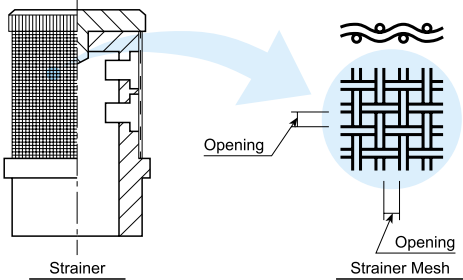


For Effective Use of Standard Flat Spray Nozzles

Strainer Mesh Size

The strainer fitted inside the nozzle comprises strainer holder, cap and strainer screen.

Strainer Mesh Size	Opening (mm)	Free Passage Diameter (mm)
#200	0.07	below 0.2
#150	0.10	0.3~0.4
#100	0.15	0.5~0.7
#50	0.30	0.8~0.9

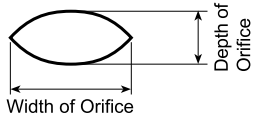


Advantages and Disadvantages of Ceramic Nozzles

- CERJET® Ceramic Nozzle can resist most acids and strong corrosive liquid except for hydrofluoric acid and strong alkalis (pH 12 or higher).
- CERJET® Ceramic Nozzle has high wear resistance (its hardness Mohs scale 7), several hundred times that of brass and 20-30 times that of stainless steel. It is well-suited for high pressure cleaning. However, it is brittle and may crack by quenching or sudden temperature drops of more than 200°C.
- For attaching the ceramic orifice to the metal body or retainer, epoxy resin adhesive(Araldite®) is used. In applications where epoxy resin is not suitable, CERTIIM® with the ceramic orifice inserted into a plastic body or retainer by injection molding is recommended.

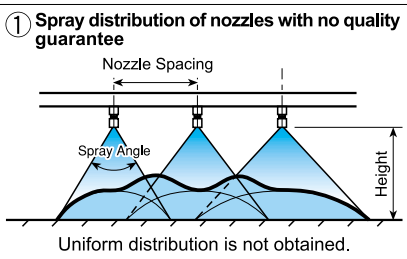
Free Passage Diameter

The flat spray nozzle orifice has a cat-eye shape and the free passage diameter shows the approximate depth of the orifice.



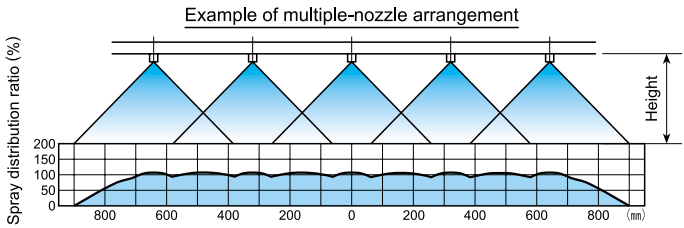
Spray Distribution

The standard flat spray nozzles are designed to produce a mountain-shaped distribution in order to obtain a uniform spray distribution in a multiple-nozzle arrangement. Although the distribution depends on spray height, nozzle spacing, liquid pressure and liquid nature, you need spray nozzles guaranteed in spray performance to get the desired superimposed spray distribution. IKEUCHI nozzles have guaranteed spray angles and spray capacities in order to maintain uniform distribution.



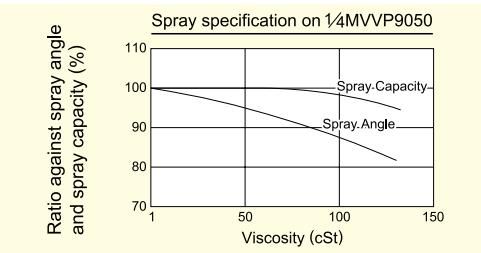
② Spray distribution of nozzles guaranteed in spray performance

Uniform distribution is formed by overlapping mountain-shaped distributions.



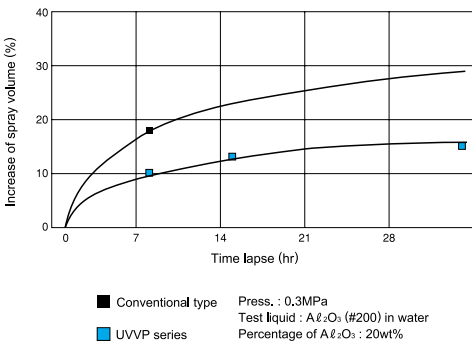
Viscosity

There is a tendency for spray capacity and spray angle to be decreased and also for spray distribution to deteriorate if the viscosity of the liquid is increased. The resistance of liquid in the pipe is also increased. When spraying such liquids, pressure drop in the pipe must be also taken into consideration.



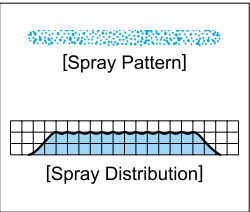
Comparison of Wear-resistance

The comparison of wear-resistance between a UVVP flat spray nozzle and our conventional type is shown here.



Even Flat Spray Nozzles

VE / VEP



[Features]

- Flat spray pattern with uniform distribution throughout pattern area.
- Even spray impact across the entire spray area.

[Standard Pressure]

0.3MPa

[Applications]

- Cleaning : Automotives, containers, films, felts, filters, screens, bottles, gravel, stones, sand, metal parts, machines, steel plates, steel pieces, wires, etc.
- Spraying : Etchants, oils, lubricants, liquids, solutions, insecticides, herbicides, etc.
- Cooling : Gases, smokes, heat exchangers, tanks, steels, roofs, etc.
- Water screen : Fire protection, heat protection, dust suppression, deodorization, etc.

VE-series

VE-series (3-piece structure)	
Structure	3-piece structure with ceramic orifice inserted. - Comprises three parts : Spray tip, cap and adaptor. - Worn-out spray tip can be replaced separately. - Removable strainer is fitted and supplied as standard part with small capacity nozzle. - CERTIIM® is one-shot injection molded spray tip created by molding the precision-made ceramic orifice into a plastic retainer.
Material	- Spray orifice : ceramic - Metal Parts : B (brass) or S303 (stainless steel 303) - CERTIIM®'s plastic retainer : PVDF (polyvinylidene fluoride) - Optional material : S316 or others

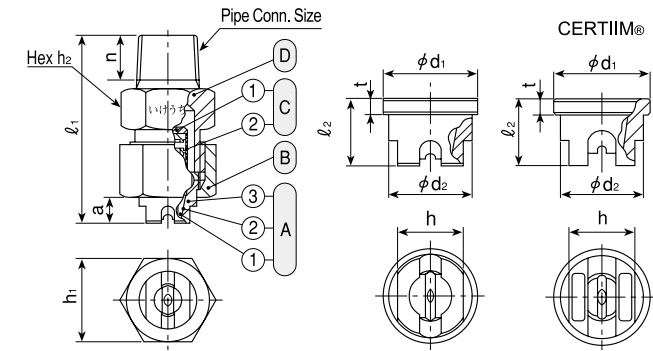
[Complete nozzle]

Series	Pipe Conn. Size	Dimensions(mm)					Mass(g)	
		ℓ₁	h₁	h₂	a	n	B	S303
VE	1/4 M	42.5	19	17	6	10.5	53	49

*For VE with strainer, add 2-5g to the above mass and 2mm to the above ℓ₁ length.

[Spray tip]

Series	Pipe Conn. Size of Complete Nozzle	Dimensions(mm)					Mass(g)	
		ℓ₂	φ d₁	φ d₂	h	t	B	S303
VE	CERTIIM® 1/4 M	10.5	14.5	12.5	10	2.5	7	6.5
	CERTIIM® 1/4 M	10.5	14.5	12.5	10	2.5	—	—



- ① Spray tip (① Ceramic orifice ② Adhesive : Araldite® ③ Retainer)
- ④ Cap
- ⑤ Strainer (① Strainer holder ② Strainer screen)
- ⑥ Adaptor

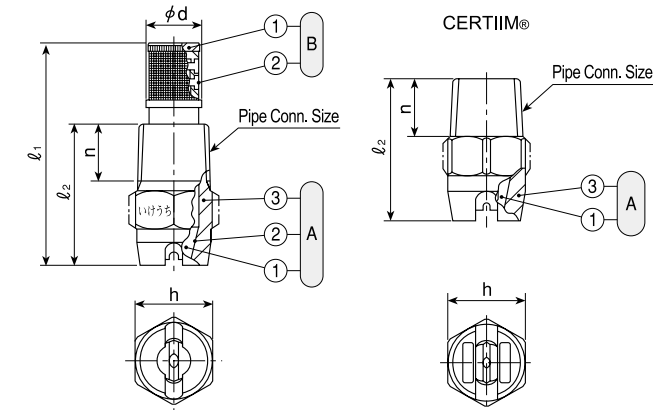
[Note] Appearance and dimensions may differ slightly depending on materials and nozzle codes.

VEP-series

VEP-series (one-piece structure)	
Structure	- Ceramic orifice inserted and adhered into metal or plastic body. - CERTIIM® is a plastic nozzle with a one-shot injection molded ceramic orifice.
Material	- Spray orifice : ceramic - Metal parts : B (brass) or S303 (stainless steel 303) - CERTIIM®'s plastic body : PVDF (polyvinylidene fluoride) - Optional material : S316 or others

Series	Pipe Conn. Size	Dimensions(mm)					Mass(g)	
		ℓ₁	ℓ₂	h	n	φ d	B	S303
VEP	1/8 M	30	16.5	12	6.5	7.5	8.6	7.9
	1/4 M	40	26	14	10.5	10	19	17
	3/8 M	—	30	19	11	—	35	33
	1/2 M	—	38	23	14	—	62	57
	CERTIIM® 1/8 M	—	22	12	8.5	—	—	2.1
	CERTIIM® 1/4 M	—	26	14	10.5	—	—	6

*For VEP with strainer, add 2-5g to the above mass.



- ① Nozzle (① Ceramic orifice ② Adhesive : Araldite® ③ Body)
- ④ Strainer (① Strainer holder ② Strainer screen)

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

Even Flat Spray Nozzles
VE / VEP-series

Spray Angle Code	Spray Capacity Code	VE		VEP						Spray Angle			Spray Capacity (ℓ/min)													Mean Drop. Dia. (μm)	Free Pass. Dia. (mm)	Strainer Mesh Size
		¼M	CER-TIME	⅜M	¼M	⅜M	½M	CER-TIME ⅜M	CER-TIME ¼M	0.15 MPa	0.3 MPa	0.7 MPa	0.05 MPa	0.1 MPa	0.15 MPa	0.2 MPa	0.3 MPa	0.5 MPa	0.7 MPa	1 MPa	2 MPa	3 MPa	5 MPa					
115°	19	●	○		●							104°	115°	122°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	240	0.5	100
	23	●	○		●							105°	115°	122°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39		0.6	100
	31	●	○		●							105°	115°	122°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7	0.6	100	
	36	●	○		●							105°	115°	122°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	0.7	50	
	39	●	○		●							105°	115°	122°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	0.7	50	
	59	●	○		●							105°	115°	122°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	0.9	50	
	78	○	○									106°	115°	121°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	1.0	—	
	117	○	○									106°	115°	120°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	1.2	—	
	157	○	○									106°	115°	120°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	1.4	—	
	196											108°	115°	120°	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	1.6	—	
	235											108°	115°	118°	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3	95.9	1.7	—	
	274											108°	115°	118°	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112	1.9	—	
	314											108°	115°	118°	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	2.0	—	
	392											108°	115°	118°	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	2.2	—	
	469											108°	115°	118°	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	2.4	—	
90°	03	●	○	●	●							78°	90°	101°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	0.95	1.22	140	0.2	200
	04	●	○	●	●							79°	90°	101°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	1.26	1.63	0.2	200	
	05	●	○	●	●							79°	90°	101°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	1.58	2.04	0.3	150	
	07	●	○	●	●							80°	90°	101°	—	0.40	0.49	0.57	0.70	0.90	1.07	1.28	1.81	2.21	2.86	0.3	150	
	10	●	○	●	●							80°	90°	100°	0.41	0.58	0.71	0.82	1.00	1.29	1.53	1.83	2.58	3.16	4.08	0.4	150	
	15	●	○	●	●							82°	90°	100°	0.61	0.87	1.06	1.23	1.50	1.94	2.29	2.74	3.87	4.74	6.12	0.4	150	
	19	●	○	●	●							82°	90°	98°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	250	0.7	50
	23	●	○	●	●							82°	90°	98°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39	0.7	50	
	31	●	○	●	●							83°	90°	97°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7	0.9	50	
	36	○	○	○	○							83°	90°	97°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	1.0	—	
	39	○	○	○	○							83°	90°	97°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	1.0	—	
	59	○	○	○	○							83°	90°	97°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	1.2	—	
	78	○	○	○	○							84°	90°	97°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	1.4	—	
	117	○	○	○	○							84°	90°	96°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	1.7	—	
	157	○	○	○	○							84°	90°	96°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	2.0	—	
196											84°	90°	96°	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	2.2	—		
235											85°	90°	95°	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3	95.9	2.4	—		
274											85°	90°	95°	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112	2.6	—		
314											85°	90°	94°	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	2.8	—		
392											85°	90°	94°	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	3.1	—		
469											85°	90°	94°	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	3.4	—		
80°	19	●	○		●							72°	80°	84°	0.78	1.10	1.34	1.55	1.90	2.45	2.90	3.47	4.91	6.00	7.76	260	0.7	50
	23	●	○		●							72°	80°	84°	0.94	1.33	1.63	1.88	2.30	2.97	3.51	4.20	5.94	7.27	9.39	0.8	50	
	31	●	○		●							72°	80°	84°	1.26	1.79	2.19	2.53	3.10	4.00	4.74	5.66	8.00	9.80	12.7	0.9	50	
	36	○	○		○							72°	80°	84°	1.47	2.08	2.55	2.94	3.60	4.65	5.50	6.57	9.30	11.4	14.6	1.0	—	
	39	○	○		○							73°	80°	84°	1.59	2.25	2.76	3.18	3.90	5.03	5.96	7.12	10.1	12.3	15.9	1.0	—	
	59	○	○		○							74°	80°	84°	2.40	3.41	4.17	4.82	5.90	7.62	9.01	10.8	15.2	18.6	24.1	1.3	—	
	78	○	○		○							74°	80°	84°	3.18	4.50	5.52	6.37	7.80	10.1	11.9	14.2	20.1	24.7	31.8	1.6	—	
	117	○	○		○							75°	80°	84°	4.78	6.75	8.27	9.55	11.7	15.1	17.8	21.4	30.2	37.0	47.8	1.9	—	
	157	○	○		○							76°	80°	84°	6.41	9.06	11.1	12.8	15.7	20.3	24.0	28.0	40.5	49.6	64.1	2.4	—	
	196				○							76°	80°	83°	8.00	11.3	13.9	16.0	19.6	25.3	30.0	35.8	50.6	62.0	80.0	2.6	—	
	235				○							76°	80°	83°	9.54	13.6	16.6	19.2	23.5	30.3	35.9	42.9	60.7	74.3	95.9	3.1	—	
	274				○							76°	80°	83°	11.2	15.8	19.4	22.4	27.4	35.4	41.9	50.0	70.7	86.6	112	3.3	—	
	314				○							76°	80°	83°	12.8	18.1	22.2	25.6	31.4	40.5	48.0	57.3	81.1	99.3	128	3.3	—	
	392				○							76°	80°	83°	16.0	22.6	27.7	32.0	39.2	50.6	60.0	71.6	101	124	160	3.7	—	
	469				○							76°	80°	83°	19.1	27.0	33.2	38.4	46.9	60.7	71.8	85.6	121	149	192	4.3	—	
65°	03	●	○	●	●							54°	65°	76°	—	0.17	0.21	0.24	0.30	0.39	0.46	0.55	0.77	0.95	1.22	150	0.3	150
	04	●	○	●	●							54°	65°	76°	—	0.23	0.28	0.33	0.40	0.52	0.61	0.73	1.03	1.26	1.63	0.3	150	
	05	●	○	●	●							54°	65°	75°	—	0.29	0.35	0.41	0.50	0.65	0.76	0.91	1.29	1.58	2.04	0.4	150	
	07	●	○	●	●						</																	