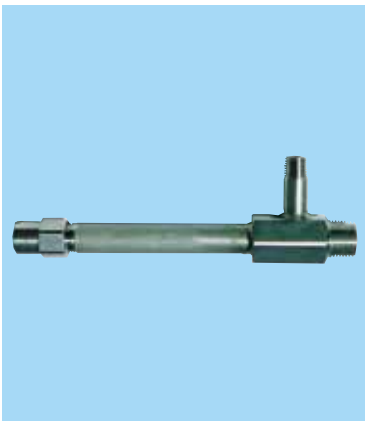
Flat Spray
Semi-Fine, Semi-Coarse Fog Nozzles

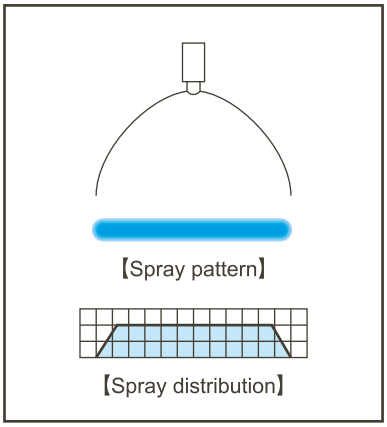
DOVEA

Features

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

*1) Droplet diameter measured by the Fraunhofer diffraction method. Please see pages 6–7 for comparison with laser Doppler method.

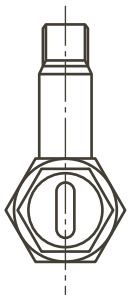


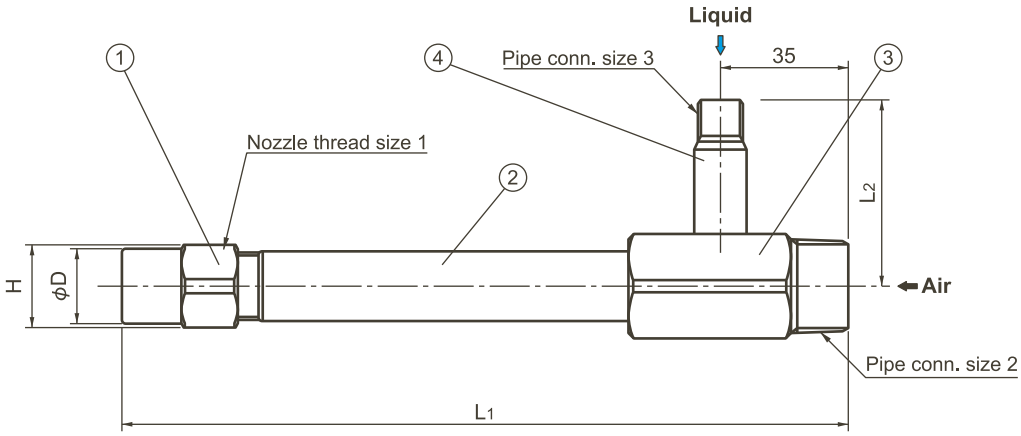


Applications

■Cooling: Gas, steel plates, steel pieces, moldings

Structure & Materials





■Components and materials

No.	Components	Standard materials
①	Nozzle body	S303
②	Pipe	S304
③	Mixing adaptor	S304
④	Liquid nipple	S304

Dimensions & Pipe Connection Sizes

Spray capacity code	Nozzle thread size	Pipe connection size		Outer dimensions (mm)				Mass*3 (g)
	1	2 (Air)	3 (Liquid)	L1*2	L2	H	ϕD	
82 110	Rc1/4	R1/2	R1/4	500	47.5	19	18	550
180 230	Rc3/8			500	47.5	21	19	650
400	Rc1/2			500	47.5	26	25	850

*2) L_1 = 200–1,500 mm
*3) The mass shown is when L_1 is 500 mm of straight pipe.
For the mass of DOVEA with a longer/shorter pipe, add or subtract the corresponding mass (listed below) for each 100 mm of L_1 length, according to the Nozzle thread size 1.

Nozzle thread size 1	Mass per 100 mm
Rc1/4	63 g
Rc3/8	85 g
Rc1/2	130 g

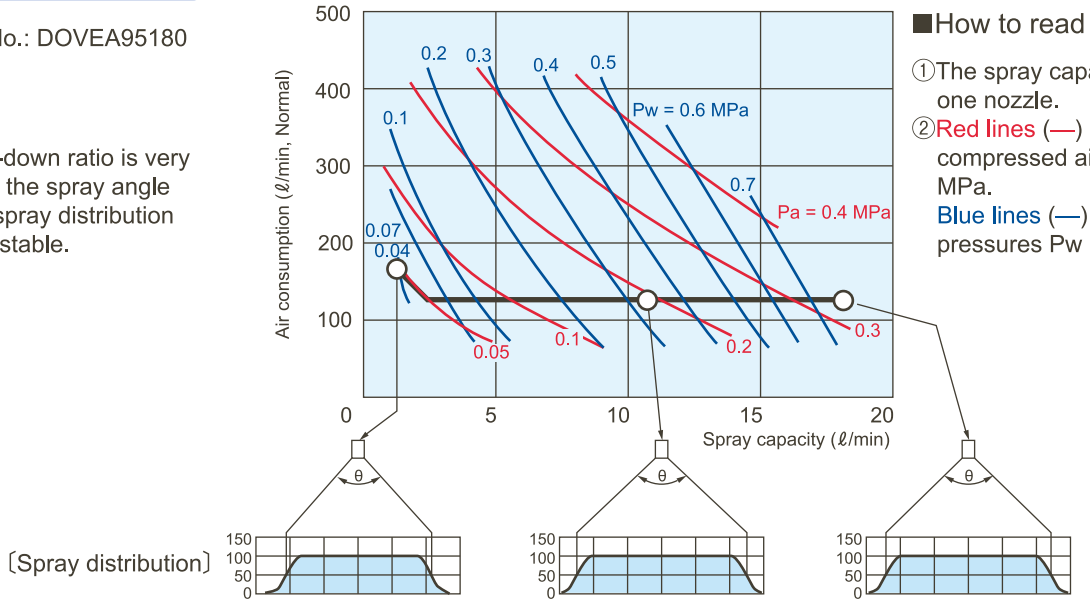
Spray angle code*4	Spray capacity code	Air pressure (MPa)	Spray capacity (ℓ/min) & Air consumption (ℓ/min, Normal) Liquid pressure (MPa)										Mean droplet diameter (μm)		Free passage diameter (mm)		
			0.07		0.1		0.2		0.4		0.7		Immersion sampling method	Fraunhofer diffraction method	Spray orifice	Adaptor	
			Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air	Liquid	Air				Liquid	Air
110	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100–350	50–175	2.7	3.6	5.1
		0.2	—	—	—	—	4.34	280	12.9	100	—	—					
		0.3	—	—	—	—	—	—	9.49	250	18.0	100					
		0.4	—	—	—	—	—	—	—	—	15.9	200					
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	3.1	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100–400	50–200	4.1	5.2	7.7
		0.2	—	—	—	—	9.65	630	28.6	220	—	—					
		0.3	—	—	—	—	—	—	21.1	560	40.0	225					
		0.4	—	—	—	—	—	—	—	—	35.4	450					
95	82	0.1	0.42	125	1.45	85	4.19	30	—	—	—	—	100–300	50–150	2.0	2.5	3.5
		0.2	—	—	—	—	1.98	125	5.86	45	—	—					
		0.3	—	—	—	—	—	—	4.32	110	8.2	45					
		0.4	—	—	—	—	—	—	—	—	7.26	90					
	180	0.1	0.92	275	3.18	180	9.21	65	—	—	—	—	100–350	50–175	3.0	3.6	5.1
		0.2	—	—	—	—	4.34	280	12.9	100	—	—					
		0.3	—	—	—	—	—	—	9.49	250	18.0	100					
		0.4	—	—	—	—	—	—	—	—	15.9	200					
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	3.3	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100–400	50–200	4.5	5.2	7.7
		0.2	—	—	—	—	9.65	630	28.6	220	—	—					
		0.3	—	—	—	—	—	—	21.1	560	40.0	225					
		0.4	—	—	—	—	—	—	—	—	35.4	450					
70	110	0.1	0.56	180	1.94	120	5.63	40	—	—	—	—	100–300	50–150	2.8	2.8	4.1
		0.2	—	—	—	—	2.65	180	7.87	65	—	—					
		0.3	—	—	—	—	—	—	5.8	160	11.0	65					
		0.4	—	—	—	—	—	—	—	—	9.74	130					
	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	4.1	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
55	230	0.1	1.18	355	4.07	240	11.8	85	—	—	—	—	100–350	50–175	4.5	4.0	5.9
		0.2	—	—	—	—	5.55	370	16.4	130	—	—					
		0.3	—	—	—	—	—	—	12.1	320	23.0	130					
		0.4	—	—	—	—	—	—	—	—	20.4	260					
	400	0.1	2.05	620	7.07	410	20.5	150	—	—	—	—	100–400	50–200	5.6	5.2	7.7
		0.2	—	—	—	—	9.65	630	28.6	220	—	—					
		0.3	—	—	—	—	—	—	21.1	560	40.0	225					
		0.4	—	—	—	—	—	—	—	—	35.4	450					

*4) Spray angle measured at compressed air pressure of 0.3 MPa and liquid pressure of 0.7 MPa.

Flow-rate Diagram

Nozzle No.: DOVEA95180

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



■How to read the chart

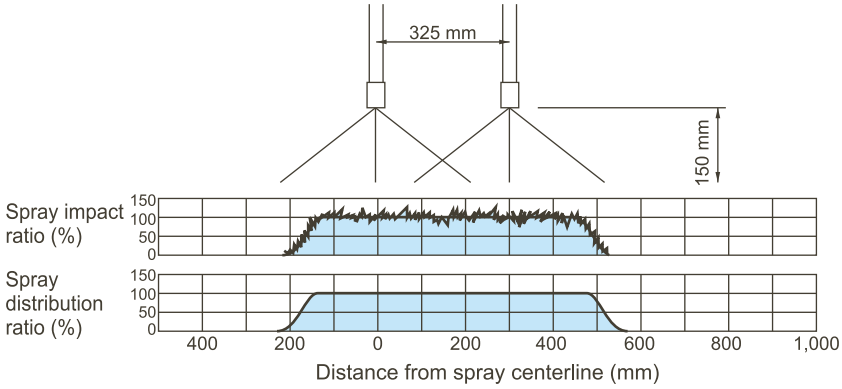
①The spray capacity shown is for one nozzle.
②Red lines (—) represent compressed air pressures Pa in MPa.
Blue lines (—) represent liquid pressures Pw in MPa.

Spray Flow distribution & Spray Impact Distribution

Nozzle No.: DOVEA95180

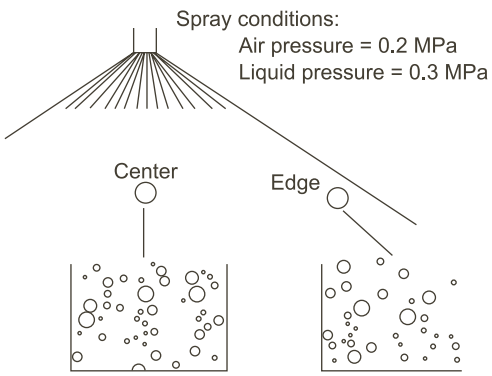
Spray conditions:
Air pressure = 0.2 MPa
Liquid pressure = 0.3 MPa

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



Spray Droplet Diameter

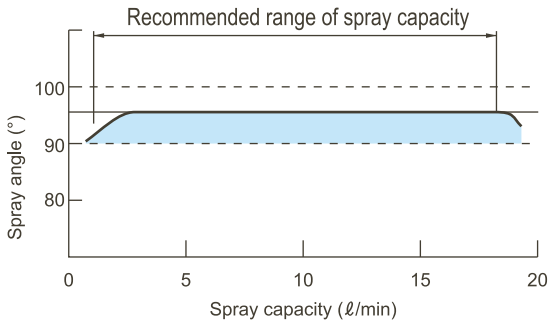
Nozzle No.: DOVEA95180



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

Variation in Spray Angle

Nozzle No.: DOVEA95180

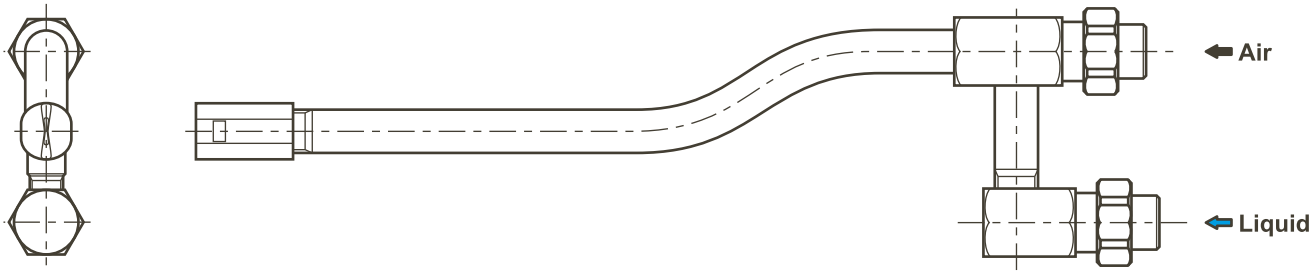


The variation in spray angle is minimized despite the large modulation of spray capacities.

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

Special Pipe

– Bent Pipe –



Note: For details of bent pipes or other special pipes, please contact our sales office.

How to order

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

<Example> 1/4 DOVEA 9582-M × 500 S303-n

1/4	DOVEA	95	82	- M ×	500	S303 -	n
Nozzle thread size 1		Spray angle code	Spray capacity code		Total length L_1		Code of bent pipe*
■1/4 ■3/8 ■1/2		■110 ■95 ■70 ■55	■82 I ■400		■Min . 200 ■Standard 500 ■Max. 1500		

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

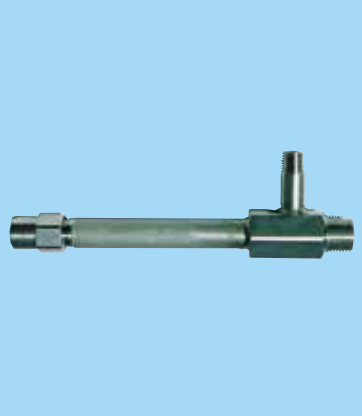
Sister product

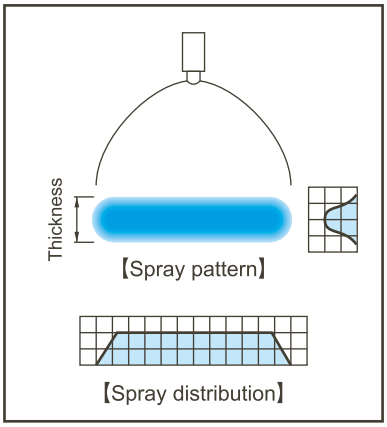
Thick Flat Spray Semi-Fine, Semi-Coarse Fog Nozzles

DOVEA-W

Features

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





Applications

■Cooling: Steel plates, steel pieces, gas

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

DOVEA-W series

Conventional nozzles (DOVEA series)

The increased thickness of the flat spray from this nozzle allows for more effective cooling in the space between rolls.

For further information, please contact our sales office.