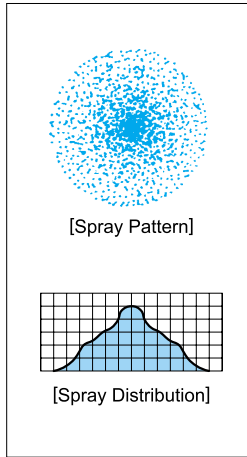


# Quick-Detachable High-efficiency Etching Nozzles

# SNAPJet



### [Features]

- Mountain-shaped distribution and high spray impact achieve high-precision etching.
- Uniform etching effect in any production lines because the distortion of spray distribution is minimized even if spray pressure is modulated.
- Quick-detachable design makes periodic maintenance easy. Whirler inside the nozzles is also removable.
- Also available in titanium for high-temperature and high-pressure condition.

### [Standard Pressure]

0.2MPa

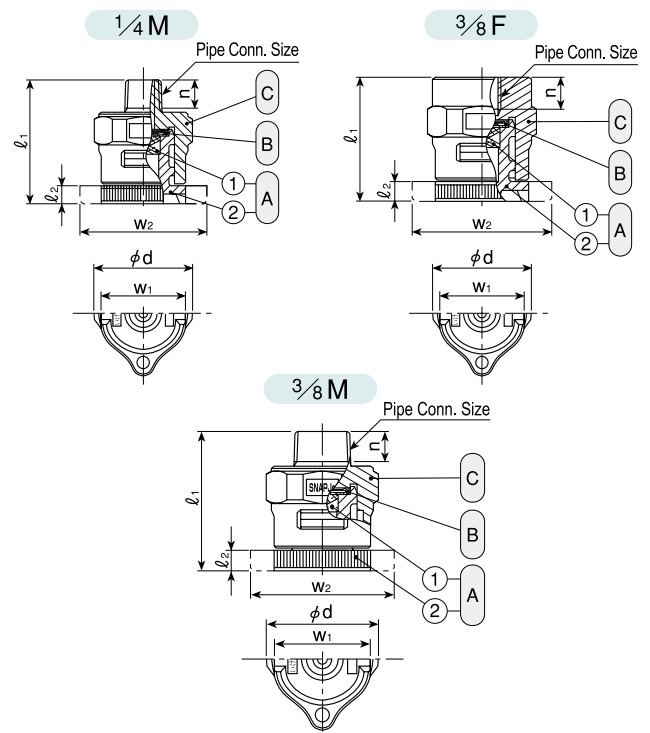
### [Applications]

Shadow mask etching, lead frame etching  
High-precision etching for PCB and TAB, etc.

Full Cone

## SNAPJet-series

SNAPJet-series	
Structure	• 2-piece structure comprised of adaptor and nozzle with whirler. Nozzle is removable only by turning 90°.
Material	• Nozzle body, adaptor and whirler : PPS(polyphenylene sulfide) • Packing : EPDM • Optional material : Nozzle body made of TN (titanium)



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

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

Ⓐ Nozzle (Ⓐ) Whirler (Ⓑ) Body (Ⓒ) Packing-EPDM (Ⓓ) Adaptor-PPS

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

### How to order

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

#### ① Complete unit

〈Example〉...1/4MSNAPJJX040PPS+PPS

1/4 M	SNAPJJX	040	PPS+PPS
Pipe Conn. Size		Spray Capacity Code	
1/4 M		040	
3/8 F		}	
3/8 M		070	

#### ② Nozzle only

〈Example〉...SNAPJJX040PPS

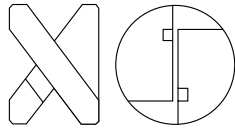
SNAPJJX	040	PPS
	Spray Capacity Code	
	040	
	}	
	070	

# For Effective Use of Full Cone Spray Nozzles

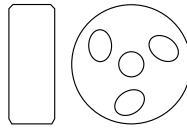
## Clogging & Free Passage Diameter

In order to form uniform distribution, full cone spray nozzles are usually fitted with whirlers and this part is the bottleneck of the liquid passage, where clogging problems often occur. Whirlers have several shapes such as X-shaped, disc-shaped and spiral-shaped ones, and the diameter of a sphere that can pass through the whirler is defined as free passage diameter.

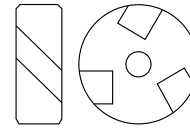
As compared with other whirlers, the **X-shaped whirler** has a larger free passage diameter, which minimizes clogging. Some full cone nozzles without whirlers have been developed to eliminate clogging problems, such as the **AJP-series** which features minimal clogging.



X-shaped whirler



Disc whirler



Spiral-shaped whirler

## Wear and Corrosion Resistance

If the liquid contains slurry, the inside of the nozzle exposed to the flow of liquid at high speed will wear out relatively quickly. For these applications, the **JUP-series** is ideal, as the orifice and whirler are made of ceramics. **JUXP, AJP-AL92 and TJJX-SiC series** are more effective as all parts are made of ceramics. For corrosive applications, nozzles made of special materials such as plastics and titanium alloy are available.

## Weight Savings

For arrangements of many large size nozzles, weight savings of the nozzles affects the total production cost for the systems. The **TJJX-series** with a newly developed X-shaped whirler has a 20% shorter overall length and 20% less weight than conventional nozzles. In addition, the weight of TJJX-SiC is less than half of metal nozzles.

## Rotation Reaction Force

In full cone spray nozzles with whirlers, rotation torque is generated as a reaction force by the vortex current produced by the whirler, which is determined by the following equation.

$$T \cong C \cdot Q \cdot D \cdot \sqrt{P}$$

[ Example ]

Nozzle No.	Torque at pressure of 0.2MPa
¾FJXP23	2.5N-cm
8TJJX8000	8,000N-cm

T : Torque (N-cm)

C : Constant

Q : Spray capacity (ℓ/min)

D : External dimension of whirler (mm)

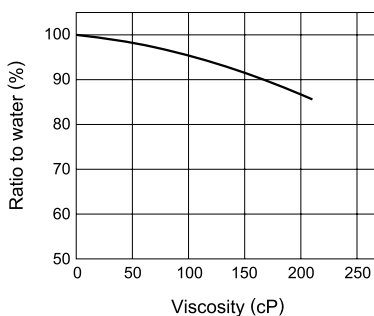
P : Spray pressure (MPa)

## Viscosity

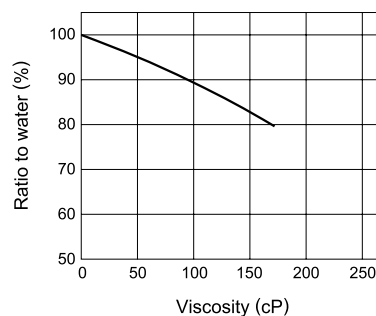
As the viscosity of the liquid increases, generally spray capacity and angle decreases, spray distribution deteriorates and spray droplet size becomes larger.

(Spray capacity of hollow cone spray nozzles increases as the viscosity of liquid increases. See p.55 for details.)

[ Relation between viscosity and spray capacity ]



[ Relation between viscosity and spray angle ]



Nozzle tested : JJXP90  
Pressure : 0.02-0.03MPa