



AIR-POLLUTION CONTROL

JAPANESE ATOMIZING TECHNOLOGY SOLUTIONS:
FLUE-GAS DESULPHURIZATION AND DENITRATION

IKEUCHI SPRAY NOZZLE SOLUTIONS FOR AIR POLLUTION CONTROL SYSTEMS

Since its founding in 1954, Ikeuchi has been a pioneer in the development and manufacturing of advanced spray nozzle technology. Building on decades of engineering excellence, the company introduced its first gas cooling nozzle in 1998. Today, Ikeuchi continues to lead the industry with a comprehensive portfolio of air quality control solutions, continuously evolving to meet the changing needs of customers worldwide with precision, reliability, and cutting-edge technology.



OVERVIEW OF APPLICATIONS OF IKEUCHI SPRAY NOZZLES FOR POLLUTION CONTROL

- GAS COOLING
- DUST SUPPRESSION
- DeSOx (FGD)
- SINTER MIXER STEAM
- DeNOx (SNCR)
- DeNOx (SCR)

CONTENT

- 1** GAS COOLING.....3-7
- 2** DENOX.....8-9
- 3** DESOX.....10-11
- 4** CASE STUDIES.....12-13
- 5** CONTACT.....14

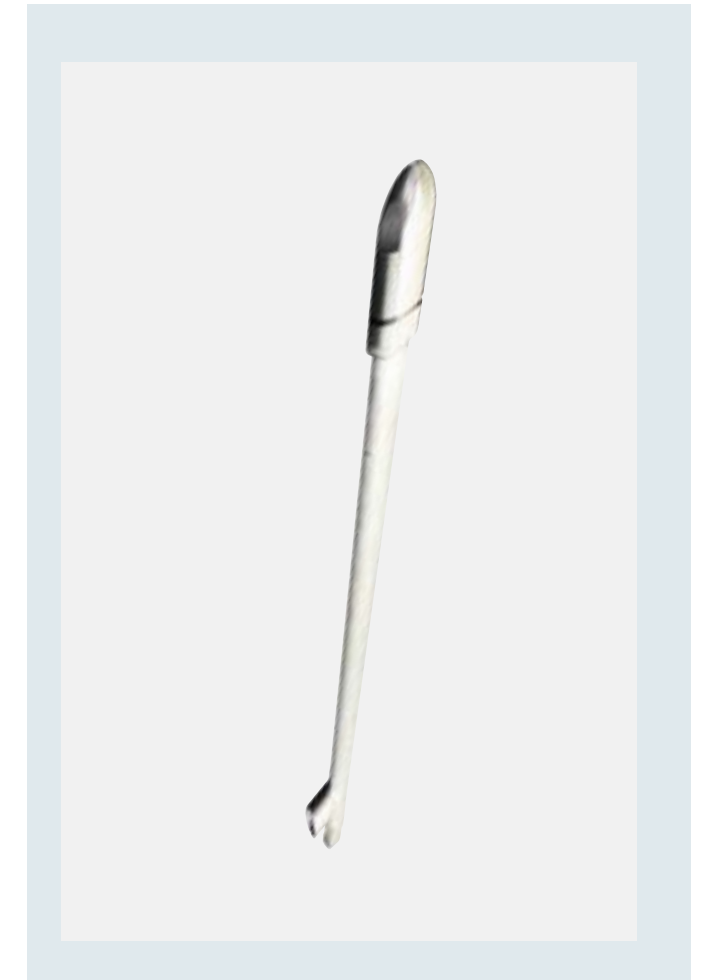


INNOVATIVE GAS COOLING NOZZLES

GSIM II SERIES - FINE FOG PNEUMATIC SPRAY NOZZLES FOR GAS COOLING

Large spray capacity with excellent atomization

GSIM II's average droplet size is 50µm (largest droplet size 150µm) with a spray capacity of 500L/hr at an air-water ratio of 130. GSIM II provides a 30% finer atomization than conventional nozzles.



DOWNSIZE GAS COOLING TOWER

The number of required nozzles can be minimized with GSIM II, which combines large spray capacity with ultra-fine fog. This allows for a smaller gas cooling tower design than normal, reducing construction and maintenance costs. The standard material is stainless steel but the optional, high-alumina ceramic tip with high wear-resistance is available for drying reacted limestone slurry. Anti-corrosion alloy such as Titanium and Hastelloy® is also available.

SPB - SERIES - SPILLBACK NOZZLES FOR GAS COOLING



MINIMAL VARIATION IN DROPLET SIZES

SPB is ideal for gas cooling applications where the temperature and volume of the inlet gas varies as the spray capacity can easily be controlled. With the liquid/water supplied at constant pressure, the spray capacity can be controlled by opening or closing the return flow valve. The turn-down ratio of spray capacity is 1: 10. The variation in sprayed droplet size is minimal despite the modulation of spray flow.

WIDE RANGE OF SPRAY CAPACITIES

SPB is available as single-head or multi-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 conditions in the cooling tower. Multi-head SPB nozzles are suitable when a larger spray capacity is required, with a spray angle up to 140° or even wider, but with minimal increase in spray droplet size.



ASPB SERIES - AIR-ASSISTED SPILLBACK NOZZLES



PNEUMATIC TYPE OF SPILL-BACK NOZZLE

ASPB is an air-assisted spillback nozzle with a higher cooling capacity and lower air consumption than conventional spill-back nozzles. Since the high-velocity fog is not disturbed by the flow of exhaust gas, it is able to reach the center of the gas cooling tower and cool efficiently.

ENERGY-SAVING DESIGN FOR LESS AIR CONSUMPTION

- Reduced air consumption
- Higher cooling capacity than conventional spillback nozzles
- Reduced unvaporized-water drainage and problems caused by dust adhesion to interior walls or around outlet of gas cooling tower



JOKIJET® SERIES



JOKIJET® STEAM NOZZLES IN SINTER MIXER APPLICATION

STEAM NOZZLE

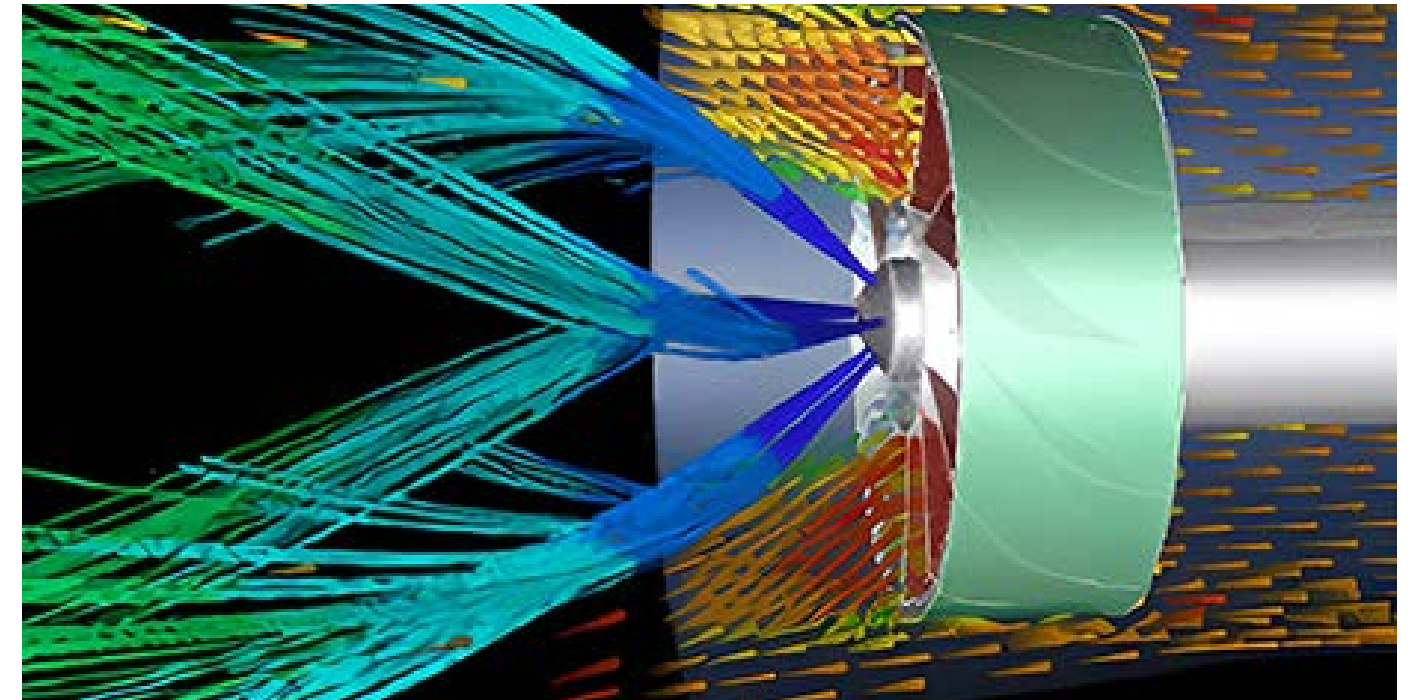
Innovative pneumatic spray nozzle using steam instead of compressed air to produce fine atomization for gas cooling or moisturizing applications such as in a sinter mixer.

SINTER MIXER STEAM MOISTURIZATION

Adding steam spray to a sinter mixer is a proven way to improve both process efficiency and final sinter quality. Steam provides fine, evenly distributed moisture that helps bind fine particles into stable granules. Compared to water alone, steam penetrates more uniformly, leading to stronger and more consistent granule formation while lowering water consumption and suppressing dust. In addition, steam can prevent the drum's inside temperature from decreasing too much compared to when spraying with water.



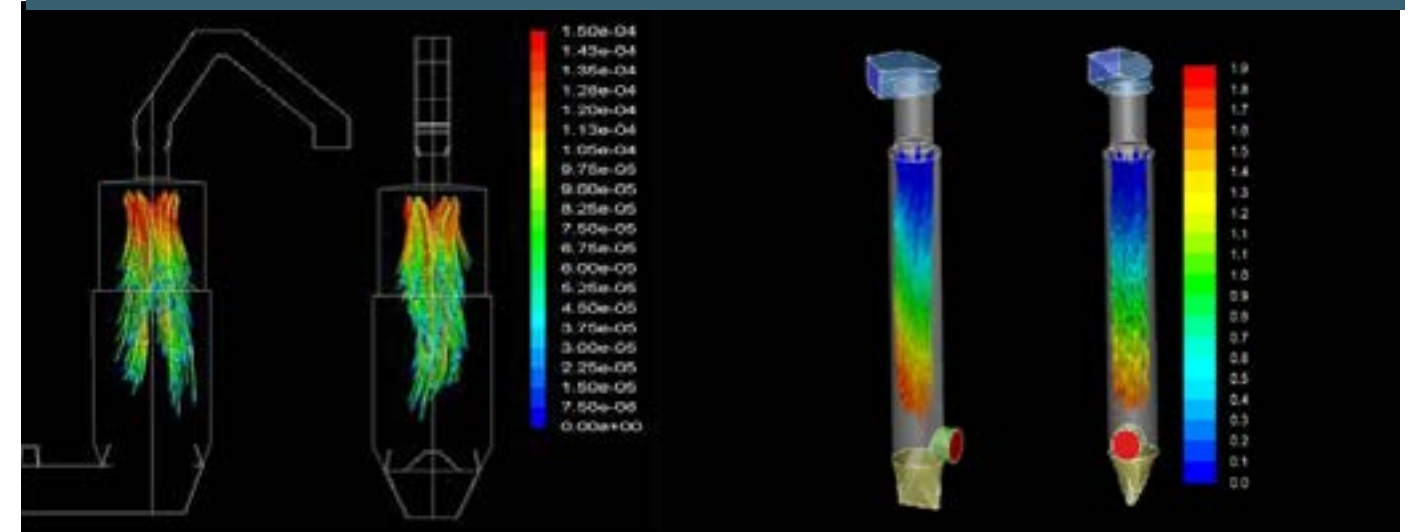
TECHNICAL SUPPORT FOR GAS COOLING NOZZLES

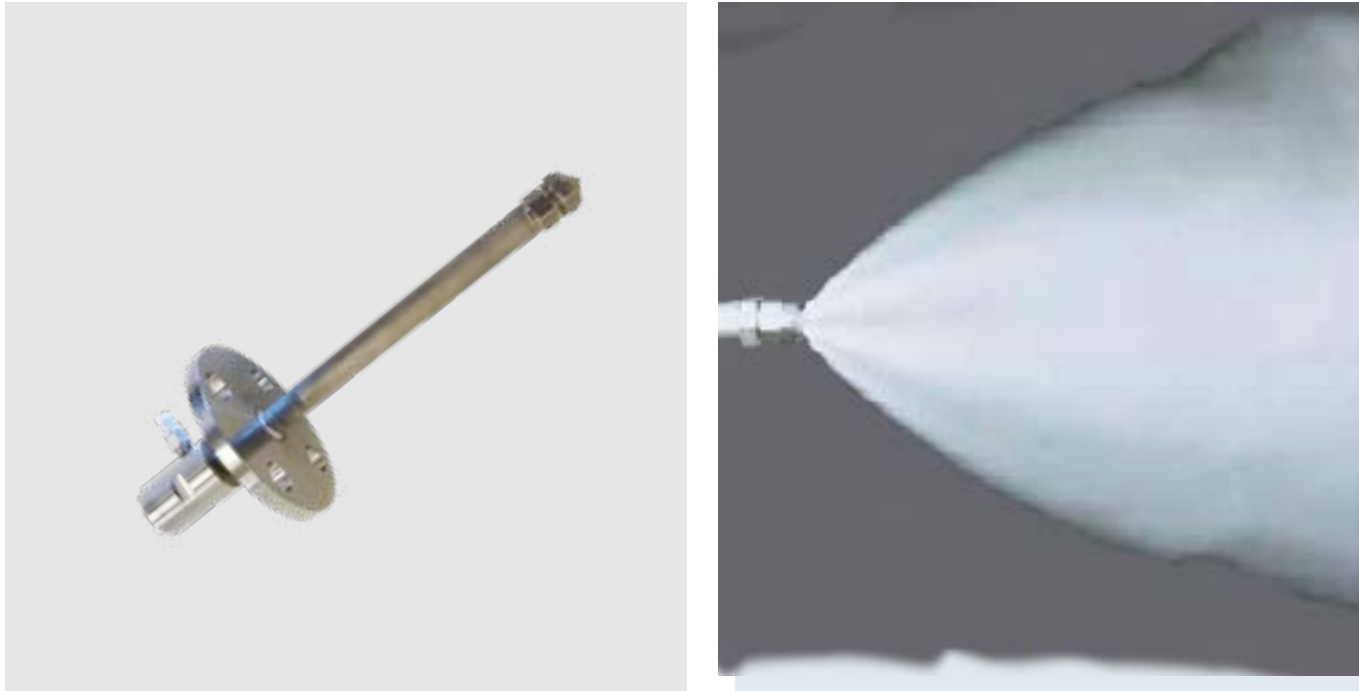


CFD ANALYSIS

In order to optimize the gas cooling process to its fullest, we can provide a thorough CFD analysis of the spray conditions. This is a more efficient way to test gas cooling spray nozzles on several parameters. In order to support spray conditions, we can provide testing reports of actual measurement of various parameters such as:

- Optimizing droplet size and distribution
- Predicting Spray dimension and coverage
- Predicting real cooling performance
- Avoiding wall wetting and corrosion
- Reducing energy and water consumption



DENOX - FINE ATOMIZATION SCR NOZZLES**SETOJET SERIES - CLOG-RESISTANT FINE FOG NOZZLES FOR SCR****CLOG-RESISTANT DESIGN**

The SETOJet-series has a clog-resistant design thanks to its external mixing type, which mixes air and liquid outside the nozzle. SETOJet produces a fine atomization with a mean droplet diameter of 20-60 μm . This ensures the prevention of coarse, unevaporated particles which can cause corrosion of the refractory bricks and mortar.

DESIGNED FOR THE APPLICATION ENVIRONMENT

SETOJet has been designed for intense heat environments. The liquid pipe is set inside the air pipe so that the liquid is not affected by heat. In addition, the integrated spray lance requires no troublesome piping around the nozzle and the spray nozzle lance is easy to remove from the equipment at site.

**DENOX - CLOG-RESISTANT SNCR NOZZLES****DOVVA-G SERIES - FLAT SPRAY PNEUMATIC SPRAY NOZZLES FOR SNCR****DESIGNED FOR THE APPLICATION ENVIRONMENT**

The DOVVA-G-series is a pneumatic spray nozzle suitable for spraying aqueous ammonia and urea. Due to its large passage diameter, it is also clogging resistant. DOVVA-G produces a semi-fine atomization with a mean droplet diameter of 80 μm . This ensures the prevention of coarse, unevaporated particles which can cause corrosion of the refractory bricks and mortar.

HEAT RESISTANT MATERIALS

In addition to the standard material, Stainless Steel 316L, the nozzle tip is also available in heat-resistant steel such as Stainless Steel 310S. For more hazardous environments, we offer additional optional protection equipment for protection against heat damages such as protective air tubes and water cooling jackets.



DESOX - SIC, SISIC NOZZLES FOR FGD

TAA SERIES LARGE CAPACITY, HOLLOW CONE SPRAY NOZZLES FOR FGD



HIGH WEAR AND ACID RESISTANCE

The TAA-series is a hydraulic hollow cone spray nozzle which is ideal for flue gas desulphurization applications due to its highly durable material. TAA is made of SiC (silicon carbide) which is known for its high wear resistance and resistance to chemicals. It is also available in SiSiC (siliconized silicon carbide).

DESIGNED FOR LOW-PRESSURE OPERATION

Due to its unique internal design of the involute vortex chamber, the spray angle and spray distribution are stable even at 0.03MPa (ca. 0.3 bar). TAA features a tangential design with the spraying axis at a 90° angle from the nozzle inlet. It also has a large passage diameter which prevents clogging.



DESOX - BI-DIRECTIONAL SLURRY SPRAY NOZZLE FOR FGD

TWAA SERIES - BI-DIRECTIONAL HOLLOW CONE SPRAY NOZZLES FOR FGD



WEAR-RESISTANT AND LIGHTWEIGHT DESIGN

Our TWAA-series is a hydraulic bi-directional slurry spray nozzle which is suitable for flue gas desulphurization. It is made of SiC / SiSiC (silicon carbide / silicon infiltrated silicon carbide) with excellent wear-resistance and chemical durability. This material also 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.
- With 2 orifices, the flow normally sent through 1 orifice is halved, yielding smaller droplets



CASE STUDIES



SNCR process improvement

“ A carbon materials manufacturing plant experienced issues with their SNCR process. The spray nozzles used at the time produced inconsistent spray particle sizes. Coarse, unevaporated particles adhered to the incinerator's inner walls, causing corrosion of the refractory bricks and mortar. Furthermore, urea precipitation led to nozzle clogging. Ikeuchi solved this by implementing a pneumatic spray nozzle with a very fine atomization. This resulted in an elimination of coarse particles and corrosion as well as a 40% reduction in urea solution consumption leading to an annual cost saving of around €5.000.



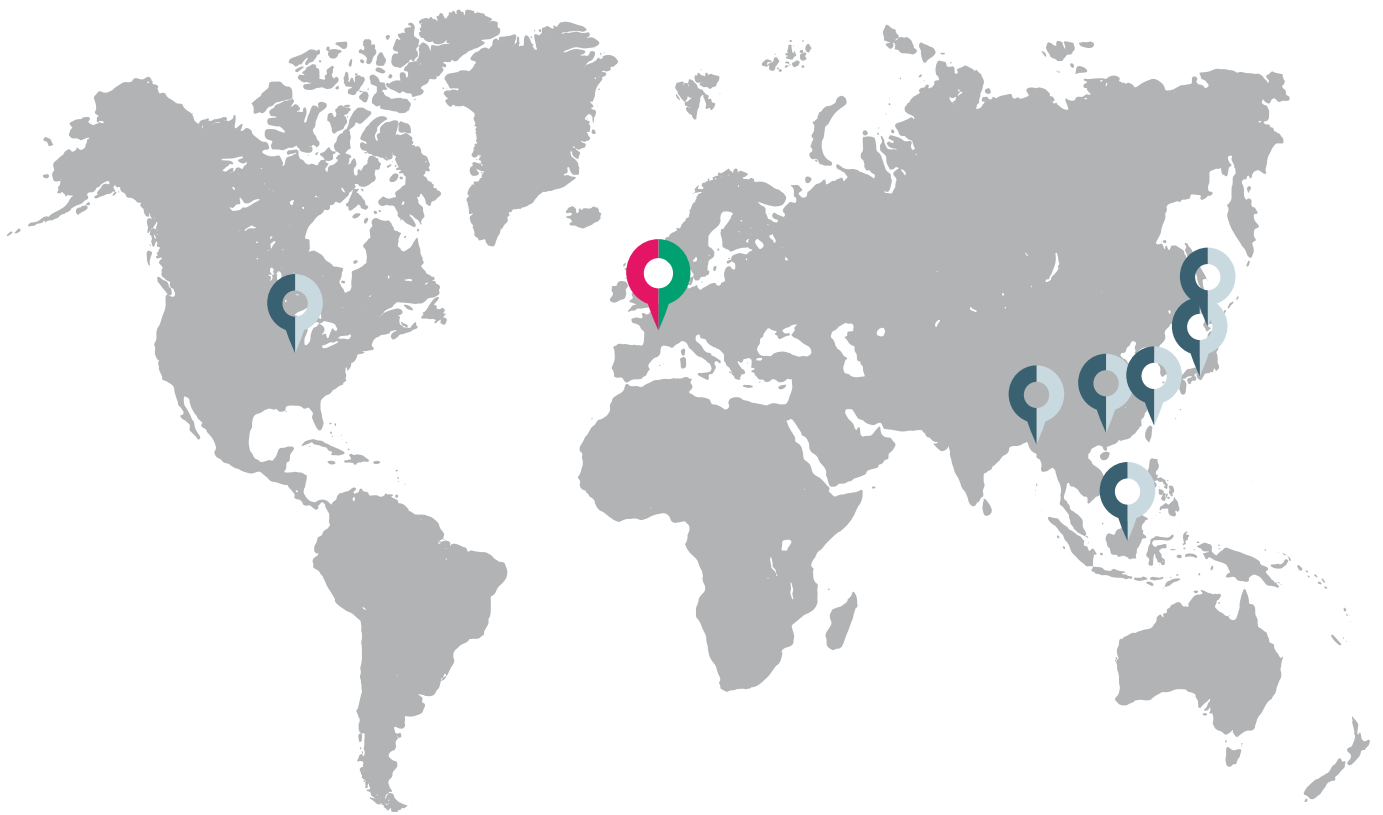
Gas cooling in waste incineration plant

“ A Waste Incineration Plant had to replace their spillback nozzles for gas cooling very frequently due to the increased temperature of the exhaust gases. Ikeuchi solved this issue by designing an integrated spill-back nozzle and sleeve. The nozzle and sleeve are welded together as a single unit, allowing both to be replaced simultaneously. This structure eliminates the gap between the nozzle and sleeve, further enhancing the protective performance of the nozzle piping. As the nozzle sections now require much less frequent replacement, great cost benefits were achieved.



Dust control in coal storage facility

“ A coal storage facility at a chemical plant faced the challenge of airborne dust escaping outdoors and dispersing with the wind, adversely affecting the living environment of nearby residents. Ikeuchi solved this problem by installing a fog-based dust control system. It suppresses dispersion by spraying fine mist from nozzles to settle airborne dust. As a result, the amount of dust escaping the worksite has been significantly reduced, eliminating complaints from neighbouring residents. At the same time, improving the working environment has also dispelled concerns regarding potential health hazards for workers.



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 to these products, please contact us



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The fog engineers

“Taking the path less traveled”

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