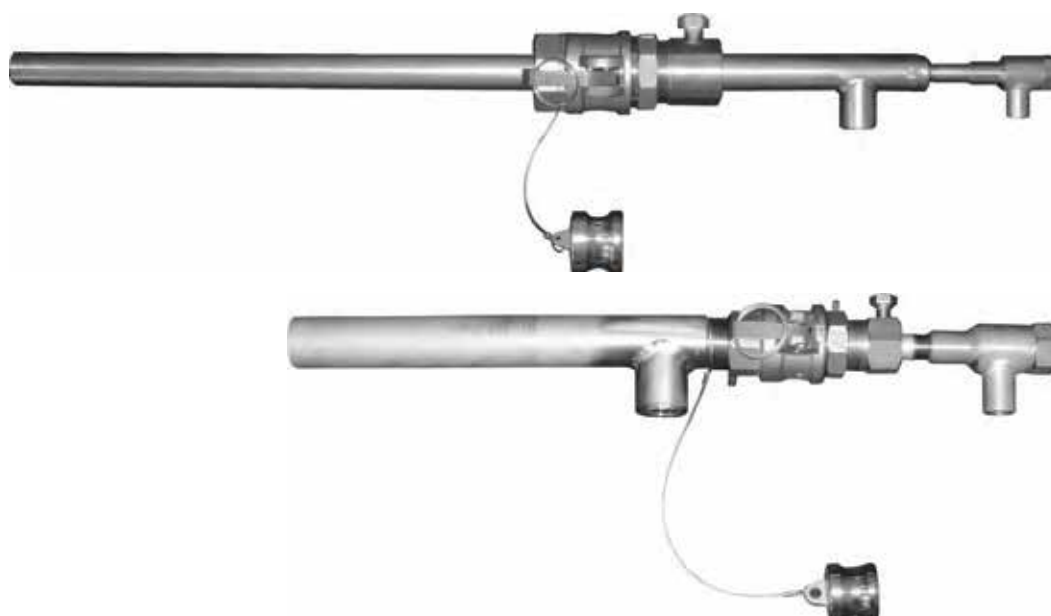
Urea/ammonia spray nozzles

Connecting option

- With flexible hose



- With plug quick connector



Example for application



Nozzles for gas cooling tower

KAMX nozzle

Features

Light weight and compact design.

Spray angle capacity from 40° to 80°.

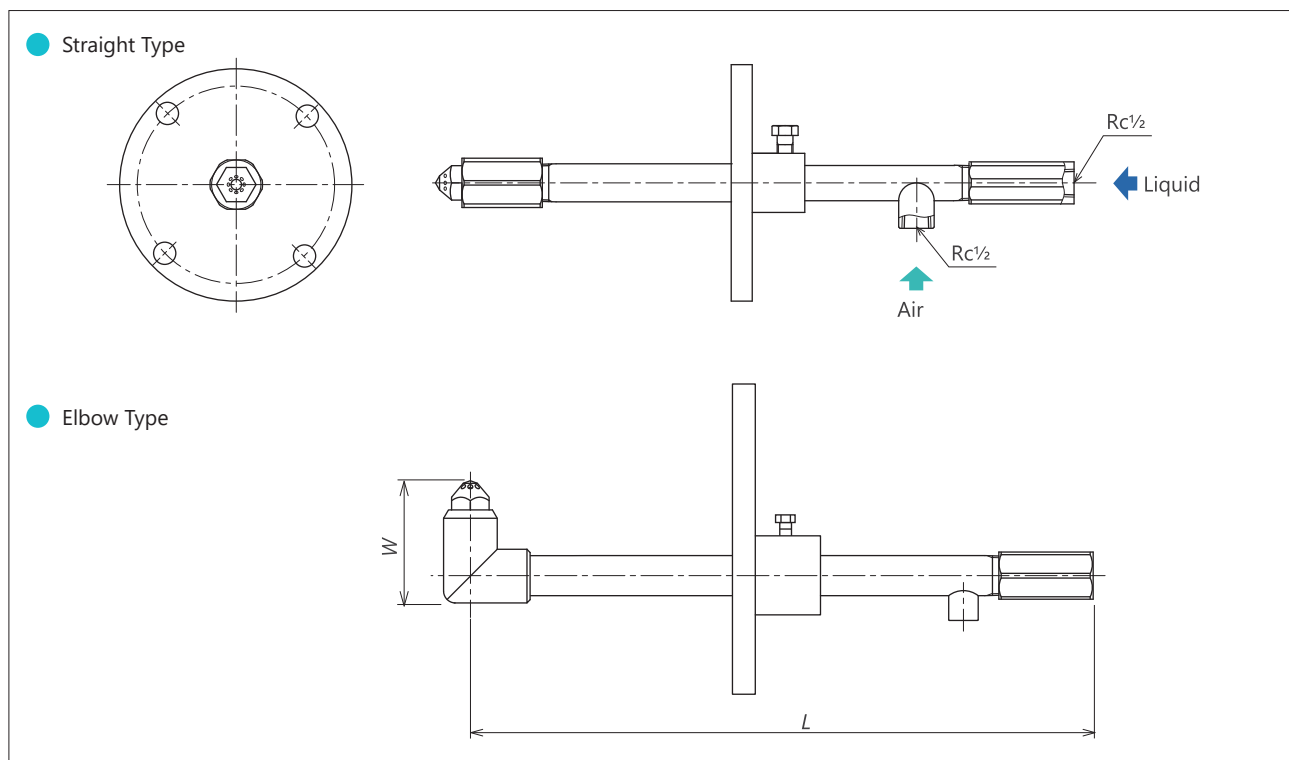
Prevention of dust adhesion by reducing large droplets in the spray periphery even at a low air-water volume ratio (air-water volume ratio:100).

Material

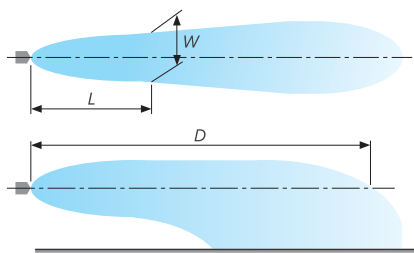
Principal parts: Stainless steel (standard: SUS316L)



Shapes



Spray pattern



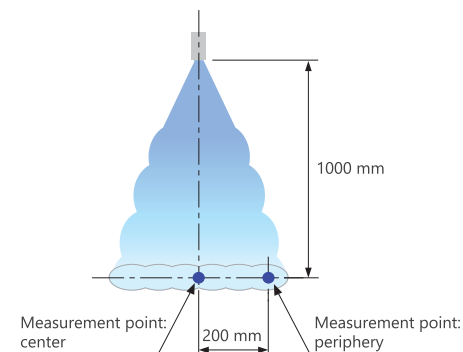
Model No.	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray pattern value [mm]		
						D	L	W
KAMX 300	0.41	0.41	26.4	220.2	120	5,000	500	360
							1,000	500
							2,000	700
							3,000	850
KAMX 500	0.37	0.36	60.0	499.8	120	6,000	500	430
							1,000	630
							2,000	850
							3,000	900
KAMX 1000	0.49	0.47	120.0	1000.2	120	7,000	500	460
							1,000	650
							2,000	850
							3,000	950

Model number list

Model No.	Min. orifice diameter [mm]	Air-Water volume ratio	Water flow rate[L/h] at following water pressure[MPa]			
			0.2	0.3	0.4	0.5
KAMX 300	1.7	100	220	280	340	400
		150	170	220	270	310
		200	140	180	220	260
KAMX 400	1.9	100	310	400	480	580
		150	250	310	380	440
		200	200	260	320	370
KAMX 500	2.1	100	380	490	590	670
		150	310	380	470	540
		200	240	310	390	460
KAMX 600	2.3	100	440	560	680	800
		150	350	440	540	630
		200	280	380	460	530
KAMX 750	3.0	100	520	660	800	930
		150	410	520	630	720
		200	340	430	520	600
KAMX 1000	3.4	100	650	830	1,010	1,170
		150	500	650	780	920
		200	420	540	650	770

Performance data

Particle size and velocity



Model No.	Air pressure [MPa]	Water pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Sauter mean diameter [μm]		Maximum diameter [μm]		Mean particle velocity [m/s]	
						center	periphery	center	periphery	center	periphery
KAMX 300	0.41	0.41	26.4	220.2	120	44.4	39.3	116.1	114.0	10.2	4.9
KAMX 500	0.37	0.36	60.0	499.8	120	51.3	46.4	119.4	107.4	12.6	7.7
KAMX 1000	0.48	0.47	120.0	1000.2	120	54.0	48.6	120.7	111.6	15.3	10.0

Nozzles for gas cooling tower

KAMX nozzle (High-capacity type)

Features

Light weight and compact design.
Spray angle capacity from 40° to 80°.

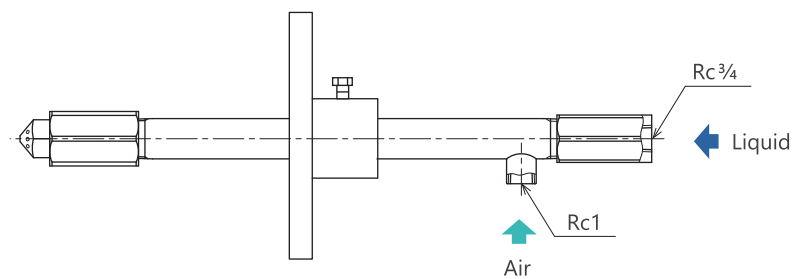
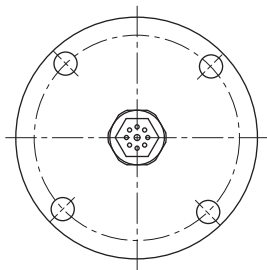
Material

Principal parts: Stainless steel (standard: SUS316L)

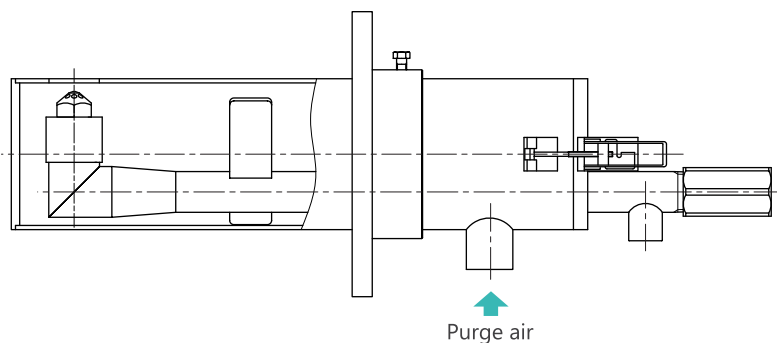
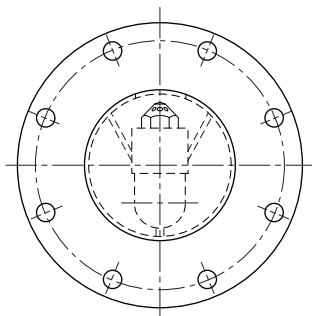


Shapes

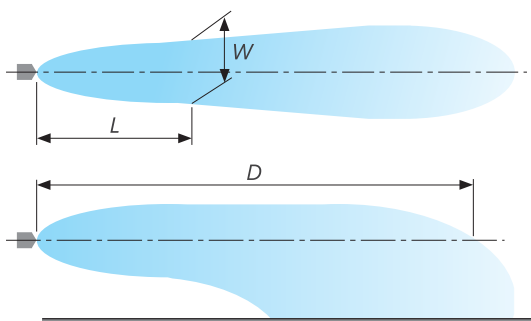
● Straight Type



● Elbow Type (with protective pipe)



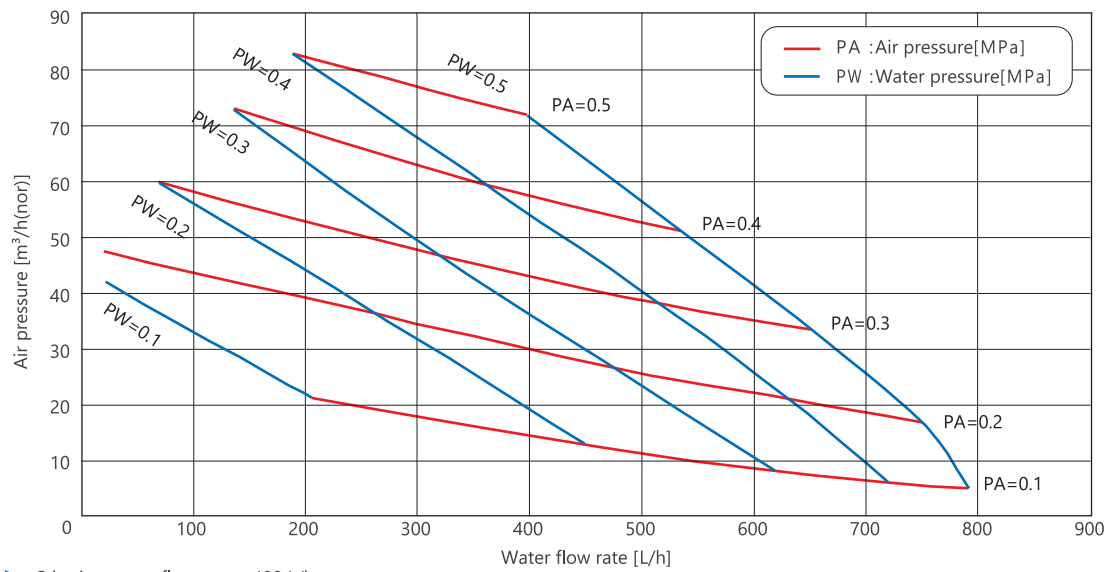
Spray pattern



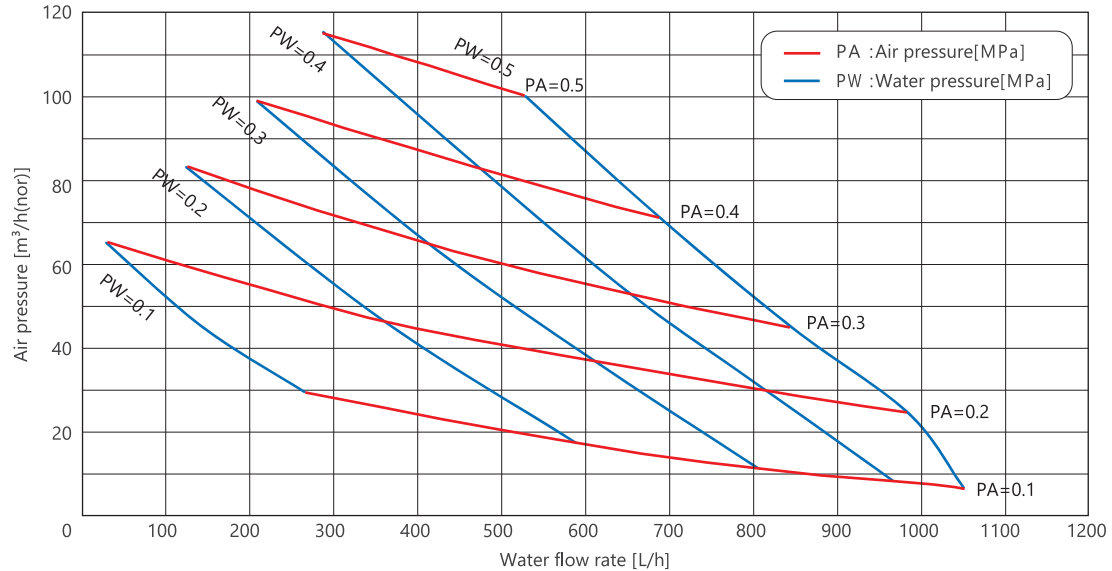
Model number: KAMX 2300

Air flow rate [m ³ /h(nor)]	Water flow rate [L/h]	Air-Water volume ratio	Spray pattern value [mm]		
			D	L	M
276	2,300	120	8,000	500	400
				1,000	600
				2,000	900
				3,000	1,300

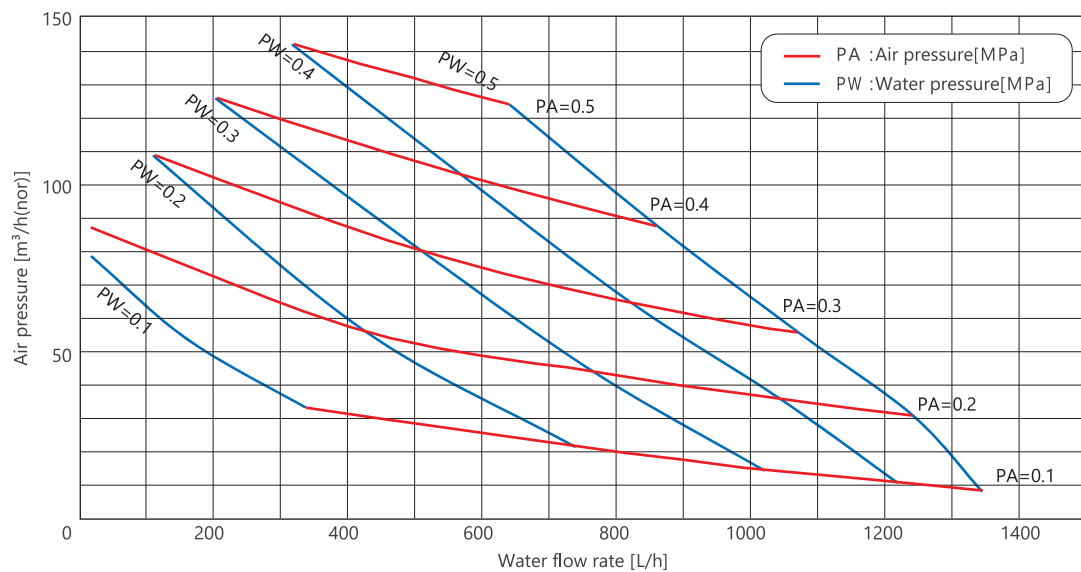
► Criterion water flow rate : 300 L/h



► Criterion water flow rate : 400 L/h



► Criterion water flow rate : 500 L/h



Nozzles for gas cooling tower

QC nozzle (High-capacity type)

Features

Spray flow rate can be controlled within the range of 10:1 by controlling return pressure with the constant supply pressure.

Only one can spray high flow rate , for huge cooling tower.

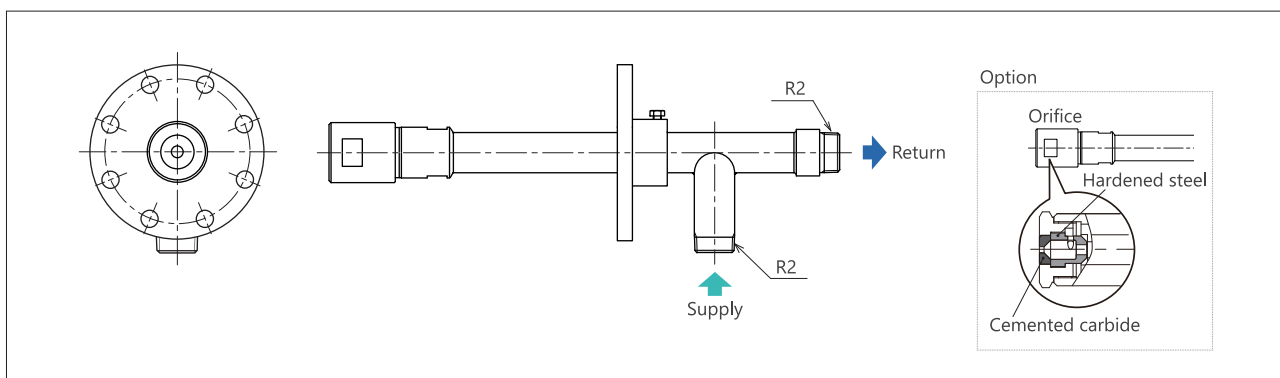
Material

Principal parts: Stainless steel(standard: SUS316)

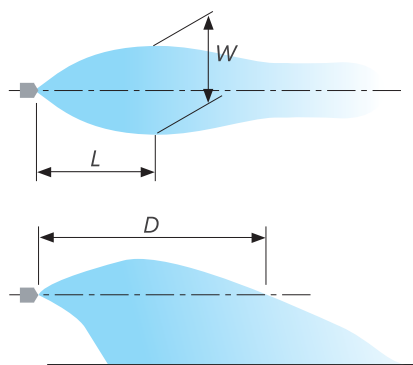
The orifice parts: Stainless steel, cemented carbide, ceramic.



Shapes



Spray pattern (at supply pressure of 3.5MPa)



Model No.	Return pressure [MPa]	Spray dimensions $W / L / D$ [mm]		
		W	L	D
KSWC 800-QC-EE	1.36 Full-closed	1,350	1,500	6,500
	0.8	3,280	2,300	4,550
	0.2	3,650	1,530	3,250

Model number list (at supply pressure of 3.5MPa)

Model No.		Standard flow rate [L/h]	Min. orifice diameter [mm]	Water flow rate[L/min] at following return pressure [MPa]				Spray angle at following return pressure [MPa]				Sauter mean diameter [μm]
				1.36 Full-closed	1.0	0.6	0.2	1.36 Full-closed	1.0	0.6	0.2	
KSWC ----QC-EE	141	3,000	3.4	50.0	31.0	12.3	5.0	80°	86°	94°	100°	110
	189	4,000	3.9	66.7	41.3	16.4	6.7	80°	86°	94°	100°	120
	283	6,000	4.9	100	62.0	24.7	10.0	80°	86°	94°	100°	130
	377	8,000	5.4	133	82.7	32.9	13.3	80°	86°	94°	100°	140
	471	10,000	6.1	166	103	41.1	16.6	80°	86°	94°	100°	150
	566	12,000	6.7	200	124	49.3	20.0	80°	86°	94°	100°	160
	707	15,000	7.5	250	155	61.7	25.0	80°	86°	94°	100°	170
	800	17,000	8.0	283	176	69.9	28.3	80°	86°	94°	100°	180
	943	20,000	8.7	333	207	82.2	33.3	80°	86°	94°	100°	195
	1179	25,000	9.7	416	258	103	41.6	80°	86°	94°	100°	210
	1414	30,000	10.6	500	310	123	49.9	80°	86°	94°	100°	225
	1650	35,000	11.5	583	362	144	58.3	80°	86°	94°	100°	240
1886	40,000	12.3	666	413	165	66.6	80°	86°	94°	100°	255	

*Supply flow rate is required 1.3 times against spray flow rate at least [L/h].

The available flow rate capacity is 3,000 - 40,000 L/h. Please contact Everloy representative for the flow rate.

Desulfurization nozzle

Full-cone nozzle

Features

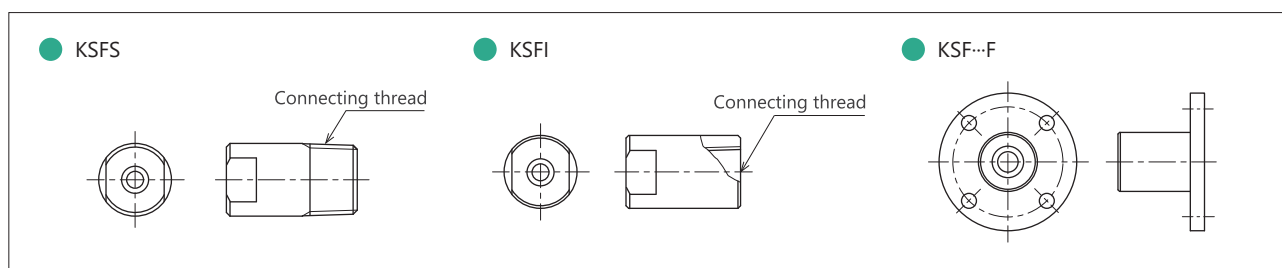
- Full-circle spray pattern.
- Relatively small droplet.
- Various flow rates and spray angles available.

Material

- Stainless steel(standard: SUS316), Brass, Nickel alloy,
- Plastics(PTFE,PVC,PP), Ceramics
- Principal parts: Stainless steel (standard:SUS316L)



Shapes



Model number list

The stainless steel-made models are listed for reference in the table below.

Model No.		Min. orifice diameter [mm]	Water flow rate[L/min] at following pressure [MPa]							Spray angle at following pressure[MPa]			
			0.05	0.1	0.2	0.3	0.5	0.7	1.0	0.05	0.1	0.3	0.5
¾ KSFI	5070	4.3	23.2	31.2	42.0	50.0	62.3	72.0	84.0	63°	68°	70°	65°
	50120W									108°	123°	120°	111°
	6070	4.6	27.8	37.4	50.4	60.0	74.8	86.4	101	63°	68°	70°	65°
	60120W									108°	121°	120°	113°
1 KSFS	7070	4.9	32.4	43.7	58.8	70.0	87.3	101	118	63°	70°	70°	65°
	70120W									108°	123°	120°	113°
	8070	5.2	37.1	49.9	67.3	80.0	99.7	115	134	63°	70°	70°	65°
	80120W									108°	123°	120°	113°
1 KSFI	9070	5.6	41.7	56.2	75.7	90.0	112	130	151	65°	70°	70°	65°
	90120W									112°	123°	120°	113°
1¼ KSFS	10070	5.9	46.3	62.4	84.1	100	125	144	168	65°	70°	70°	65°
	100120W									112°	123°	120°	113°
1¼ KSFI	12570	6.6	57.9	78.0	105	125	156	180	210	65°	70°	70°	65°
	125120W									112°	125°	120°	109°
1½ KSFS	15070	7.2	69.5	93.6	126	150	187	216	252	67°	72°	70°	67°
	150120W									115°	128°	120°	110°
1½ KSFI	17570	7.8	81.1	109	147	175	218	252	294	67°	72°	70°	67°
	175120W									115°	128°	120°	110°
	20070	8.4	92.6	125	168	200	249	288	336	67°	72°	70°	67°
	200120W									118°	131°	120°	111°
	25070	9.4	116	156	210	250	312	360	420	67°	72°	70°	67°
	250120W									118°	131°	120°	111°
2 KSFI	30070	10.3	139	187	252	300	374	432	504	67°	74°	70°	67°
	300120W									121°	134°	120°	112°
	45070	12.6	208	281	378	450	561	648	756	67°	74°	70°	67°
	450120W									121°	134°	120°	112°
2 KSF...F	50070	13.3	232	312	420	500	623	720	840	67°	76°	70°	67°
	500120W									123°	136°	120°	113°
2½ KSFI	60070	14.5	278	374	504	600	748	864	1,008	67°	76°	70°	67°
	600120W									123°	136°	120°	113°
	70070	15.7	324	437	588	700	873	1,008	1,176	67°	76°	70°	67°
	700120W									123°	136°	120°	113°
2½ KSF...F	80070	16.8	371	499	673	800	997	1,153	1,344	67°	76°	70°	67°
	800120W									123°	136°	120°	113°

Model number list The stainless steel-made models are listed for reference in the table below.

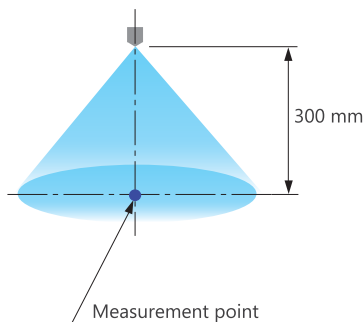
Model No.		Min. orifice diameter [mm]	Water flow rate[L/min] at following pressure [MPa]							Spray angle at following pressure[MPa]			
			0.03	0.05	0.07	0.1	0.15	0.2	0.3	0.03	0.07	0.15	0.3
3 KSFI	90090	17	335	417	482	562	669	757	900	73°	90°	95°	92°
	900120W									108°	120°	127°	114°
3 KSF...F	100090	18	372	463	535	624	743	841	1,000	73°	90°	94°	90°
	1000120W									110°	120°	124°	112°
4 KSFI	125090	20	465	579	669	780	929	1,051	1,250	75°	90°	94°	90°
	1250120W									110°	120°	124°	112°
4 KSF...F	150090	22	558	695	803	936	1,114	1,261	1,500	77°	90°	93°	88°
	1500120W									112°	120°	121°	110°
5 KSFI	200090	26	744	926	1,071	1,248	1,486	1,681	2,000	80°	90°	92°	86°
	2000120W									115°	120°	118°	107°
5 KSF...F	250090	29	930	1,158	1,338	1,560	1,857	2,102	2,500	83°	90°	92°	86°
	2500120W									115°	120°	118°	107°
6 KSFI	300090	32	1,115	1,390	1,606	1,872	2,229	2,522	3,000	85°	90°	90°	85°
	3000120W									117°	120°	115°	105°
6 KSF...F	400090	37	1,487	1,853	2,141	2,496	2,971	3,363	4,000	88°	90°	88°	83°
	4000120W									119°	120°	113°	103°
8 KSFI	500090	41	1,859	2,316	2,676	3,120	3,714	4,203	5,000	90°	90°	88°	82°
	5000120W									120°	120°	113°	101°
8 KSF...F	600090	45	2,231	2,779	3,212	3,744	4,457	5,044	6,000	90°	90°	88°	82°
	6000120W									120°	120°	113°	101°

*Method to calculate spray angles

The spray angle for nozzle model numbers 90065 or more is calculated from the spray opposite side distance at a distance of 1000 mm when spraying downward.

Performance data

Particle size characteristic



Model No.	Sauter mean diameter [μm] at following pressure [MPa]					
	0.1	0.2	0.3	0.5	0.8	1.0
5070	710-568	655-524	598-478	510-408	426-341	411-329
50120W						
10070	894-715	826-661	753-602	642-514	536-429	518-414
100120W						
20070	1,126-901	1,040-832	949-759	809-647	676-541	652-522
200120W						
30070	1,189-1,031	1,191-953	1,086-869	926-741	774-619	746-597
300120W						
50070	1,529-1,223	1,412-1,130	1,287-1,030	1,098-879	917-734	885-708
500120W						
80070	1,788-1,430	1,652-1,321	1,506-1,205	1,285-1,028	1,073-858	1,035-828
800120W						

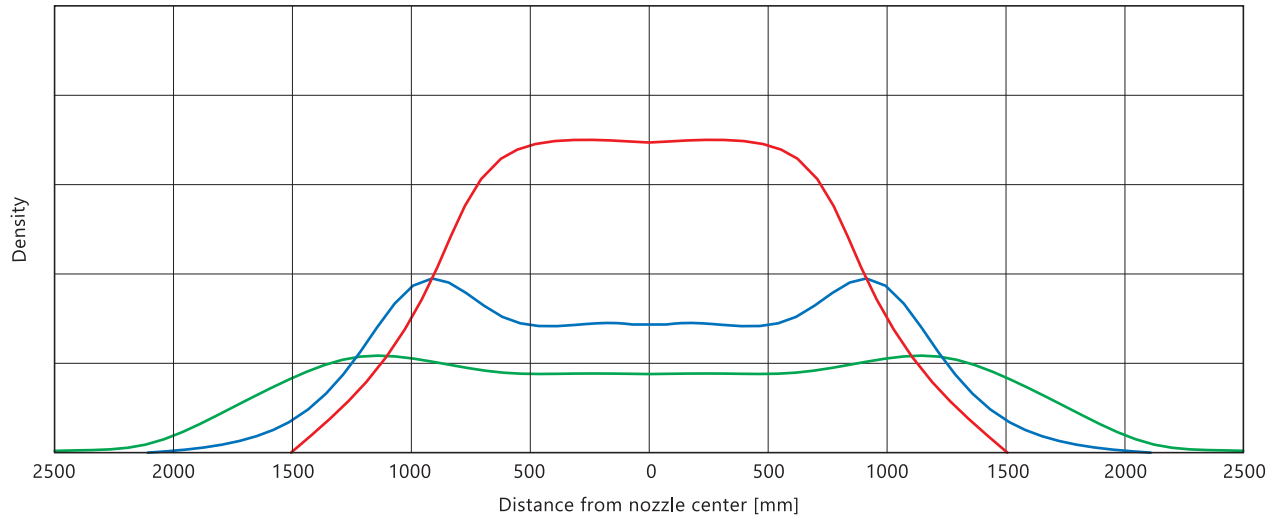
Performance data

Flow rate distribution

Model number : 3000120W

Pressure : 0.03 MPa

Spray distance: — 700 mm
— 1250 mm
— 1550 mm



Desulfurization nozzle Spiral nozzle

Features

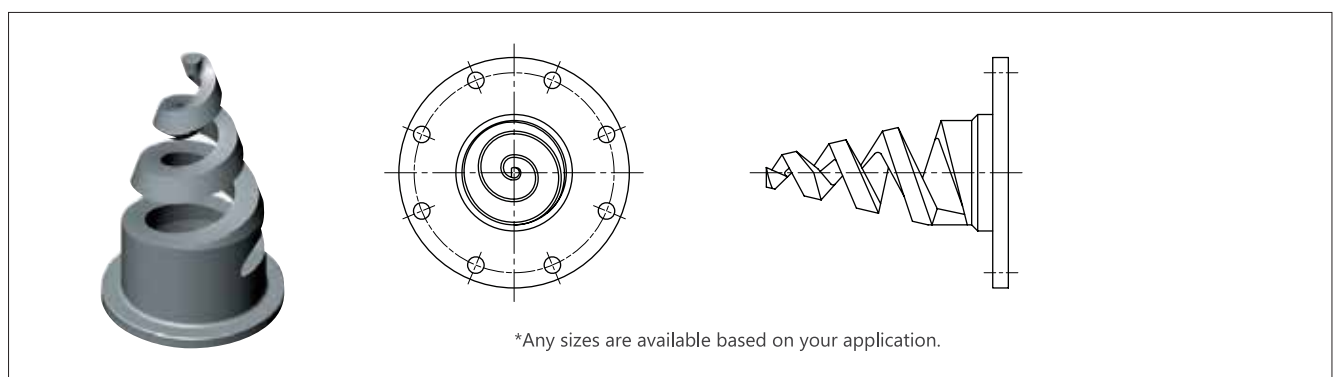
- Highly resistant to clogging.
- Large flow rate with compact size is available.

Material

- Stainless steel
- Ceramics(SiSiC)



Shapes



Desulfurization nozzle Whirl spray nozzle (Flange type)

Features

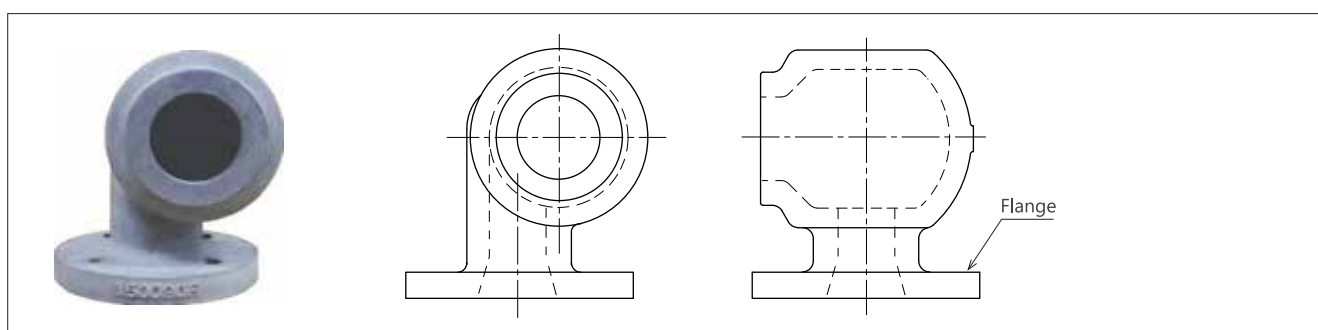
- Nearly uniform flow distribution in the circumferential direction.
- No part inside the nozzle ensuring clog-free operation.

Material

Ceramics

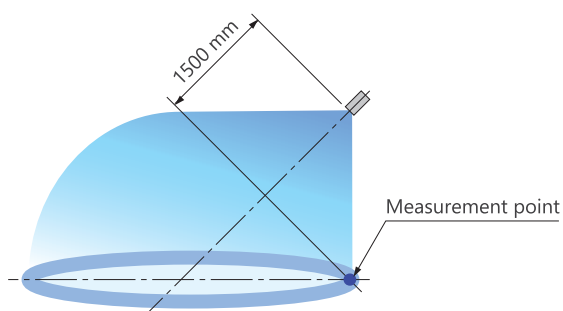


Shapes



Performance data

Particle size and velocity



Model number: 3 KCEW 150090F

Pressure [MPa]	Sauter mean diameter [μm]	Max. particle size [μm]	Mean velocity [m/s]
0.07	2,470	6,392	7.8

Model number list

Flange size	Model No.	Flow rate [m³/h]	Water flow rate [L/min] at following pressure [MPa]						Spray angle at following pressure(MPa)
			0.05	0.07	0.1	0.15	0.2	0.3	
3	3 KCEW 150090F	44	619	733	876	1,073	1,239	1,517	87°- 90°
	3 KCEW 180090F	52	733	867	1,036	1,269	1,465	1,795	
4	4 KCEW 200090F	64	902	1,067	1,275	1,562	1,804	2,209	
	4 KCEW 260090F	75	1,056	1,250	1,494	1,830	2,113	2,588	

PAW nozzle

Features

Relatively small droplet even when high flow rate.

Large orifice diameter.

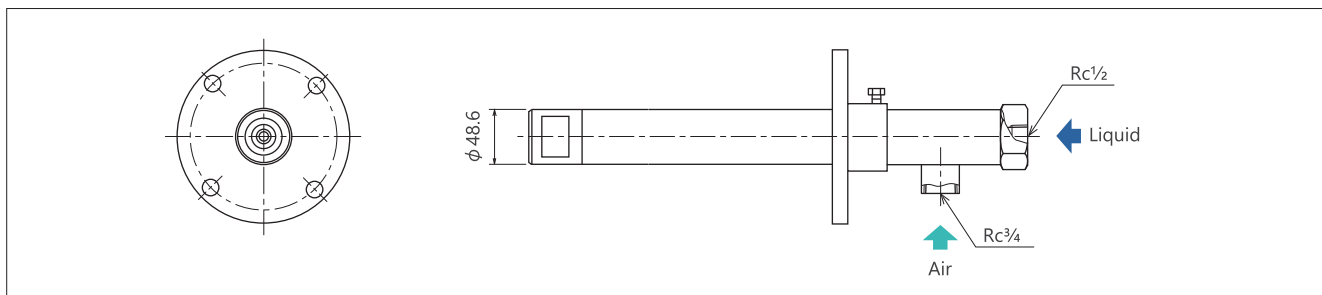
Wide-angle full-cone spray pattern.



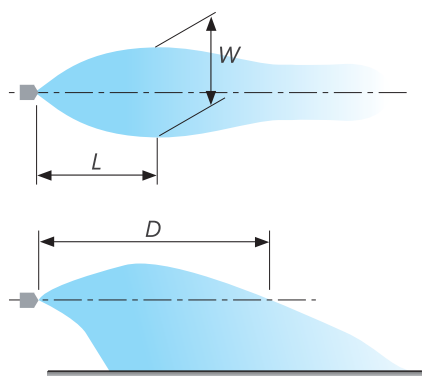
Material

Principal parts: Stainless steel (standard: SUS316L)

Shapes



Spray pattern



Model number: PAW-B-47S

Air pressure [MPa]	Water pressure [MPa]	Spray pattern value[mm]			
		D	Spray width W at following spray distance L		
			1000	2000	3000
0.2	0.02	2,400	1,400	1,600	800
	0.03	2,400	1,400	1,600	1,000
	0.04	2,800	1,400	1,800	1,100
0.3	0.02	2,800	1,800	1,200	800
	0.03	2,800	1,400	1,200	800
	0.04	2,800	1,300	1,100	800
0.4	0.02	3,000	1,600	1,200	1,000
	0.03	3,000	1,600	1,400	1,000
	0.04	3,000	1,400	1,200	1,000

Model number list

Model No.	Min. orifice diameter [mm]	Air pressure [MPa]	Air flow rate [m³/h(nor)]	Water flow rate[L/min] at following water pressure[MPa]				
				0.005	0.01	0.02	0.03	0.04
PAW-B-47S	6.0	0.2	29.2	2.1	3.0	5.4	8.0	9.8
		0.3	38.6	-	-	4.8	5.7	7.2
		0.4	47.7	-	-	4.9	6.0	5.7
PAW-B-55S	6.0	0.2	53.3	-	-	7.8	10.0	12.1
		0.3	74.3	-	-	7.0	8.8	10.0
		0.4	93.2	-	-	5.1	7.7	9.2

Chemical spray nozzle/Deodorizing nozzle
Mini mist nozzle (Internal mixing type)

Features

- Flow rate controllable within a wide range, from very small to relatively large.
- Compact design for connection in a limited space.
- Quick-drying mist.
- Simple structure for resistance to clogging and for overhaul cleaning with ease.



Material

Standard materials: Stainless steel (SUS303) or brass.

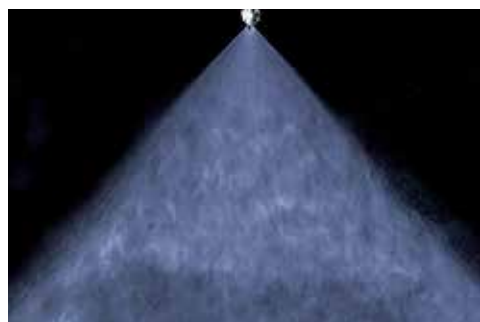
Model number list

Model No.		Min. orifice diameter [mm]	Air pressure [MPa]	Water flow rate[mL/min] and air flow rate[L/min(nor)] at following pressure [MPa]								Spray width [mm] at following water pressure [MPa] (Spray distance 500mm)		
				0.2		0.3		0.4		0.5				
				Water	Air	Water	Air	Water	Air	Water	Air	0.2	0.3	0.4
KSMMS	015115-A11W035	0.35	0.1	64	16	107	15	121	15	126	15	800	800	900
			0.2	68	27	94	26	112	25	125	25	700	800	900
			0.3	50	36	79	35	100	34	117	33	600	800	900
			0.4	27	46	60	45	85	44	104	43	600	700	900
			0.5	-	-	41	54	71	53	92	52	-	700	900
	027115-A15W05	0.5	0.1	182	28	228	27	258	26	284	25	800	900	900
			0.2	146	47	200	45	248	43	280	41	800	800	900
			0.3	102	65	168	63	222	61	259	59	700	800	900
			0.4	58	83	127	82	189	80	232	78	600	800	900
			0.5	-	-	92	97	158	96	207	95	-	800	900
	040115-A18W06	0.6	0.1	256	43	315	41	357	40	390	38	800	900	900
			0.2	220	69	290	66	350	64	388	62	800	900	900
			0.3	176	97	252	96	318	95	372	93	700	800	900
			0.4	132	123	213	123	283	121	345	119	600	800	900
			0.5	89	149	176	146	249	146	313	145	600	800	900

Chemical spray nozzle/Deodorizing nozzle
Flat atomizing nozzle

Features

- Soft spraying of fine droplets.
- Fine droplets with no air injection.
- Interchangeable nozzle tips.



Material

Standard materials: Stainless steel (SUS303)

Model number list

Model No.		Min. orifice diameter [mm]	Water flow rate[L/min] at following pressure [MPa]							Spray angle at following pressure [MPa]				
			0.1	0.2	0.3	0.5	0.7	1.0	1.5	0.1	0.3	0.5	1.0	1.5
¼ AS	00380	0.3	0.173	0.24	0.30	0.39	0.46	0.55	0.67	58°	80°	86°	90°	90°
	00480	0.4	0.23	0.33	0.40	0.52	0.61	0.73	0.89	60°	80°	86°	90°	90°
	00680	0.5	0.35	0.49	0.60	0.77	0.92	1.10	1.34	62°	80°	86°	90°	90°
	00880	0.6	0.46	0.65	0.80	1.03	1.22	1.46	1.79	64°	80°	85°	88°	88°
	0180	0.6	0.58	0.82	1.00	1.29	1.53	1.83	2.20	66°	80°	85°	88°	88°
	01580	0.8	0.87	1.22	1.50	1.94	2.30	2.70	3.40	67°	80°	85°	88°	88°
	0280	0.9	1.15	1.63	2.00	2.60	3.10	3.70	4.50	67°	80°	85°	88°	88°

Chemical spray nozzle/Deodorizing nozzle

Mini atomizing nozzle

Features

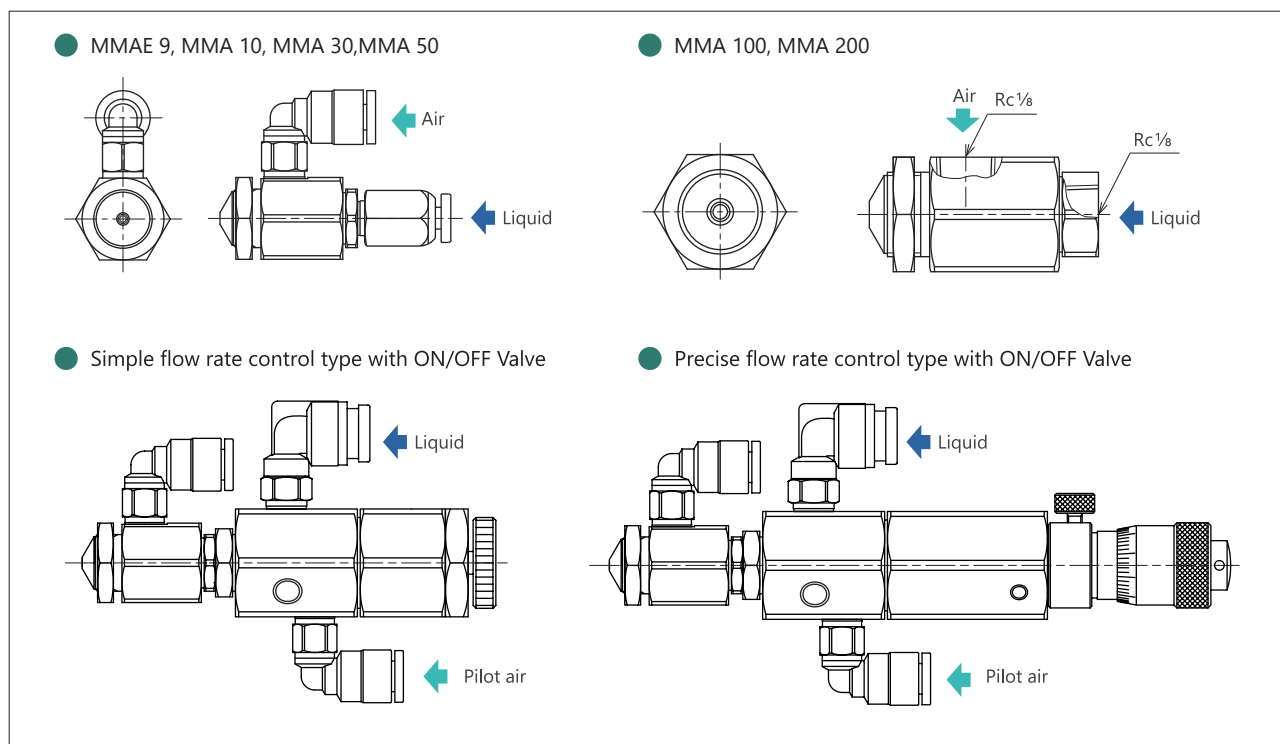
- Small particles.
- Minimal flow rate misting is possible.
- Clog-resistant, large diameter discharge port.
- Misting is possible through syphoning highly viscous liquids.
- No dripping when used in syphon mode.

Material

- Principal parts: Stainless steel (standard: SUS316L)
- Other materials available upon request.



Shapes



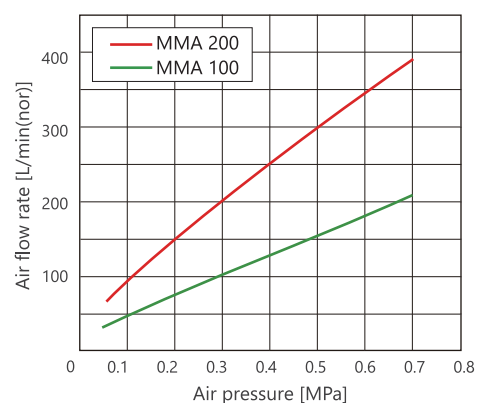
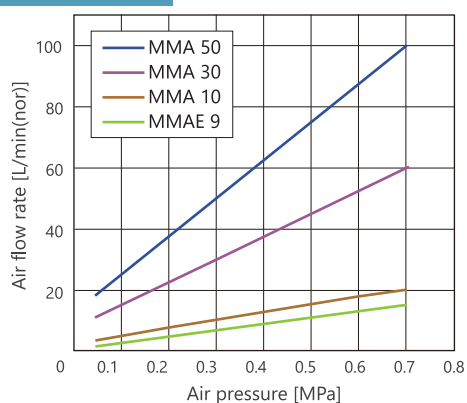
Model number list

Model No.		Liquid atomization orifice [mm]	Air flow rate [L/min(nor)] (at air pressure 0.3 MPa)	*Water flow rate [mL/min]	Size of application tube and connection
MMAE	9	0.7	9	0.5-10	φ4
	10	1.1	10	1-20	φ4
	30	1.5	30	3-60	φ4
	50	1.7	50	5-100	φ4
	100	2.4	100	20-200	Rc1/8
	200	2.8	200	50-500	Rc1/8

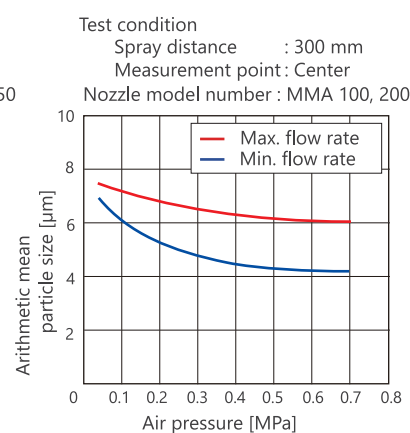
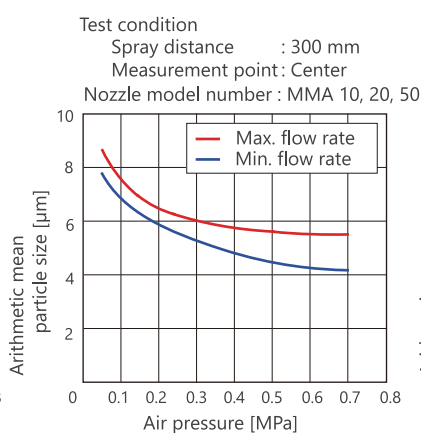
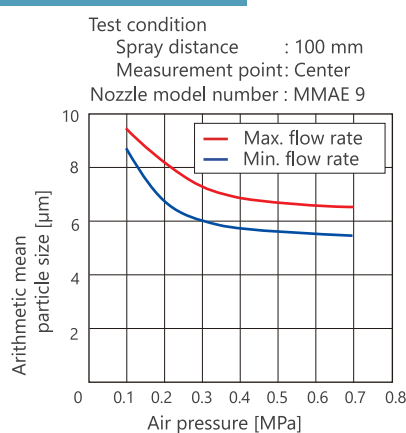
*Water flow is adjustable by using regulation valve.

Performance data

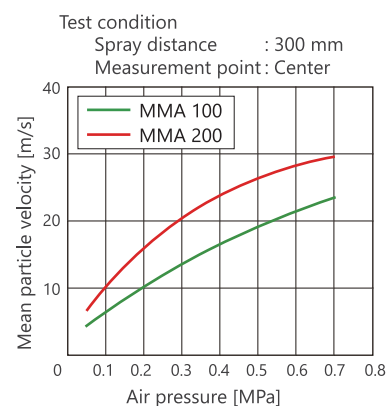
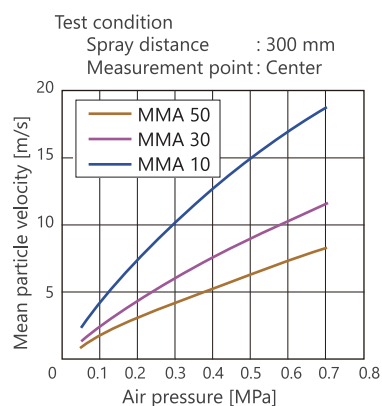
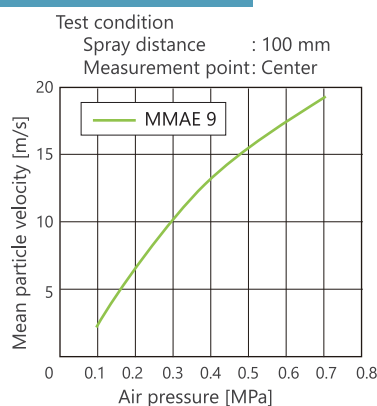
Air flow rate characteristic



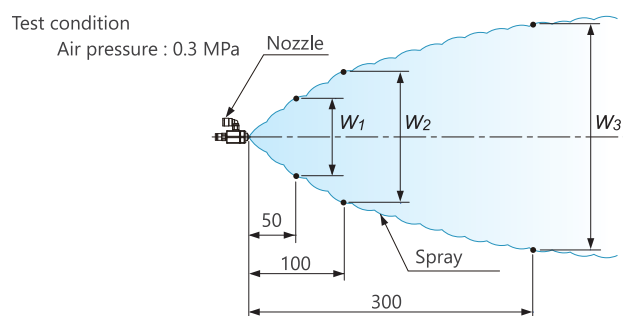
Particle size characteristic



Particle velocity characteristic



Spray width at minimum water flow rate

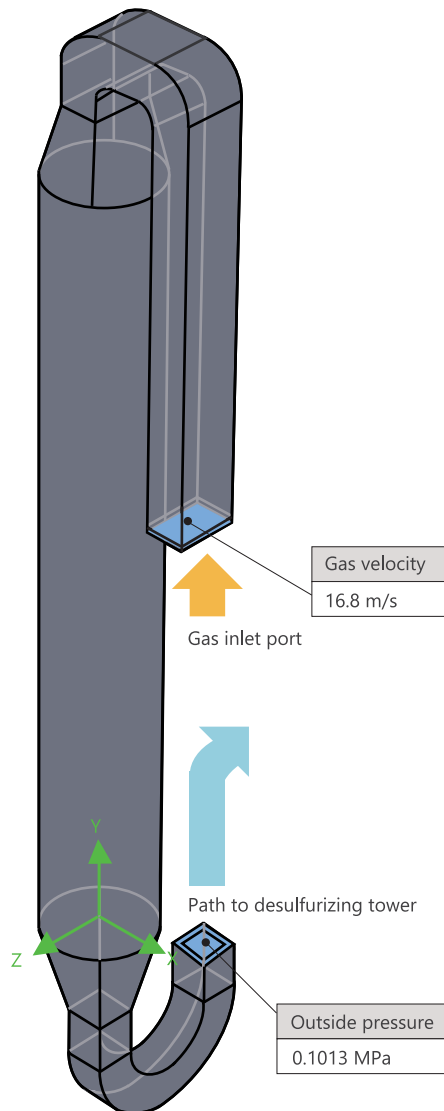


Model No.	Spray width [mm]		
	W ₁	W ₂	W ₃
MMAE 9	45	60	95
MMA 10 MMA 30 MMA 50	40-50	55-70	110-150
MMA 100 MMA 200	35-45	55-70	130-150

Test equipment and analysis

Simulation of gas flow in gas cooling tower

► Analysis model



Gas: Physical value at 20 degrees

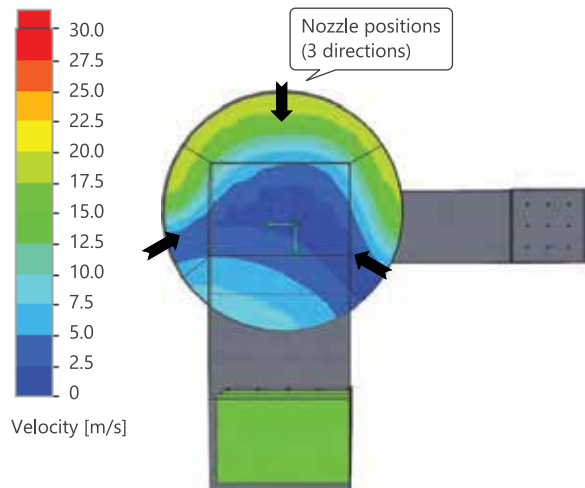
Analysis conditions

Gas velocity at inlet port: 16.8 m/s

Pressure at outlet port: 0.1013 MPa(1 atmosphere pressure)

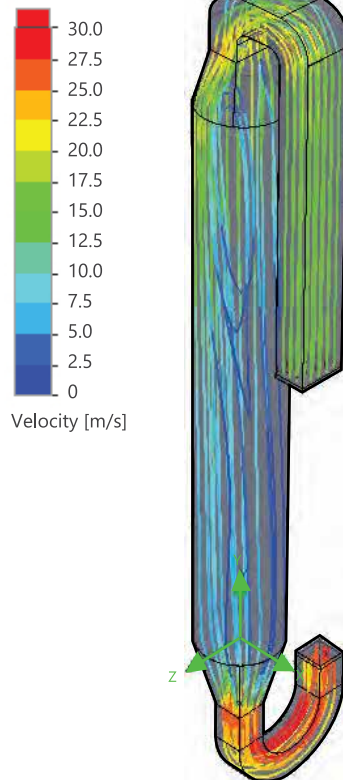
Analysis result 1:

Velocity distributions of gas at nozzle positions



Analysis result 2:

Gas velocity



Test equipment and analysis

Flow distribution measurement system

This system measures the distribution of spray flow density using an acrylic container grid, on which a liquid is sprayed, and the amounts of deposits are measured. It is also capable of measurement results in a flow distribution graph. Data is used for evaluation of distribution shape.

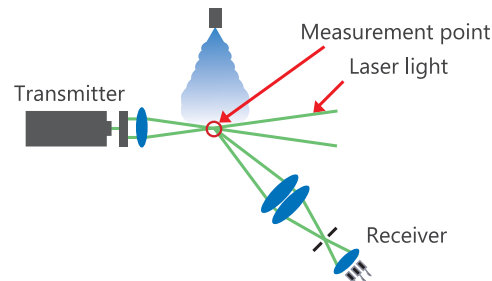


Test equipment and analysis

Particle size measurement system

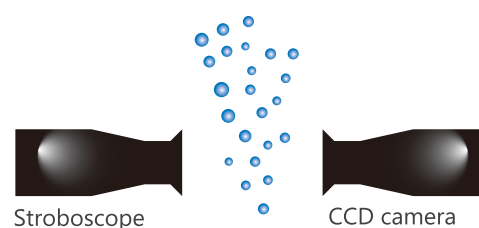
1. Phase doppler method

This system is a particle analyzer making use of the phase doppler principle of the laser doppler system to simultaneously measure the velocity and size of a particle. PDPA (using the phase doppler method) measures the particle size of a continuous spray without interference with the spray. It is capable of sampling many particles instantaneously and has become the dominant technology in particle size analysis. PDPA is suitable for the measurement of relatively small particles.



2. Image analysis method

This system determines average particle size by measurements incorporating image analysis using a stroboscope and a CCD camera as basic devices. It measures particle size regardless of the shape of particles (spherical or aspherical) and type (clear or opaque). This system is suitable for measuring relatively large particles.





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