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# AIR-POLLUTION CONTROL

JAPANESE ATOMIZING TECHNOLOGY  
SOLUTIONS:

# IKEUCHI SPRAY NOZZLES FOR AIR POLLUTION CONTROL SYSTEM

**WE OFFER SOLUTIONS FOR AIR QUALITY CONTROL SYSTEMS (AQCS), SUCH AS FGD PROCESS AND SCR/SNCR, BY REDUCING PARTICULATE MATTER IN AN EXHAUST GAS FROM COAL FIRED PLANTS, REFINER-**



## OVERVIEW OF APPLICATIONS OF IKEUCHI SPRAY NOZZLES FOR POLLUTION CONTROL



COOLING



DUST SUPPRESSION



DENITRIFICATION



ODOUR REDUCTION



DESULPHURIZATION



HEAT REDUC-

## BENEFITS

- 1** Lower running costs
- 2** Minimal maintenance downtime with clog-resistant nozzles
- 3** Maximum cooling effect



## INNOVATIVE GAS COOLING NOZZLES

GSIMII SERIES - FINE FOG PNEUMATIC SPRAY NOZZLES FOR GAS COOLING

### DOWNSIZE GAS COOLING TOWER

■ The number of required nozzles can be minimized with GSIMII, which combine large spray capacity and fine fog of 50  $\mu\text{m}^*$ .

### LARGE SPRAY CAPACITY WITH EXCELLENT ATOMIZATION

■ GSIMII's average droplet size is 50  $\mu\text{m}$  (largest droplet size is 150  $\mu\text{m}$ ) with a spray capacity of 500  $\ell/\text{hr}$  at an air-water ratio of 130.



### NOZZLE TIP AVAILABLE IN OPTIONAL MATERIALS

The nozzle tip is also available in corrosion resistant material such as Hastelloy®





## SPB - SERIES - SPILLBACK NOZZLES FOR GAS COOLING



### MINIMAL VARIATION IN DROP-LET SIZES

- Spray capacity can be controlled by adjusting the return pressure while keeping the supply pressure constant. Turn-down ratio of spray capacity is 1: 10. The variation in sprayed droplet size is minimal despite the

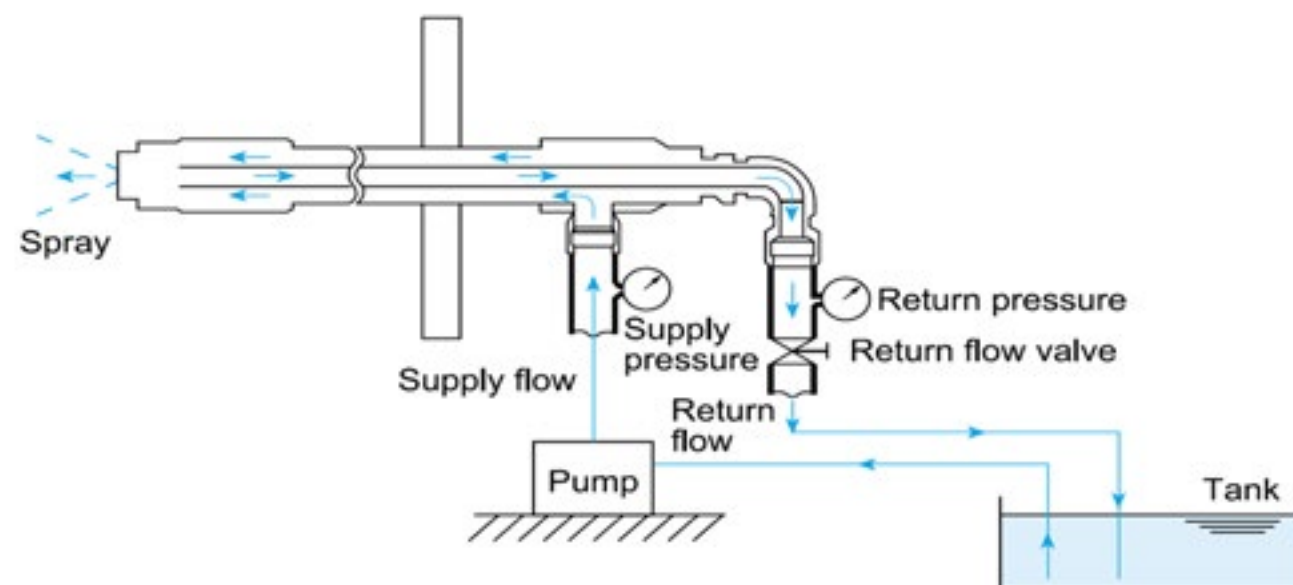
### WIDE RANGE OF SPRAY CAPACITIES

- SBS series is available as a single-head or multiple-head nozzle. The single-head SPB nozzle is available in 60 ° and 85 ° spray angles, and with 15 different spray capacities according to nozzle arrangement and gas

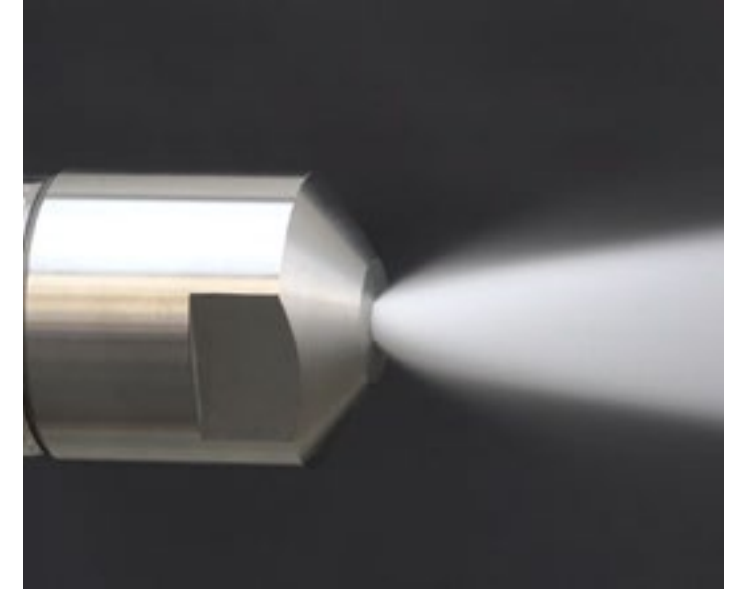
### MULTIPLE-HEAD NOZZLES

Multiple-head SPB nozzles are suitable when a larger spray capacity is required, with a spray angle up to

#### System Diagram (Example)



## ASPB SERIES - AIR-ASSISTED SPILLBACK NOZZLES



### PNEUMATIC TYPE OF SPILLBACK NOZZLES:

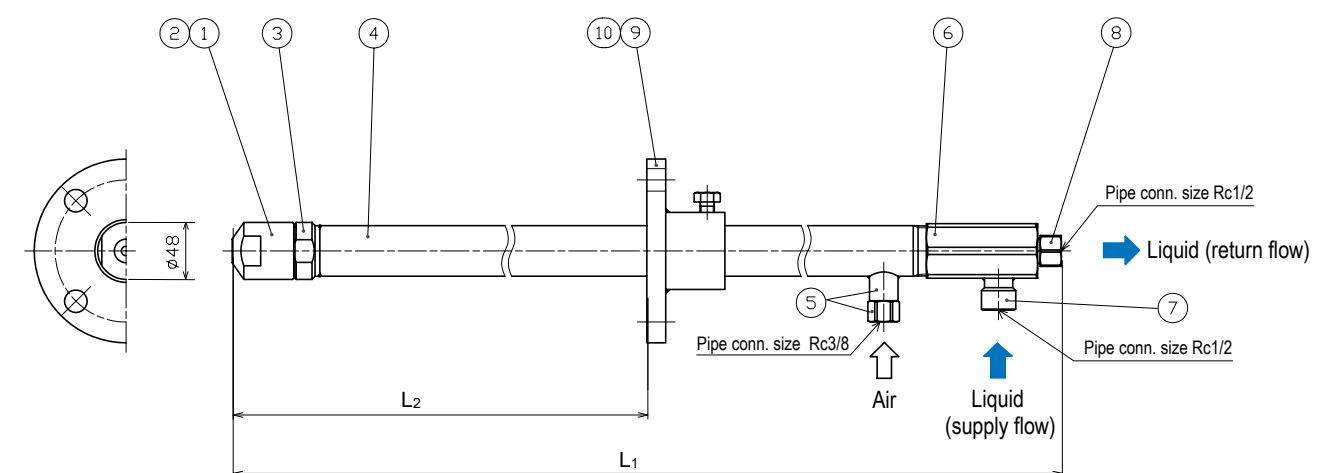
- Adding compressed air supply line to the existing facility can solve various problems
- High-velocity fog is not disturbed by flow of exhaust gas and reaches

### ENERGY-SAVING DESIGN FOR LESS AIR CONSUMPTION

- Higher cooling capacity than conventional spillback nozzle
- Reduced air consumption

### PROBLEM SOLVER

Reduces unvaporized-water drainage and problems caused by dust adhesion to interior walls or around outlet of gas cooling tower



## JOKIJET® SERIES



## STEAM NOZZLE

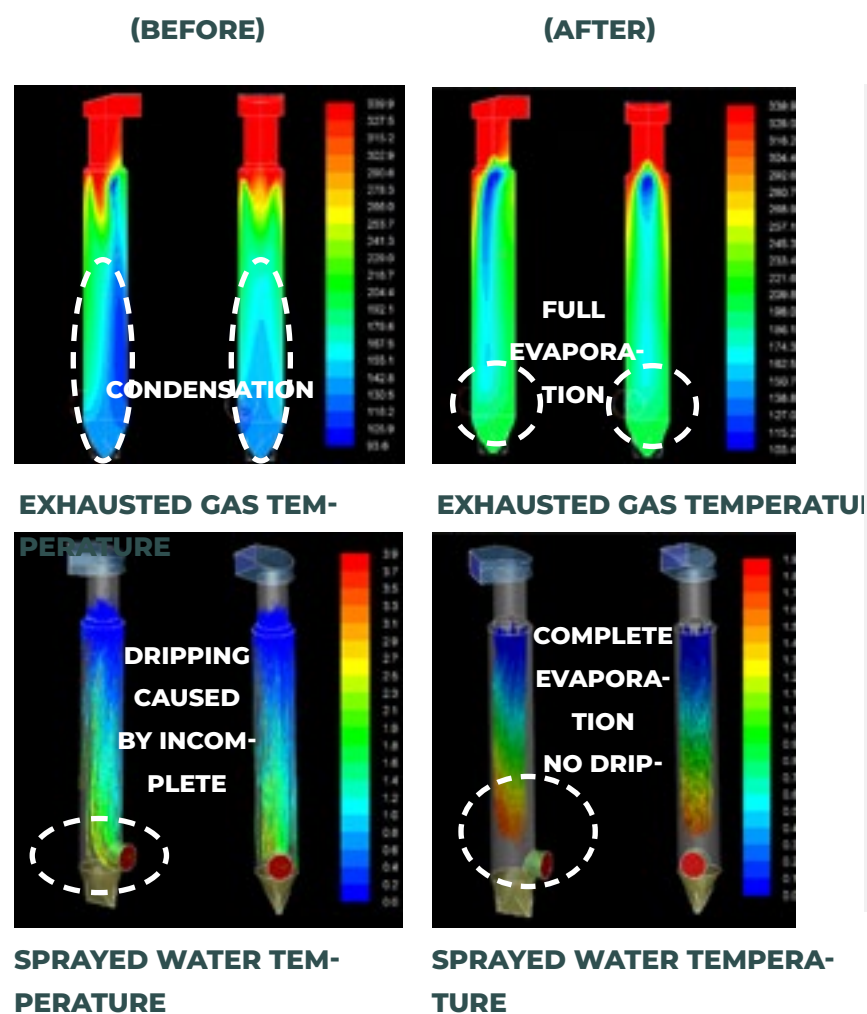
Innovative pneumatic spray nozzle using steam instead of compressed air to produce fine (semi-fine) atomization.



## COST EFFICIENT

Great savings on running costs realized by utilizing steam from an existing boiler facility

## TECHNICAL SUPPORT FOR GAS COOLING NOZZLES

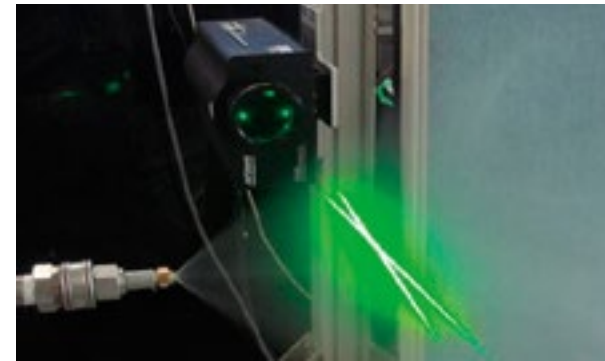


## TEST REPORT

In order to support spray conditions, we can provide testing reports of actual measurement of the various parameters such as:

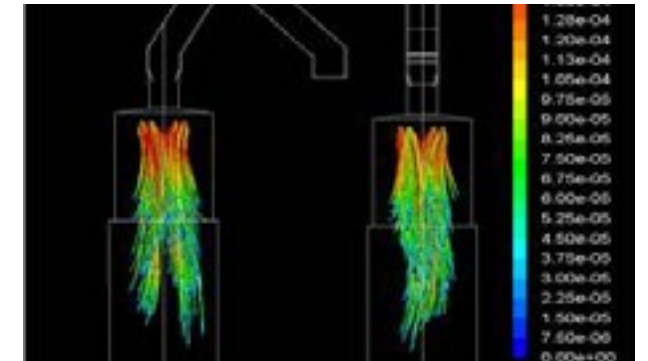
- Droplet size and distribution by laser Doppler particle analyzer
- Spray dimension and coverage

## TECHNICAL SUPPORT FOR GAS COOLING NOZZLES



## DROPLET SIZE MEASUREMENT

We provide droplet size measurement by the means of a laser Doppler particle analyzer



## CFD ANALYSIS

We provide a thorough CFD analysis of the spray conditions. This is a more cost efficient and fast way to test spray nozzles on several

## SELECTING THE CORRECT SPRAY NOZZLE

## PROVIDING NOZZLE SELECTION AND SPRAY CONDITIONS

Based on the "specifications Check Sheet" you complete, we select suitable nozzles and send our suggestions report, in which we include suitable spray conditions and spray droplet sizes required for full evaporation confirmed by our original program. Nozzle lances, flanged connections and other optional mounting

Suggestion on Gas cooling Nozzle (For Pneumatic Nozzle)

Customer:			
Person in charge:			
End User:			
Application:	Gas cooling	Date:	18 April 2018
Type of Furnace:			

<INPUT>		<OUTPUT>	
Gas Volume	10000 Nm <sup>3</sup> /hr	Required spray volume	1133 L/hr
Temp. of Inlet Gas	300 °C		18.9 L/min
Temp. of Outlet Gas	80 °C	Cooling time	9.6 sec
Temp. of spray water	20 °C	Required droplet size (Immersion sampling method)	
Specific gravity of Air	1.29 kg/Nm <sup>3</sup>	Max dia. (d max)	231 µm
Pressure inside of tower	-4 kPaG	Summised average dia.(SME)	61 µm
Inner Dia. of cooling tower	3 m	Required droplet size (Laser doppler method)	
Height of cooling tower	7 m	Max dia. (d max)	184 µm
(Distance for evaporation)		Summised average dia.(SME)	56 µm
		Average gas velocity	0.7 m/sec

Nozzle series	GSIM	Summised spray conditions		Summised droplet size	
Nozzle name	GSIM20110II	Supplied air pre.	0.35 MPa	Immersion sampling method(dm <sub>0.5</sub> )	µm
		Air consumption	1000 NL/ min	Immersion sampling method(SME)	µm
Number of Nozzle	4 pc(s)	Supplied water pres	0.3 MPa	Laser Doppler method (X99)	µm
Capacity of each nozzle	283.1 L/ hr	Spray capacity	283 L/hr	Laser Doppler method (SMD)	µm
		Air-water ratio	212 -		

## FINE ATOMIZATION SCR NOZZLES

### SETOJET SERIES - CLOG-RESISTANT FINE FOG NOZZLES FOR SCR

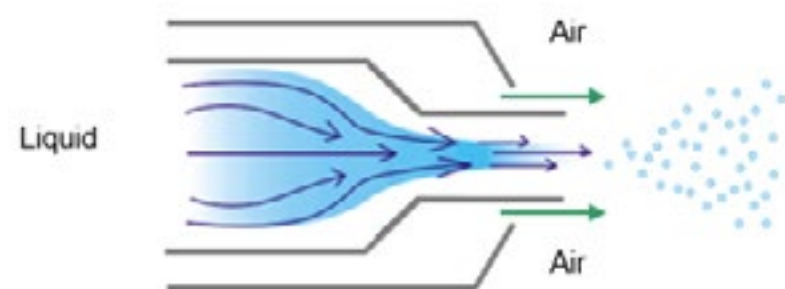


#### DESIGNED FOR THE APPLICATION ENVIRONMENT

- Liquid pipe is set inside the air pipe so that liquid is not affected by heat.
- Designed to mix air and liquid outside the nozzle. Clogging due to precipitated air is minimized.
- Protector has an air purging hole to protect the nozzle and liquid from heat.
- Odor tight structure

#### OPTIMAL SPRAY LANCE FOR YOUR EQUIPMENT OR THE ENVIRONMENT

- Integrated spray lance requires no troublesome piping around the nozzle.
- Easy to remove the spray lance from the equipment at site
- Spray direction can be chosen as desired, straight type or angled type, depending on the equipment and the installation position



### EXTERNAL MIXING SPRAY NOZZLES

## CLOG-RESISTANT SNCR NOZZLES

### DOVVA-G SERIES - FLAT SPRAY PNEUMATIC SPRAY NOZZLES FOR



#### CLOG-RESISTANT DESIGN

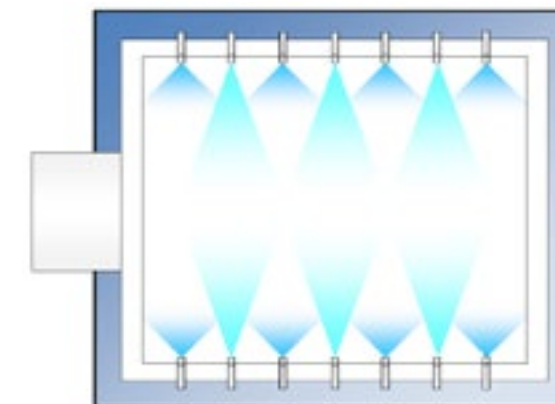
- Pneumatic spray nozzle suitable for spraying aqueous ammonia and urea. Due to its large passage diameter, it also minimizes clogging.
- Weighs less than half the weight of stainless steel.

#### SEMI-FINE ATOMIZATION

- Produces semi-fine atomization with a mean droplet diameter of 80μ or more.

#### HEAT RESISTANT MATERIALS (OPTION)

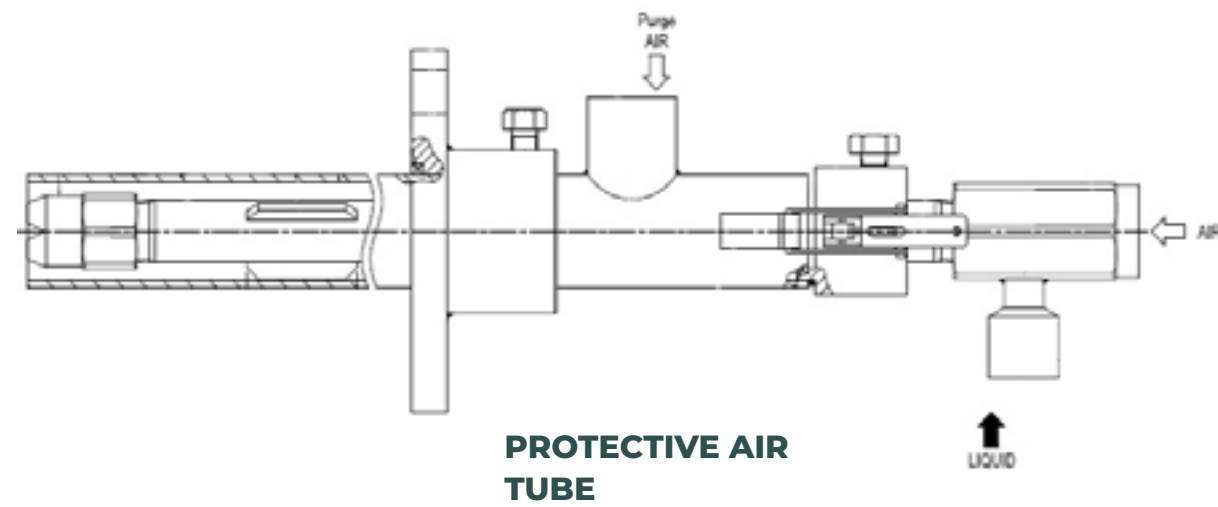
- In addition to the standard material, Stainless Steel 316L, the nozzle tip is also available in heat-resistant steel such as Stainless Steel 310S



Example of an installation: To cover a wide area with an even distribution, alternate a wide angle spray nozzle with a narrow angle spray nozzle

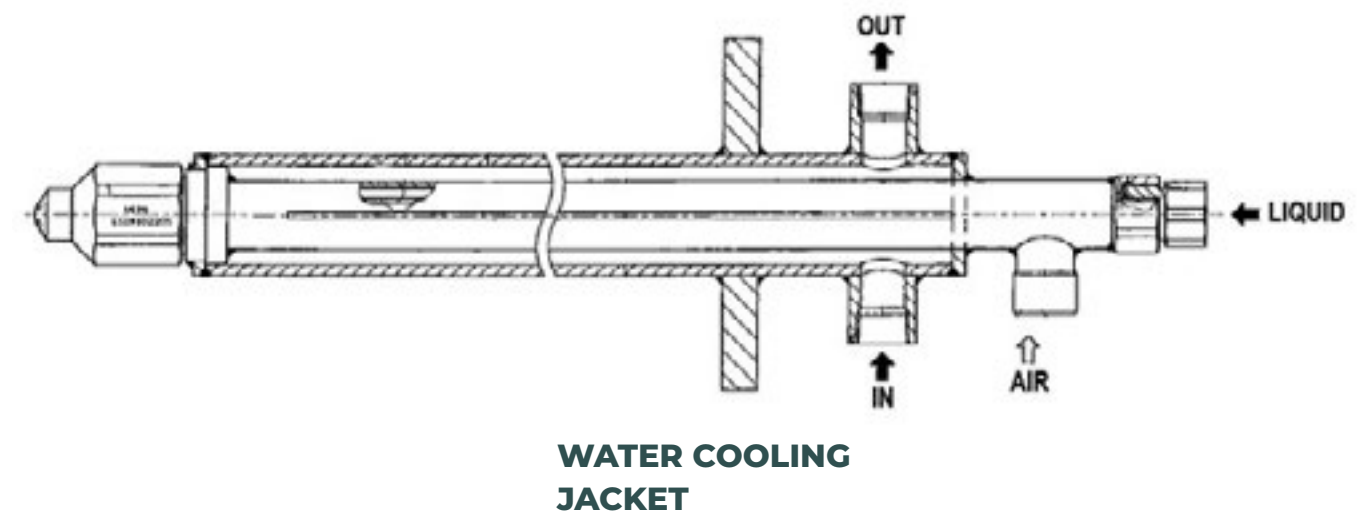


**WE ENSURE A LIFE-LONG APPLICATION FOR YOUR PRODUCT. WE OFFER OPTIONAL EQUIPMENT TO PROTECT AGAINST: HEAT DAMAGES, CLOGGING**

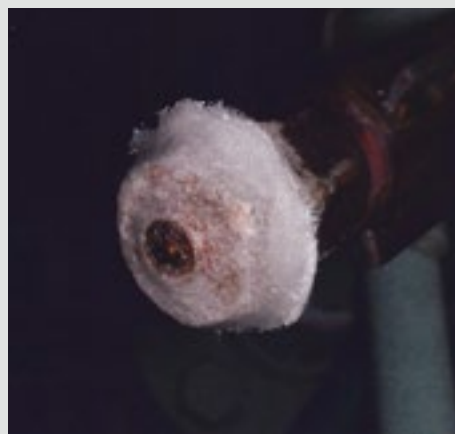


## TECHNICAL SUPPORT FOR GAS COOLING NOZZLES

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**HEAT DAMAGES**



**CLOGGING ISSUES**



**EXTERIOR**



## SIC, SISIC NOZZLES FOR FGD

### TAA SERIES LARGE CAPACITY, HOLLOW CONE SPRAY NOZZLES FOR FGD



#### HIGH WEAR AND ACID RESISTANCE

- Made of wear-/acid- resistant clog-resistant SIC (silicone carbide). Also available in SiSiC (siliconized silicon carbide)

#### DESIGNED FOR LOW-PRESSURE OPERATION

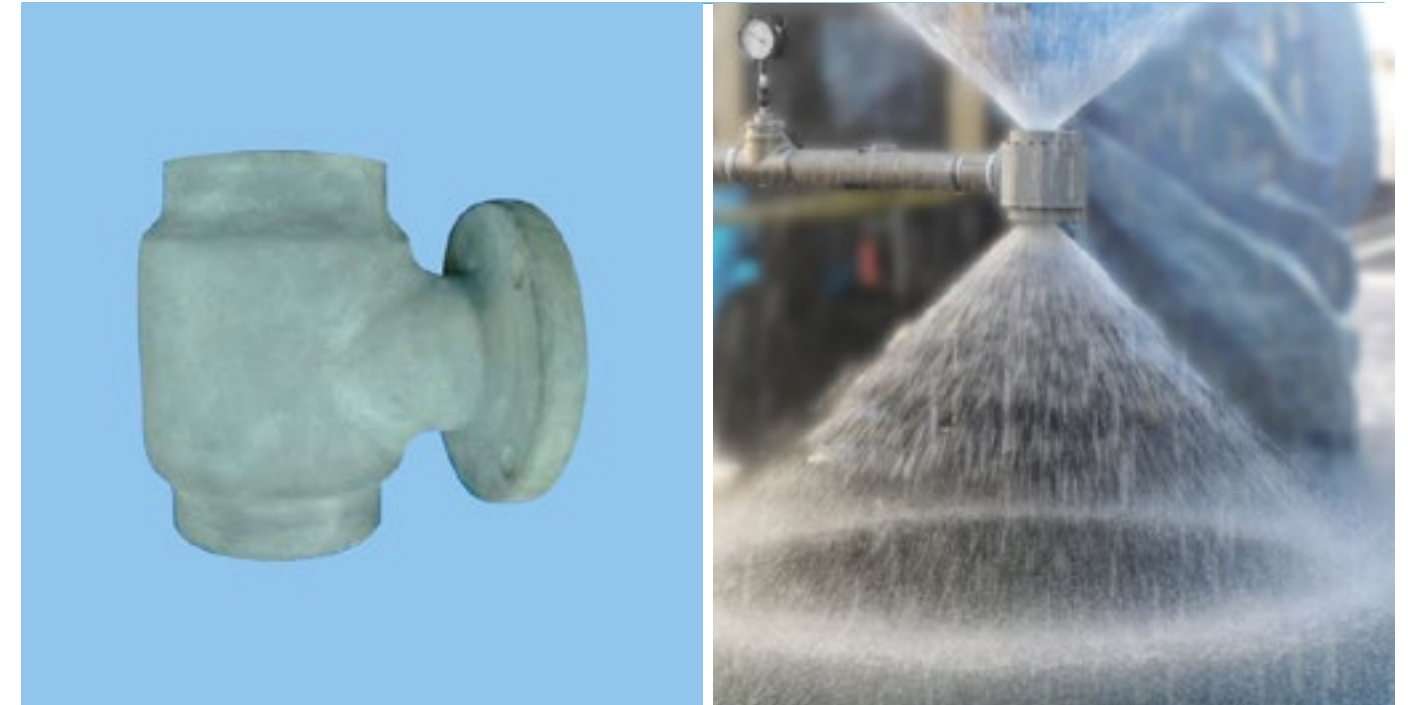
- Due to its unique internal design, the spray angle and spray distribution are stable even at 0.03MPa (ca. 0.3 bar).

#### LARGE FREE PASSAGE DIAMETER

- No internal parts to minimize clogging issues



## BI-DIRECTIONAL SLURRY SPRAY NOZZLE FOR FGD



#### WEAR-RESISTANT, LIGHTWEIGHT

- Made of SiC / SiSiC (silicon carbide / silicon infiltrated silicon carbide) with excellent wear-resistance and chemical durability.
- Weighs less than half the weight of stainless steel.

#### BI-DIRECTIONAL SPRAY

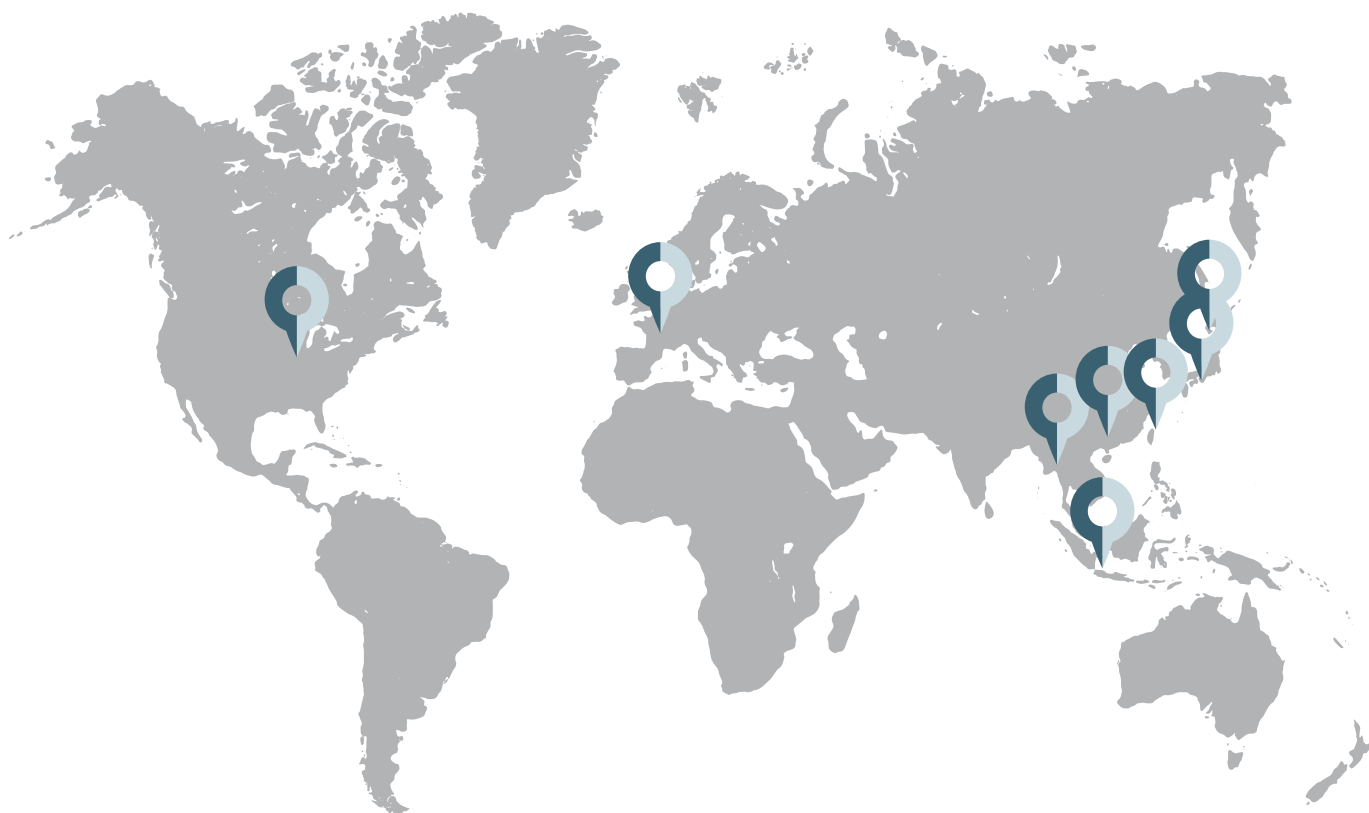
- The TWAA series is bi-directional, so one nozzle unit can take the place of two.
- The result: Simpler equipment layout, less maintenance and reduced costs.

#### SMALLER DROPLETS

- With 2 orifices, the flow normally sent through 1 orifice is halved, yielding smaller droplets.
- Best for applications with contact / reactions







Ikeuchi is a Japanese company with branches all over the world. It was founded in 1954 in Osaka and has since then expanded across Asia, North America and Europe.

For inquiries / information requests / quotations related this product, please contact us



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**Ikeuchi Europe**

The fog engineers

"Taking the path less traveled"

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