




## Spray Nozzles & Systems for Pharmaceutical Industry





Spraytech Systems (India) Pvt. Ltd. was started by Shri. Bapusaheb Kharade, in early 2000 as a Spray Nozzle Manufacturer for replacement market catering to Steel Industries. Primarily company was started in a 1000 sq. feet workshop & within a decade it is elaborated to 7000 sq. feet modern factory. An another factory is started at Indapur 100 kms. away from Pune with a area of 2,00,000 sq. feet is again a big achievement for the Organisation. Recently Spraytech has started one another factory at Rabale (Navi Mumbai) with area of 13000 sq. feet. All three factories are facilitated with next generation class CNC machines, heavy material handling equipments to serve raising market demands with no compromise with world class product quality. Along with this field of engineering we are entered in forging to serve respective product demands.

"Spraytech" is a leading organization & a good name in the market for mfg. of Spray Nozzles.

We attribute our success to our motivated and skilled work force who can accomplish job orders of varying magnitudes and complexities. We are proud to have esteemed customers who have entrusted their faith in us over the years.

The aim of our organization is customer satisfaction which is achieved through following objectives: Commitment to quality, Prompt response, Technological solutions, On time delivery, After sales service.

Our challenge is to meet the widely ranging delivery demands of an equally diverse customer base coupled with constant up gradation of production equipment and techniques to keep pace with new market trends and applications.

## Tablet Coating Process

**It is the process to apply coating material on external surface of tablets to enhance its efficiency and properties.**

Today many solid pharmaceutical dosage mediums are produced with coatings, either on the external surface of tablets, or on materials dispensed within gelatine capsules.

Coating serves a number of purposes right from protecting stomach lining from aggressive drugs to protecting the tablet from stomach acids. It also helps in maintaining the shape of the tablet and thus can offer a delayed release of the medication.

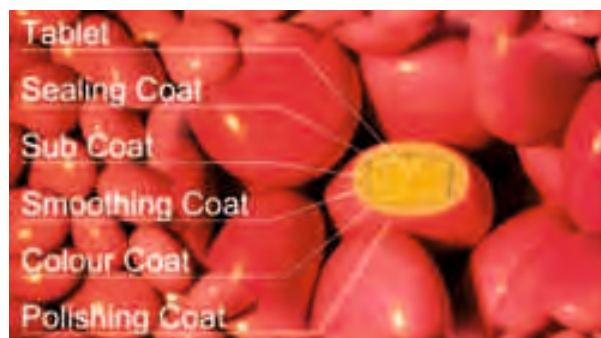
But for good results, a better coating medium is required. And the same can be fulfilled by Tablet coating spray nozzles.

### General purposes of tablet coating

- Covers unpleasant taste, colour and odour
- Chemical and physical protection from environment
- To control the release of drug with enteric coating
- It protects drug from gastric surrounding of stomach
- Provide way to identify the drug and improves appearance

### Results of bad coating

- Sticking or picking
- Roughness
- Twinning
- Peeling
- Cracking



Example of Bad Tablet Coating

## Granulation With RMG / HSG

Also known as wet granulation process. material is loaded into bowl having agitator and chopper and mixed rigorously then binder material is sprayed from top and granules are formed.

Good quality granules are foundation for good quality tablet.

Various liquid blenders are used for wet granulation.

Spraying binder over bulk material could reduce wet granulation cycle time and increase productivity.



## Fluid bed process consists of following applications :

### 1. Drying

Process of extracting moisture from solid bulk material by making it fluidized with high flow blow of air, so moisture is removed homogeneously and all over surface of every single particle.

### 2. Granulation/ Agglomeration

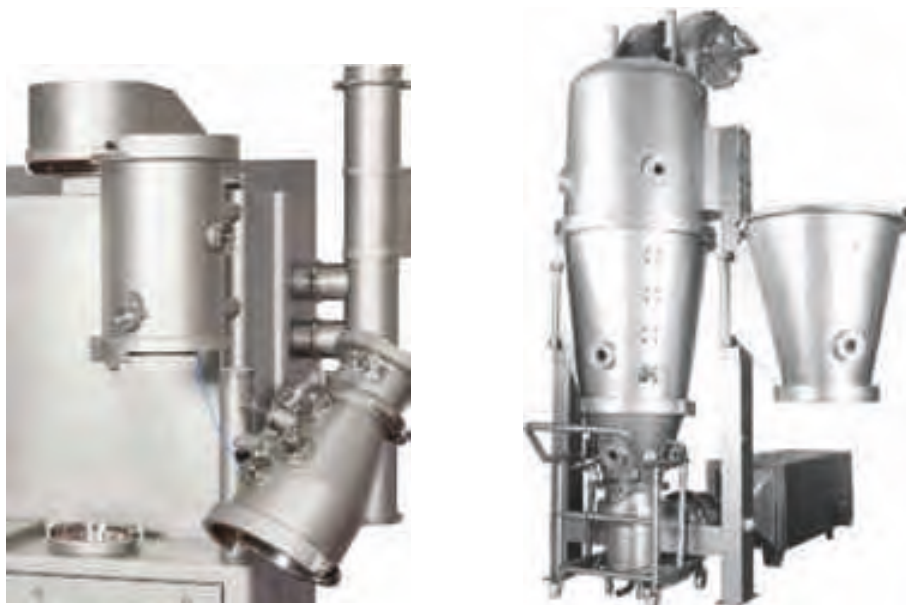
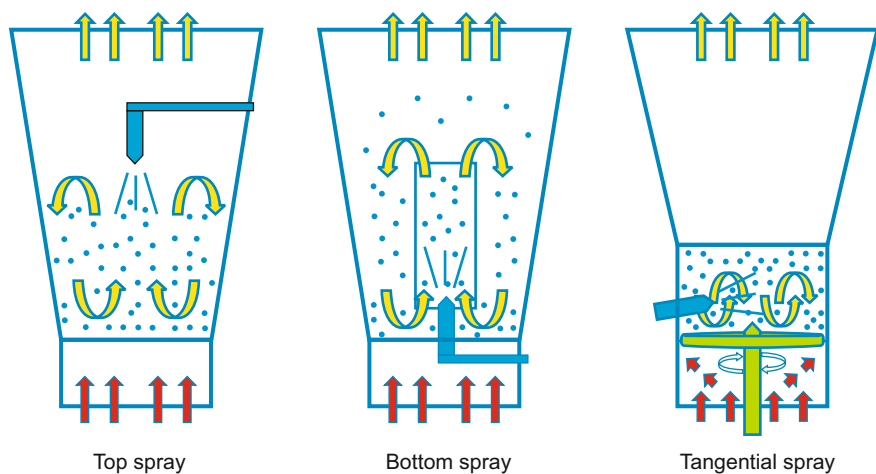
Powder particles of bulk material bonded by liquid fine spray. Liquid could be water or an organic solvent and the powder material will be mixed together. Agglomerate has less strength of particle bond.

### 3. Coating

Fluidized particles are coated with spray of coating material which enhances. coating film must be very uniform over the particle surface.

### 4. Tangential Coating

Centrifugal motion is used for making spherical pellets, at the same time particles are bonded by binder liquid. layering also can be done in same way.



# Tablet Coating Spray Nozzles

The following description will help to explain our Part Number/ Code in relation to the "SPRAYTECH" Spray Nozzle  
EXAMPLE ORDERING.

SPRAYTECH	R C	10	M2L	X A	FC
↓ Company Name	↓ Spray Nozzle Series	↓ Orifice Size	↓ Material Code	↓ Thread Type    ↓ Thread Size	↓ Flow Control

## 1) Spray Nozzles Series

R = Coating Nozzle

## 2) Sub Type of Nozzles



RC



RB



RCS



RDS

## 3) Orifice Size

05 = 0.5mm  
08 = 0.8mm  
10 = 1.0mm  
12 = 1.2mm  
15 = 1.5mm  
18 = 1.8mm  
20 = 2.0mm

## 4) Material code

M2 = SS316  
M2L = SS316L

## 5) Thread Type Code

X = BSPP

Note : Special Connection on request

## 6) Thread Size code

A = 1/8"

B = 1/4"

C = 3/8"

Note : Special Size on request

# RC Series Tablet Coating Spray Nozzles



**Liquid Orifice Range: 0.5 to 1.8 MM**



Spraytech's popular RC Series tablet coating spray nozzle are specially designed to meet GMP requirements where surface texture plays very important role.

The unique Air Cap design makes it Anti Bearding and keeps coating process shutdown free, thus higher production ratio and quality requirements are achieved.

RC series spray nozzle is a compact device incorporating of independent controls for Liquid, Atomizing Air and Fan Air for fine tuning of spray capacity, droplet size and spray patterns. It is available in wide variety of spray setups that give a complete selection of flow rate and flat spray patterns.

RC series spray nozzles are externally mix nozzles. This means the liquid and air are mixed outside of air cap to produce complete atomized spray.

The liquid atomization is controlled by varying atomizing air and fan air pressures without changing liquid flow rates. The flat spray pattern is controlled by varying the fan air pressure in conjunction with the atomizing air. This is effective for high viscosity liquids, coatings and suspensions.

Tablet coating spray nozzle features a cylinder for controlled "on-off" operation. The cylinder controls a liquid clean-out/ Shut-off needle which also cleans the liquid orifice.

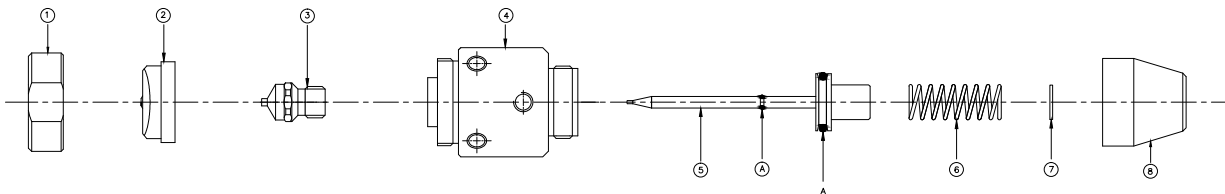
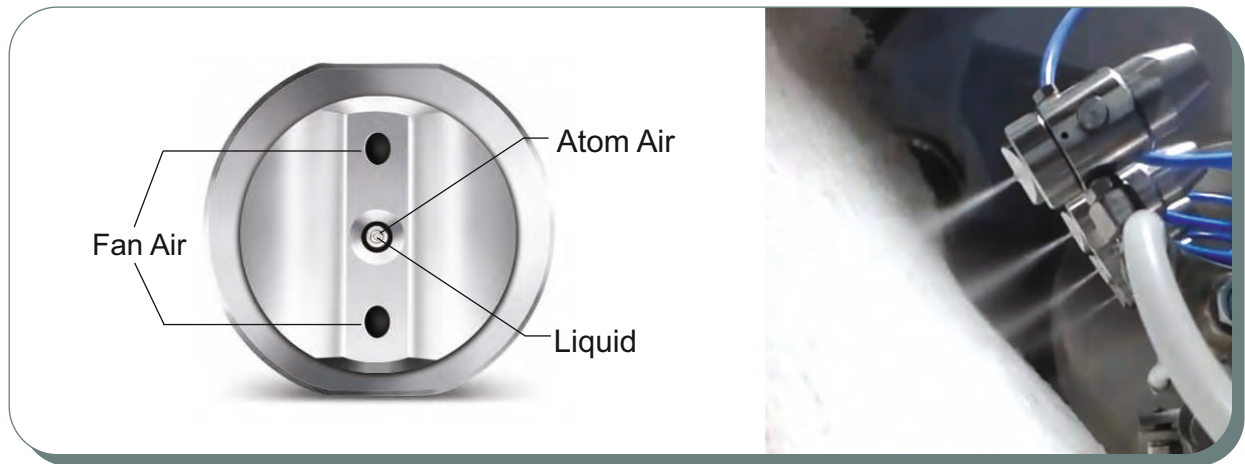
The RC Series coating Spray Nozzle are a compact, precision nozzles. Incorporating independent controls of liquid atomizing air and fan air for fine tuning of spray capacity droplet size and spray patterns. It is available in a wide variety of spray Set-ups that give a complete selection of flow rates and flat spray patterns.

Spray Nozzle	Type	RC
<b>Spray Type :</b>	<b>Airborne</b>	<b>Air Atomised</b>
Liquid orifice size Range (standard)	mm	0.8 - 1.8, (1.0)
Solution Flow Rate (typical per nozzle)	Liters/hour	6 - 30
Atomizing Air Pressure Range	bar	0.7 - 3
Spray Width Pressure Range	bar	1.0 - 4.0
Maximum Compressed Air Pressure	bar	5.5
Compressed Air Consumption (maximum @ 2.0 bar)	Nm <sup>3</sup> /hour	10.5
Seal Material (standard) check compatibility for organic use	FDA	Approved

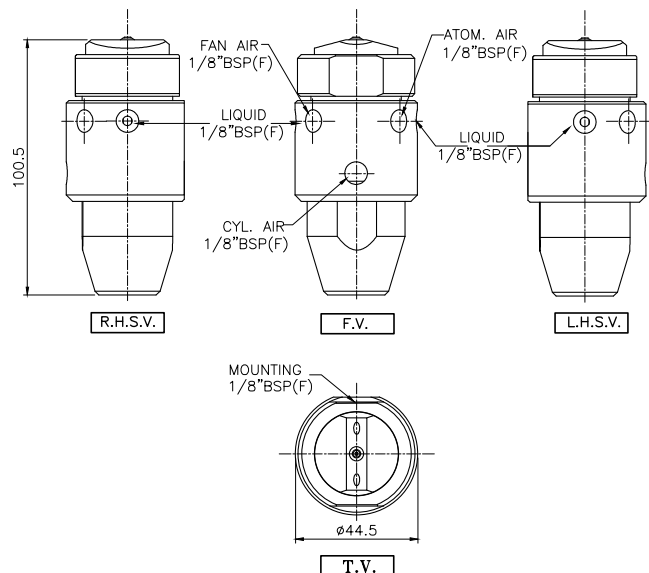
# RC Series Tablet Coating Spray Nozzles

## DESIGN FEATURES

1. GMP model
2. Complete SS316L construction
3. Separate atomizing and fan air lines for complete control.
4. Minimum part assembly for easy maintenance
5. Only 2 O-rings
6. Provides variable coverage and fine control of drop size without affecting liquid flow rates.
7. Non clogging and anti - bearding design
8. Auto shut-off & anti-drip feature
9. Self-cleaning needle design.
10. Available with and Without flow control feature



## Details of Inlet Connections



### Part Details

- |                   |                 |
|-------------------|-----------------|
| 1 Lock Nut        | 7 Strainer Disc |
| 2 Air Cap         | 8 End Cap       |
| 3 Liquid Nozzle   |                 |
| 4 Body            |                 |
| 5 Needle Assembly |                 |
| 6 Rear Spring     |                 |

# RB Series Coating Spray Nozzles



## Design Summary :

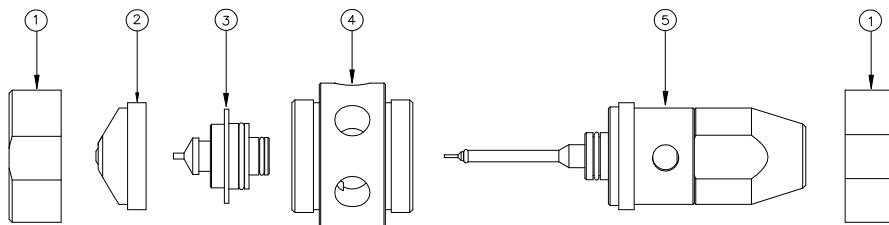
Liquid Orifice Range: 0.5 to 2.0 MM

- RB Series variable spray nozzles provide uniform spray distribution with uniform droplet sizes, even when spraying viscous fluids.
- RB series works with HVLP principle where the atomization is possible at lowest pressures.
- RB series comes with Independent inlets for Atomization air, Fan air, Cylinder air and Liquid for complete control over the spray nozzle.

## DESIGN FEATURES

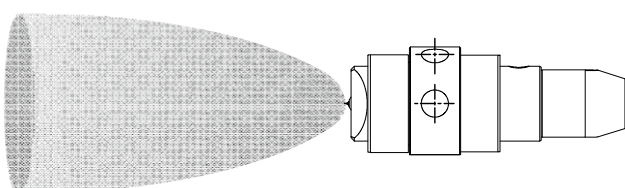
1. GMP model
2. Complete SS316L construction
3. Separate atomizing and fan air lines for complete control.
4. Provides variable coverage and fine control of drop size without affecting liquid flow rates.
5. Non clogging and anti - bearding design
6. Auto shut-off & anti-drip feature
7. Self-cleaning needle design.
8. Comes with Wide range of orifice size

- RB series is best suitable for auto coaters for large scale production.
- Additional inlet /outlet port allows for liquid re-circulation that effectively maintains the flow of viscous liquids.
- Having removable auto shut off and spring loaded needle cylinder assembly is provided for maintenance



## Part Details

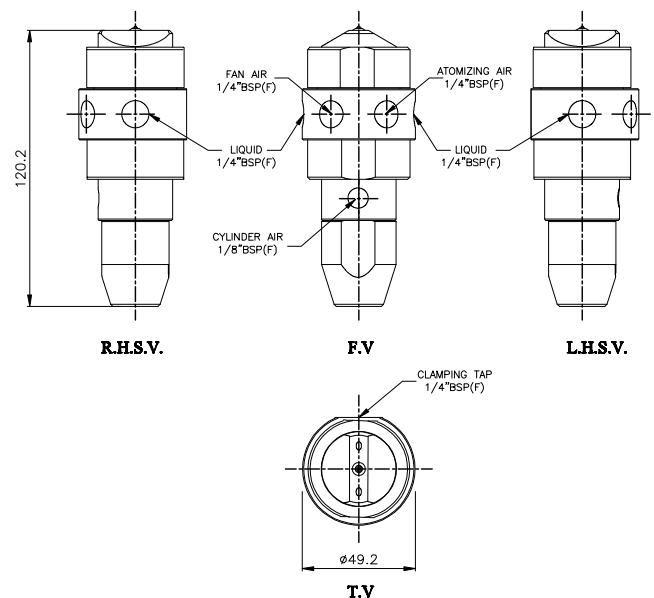
- 1 Lock Nut
- 2 Air Cap
- 3 Fluid Cap
- 4 Body
- 5 Cylinder (Needle) Assembly



**With fan air:** Flat Spray Pattern.

**Without fan air:** Round Spray Pattern.

## Details of Inlet Connections :





# RCS Series Coating Spray Nozzles



Liquid Orifice Range: 0.5 to 1.2MM

SPRAYTECH'S RCS series coating spray nozzles offers very compact design with innovative flow control feature. This feature offers the user to take the RCS coating nozzle from the lowest 20 ml to its max limit is just a spin.

RCS type coating spray nozzle is very light weight and features anti bearding air cap design which eliminates the deposition of material over the air cap and abolishes bearding over gun.

RCS comes with individual ports for liquid, Atomizing, Fan control and auto shut-off for total control. Also as it has external mixed design thus, atomized spray properties could be changed as per need with fine tuning of individual pressures of Atomizing air, Fan Air & Liquid pressure.

Innovative needle assembly provides the Auto-shut off, Anti-Drip and Auto Cleaning of liquid orifice.

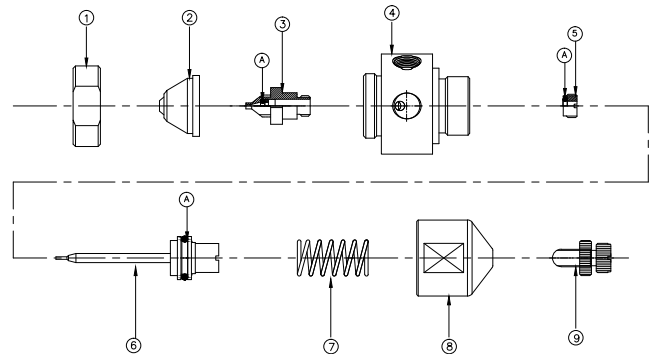
RCS type coating spray nozzle is best suitable for Lab-coater and Conventional coater.

Spray setup available with Flat Fan, and Round Pattern.

All Sealing materials are FDA Approved.

## DESIGN FEATURES

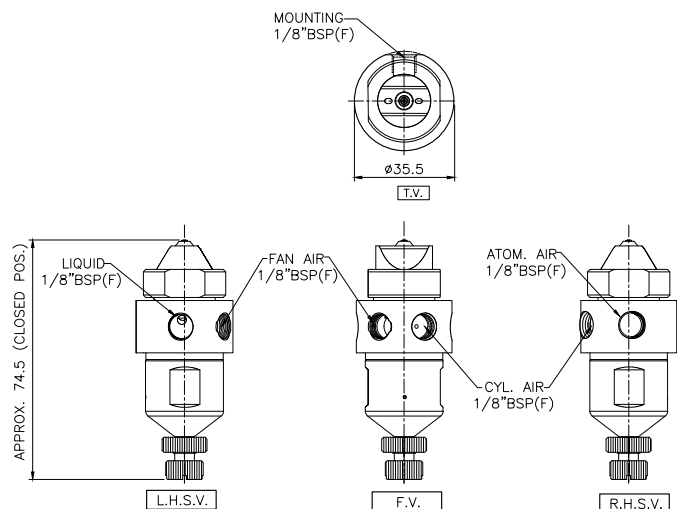
1. GMP model
2. Compact & lightweight design
3. Complete SS316L construction
4. Separate atomizing and fan air lines for complete control.
5. Minimum part assembly for easy maintenance
6. Provides variable coverage and fine control of drop size without affecting liquid flow rates.
7. Non clogging and anti - bearding design
8. Auto shut-off & anti-drip feature
9. Self-cleaning needle design.
10. Available with and Without flow control feature



## Part Details

- 1 Lock Nut (Front)
- 2 Air Cap
- 3 Liquid Nozzle
- 4 Body
- 5 Gland
- 6 Needle Assembly
- 7 Needle Spring
- 8 End Cap
- 9 Flow Control Regulator
- 10 Flow Adjustment Screw

## Details of Inlet Connections



# RDS Series Coating Spray Nozzles

Liquid Orifice Range: 0.5 to 1.8 MM

SPRAYTECH'S Latest Development, RDS series coating spray nozzles offers operation of spray using just three connections, 1 for Atomization air & Fan air combined, 1 for cylinder air and 1 for liquid. Only two air connections makes it best suitable for conventional pan coaters.

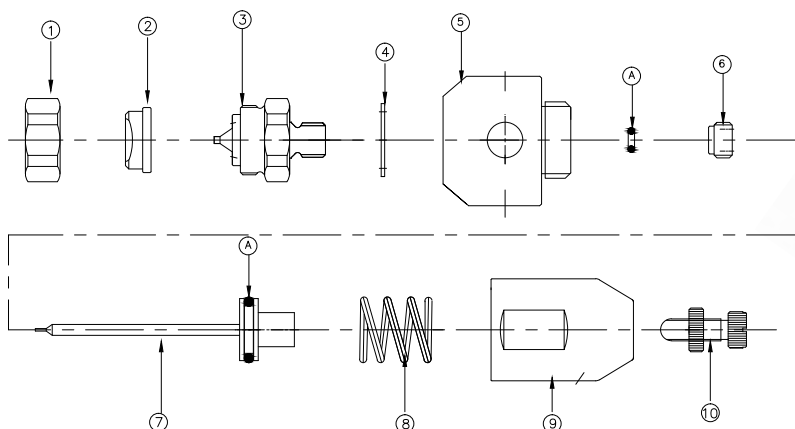
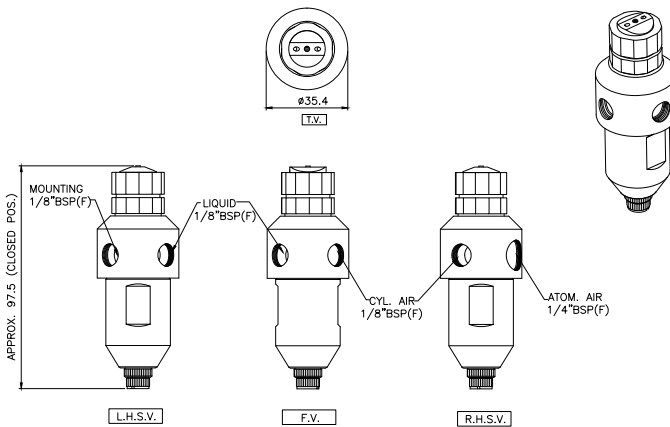
RDS offers variety of spray setups ranging from 0.5 mm to 1.8 mm.

RDS comes with Anti bearding air cap design for clog free operation and its special design needle makes it anti drip and auto shut off.

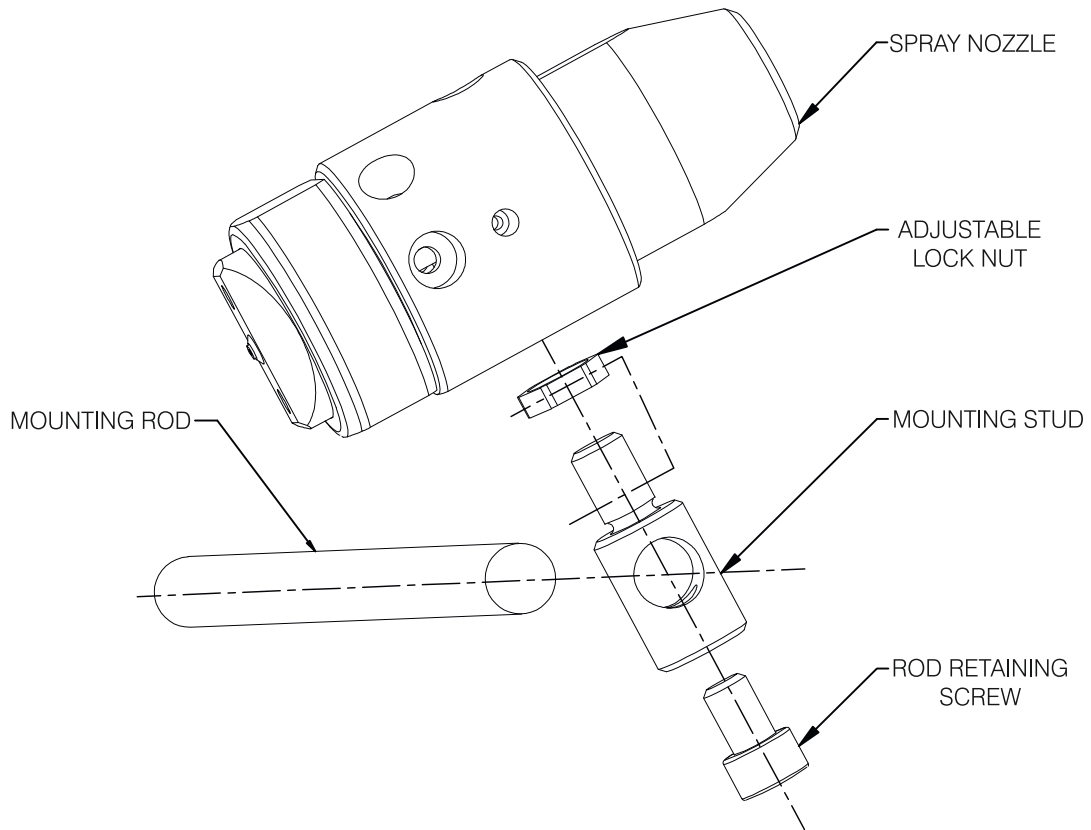
RDS comes with flow control feature to take total control over the flow rate.

## DESIGN FEATURES

1. GMP model
2. Complete SS316L construction
3. Only 3 connections
4. Minimum part assembly for easy maintenance
5. Provides variable coverage and fine control of drop size without affecting liquid flow rates.
6. Non clogging and anti - bearding design
7. Auto shut-off & anti-drip feature
8. Self-cleaning needle design.
9. Available with flow control feature

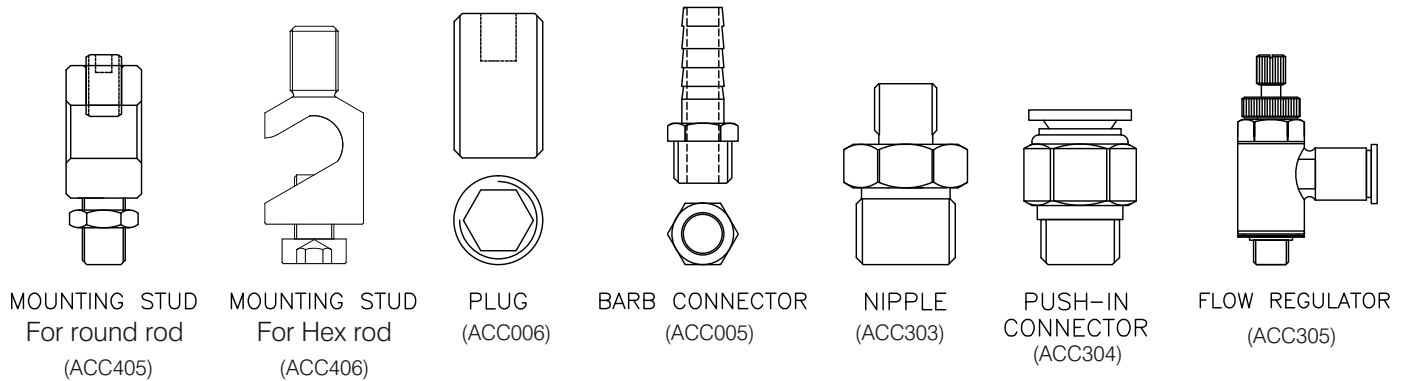


# Mounting Assembly



## Accessories

Optional Accessories available for R series coating spray nozzles



## TS 50

Spraytech's TS 50 is very compact spray nozzle designed specially design for Lab Scale Fluid Bed Processors. With length less than 50 mm it can be easily mounted in any lab model FBP. It is also available with wide range of spray rates with fine atomization.

### Design Features

- Compact design
- Narrow spray angle (Top down spray)
- Multiple orifice sizes for liquid nozzle
- Homogeneous spray distribution
- Minimum parts for easy maintenance
- Auto shut off feature (Available in TS 50AS)
- GMP Suitable design
- Made from SS316L and All O-rings from FDA Approved material

### Specifications

Spray pattern	: Full cone
Spray angle	: 15°-20°(Variable)
Orifice range	: 0.5 to 2.0 mm
Capacity	: 0.1 to 1.5 LPM



## TS 100

Spraytech's TS100 is a compact design Top spray granulation nozzle equipped with one spray head (single head) and is ideal for lab scale and small capacity FBP. The single head provides fine atomized cone spray pattern with adjustable spray angles. The unique air cap has air flow adjustment where the atomization and the spray angle can be fine-tuned.

Manufactured and designed considering GMP standards, TS100 is equipped with cylinder assembly which offers auto shutoff feature and needle assembly which shuts the liquid orifice to provide anti-drip function.

### Design Features

- Compact design
- Auto-shut off & Anti Drip feature
- Complete SS316L and Food grade Viton seals
- Anti-bearding air cap
- Interchangeable liquid nozzles
- Customised lance available

### Specifications

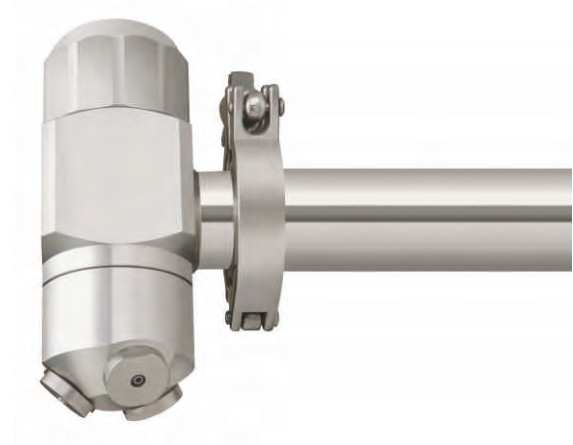
Spray pattern	: Full cone
Spray angle	: 20° - 30° (Variable)
Orifice range	: 0.5 to 2.5 mm
Capacity	: 0.05 to 2 LPM



## TS 300

Spraytech's TS300 is a multi-head design top spray granulation nozzle equipped with three spray head (Three head) suitable for medium capacity Fluid Bed Processors. It offers interchangeable liquid nozzle and air caps setups that works on external mix spray platform which enhances the spray quality and distribution in optimum way.

The multi-head setup provides three individual 20 degree full cone spray pattern which combines and forms a cluster of fine atomized spray. TS300 also offers cylinder assembly for auto shut-off operation.



### Design Features

- Interchangeable Liquid nozzle and air cap setups
- Auto-shut off Feature
- Wider spray angle with maximum coverage area
- Finest droplet size & Homogeneous spray distribution
- Complete SS316L and Food grade Viton seals
- Customised lance available

### Specifications

Spray pattern	: Full cone
Spray angle	: 60° - 90°
Orifice range	: 0.5 to 2.5 mm
Capacity	: 0.15 to 4 LPM



## TS 600

Spraytech's TS600 is a multi-head design top spray granulation nozzle equipped with six spray head (Referred as Six head) suitable for large capacity Fluid Bed Processors. The unique cluster head block comprises of six independent liquid nozzle and air cap setups. The six cluster head design provides higher capacity flow with homogenous spray pattern distribution.

### Design Features

- Interchangeable Liquid nozzle and air cap setups
- Auto-shut off Feature
- Wider spray angle with maximum coverage area
- Finest droplet size & Homogeneous spray distribution
- Complete SS316L and Food grade Viton seals
- customised lance available

### Specifications

Spray pattern	: Full cone(Circular type)
Spray angle	: 60° - 90°
Orifice range	: 0.5 to 2.5 mm
Capacity:	: 0.15 to 5 LPM



## WS 30

Spraytech's specially designed and customizable Fluid bed Bottom spray (Wurster coating) nozzle helps to improve the wurster coating application and also makes it possible to attain high-quality results in coating pellets and particles.

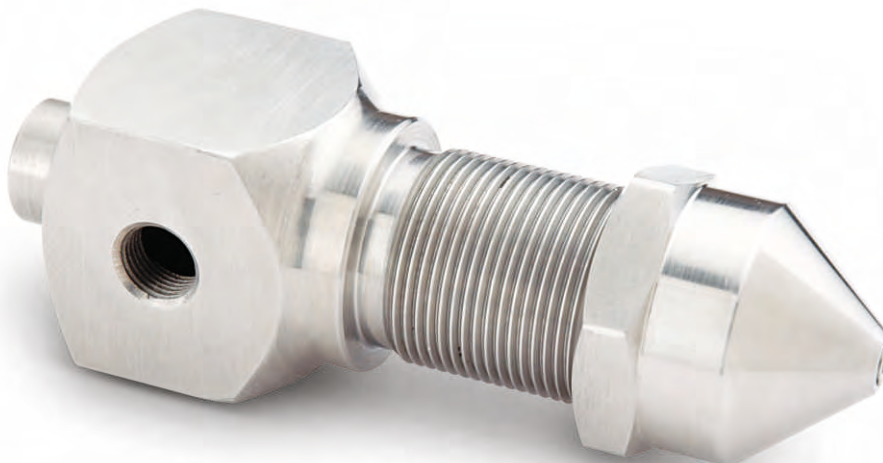
Designed for All type of Bottom Spray Coating, Allegiant spray distribution and fine droplets results in optimum quality of coating. Light weight design and easy to control the spray parameters. Minimum internal parts hence less maintenance.

### Design Features

- Optimum spray quality
- Easy to assemble and dismantle
- GMP Suitable design
- Available with various orifices sizes
- Custom made designs available
- Variable mounting height
- Compact design

### Specifications

Spray pattern	: Full cone
Spray angle	: 15° - 25° (Adjustable)
Orifice range	: 0.5 to 2.2 mm
Capacity:	: 0.1 to 1.5 LPM





## WS 50 & WS 50AS

Spraytech's specially designed and customizable Fluid bed Bottom spray (Wurster coating) nozzle helps to improve the wurster coating application and also makes it possible to attain high-quality results in coating pellets and particles.

Designed for Lab & small of Bottom Spray Coating, Applications. Allegiant spray distribution and fine droplets results in optimum quality of coating. Light weight design and easy to control the spray parameters. Minimum internal parts hence less maintenance. Also can be mounted directly on perforated sheet

### Design Features

- Optimum spray quality
- Easy to assemble and dismantle
- Auto shut off feature (Available in WS 50AS)
- Special air cap design to avoid material build-up
- GMP Suitable design
- Available with various orifices sizes
- Made from SS316L and All O-rings from FDA Approved material
- Custom made designs available
- Easy Mounting



### Specifications

Spray pattern	: Full cone
Spray angle	: 15° - 20° (Adjustable)
Orifice range	: 0.5 to 1.8 mm
Capacity:	: 0.1 to 1 LPM

# FBP Bottom Spray Nozzle & Lance

## WS 200

Spraytech's specially designed and customizable WS 200 Fluid bed Bottom spray (Wurster coating) nozzle helps to improve the wurster coating application and also makes it possible to attain high-quality results in coating pellets and particles.

Suitable for all Small and Medium scale Bottom Spray Coating application. It provides homogenous spray distribution and fine droplets which results in optimum quality of coating. It is Light weight and easy to operate.

### Design Features

- Optimum spray quality
- Anti-drip spray tip
- Spray angle and atomization Adjustment
- Easy to assemble and dismantle
- Special air cap design to avoid material build-up
- GMP Suitable design
- Available with various orifices sizes
- Made from SS316L and All O-rings from FDA Approved material
- Custom made designs available

### Specifications

Spray pattern	: Full cone
Spray angle	: 15° - 20° (Adjustable)
Orifice range	: 0.5 to 2.0 mm
Capacity	: 0.1 to 1.5 LPM



# FBP Bottom Spray Nozzle & Lance

## WS 300

Spraytech's WS 300 popularly known as High speed gun is specially designed for higher capacity Fluid bed Bottom spray (Wurster coating) application. Its unique design and Higher capacity helps to improve the wurster coating application and also makes it possible to attain high-quality results in coating pellets and particles in less time.

Suitable for all type of Bottom Spray Coating application with homogenous spray distribution and fine droplets that results in optimum quality of coating.

### Design Features

- High capacity spray nozzle
- Optimum spray quality
- Spray angle and atomization Adjustment
- Anti-drip spray tip
- Auto-clean needle assembly
- Special air cap design to avoid material build-up
- GMP Suitable design
- Anti-clogging lance
- Available with various orifices sizes
- Made from SS316L and All O-rings from FDA Approved material
- Custom made designs available



### Specifications

Spray pattern	: Full cone
Spray angle	: 15° -20° (Adjustable)
Orifice range	: 0.5 to 2.5 mm
Capacity	: 0.1 to 1.5 LPM

## GN 400

Spraytech's RMG / HSG Top Spray Nozzles & Lance are design for Large Scale, Medium Scale and Lab Scale Rapid Mixer Granulator and High - Shear Granulator for Wet Granulation. Superior spray quality produces best in class granules from bulk. Manufactured according to GMP and available in wide range of spray rates. And external mixing spray setup enhances the spray quality and distribution in optimum way.

Spray Nozzles and special purpose lance designs available

### Design Features

- Available in 1, 3, 4 spray heads
- Available in various spray angles
- Auto-shut off feature
- Anti-drip spray heads
- Long Life Lance design
- Compact design of spray nozzle
- Homogeneous spray distribution
- Fine droplet size, best for wet granulation,
- GMP Suitable design
- Anti-clogging lance design
- Made from SS316L and All O-rings from FDA Approved material
- Custom made designs available





Spray angle range : 60° - 80°

Flow range : 10 LPM to 50 LPM

Features:

- Anti drip Spray setup
- Auto shut off
- Finest droplet Size

## Internal Mix Setup

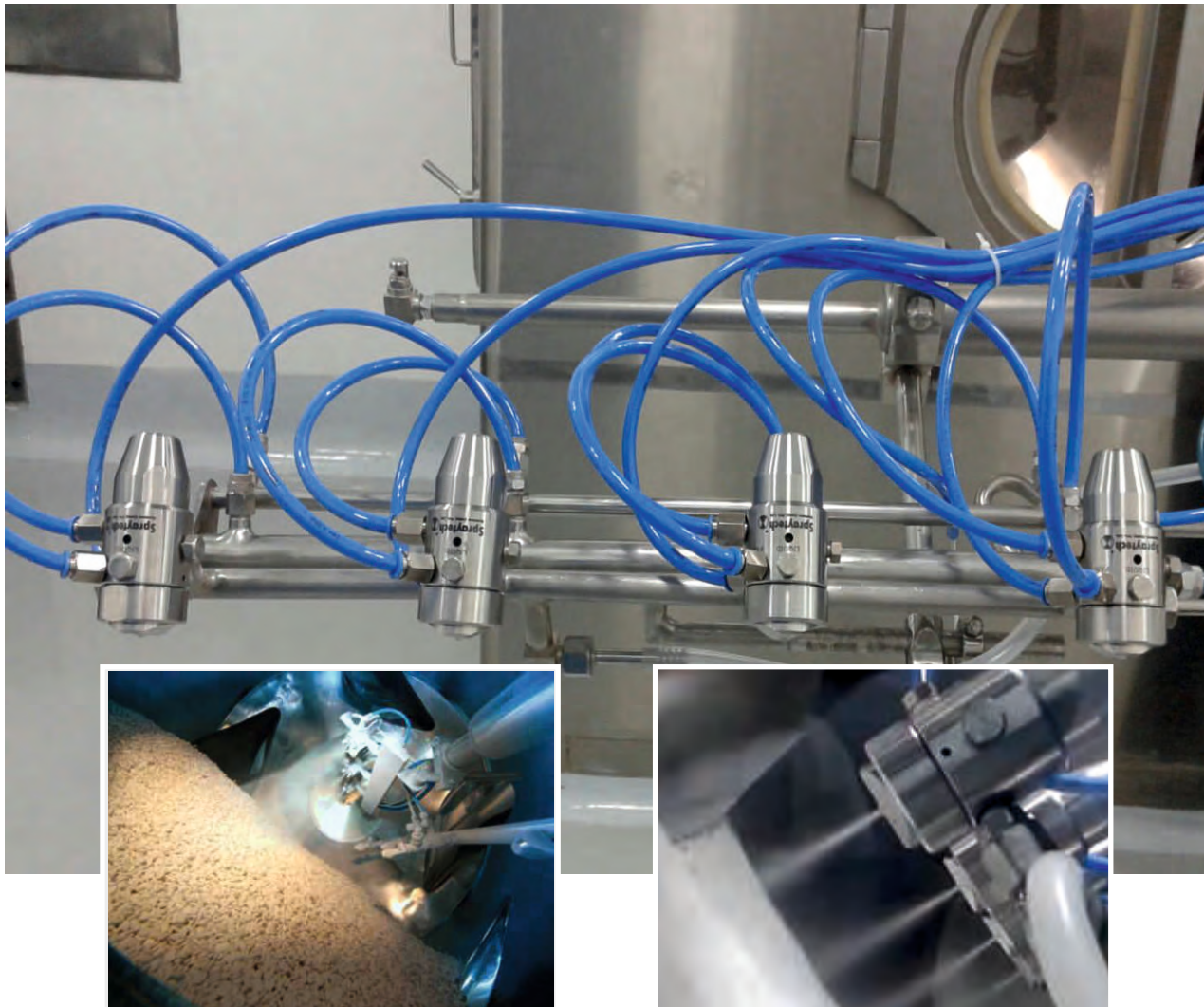


Special Design For R&D & Pilot  
RMG / HSG Equipment

Spray angle range: 20° - 90°

Flow range : 1 LPM to 8 LPM

## Air Atomizing Spray Nozzles



### APPLICATION

- Tablet Coating
- Pallet Coating
- Atomization of viscous liquids
- Agglomeration
- Granulation
- Humidification of air

# Air Atomizing Design, Features & Introduction

Air atomizing spray nozzles produces fine mist spray with the help of compressed air, liquid breaks into small droplets as air provides shearing effects on liquid droplets. Various spray patterns are available, they are categorized into Flat and Round spray patterns. The droplet size can be adjusted by flow adjustment of compressed air. Air atomizing nozzles are divided into two types Internal and External mix air atomizing nozzles. Those are available in various metals.

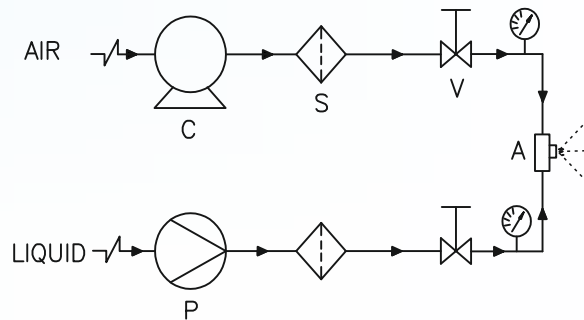
An air atomizing spray nozzle can work on three principles as below:

- 1) Pressure Principle
- 2) SIPHON Principle
- 3) Gravity Head Principle



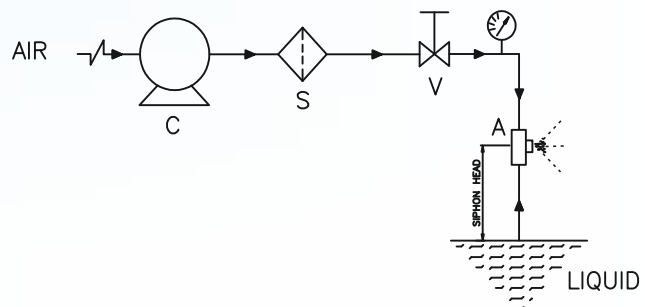
## 1) Pressure Principle

Liquid is supplied in pressurised form with the help of pump or pressurised container, separate compressed air is needed



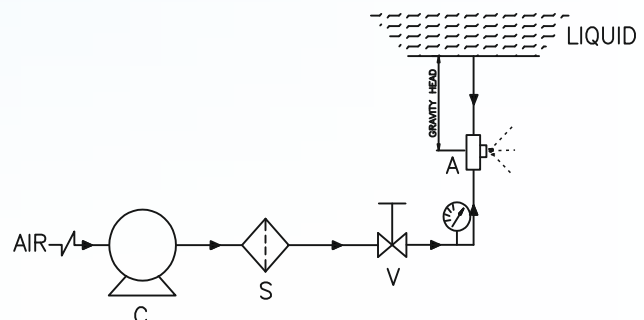
## 2) Siphon Principle

Siphon principle is utilised to lift liquid from certain height from spray nozzle, suitable where pump or pressurised container of liquid is not available.



## 3) Gravity head Principle

Gravitational head of liquid is utilised to feed liquid to the spray nozzle, suitable where pump or pressurized container of liquid is not available.



**Choice of spray Nozzles**

Each spray set-ups consists of an air cap and liquid cap which provide a specific spray pattern capacity and coverage performance

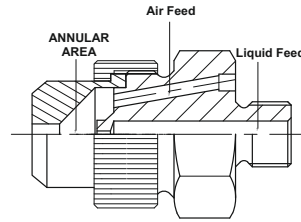
**Inside Body Mixing**

Liquid and air streams meet within nozzle and are mixed together and expelled through the same orifice. This internal mixing means the streams are not independent; a change in air flow will affect the liquid flow. This makes precise metering of the liquid more difficult than with an External Mix Set-up. Internal Mix set-ups are able to produce the finest atomization of any of the XA set-ups, but they are generally not suitable for use with liquids which have a viscosity that is above 200 centipoise.

**Out Side Body Mixing**

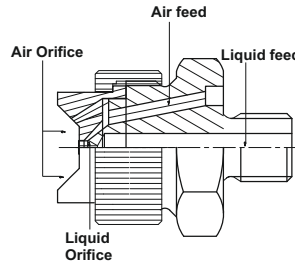
The air and liquid streams exit the nozzle independently and are combined and mixed outside of the nozzles. Because there is no connection between the air and liquid lines within the nozzles, the air and liquid flow rates can be controlled independently, allowing precise metering of the liquid. The atomization can be controlled by adjusting the air flow rate more air produces finer atomization. In most cases these set-up do not atomize as finely as Internal Mix Set-ups.

External Mix Set-up may be used with liquid having a viscosity above 200 centipoise and for abrasive suspensions. Spraytech provides Engineering guidance for spraying high viscosity liquids.



**Internal Mix Set-Ups**

Air & Liquid mix inside the nozzle



**External Mix Set-Ups**

Air & Liquid exit independently and combine outside the nozzle

**Applications**

- 1. Tablet Coating
- 2. Thin Film Coating
- 3. Humidification
- 4. Paper Moisturising
- 5. Dust Suppression

**Optional Features**

- 1. Manual Shut-off / Cleaning Needle
- 2. Automatic self Cleaning Needle
- 3. Auto shut-off Arrangement

**Material Code**

- M1 = SS303/SS304
- M2 = SS316/M2L=SS316L
- M3 = Brass (Nickel Plating on Request)
- M4 = SS410/ M4-3=SS310

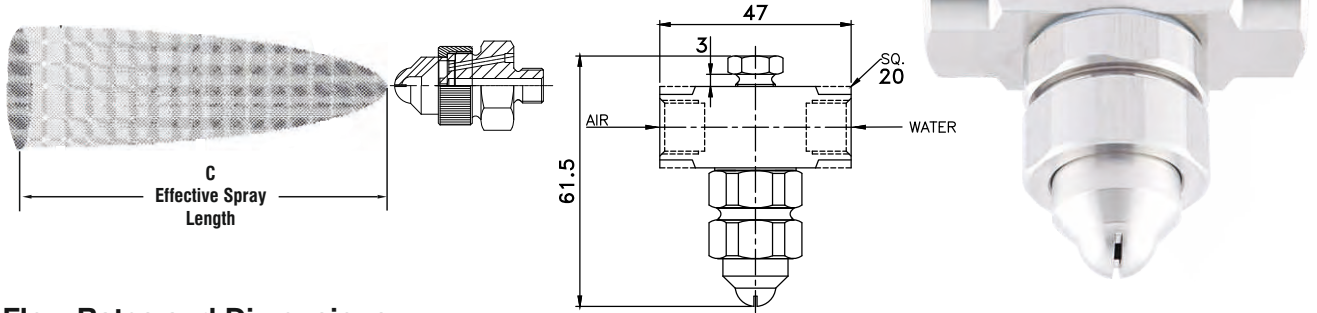




# CAIA Series Flat Internal Air Atomizing Spray Nozzles

## DESIGN / SPRAY CHARACTERISTICS

- Internal mix
- Very fine atomization
- Flat fan, wide angle spray patterns (range 45° and 120°)



## Flow Rates and Dimensions

Pressure-fed, Internal Mix, Flat Spray Pattern, 1/8" and 1/4" Pipe Sizes, BSP or NPT

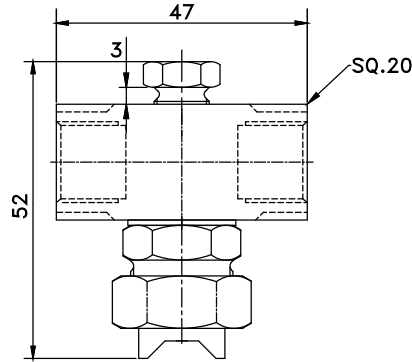
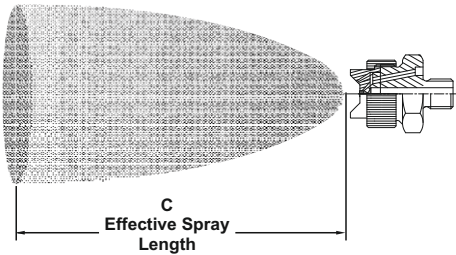
Pipe Size	Model No.	0.7 Bar Liquid			1.5 Bar Liquid			2.0 Bar Liquid			3.0 Bar Liquid			4.0 Bar Liquid			Spray Dimensions	
		Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	"C" Effective Spray Length (mm)	Max. Spray Length (m)
1/8 or 1/4	CAIA 050	0.7	5.5	1.44	1.3	9.1	1.86	2.0	8.6	2.52	2.7	11.2	3.12	3.9	12.0	4.14	460 660 760 860 940	2.6 3.0 3.2 3.4 4.0
		0.9	4.7	1.62	1.5	7.7	2.16	2.2	7.5	2.82	3.0	10.1	3.36	4.6	9.7	4.86		
		1.0	4.1	1.86	1.8	6.5	2.52	2.5	6.2	3.12	3.2	9.1	3.72	5.3	7.5	5.58		
		1.1	3.5	2.04	2.1	5.4	2.82	2.8	5.2	3.42	3.5	8.1	3.96	6.0	5.3	6.24		
		1.3	3.0	2.22	2.4	4.3	3.12	3.1	4.2	3.78	4.2	5.4	4.74	6.3	4.3	6.60		
		1.4	2.5	2.40	2.7	3.3	3.42	3.2	3.7	3.90	4.6	4.2	5.10	6.7	3.3	6.96		
1.5	2.0	2.64	2.8	2.8	3.60	3.4	3.2	4.08	4.9	3.1	5.46	7.0	2.4	7.32				
1/8 or 1/4	CAIA 100	1.3	3.9	1.80	2.1	7.4	2.40	3.0	6.1	3.12	3.9	9.4	3.60	5.3	10.2	4.68	460 690 740 940 970	1.8 2.0 2.0 2.1 2.3
		1.4	3.0	1.98	2.4	5.3	2.70	3.1	5.3	3.24	4.2	7.2	4.02	5.6	8.3	5.04		
		1.5	2.3	2.10	2.5	4.4	2.82	3.2	4.5	3.42	4.6	5.3	4.38	6.0	6.6	5.34		
		1.7	1.8	2.28	2.7	3.7	3.00	3.4	3.8	3.54	4.9	3.8	4.80	6.3	5.1	5.88		
		1.8	1.3	2.46	2.8	3.1	3.12	3.5	3.2	3.72								
		2.0	1.0	2.64	3.0	2.6	3.30	3.9	1.8	4.08								
1/8 or 1/4	CAIA 150	0.9	8.2	1.20	1.4	14.4	1.62	2.1	13.5	2.16	2.7	19.1	2.52	4.6	16.1	4.14	710 810 890 970 970	2.1 2.4 2.6 2.7 3.2
		1.0	6.8	1.38	1.7	11.9	1.92	2.4	11.4	2.52	3.0	17.1	2.76	4.9	13.8	4.56		
		1.1	5.5	1.62	2.0	9.5	2.22	2.7	9.2	2.82	3.2	15.1	3.12	5.3	11.5	4.98		
		1.3	4.1	1.80	2.1	8.3	2.40	3.0	7.1	3.18	3.5	13.1	3.42	5.6	9.3	5.40		
		2.2	2.9	2.04	2.2	7.1	2.58	3.2	5.0	3.54	4.2	8.1	4.32	6.0	7.3	5.82		
		2.4	6.1	2.76	3.4	4.0	3.78	4.0	3.78	4.6	5.9	4.74	6.3	5.6	6.24			
2.5	5.1	2.94	3.5	3.3	3.96	3.5	3.3	3.96	4.9	4.0	5.16	6.7	4.3	6.72				
1/8 or 1/4	CAIA 200	1.0	9.0	1.50	2.0	10.4	2.46	2.4	11.6	2.88	3.1	15.6	3.36	4.2	17.1	4.38	170 200 220 280 330	3.0 3.7 4.0 4.2 4.8
		1.1	7.8	1.80	2.1	9.3	2.70	2.5	10.4	3.06	3.2	14.6	3.54	4.6	15.0	4.80		
		1.3	6.6	1.92	2.2	8.2	2.88	2.7	9.4	3.24	3.4	13.7	3.72	4.9	12.8	5.22		
		1.4	5.2	2.16	2.5	6.1	3.30	3.0	7.3	3.66	3.8	10.8	4.26	5.3	11.0	5.64		
		1.7	3.1	2.64	2.8	4.3	3.72	3.2	5.5	4.08	4.2	8.5	4.92	5.6	9.4	6.18		
		2.0	2.0	3.00	3.1	3.0	4.14	3.5	4.1	4.50	4.9	5.2	5.88	6.3	7.2	7.14		
2.2	1.1	3.36	3.4	2.0	4.50	3.8	2.9	4.86	6.0	2.3	7.20	7.0	6.1	8.04				
1/8 or 1/4	CAIA 250	1.1	11.2	3.24	2.1	18.0	4.47	2.7	19.6	5.58	3.5	27.0	6.72	4.6	33.0	8.22	200 330 400 460 480	3.0 3.2 3.4 3.5 4.0
		1.3	8.5	3.60	2.2	15.8	5.04	2.8	17.3	5.88	3.7	25.0	6.96	4.9	28.0	8.94		
		1.4	6.5	3.90	2.4	13.6	5.34	3.0	15.2	6.18	3.8	23.0	7.26	5.3	24.0	9.66		
		1.5	5.0	4.26	2.5	11.6	5.70	3.1	13.2	6.54	3.9	21.0	7.56	5.6	19.7	10.4		
		1.7	3.8	4.62				3.2	11.4	6.84	4.1	18.9	7.92	6.0	15.7	11.2		
1.5									4.2	17.0	8.22	6.3	12.4	12.0				
1/8 or 1/4	CAIA 300	0.9	27.0	1.98	1.8	38.0	3.30	2.4	39.0	4.02	3.2	58.0	4.56	4.6	59.0	6.36	300 410 430 480 510	3.4 3.5 3.7 3.8 4.4
		1.0	20.0	2.28	2.1	28.0	3.96	2.7	30.0	4.62	3.5	47.0	5.22	5.3	40.0	7.92		
		1.1	15.9	2.70	2.2	24.0	4.26	3.0	24.0	5.22	3.8	38.0	5.82	5.6	32.0	8.70		
		1.3	12.5	2.88	2.4	21.0	4.56	3.2	17.8	5.88	3.9	34.0	6.18	6.0	26.0	9.48		
		1.4	10.2	3.36	2.5	17.8	4.92	3.4	15.1	6.18	4.2	27.0	6.78	6.3	20.0	10.3		
		1.5	7.6	3.72	2.7	15.1	5.22	3.5	12.9	6.54	4.6	20.0	7.56	6.7	15.9	11.1		
10.6			3.7	10.6	6.84	4.9	10.6	6.84	4.9	14.8	8.40	7.0	12.7	11.9				
1/8 or 1/4	CAIA 350	1.0	17.0	1.38	2.0	24.0	2.64	2.4	28.0	3.06	3.4	38.0	4.32	3.9	65.0	4.50	150 170 220 280 350	2.4 3.0 3.4 3.6 4.0
		1.1	11.0	1.62	2.1	18.9	3.00	2.5	23.0	3.54	3.5	33.0	4.80	4.2	53.0	5.34		
		1.3	7.6	1.98	2.2	14.4	3.36	2.7	18.9	3.96	3.7	28.0	5.34	4.6	40.0	6.48		
		2.4	3.2	2.40	2.4	10.6	3.78	2.8	15.1	4.44	3.8	23.0	5.82	4.9	30.0	7.62		
		2.5			2.5	7.2	4.26	3.0	11.7	4.74	3.8	19.7	6.30	5.3	21.0	8.94		
4.2									4.2	13.1	7.20	5.6	13.8	10.4				
4.6									4.6	7.2	8.28	6.3	3.2	13.5				
1/8 or 1/4	CAIA 400	1.0	29.0	5.40	1.8	56.0	7.02	2.1	100	7.14	3.0	126	8.40	4.1	140	10.9	250 430 460 530 580	3.4 3.8 4.3 4.6 5.2
		1.1	18.9	6.48	2.0	40.0	7.98	2.2	79.0	7.98	3.1	110	9.06	4.2	125	11.6		
								2.4	62.0	8.82	3.2	95.0	9.78	4.6	89.0	13.5		
								2.5	48.0	9.72	3.4	78.0	11.0	4.9	58.0	15.9		
								2.7	36.0	10.6	3.5	62.0	11.6	5.3	34.0	18.3		
											3.7	48.0	12.6	5.6	16.7	20.4		
									3.8	37.0	13.5							

Standard Materials: Nickel-plated Brass, 303 Stainless Steel and 316 Stainless Steel.

# CAEA Series Flat External Air Atomizing Spray Nozzles

## DESIGN / SPRAY CHARACTERISTICS

- External mix: allows spraying of viscous materials
- Variable atomization
- Moderate spray angle (range 60°- 90°)
- Precise metering of the liquid flow rate



## Flow Rates and Dimensions

Siphon-fed, External Mix, Flat Spray Pattern, 1/8" and 1/4" Pipe Sizes, BSP or NPT

Orifice size & water flow		Water Pressure [kg/cm <sup>2</sup> ]									
		Pressure 0.2 Bar	Pressure 0.4 Bar	Pressure 0.6 Bar	Pressure 0.8 Bar	Pressure 1 Bar	Pressure 1.2 Bar	Pressure 1.4 Bar	Pressure 1.6 Bar	Pressure 1.8 Bar	Pressure 2 Bar
0.5	ML/MIN	80	100	130	150	170	190	200	210	210	210
	LPH	4.8	6	7.8	9	10.2	11.4	12	12.6	12.6	12.6
0.6	ML/MIN	160	200	240	260	300	320	340	360	380	400
	LPH	9.6	12	14.4	15.6	18	19.2	20.4	21.6	22.8	24
0.7	ML/MIN	170	220	250	300	320	340	360	400	420	440
	LPH	10.2	13.2	15	18	19.2	20.4	21.6	24	25.2	26.4
0.8	ML/MIN	260	300	360	400	440	480	510	540	580	610
	LPH	15.6	18	21.6	24	26.4	28.8	30.6	32.4	34.8	36.6
0.9	ML/MIN	280	320	380	420	470	500	540	580	600	640
	LPH	16.8	19.2	22.8	25.2	28.2	30	32.4	34.8	36	38.4
1	ML/MIN	340	420	500	560	620	680	720	740	760	780
	LPH	20.4	25.2	30	33.6	37.2	40.8	43.2	44.4	45.6	46.8
1.1	ML/MIN										
	LPH										
1.2	ML/MIN	440	540	640	760	840	900	990	1040	1080	1100
	LPH	26.4	32.4	38.4	45.6	50.4	54	59.4	62.4	64.8	66
1.3	ML/MIN	740	760	880	1000	1100	1200	1300	1380	1200	1260
	LPH	44.4	45.6	52.8	60	66	72	78	82.8	72	75.6
1.4	ML/MIN	760	880	940	1100	1200	1300	1400	1500	1560	1600
	LPH	45.6	52.89	56.4	66	72	78	84	90	93.6	96
1.5	ML/MIN	800	1000	1200	1300	1440	1580	1660	1800	1900	1980
	LPH	48	60	72	78	86.4	94.8	99.6	108	114	118.8

Standard Materials: Nickel-plated Brass, 303 Stainless Steel and 316 Stainless Steel.

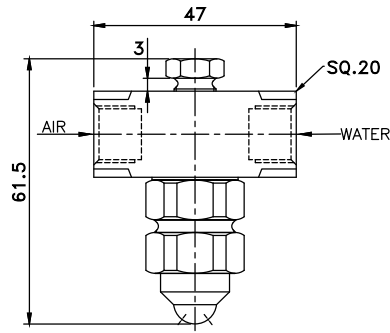
# CAEA Series Flat External Air Atomizing Spray Nozzles



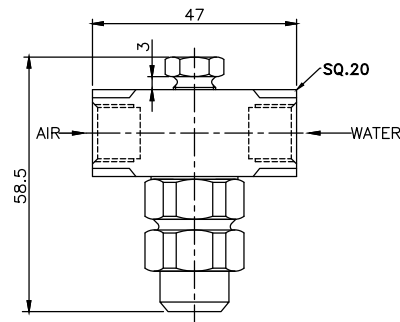
Pipe Size	Model No.	0.7 Bar Liquid			1.5 Bar Liquid			2.0 Bar Liquid			3.0 Bar Liquid			4.0 Bar Liquid			Spray Dimensions					
		Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	"C" Effective Spray Length(mm)	Max. Spray Length (m)				
1/8 or 1/4	CAEA 350	0.6	13	5.46	16	6.12	25	9.36	37	12.6	52	17.1	52	3.2	52	17.1	480	3.8				
		0.7		6.12		7.80		9.36		11.0		12.6		15.6		21.6			25.8	27.3		
		1.1		7.80		11.0		12.6		15.6		21.6		25.8		27.3			32.0	36.0	40.0	4.6
1/8 or 1/4	CAEA 400	0.7	13	5.10	16	6.12	25	9.36	37	12.6	52	17.1	52	3.2	52	12.7	250	1.7				
		1.0		6.12		7.80		9.36		11.0		12.6		15.6		21.6			25.8	27.3		
		1.4		7.80		11.0		12.6		15.6		21.6		25.8		27.3			32.0	36.0	40.0	4.9
1/8 or 1/4	CAEA 450	0.6	18	5.46	22	6.12	33	9.36	48	14.1	68	18.6	68	3.5	68	18.6	510	3.5				
		1.1		7.80		9.36		11.0		12.6		15.6		21.6		25.8			27.3			
		1.4		9.36		11.0		12.6		15.6		21.6		25.8		27.3			32.0	36.0	40.0	
1/8 or 1/4	CAEA 500	0.7	18	5.10	22	6.96	33	8.34	48	11.7	68	13.9	68	3.5	68	13.9	270	2.1				
		1.0		6.12		7.80		9.36		11.0		12.6		15.6		21.6			25.8	27.3		
		1.4		7.80		11.0		12.6		15.6		21.6		25.8		27.3			32.0	36.0	40.0	5.8
1/8 or 1/4	CAEA 550	0.7	36	6.12	45	7.80	68	9.36	100	11.0	141	25.8	141	5.3	141	25.8	760	3.0				
		1.1		7.80		9.36		11.0		12.6		15.6		21.6		25.8			27.3			
		1.4		9.36		11.0		12.6		15.6		21.6		25.8		27.3			32.0	36.0	40.0	5.8
1/8 or 1/4	CAEA 600	1.0	36	6.12	45	8.34	68	10.7	100	12.7	141	15.3	141	3.9	141	15.3	250	2.7				
		1.4		6.96		8.34		10.7		12.7		14.8		16.5		17.8			18.8	21.6	24.7	27.2
		2.1		8.34		10.7		12.7		14.8		16.5		17.8		18.8			21.6	24.7	27.2	32.0
1/8 or 1/4	CAEA 650	1.8	36	14.1	45	14.1	68	18.0	100	24.6	141	29.0	141	3.0	141	29.0	300	3.0				
		2.1		15.6		18.0		21.3		22.8		24.6		26.7		28.8			31.2	33.9	36.0	41.1
		2.5		18.0		21.3		22.8		24.6		26.7		28.8		31.2			33.9	36.0	41.1	46.0
1/8 or 1/4	CAEA 700	2.1	64	15.6	78	19.8	119	24.6	175	31.2	175	34.0	175	3.5	175	34.0	360	3.5				
		2.5		18.0		21.3		22.8		24.6		26.7		28.8		31.2			33.9	36.0	41.1	
		2.8		19.8		22.8		24.6		26.7		28.8		31.2		33.9			36.0	41.1	46.0	6.1
1/8 or 1/4	CAEA 750	2.8	102	19.8	125	22.8	192	28.8	280	34.0	280	36.0	280	4.6	280	36.0	360	4.6				
		3.2		21.3		24.6		26.7		28.8		31.2		33.9		36.0			41.1			
		3.5		22.8		24.6		26.7		28.8		31.2		33.9		36.0			41.1	46.0	6.1	

Standard Materials: Nickel-plated Brass, 303 Stainless Steel and 316 Stainless Steel.

# DAIA Series Full Cone Internal Air Atomizing Spray Nozzles



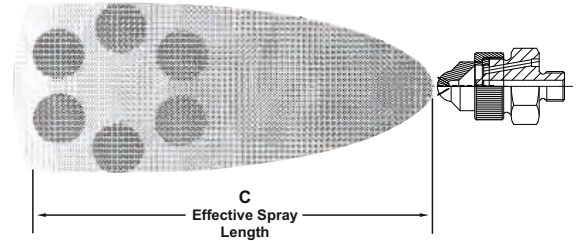
Full Cone spray pattern ( range 45° to 120° )



Full Cone spray pattern ( range 15° to 30° )

## DESIGN / SPRAY CHARACTERISTICS

- Internal Mix
- Very fine atomization
- Full Cone spray pattern ( range 15° to 120° )
- Moderate forward spray projection



## Flow Rates and Dimensions

Pressure-fed, Internal Mix, Wide Angle Round Spray Pattern, 1/8" and 1/4" Pipe Sizes, BSP or NPT

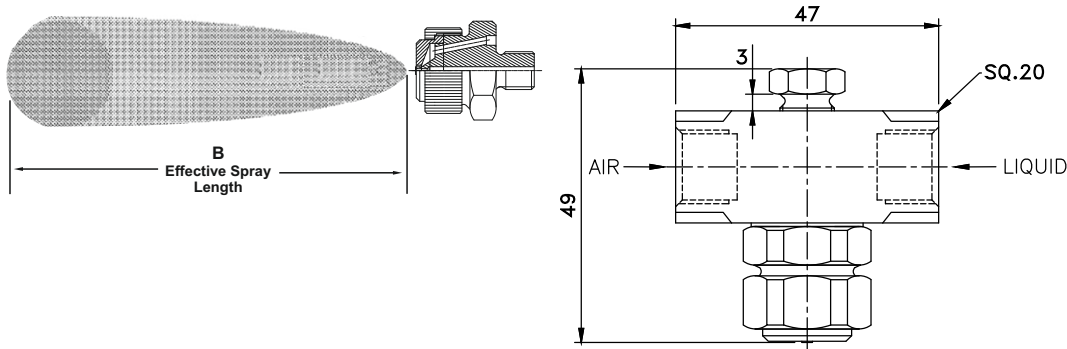
Pipe Size	Model No.	0.7 Bar Liquid			1.5 Bar Liquid			2.0 Bar Liquid			3.0 Bar Liquid			4.0 Bar Liquid			Spray Dimensions			
		Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	Air (bar)	l/h	Nm <sup>3</sup> /h	"C" Effective Spray Length(mm)	Max. Spray Length (m)		
1/8 or 1/4	DAIA 050	0.6	5.3	0.60	1.1	8.1	0.79	1.5	8.1	0.92	2.4	8.9	1.24	3.1	10.5	1.44	230 240 250 260 300	1.5 1.8 2.1 2.7 4.0		
		0.7	4.3	0.72	1.3	7.0	0.88	1.8	6.6	1.09	2.7	8.1	1.40	3.4	9.7	1.68				
		0.9	3.0	0.84	1.4	6.4	0.94	2.1	4.9	1.32	3.0	6.4	1.66	3.9	7.8	2.16				
		1.0	1.7	1.02	1.5	5.5	1.01	2.4	3.2	1.68	3.2	4.9	1.92	4.2	6.1	2.52				
					1.7	4.5	1.16				3.4	4.2	2.13	4.6	4.4	2.82				
			1.8	3.5	1.30					3.4	2.33	4.9	2.8	3.24						
1/8 or 1/4	DAIA 100	0.9	7.0	3.00	1.7	13.2	4.08	2.0	18.5	4.08	2.8	25.0	5.04	3.7	31.0	5.76	310 330 330 340 370	1.8 2.4 3.2 4.1 5.9		
		1.0	2.1	3.72	1.8	9.8	4.74	2.1	15.1	4.56	3.0	22.0	5.52	3.8	28.0	6.30				
								2.2	11.7	5.10	3.1	18.5	6.06	3.9	26.0	6.78				
											3.2	15.1	6.54	4.1	23.0	7.32				
											3.4	12.1	7.14	4.2	20.0	7.80				
									3.5	9.1	7.80	4.6	13.6	9.18						
									3.7	6.1	8.52	4.9	6.8	11.0						
1/8 or 1/4	DAIA 150	1.1	12.3	2.40	2.2	16.3	3.72	2.7	21.0	4.14	4.2	19.3	6.00	5.6	22.0	7.80	230 240 240 250 280	2.7 4.6 5.5 7.3 9.4		
		1.3	9.9	2.70	2.5	12.1	4.26	3.0	16.3	4.68	4.6	14.6	6.78	6.0	17.6	8.52				
		1.4	7.9	3.00	2.8	8.9	4.74	3.2	12.3	5.16	4.9	10.8	7.44	6.3	14.0	9.12				
		1.5	6.1	3.24	3.0	7.6	4.98	3.4	10.7	5.46	5.3	8.1	8.10	6.7	11.4	9.78				
		1.7	4.9	3.48	3.1	6.4	5.22	3.5	9.3	5.64	5.6	6.2	8.76	7.0	9.1	10.4				
			3.2	5.5	5.46	3.9	6.4	6.30	6.0	4.9	9.42									
			2.0	3.1	4.02	3.4	4.7	5.70	4.2	4.7	6.90	6.3	4.0	10.00						
1/8 or 1/4	DAIA 200	0.7	24.0	1.92	1.4	43.0	2.22	2.1	33.0	3.96	2.8	52.0	3.90	3.7	63.0	4.08	360 370 370 380 390	2.1 3.2 4.1 5.0 6.8		
		0.9	13.6	2.64	1.5	35.0	2.94	2.2	26.0	4.68	3.0	46.0	4.56	3.8	58.0	4.74				
		1.0	7.6	3.42	1.7	28.0	3.66	2.4	18.9	5.34	3.1	39.0	5.22	4.0	52.0	6.06				
					1.8	21.0	4.26	2.5	11.7	6.00	3.2	33.0	5.94	4.2	41.0	6.66				
											3.4	26.0	6.60	4.6	27.0	8.28				
									3.5	19.5	7.32	4.9	15.9	9.96						
									3.7	13.2	7.98									
1/8 or 1/4	DAIA 250	1.3	36.0	5.10	2.1	57.0	6.96	3.1	53.0	9.36	4.2	64.0	11.8	5.6	74.0	14.7	330 340 370 380 400	5.5 6.4 8.2 9.1 10.4		
		1.5	29.0	6.12	2.4	51.0	7.80	3.2	50.0	9.78	4.9	51.0	13.8	6.0	68.0	15.6				
		1.8	23.0	7.02	2.7	45.0	8.58	3.4	47.0	10.2	5.6	40.0	15.9	6.3	62.0	16.8				
		2.0	19.7	7.50	3.0	39.0	9.42	3.5	45.0	10.6	6.0	34.0	17.1	6.7	56.0	17.7				
		2.1	16.7	7.98	3.2	33.0	10.2	3.9	38.0	11.6	6.3	28.0	18.0	7.0	51.0	18.9				
			2.3	14.0	8.52	3.5	28.0	11.1	4.6	25.5	13.8	6.7	22.0	19.2						
			2.4	11.4	8.94	4.2	13.6	13.2	4.9	18.5	14.7	7.0	17.8	20.1						
1/8 or 1/4	DAIA 300	1.7	27.0	9.36	3.0	39.0	13.8	3.4	50.0	15.0	4.6	62.0	19.2	6.0	93.0	23.7	460 470 510 530 580	5.5 6.4 7.3 7.9 9.8		
		1.8	20.0	10.0	3.1	33.0	14.4	3.5	43.0	15.6	4.9	47.0	20.7	6.3	77.0	25.5				
		2.0	15.9	10.7	3.2	27.0	15.3	3.7	41.0	16.5	5.3	36.0	22.5	6.7	62.0	27.6				
		2.1	12.5	11.6	3.4	23.0	15.9	3.9	27.0	18.0	5.6	26.0	24.3	7.0	52.0	29.7				
		2.3	10.2	12.3	3.5	18.5	16.8	4.1	23.0	18.6	6.0	18.9	26.1							
			3.7	14.8	17.4	4.2	18.9	19.2	6.3	13.6	27.6									

Standard Materials: Nickel-plated Brass, 303 Stainless Steel and 316 Stainless Steel.

# DASA Series Full Cone Siphon Air Atomizing Spray Nozzles

## DESIGN / SPRAY CHARACTERISTICS

- Lowest flow available
- Very fine atomization
- Narrow spray angle (12° - 25°)
- Full cone pattern
- Short to moderate forward spray projection



## Flow Rates and Dimensions

Siphon-fed, External Mix, Round Spray Pattern, 1/8" and 1/4" Pipe Sizes, BSP or NPT

Pipe Size	Spray Set-up Number	ATOMIZING AIR		Liquid Capacity in l/h (Liters Per Hour)								Spray Dimensions at 200 mm. Siphon Height	
				Gravity Head				Siphon Height					
		Air (bar)	Nm <sup>3</sup> /h	450 mm	300 mm	150 mm	100 mm	200 mm	300 mm	600 mm	900 mm	"B" Effective Spray Length (mm)	Max. Spray Length (m)
1/8 or 1/4	DASA 050	0.7	0.66	1.5	1.3	1.1	0.9	0.7	0.5			280	1.8
		1.5	1.02	1.8	1.7	1.5	1.3	1.2	1.1	0.6		280	1.9
		3.0	1.68	2.1	1.9	1.7	1.5	1.4	1.3	1.1	0.8	300	2.3
		4.0	2.16	2.2	2.0	1.8	1.6	1.5	1.4	1.2	0.9	360	2.6
1/8 or 1/4	DASA 150	0.7	0.78	24	2.1	1.7	1.5	1.2	0.8			300	2.1
		1.5	1.20	2.8	2.6	2.4	2.1	1.9	1.6	0.9		330	2.3
		3.0	1.92	3.4	3.1	2.9	2.8	2.6	2.4	1.7	1.1	380	2.6
		4.0	2.46	3.7	3.4	3.3	3.1	2.9	2.7	2.1	1.5	430	3.0
1/8 or 1/4	DASA 200	0.7	1.38	2.5	2.3	2.0	1.6	1.4	1.1			300	2.4
		1.5	2.16	2.9	2.8	2.5	2.2	2.0	1.7	0.9		330	2.7
		3.0	3.48	3.4	3.3	3.2	2.9	2.8	2.5	1.9	1.2	380	3.4
		4.0	4.44	3.7	3.6	3.5	3.4	3.3	3.0	2.5	2.0	430	4.0
1/8 or 1/4	DASA 250	0.7	1.14	4.5	4.0	3.4	2.1	1.8	1.4			380	3.0
		1.5	1.86	5.3	4.9	4.4	3.5	2.9	2.7	1.8		410	3.4
		3.0	3.00	6.0	5.6	5.0	4.4	4.0	3.4	2.4	1.2	460	4.0
		4.0	3.90	5.7	5.4	5.0	4.2	3.9	3.5	2.8	1.9	510	4.6
1/8 or 1/4	DASA 400	1.5	3.48	22	19.9	16.3	12.3	10.5	8.3	2.8		460	3.7
		3.0	5.28	25	23	19.5	16.7	14.2	11.5	6.4	2.8	510	4.3
		4.0	6.66	26	24	21	18.4	15.7	12.9	7.9	4.5	530	4.9
		5.6	8.82	26	24	22	19.7	17	14.6	9.8	6.1	580	5.5
1/8 or 1/4	DASA 450	2.0	8.64				27	22	16.8			510	6.7
		3.0	11.4				30	26	21			530	7.0
		4.0	14.4	44	43	40	31	28	23	11.0		580	7.6
		5.6	18.9	44	42	39	31	28	24	16.7	8.3	630	8.2

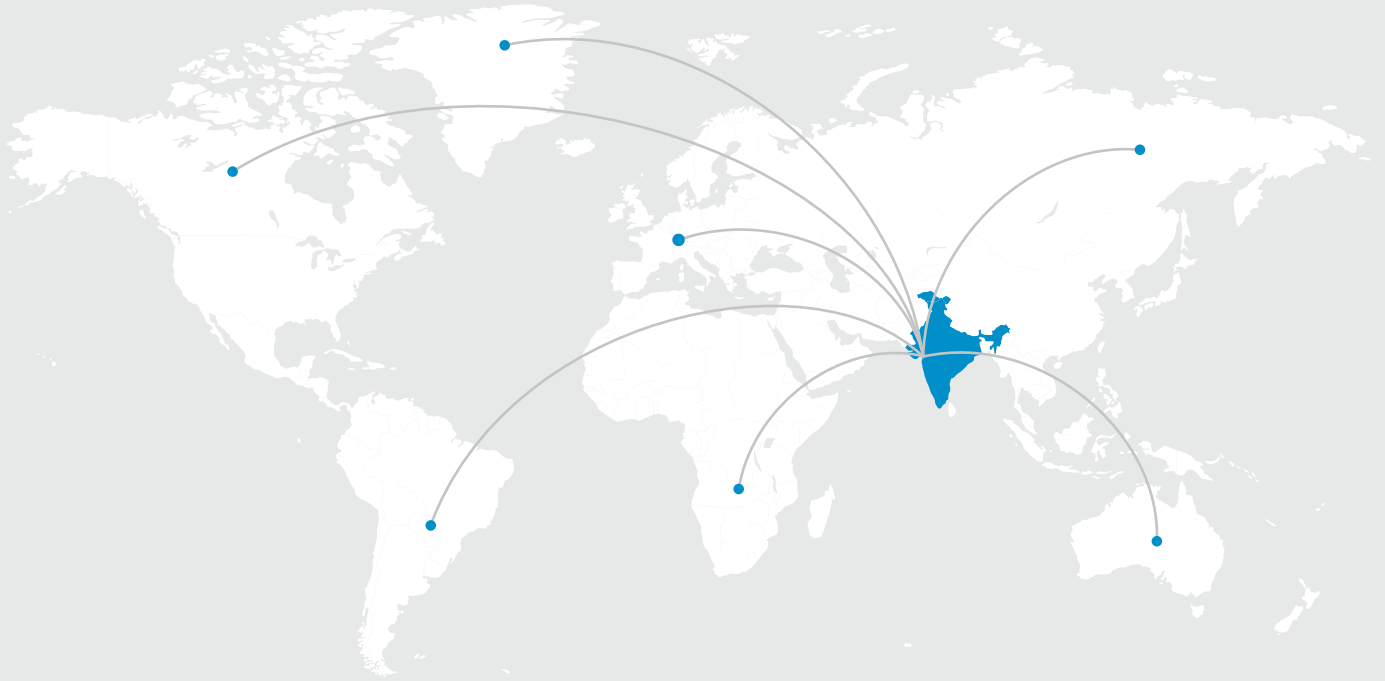
Standard Materials: Nickel-plated Brass, 303 Stainless Steel and 316 Stainless Steel.

# Self-rotating / Stationery Tank Cleaning Nozzles

Nozzle Type	Series	Spray Angle	Flow rate LPM @ 2 bar	End Connection	ATEX Certified	Specification
	<b>EA</b>	180° ↓ 270° ↓ 360°	10-40	1/4" 3/8" 1/2" Tri-Clover End		Features: Compact design suitable for Cleaning small vessel/tanks <b>Cleaning Diameter: Upto 1.5 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316, TEFLON</b>
	<b>EB</b>	180° ↓ 270° ↓	18-38	1/2" Tri-Clover End		Features: Compact design suitable for Cleaning small vessel/tanks <b>Cleaning Diameter: Upto 1.5 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316</b>
	<b>EC</b>	270° ↑↓ 360°	32-250	1/2" 3/4" 1", 1 1/2", 2" Pin connection Tri-Clover End		Features: Jet type spray pattern, Best suitable For Glass lined reactors <b>Cleaning Diameter: Upto 2.5 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316, TEFLON</b>
	<b>ED</b>	270° ↑↓ 360°	32-160	3/4" Pin connection Tri-Clover End		Features: Flat spray tips for high impact cleaning, <b>Cleaning Diameter: Upto 2.5 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316</b>
	<b>EE</b>	180° ↑↓ 270° ↑↓ 360°	140-1100	1" 1 1/2" 2" 3" Tri-Clover End		Features: Best suitable for Large vessels, High impact cleaning with maximum reach <b>Cleaning Diameter: Upto 4 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316</b>
	<b>EF</b>	180° ↑↓ 360°	40-140	3/4" 1" Tri-Clover End		Features: Unique rotating disc design. Best suitable for FBD, FBP, FBC <b>Cleaning Diameter: Upto 2 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316</b>
	<b>EG</b>	270° ↑↓ 360°	15-200	3/8" 1/2" 3/4" 1" 1 1/4" Pin connection Tri-Clover End		Features: Double sided bearing for effortless rotation Best suitable for SS reactors, Pharmaceutical Vessels <b>Cleaning Diameter: Upto 2.5 M</b> <b>Type: Self - rotating.</b> <b>MOC: SS304, SS316</b>
	<b>EH</b>	180° ↓ 270° ↓	18-100	3/8" 1/2" Tri-Clover End Pin connection		Features: Uni body design Multiple orifice for high impact jet spray, <b>Cleaning Diameter: Upto 1.5 M</b> <b>Type: Stationary</b> <b>MOC: SS304, SS316, TEFLON</b>
	<b>EI</b>	180° ↓ 270° ↓ 360°	100-500	3/4" to 2" Pin connection Tri-Clover End		Features: Uni body design, Multiple jet spray with high flow <b>Cleaning Diameter: Upto 2.5 M</b> <b>Type: Stationary</b> <b>MOC: SS304, SS316</b>
	<b>EJ</b>	180° ↑↓ 270° ↑↓ 360°	15-100	3/8" 1/2" Tri-Clover End Pin connection		Features: Uni body compact design, Multiple jet spray for 360° cleaning <b>Cleaning Diameter: Upto 1.5 M</b> <b>Type: Stationary</b> <b>MOC: SS304, SS316, TEFLON</b>
	<b>EK</b>	 270°	20-40	Tri-Clover End		Features: Unique retractable type pop up nozzle Best suitable for isolators <b>Cleaning Diameter: Upto 1 M</b> <b>Type: Self - rotating, Retractable</b> <b>MOC: SS304, SS316</b>

\* Note: All Connections are available in BSP, BSPT, NPT.

\* ↑:Upward Spray ↓:Downward spray.



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