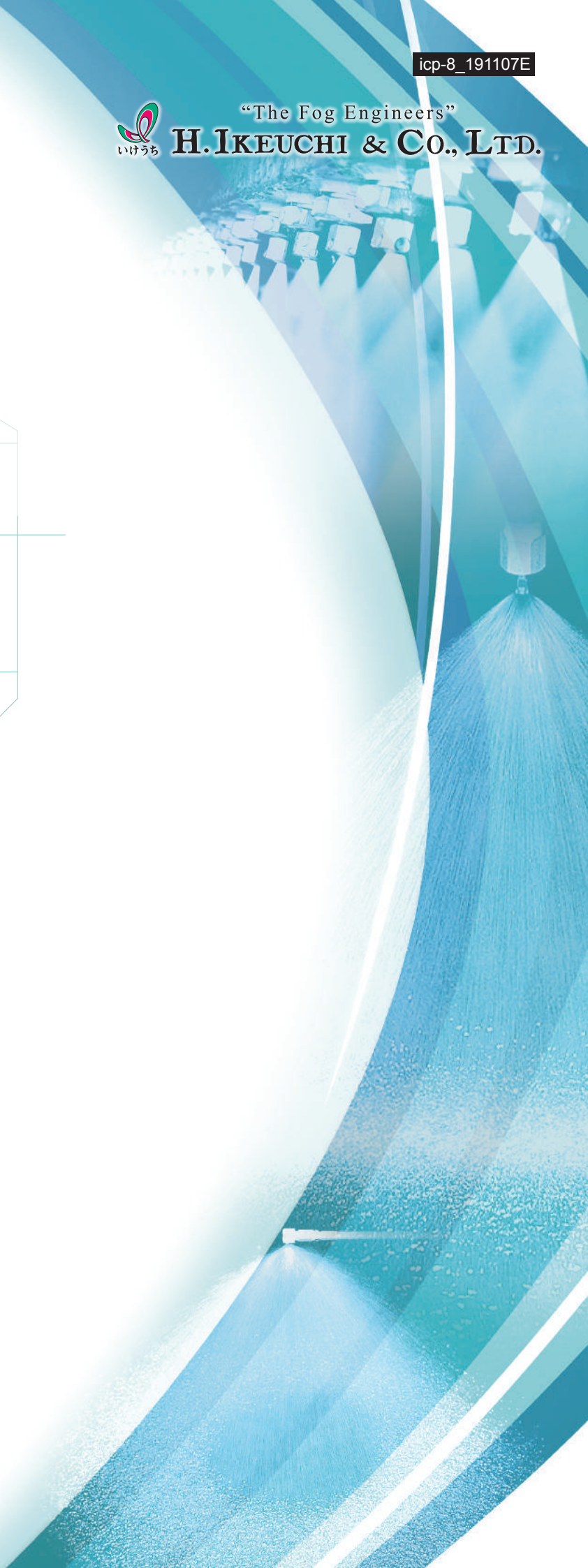
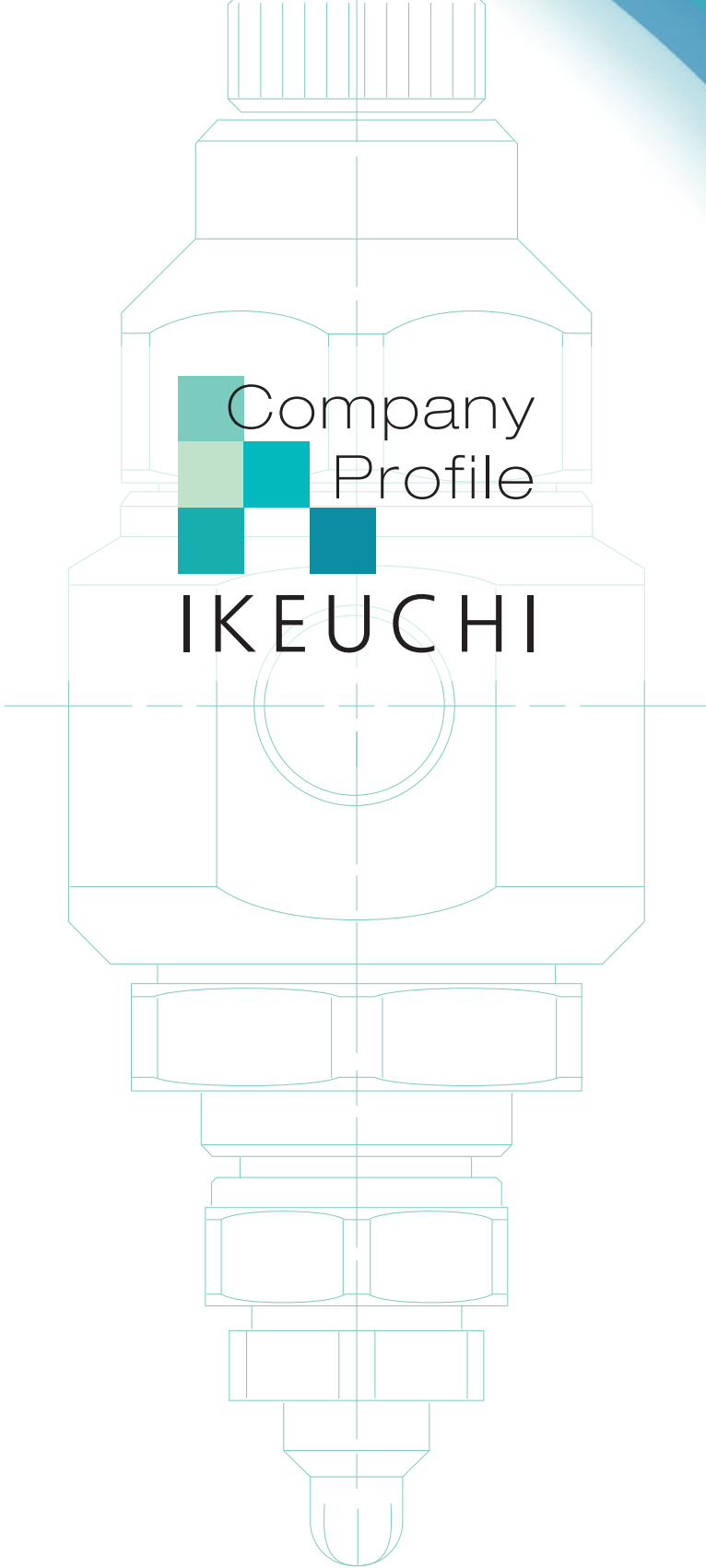




“The Fog Engineers”  
**H. IKEUCHI & CO., LTD.**

Company  
Profile

**IKEUCHI**



# From the Fog Engineers who support Japan's manufacturing industry

As one of Japan's top manufacturers of industrial spray nozzles, IKEUCHI, "The Fog Engineers," has supplied innovative, high-precision products to the world for over 60 years.

The fog produced by our spray nozzles is widely used in many industries for a broad range of manufacturing processes.

We believe that true social contribution entails bringing new products and services into the world, and this belief has been widely accepted by people everywhere. Thanks to support from a wide range of people, our company has seen success in a diverse array of industries.

We are grateful for this, and as highly specialized Fog Engineers we will continue with efforts focused firmly on fog while creating unique products no other company can provide, thus facilitating greater prosperity throughout society.



Our Management Philosophy:

Contribute to  
Society  
through **Fog**

## Paper and Pulp, Printing



Our spray nozzles are used for canvas cleaning, edge-trimming, controlling moisture content in paper and cardboard, and providing air for sheet separation and transport. They are also used to remove particles from post-cleaning wastewater and provide support for environmental protection.

Humidification	Moisture control
Trimming	Cleaning

## Electronics



Our products play an important role in semiconductor wafer cleaning, PCB precision cleaning, and humidity control in clean rooms as an electrostatic discharge countermeasure.

Cleaning	Developing
Etching	Stripping
Humidification	

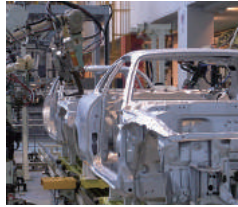
## Pollution Control



Our spray nozzles are used for flue gas cooling as a dioxin countermeasure, and also in desulfurization and denitrification systems to reduce NOx and SOx in flue gases.

Gas cooling	Cooling
Dust suppression	Heat reduction
Odor reduction	

## Automotive Manufacturing



Our spray nozzles are used in a wide variety of manufacturing processes relating to engine powertrains, car bodies, painting, bumpers, outfitting, and automotive electronics, among others.

Cooling	Humidification
Cleaning	Drying

## Steelmaking



We first developed pneumatic spray nozzles for steelmaking applications in 1983 and began supplying them for cooling in continuous casting operations. Our spray nozzles are also used in processes including descaling, cleaning, surface treatments and dust suppression.

Cooling	Descaling
Cleaning	Surface treatment
Dust suppression	Gas cooling

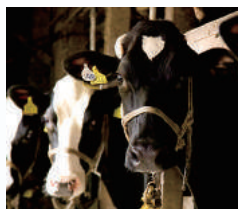
## Food Products



We automate processes originally carried out by hand to achieve greater precision and uniformity, which saves labor and reduces costs. Our spray nozzles help to create a wide variety of attractive and trustworthy food products.

Cleaning	Flavoring
Oil coating	Moisture control
Disinfection	

## Agriculture and Livestock



We make major contributions to the agriculture and livestock industries through groundbreaking developments such as an innovative cultivation method that supplies atomized liquid fertilizer directly to the roots of crops; our new all-in-one system for cooling, humidification and pest control in greenhouses; and our two-in-one unit for cooling and disinfection in livestock barns for cows, pigs, and poultry.

Cleaning	Outdoor cooling
Spraying	Disinfection

## Environment and Entertainment



Spray nozzle applications in the environmental field include urban heat island countermeasures, treatment of industrial wastewater before it enters rivers, and other such efforts. We also utilizes "special effect" sprays in fog and light displays for theme parks and similar venues, which have proven popular among users.

Outdoor cooling	Odor reduction
Fog and light displays	
Waste water filtration	

## Healthcare



Solutions from IKEUCHI include humidification in hospitals and care facilities, indoor disinfection, pharmaceutical product filling, tablet (pill) production device cleaning, and other applications. Our nozzles are also used in mist saunas and toilet cleaning.

Cleaning	Disinfection
Indoor cooling	Humidification

## Energy



IKEUCHI nozzles are widely used for fire prevention. Furthermore, we developed an inlet air cooling system for gas turbines and an assist cooling system for air-fin coolers both of which restore generation efficiency in hot weather.

Cooling	Dust suppression
Cleaning	Fire prevention



# Applications of IKEUCHI Technologies

Fog engineers at IKEUCHI are ready to serve the industrial world with high-precision spray nozzles and extensive experience.



Surface treatment,  
Lubricating, Seasoning

## Coating

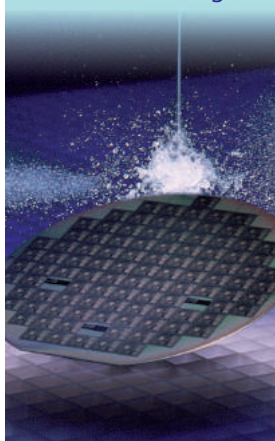
Steel plates, Dies,  
Pancakes



Insecticides,  
Fire prevention,  
Etching

## Spraying

Paddy fields,  
Tea-plantations,  
Orchards,  
Chemical plants,  
Electric & Electronics  
manufacturing



Automation, HACCP,  
Preventing ozone  
layer destruction

## Cleaning

Machine parts,  
Automobiles,  
Roads, Exhaust gases,  
Food containers,  
Bottles



Countermeasures of  
dioxin pollution,  
Rapid or slow cooling  
solid and gases

## Cooling

Exhaust gases,  
Steel ingots,  
Steel plates, Glass,  
Refractories



Descaling of steel,  
Peeling off wood bark,  
Removing shells  
from ship hulls

## Descaling

Steel, Wood,  
Ships







City environment,  
Countermeasures of  
heat-island phenomenon

## Outdoor Cooling

Train stations,  
Athletic fields, Parks,  
Shopping malls,  
School facilities



Static electricity  
control, Improving  
working environment

## Humidification

Semi-conductors,  
LCDs, Plastics,  
Printing, Textiles,  
Mushroom nurseries,  
Wine making



Countermeasures  
of dust in factories,  
Improving working  
environment

## Dust Suppression

Iron mills, Paper mills,  
Foundries,  
Recycling plants



Countermeasures  
of infection and  
poisoning from eating

## Disinfection

Hospitals,  
Care facilities,  
Dining halls, Vehicles,  
Livestock barns



Moisture control of  
solid and gases

## Moisture Control

Cardboard,  
Newspapers, Printing,  
Exhaust gases for  
dust collectors,  
Raw resin



# History of IKEUCHI

Company Motto:

## Taking The Path Less Traveled

IKEUCHI was founded as a trading company in 1954, and in 1961 we developed a ceramic spray nozzle with a precision guarantee, thus starting out on our path to becoming a major manufacturer and seller of spray nozzles.



## World's First Ceramic Nozzle

After our establishment as a trading firm, our founder—a fiercely determined man—focused his efforts on exporting only products developed in Japan. These included products related to rayon production, a pivotal sector in the textile industry at the time.

One of those products was a ceramic spinneret that was highly resistant to wear and chemicals, but this spinneret gradually became obsolete as nylon grew more dominant than rayon in the post-World War II era.

Our founder wanted to preserve the impressive technology of the ceramic spinneret, so in 1961 he established a small factory in his hometown of Kure City, Hiroshima Prefecture, where he repurposed the spinneret technology to create the world's first ceramic tip spray nozzle. His ceramic nozzles were quickly bought up by a leading agrochemical spraying

equipment manufacturer, who had been looking for a solution to the problem of wear in standard nozzles, and the founder's breakthrough opened up new business opportunities in a wide range of industries.



The first ceramic tip developed by IKEUCHI

## World's First Precision Guarantee

IKEUCHI was the first company in the world to offer precision guarantees for spray nozzles. Only nozzles that complied with specific standards for spray capacity tolerance and spray angle tolerance were shipped out to customers—a singular practice in the spray nozzle industry, both then and today.

Ever since, this guarantee on standard nozzles has served as proof of IKEUCHI product quality, and the Company continues to earn widespread customer praise for these efforts.

## Proprietary Fog Classifications

"Fog" can include a widely varying range of characteristics. From early on in our history, IKEUCHI has utilized a proprietary fog classification system based on droplet size, establishing it as a standard for fog as an industry-use material.

This makes it easier to determine which fog types will solve customer problems, and facilitates the selection and proposal of optimal spray nozzles and systems.

## Challenges in Developing the World's First Ceramic Nozzle



One of original CERJET®

We faced many challenges during our development of the world's first ceramic spray nozzle, the most difficult of these being ceramic material contraction within the material firing process.

Contraction during material firing makes it very difficult to guarantee product quality, even after carrying out intricate design of details such as fog spray pattern and spread, spray volume, and final post-firing dimensions. Furthermore, factors such as material conditions, moisture content, and the presence/absence of air bubbles can lead to differing final results even when firing conditions are constant, resulting in product quality inconsistencies. By researching each factor carefully, from material compositions through to firing temperatures, and carrying out numerous trial-and-error type tests, we overcame the issues to create CERJET®, the world's first precision-guarantee ceramic tip nozzle.

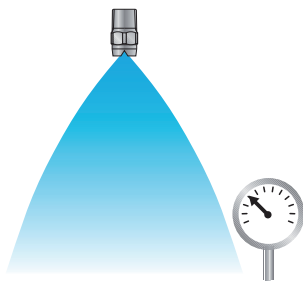
# IKEUCHI's Fog

## Spray Nozzle Precision Guarantee

IKEUCHI sets strict acceptance criteria for spray nozzle precision performance, and only nozzles that pass inspections based on those criteria are shipped out. Even when the customer has ultra-precise spraying requirements, this precision guarantee ensures that IKEUCHI can provide a reliable, safe product that fulfills all customer needs.

### Hydraulic Spray Nozzle Precision Guarantee

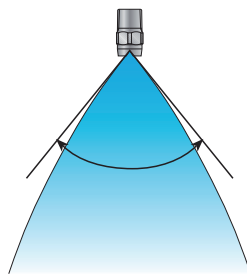
#### Spray Capacity Tolerance



±5%

Guaranteed within ±5% of the rated spray capacity at the standard pressure (set by nozzle product series).

#### Spray Angle Tolerance



±5°

Guaranteed within ±5° of the rated spray angle at the standard pressure (set by nozzle product series). Spray angle is the angle of spray measured near the nozzle, unless otherwise specified.

#### Spray Angle Tolerance for Solid Stream Jet



Within 3°

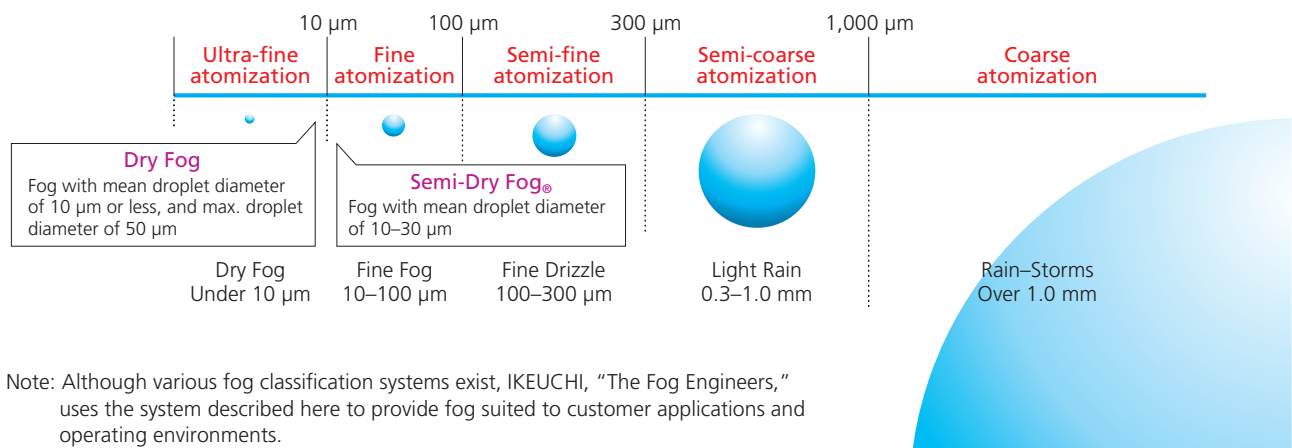
Guaranteed within 3° from the nozzle body centerline at the standard pressure (set by nozzle product series).

Note: "Standard pressure," or design pressure, is defined as the most commonly used liquid pressure for the hydraulic spray nozzle product series.

## Fog Classification

By establishing fog droplet size definitions, for which standards were previously inconsistent, we are able to offer fog as an industrial-use material. We continue to develop new products while taking full consideration of the water and air resources used in day-to-day life.

### Fog Classification System



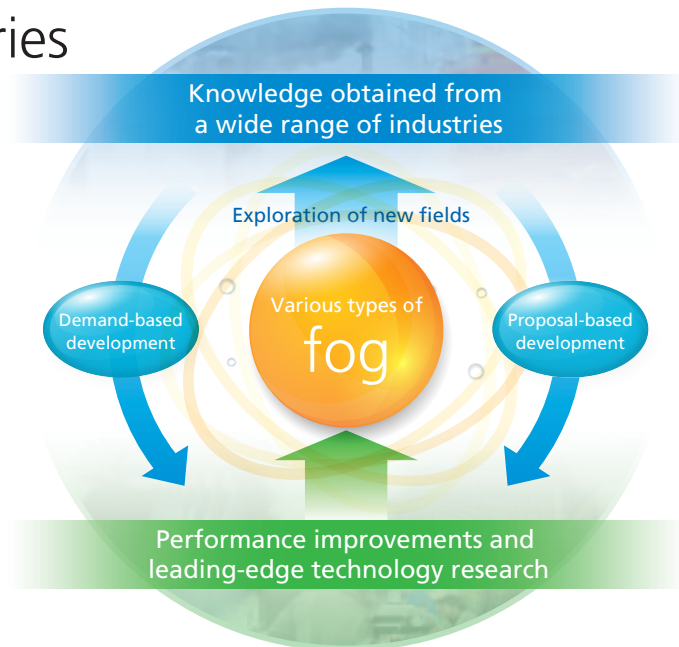
Note: Although various fog classification systems exist, IKEUCHI, "The Fog Engineers," uses the system described here to provide fog suited to customer applications and operating environments.



# IKEUCHI's Strengths

## Making full use of various fogs on a continued mission to serve a wide range of industries

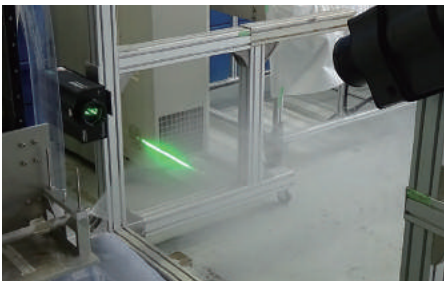
Refusing to content ourselves with nozzle manufacturing alone, we develop a wide range of fog applications in order to expand our business into new fields. We actively pursue these business endeavors in Japan as well as on the global stage, which helps us to improve our atomization technologies and lays the foundations for creating one-of-a-kind, fog-based solutions.



## Our products lay the foundations for the manufacturing industry

While maintaining the trust we have earned through provision of the world's first precision guarantee, IKEUCHI has attained certification for our quality management system (QMS) based on International Organization for Standardization (ISO) criteria, making it possible to provide even better products. In addition to our ISO-certified proprietary QMS, we carry out continual improvements to product reliability and safety as well as quality of operation, working as a unified team to boost customer satisfaction.

## Product Quality



Measurement of spray droplet diameter



Spray impact measurement

At IKEUCHI, we use sophisticated equipment to carry out exhaustive inspections of spray capacity, spray angles, spray distributions and other factors that affect final fog quality.

## Product Management



Barcode-based product management prevents shipping errors



Rotating racks

We utilize barcodes and handheld reader devices to reduce human error, along with automated warehouse facilities, rotating racks and other technologies to achieve reliable lot management and traceability.



# Spray Nozzle Business and Five Specialty Businesses



Nozzle  
Business



Environment  
Business



Humidification  
Business



Cooling  
Business

Five  
specialty  
businesses



Agro  
Business



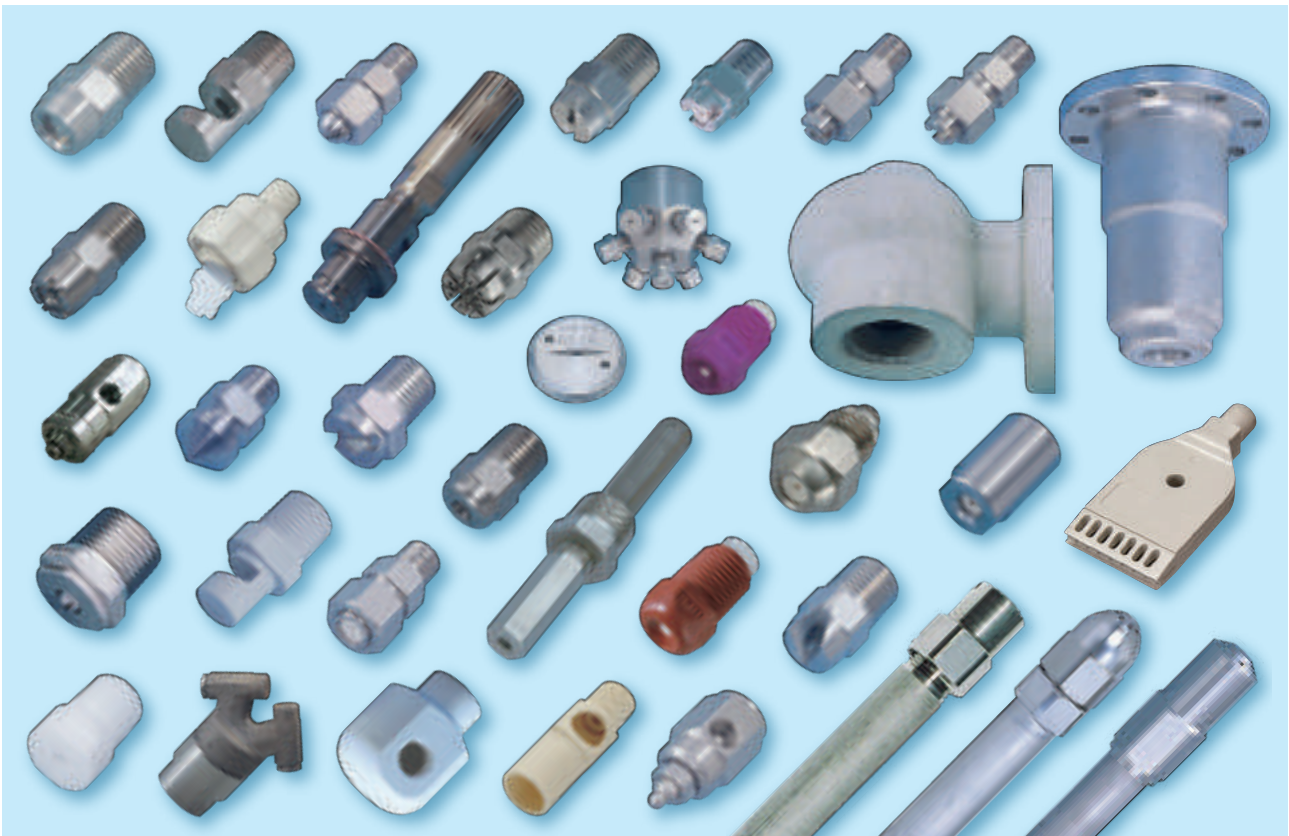
Disinfection  
Business



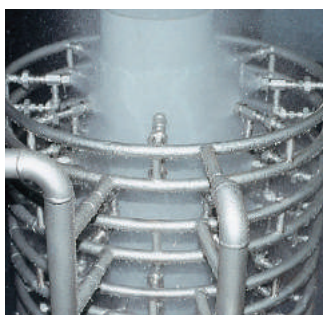
# Nozzle Business

Our Fog Engineers handle all aspects of the spray nozzle business and provide continuous support to solve customer problems

IKEUCHI developed the world's first ceramic spray nozzle in 1961 and are the only company in the nozzle industry that provides a precision guarantee. Today, we make full use of a wide range of product materials including stainless steel, brass, tungsten carbide, standard and high-alumina ceramics, plastics and others in order to meet varied applications and satisfy all customer requirements. The spray nozzle business is the core of IKEUCHI's operations, manufacturing and supplying suitable spray nozzles for use in a wide variety of applications, handling custom-made products and development of spray unit products to meet all kinds of requirements from customers.



We provide optimized spray nozzles from our catalog of more than 42,000 different products.



## Solutions only available from a true nozzle specialist

Our nozzle products, born from advanced technologies, perform splendidly even in combustion facilities and other harsh environments, and in demanding worksites such as precision machinery plants, thus satisfying all customer needs.

IKEUCHI offers comprehensive solutions, utilizing and improving on the knowledge we have gained through past nozzle manufacturing operations, in order to solve even the most complex and challenging of problems.





# Environment Business

## Providing wide-ranging, fog-based solutions that benefit both industry and people's daily lives

We also provides specialty systems that use non-wetting Semi-Dry Fog® for energy-efficient cooling of large-scale factories and urban buildings, and also for boosting humidity levels in schools and hospitals. In addition, we developed the LYOHM System® outdoor cooling system as a pioneering urban heat island countermeasure. This system reduces temperatures through evaporative fog cooling, and it is now used widely throughout urban areas.

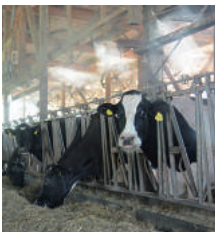
In recent years we have developed and promoted systems that improve the operating efficiency of air-conditioner outdoor units and solar panels during the summer months. We have also worked on humidification systems to help prevent infectious diseases, such as influenza, caused by dryness during the winter months.



**LYOHM System®**  
Semi-Dry Fog® outdoor cooling system



**COOLSAVE-D**  
fog cooling for air-conditioner outdoor units



**CoolPescon®**  
non-wetting livestock cooling, disinfection and deodorization



**ARS Filter**  
automatic spray-jet self-cleaning filter



(Photo courtesy of MISAWA HOMES CO., LTD.)

**COOLJetter® Dome** energy-efficient, large-space cooling system

### Fan + Fog Cooling Units

#### **COOLJetter®**

These energy-efficient cooling devices use the evaporative cooling effect of Semi-Dry Fog®, whose droplets are so small they do not wet the surfaces they contact, to reduce surrounding temperatures by 5°C (41°F). A varied lineup of products is available, from small to large spray capacity types, to meet a wide range of different user environments and applications. COOLJetter® products can be used for temperature-reduction in a diverse range of different environments, including outdoor sports venues, gymnasiums, large factory spaces, and resting areas.



One unit covers approx. 150-180 m<sup>2</sup>

#### **Large-space Humidification Unit ULM®**

ULM®, spraying Semi-Dry Fog®, which doesn't wet people, floors or other surfaces, can provide rapid humidification to large areas up to roughly 150-180 square meters in size. In addition, the unit is portable, so it can be placed anywhere a power source is available. Low electricity costs of around 19 yen per day\* make it economical as well. ULM® is quickly becoming popular as a countermeasure to stop the spread of influenza, the common cold and other diseases in facilities such as retirement homes and hospitals. Demand is also increasing for applications in cafeterias, resting areas and similar facilities.

\*When operated 12 hours per day and calculated at JPY22 / kWh.





# Humidification Business

## Mitigating industrial static electricity problems using one of the world's most advanced humidification system

IKEUCHI's Dry Fog humidification system, which uses internationally patented spray nozzles, helps to mitigate product defects and work-environment problems caused by insufficient humidity (dry air), static electricity and other such factors.

Dry Fog humidification is compatible with work environments where absolutely no wetting is permissible: it can be used to humidify wide areas, or dividedly controlled to provide close-proximity spot humidity for applicable processes only.

Moreover, our system reduces operating costs by approximately 40% compared with steam humidification systems. In recognition of this system's outstanding performance and achievements, The Institute of Electrostatics Japan has presented IKEUCHI with the Progress Award.



Progress Award from The Institute of Electrostatics Japan



AirAKI® industrial humidification system

### AirAKI® Installation Example



Offset printing plant



Electronics surface mount process



Cardboard factory



Plastic molding plant

Approx. 70% reduction in operating costs compared with steam humidification

### AirULM® Hydraulic Humidification System

This industrial, hydraulic humidification system does not require compressed air. It is recommended for use in large, open areas such as factories with a minimum ceiling height of 3.5 meters, and is driven by a high-pressure pump to provide fog-based humidification that does not wet equipment, manufactured products, etc. Our system reduces operating costs by approximately 70% compared with steam humidification systems.



Fog with mean droplet diameter of 7.5 μm

### AirAKI® Industrial Humidification System

The AirAKI® industrial humidification system combines the AKIMist® "E" Dry Fog Humidifier which produces non-wetting fog, a control unit, a water purifier, and other devices. The system can be designed to meet individual customer requirements, thus providing humidification control tailored to specific applications and improving quality in manufacturing facilities.



AKIMist® "E"





# Cooling Business

## Our industrial cooling specialists offer fog cooling systems tailored to customer needs

We have developed innovative, fog-based cooling systems that overturn industrial cooling conventions. Serving as cooling-operation consultants for both gas and solid-matter cooling, we handle everything from selection of appropriate nozzles and layout design through to computational fluid dynamics (CFD), cooling apparatus design, and equipment installation as part of efforts to provide service that meets every customer requirement and preference. We have completed numerous product deliveries for steelworks, power plants, waste incineration plants and other such facilities.



**Semi-Dry Fog® inlet air cooling system**  
(Photo courtesy of Shikoku Electric Power Company, Inc.)

Reducing gas turbine inlet air temperature using fog-based evaporative cooling improves power generation output.



### Kiln cooling system

Provides control for everything from slow to rapid cooling, thus eliminating cooling insufficiencies and excessive cooling.



### Air fin cooler assist cooling system

Utilizes fan-blowing together with the evaporative effects of fog cooling to prevent cooling performance declines when outdoor temperatures are high.



### Die-cast and cast product cooling system

Offers quick and uniform cooling without wetting products.



### Release agent spraying and die/mold cooling

Reduces usage amounts for release agents, lubricants and similar while also extending the lifespans of dies and molds.



Nozzle installation locations in a cooling tower



### Unvaporized-water free Gas Cooling System

This system cools exhaust gases with fog spraying to increase the efficiency of removal operations for dioxin and other toxic gases. We utilize computational fluid dynamics (CFD) to optimize cooling tower forms (gas flow) as well as nozzle designs. Furthermore, we use laser measurements to create optimized nozzles in ways only possible at a specialized nozzle manufacturer like IKEUCHI.

Gas cooling tower  
(Photo courtesy of JX NIPPON TOMAKOMAI CHEMICAL CO., LTD.)



# Disinfection Business

## Using Dry Fog for disinfection in customer spaces to achieve cleaner environments

In addition to anti-bacterial measures in production plants, medical facilities and similar, recent years have seen a rise in demand for cleaner environments in public facilities and other spaces where people gather. Disinfecting and cleaning these spaces prevents the spread of infectious diseases and makes for safer, more trustworthy environments.

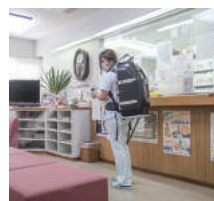
Dry-Fog HIGHNOW®, a portable and rechargeable antibacterial and deodorizing device, was created to eliminate bacteria and odors in tight and hard-to-reach spaces, overlooked areas, spaces with high ceilings, and others where thoroughgoing measures were not formerly possible. IKEUCHI's non-wetting Dry Fog eliminates bacteria in these spaces without leaving them damp afterward.

In recent years, hypochlorous acid water has been gaining popularity for its antibacterial and deodorizing effects as well as its application as a cleaning water. IKEUCHI developed Clezia®, an electrolytic refining device that generates a hypochlorous acid water and a strong alkaline water; use of this product together with Dry-Fog HIGHNOW® provides even greater bacteria elimination and deodorizing results.

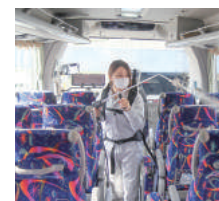
Moving forward, products such as Dry-Fog HIGHNOW® and Clezia® will help achieve the environmental improvements that society demands.



Dry-Fog HIGHNOW® disinfection and deodorization device



Hospital waiting rooms



Transportation  
(railways, buses, ships)



Preschools/Kindergartens



Hospital operating rooms



Cleaning-agent foaming for optimal cleaning  
**AWACart Cleaning Liquid Foaming Spray Unit**

This cleaner unit is capable of foaming cleaning agents in three different ways. Our popular AWACart can create foam sprays suited to specific cleaning targets, and its cart-style design makes it portable, enabling immediate deployment in any location.



Electrolyzed hypochlorous acid water

**Clezia Water**

Clezia Water is an electrolyzed hypochlorous acid water generated by means of the patented technology without using any deleterious substances such as hydrochloric acid. It is highly safe but easy to use, like tap water, and powerfully disinfects bacteria and virus harmful to humans and livestock.





## Leveraging fog atomization technology to pioneer new, revolutionary agriculture for the first time worldwide

We developed IKEUCHIPonics®, a new cultivation method for greenhouse agriculture in which liquid fertilizer is turned into Semi-Dry Fog® and applied to the roots of plants. This novel approach requires only 30% of the fertilizer costs and 2% of the water used for standard outdoor cultivation and results in greater yields, improved crop quality, reduced labor and cleaner growing operations overall, among other benefits. It also enables agricultural operations in desert regions. In addition, our CoolPescon® system, which surpasses conventional evaporative cooling in terms of cooling efficiency, combines cooling, humidification and pest control into one and has contributed to advancements in agriculture worldwide as a revolutionary automated growing support system. Here at IKEUCHI, we expect great things from the Agro Business moving forward.



CoolPescon® automated greenhouse cooling, humidification and pest control system



We grow various types of crops year-round in our company-owned experimental farms.



Harvesting summer strawberries in August



CoolPescon® CH greenhouse cooling and humidification system



### Delicious Vegetables Grown Using Fog

In Agro Business, we place top priority on profitability in its agricultural technology research and development activities. In order to earn the trust and patronage of agricultural-field customers, we sell tomatoes, lettuce, strawberries and other crops grown and harvested in our own greenhouse facilities as part of agricultural-business proof-of-concept demonstrations.



# Global Network

To meet our contribution to society by means of fog, we have advanced and specialized our fog engineering in response to current issues and requests from partnering industries. Today the field of fog utilization is not limited to Japan, but is spreading across borders into other countries and markets.

In order to effectively respond to global needs we are establishing subsidiary offices and accelerating the movement towards our own global network.

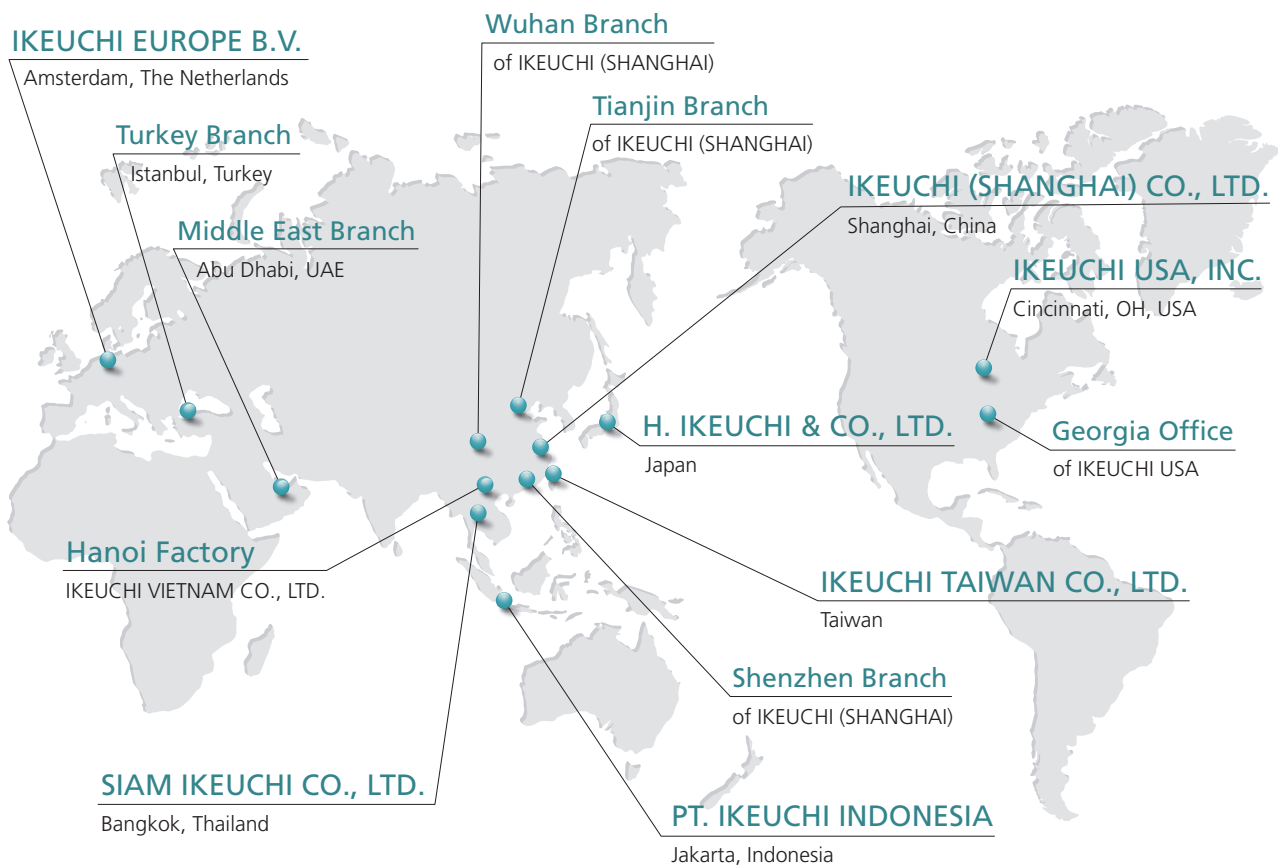
## Main overseas business activities

### In Europe:

We offer customized solutions for a wide variety of production processes, ranging from automotive and agriculture to steelmaking, heavy industries, environmental conservation, and electronic devices supporting the Internet of Things (IoT).

### In the US:

We provide engineering support for manufacturing processes, ranging from key industries such as power generation, steelmaking, and car manufacturing, to advanced technologies for the semiconductor manufacturing, data centers, and aerospace manufacturing.



### In the Middle East:

We are engaged in the installation of cooling systems that use non-wetting fog to improve heat-extreme working environments, as well as fog cultivation systems that enable crops to grow with less water than with conventional systems.

### In Asia:

We are engaged in current, cutting-edge technological innovations required to sustain a continuously growing industrial production, various production processes, and quality, as well as to maintain and improve the working environment, atmosphere, and water quality.



We have customer service representatives at each office who can communicate with customers in Japanese. We also have distributors and agents in Korea, South-East Asia, and other specific countries. Please feel free to contact them or us.

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mist@kirinoikeuchi.com (for Shanghai,  
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h-koen@kirinoikeuchi.co.jp  
<https://www.kirinoikeuchi.co.jp/eng/itr/>

### PT. IKEUCHI INDONESIA

Ruko Rodeo Drive,  
Jl. Hollywood Boulevard Blok B6  
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Jawa Barat 17530, Indonesia  
TEL: +62-21-8938-4201 (or 4202)  
sales@ikeuchi.id  
<https://www.ikeuchi.id/>

### SIAM IKEUCHI CO., LTD.

909 Ample Tower Bldg. 8FL.,  
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Bangna Nuea, Bangna, Bangkok  
10260, Thailand  
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FAX: +66-2-348-3802  
thai@ikeuchi.co.th  
<https://www.ikeuchi.co.th/>

### H. IKEUCHI & CO., LTD. Middle East Branch

Office No: 2, First floor, Plot: 59  
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Abu Dhabi, UAE  
TEL: +971-2634-4555  
FAX: +971-2634-4577  
me@kirinoikeuchi.co.jp  
<https://www.kirinoikeuchi.co.jp/eng/me/>

### Hanoi Factory

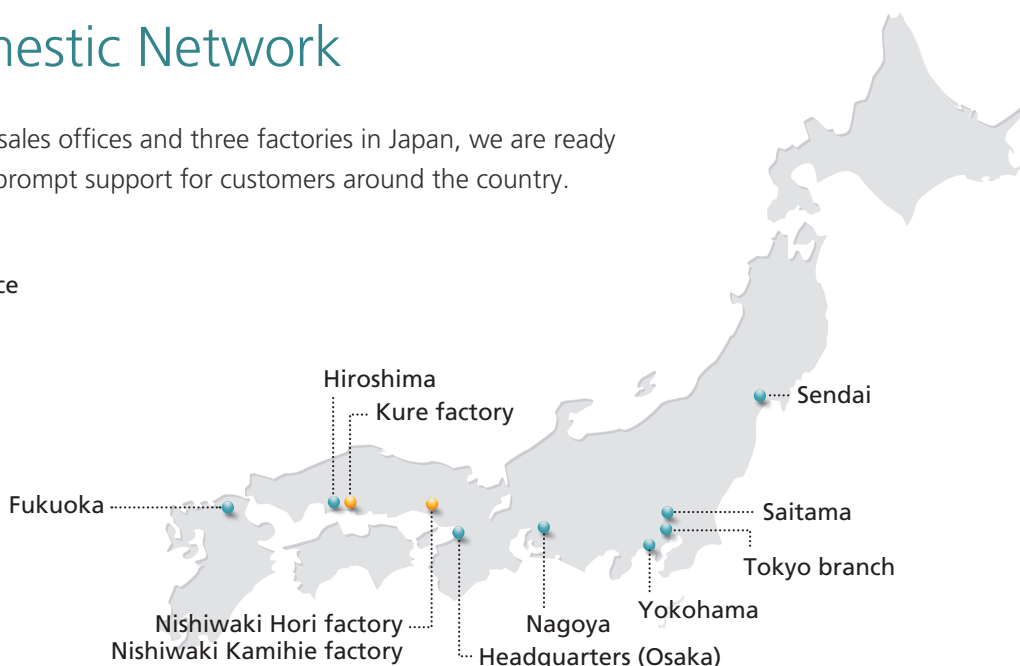
### IKEUCHI VIETNAM CO., LTD.

K-1, Thang Long Industrial Park,  
Dong Anh District, Hanoi, Vietnam

## Domestic Network











With eight sales offices and three factories in Japan, we are ready to provide prompt support for customers around the country.

● Sales office



# Company Development Activities and Historical Background

## History of Major Product Developments

<p><b>1961</b></p>  <p>Developed CERJET®, the world's first ceramic tip nozzle</p>	<p><b>1980</b></p>  <p>Invented the AKIMist® humidifier using the world-leading performance technologies of AKIJet®</p>	<p><b>1985</b></p>  <p>Developed CERTIIM®, an injection molded version of CERJET® with a ceramic tip insert</p>	<p><b>1990</b></p>  <p>Launched the world's first humidification-specialized business with the AirAKI® industrial humidification system</p>	<p><b>1994</b></p>  <p>Developed SaniCart®, a cart-type disinfecting and sterilization unit that converts chemical agents into Dry Fog</p>	<p><b>1998</b></p>  <p>Developed GSIM exhaust-gas cooling nozzle for use in dioxin countermeasures at waste incineration plants</p>
<p><b>1964</b></p>  <p>Developed the DSP series of high-pressure descaling nozzles</p>	<p><b>1979</b></p>  <p>Invented AKIJet® ultra-fine fog spray nozzle and acquired international patents</p>	<p><b>1983</b></p>  <p>Developed spray nozzles for the steelmaking industry, contributing to continuous casting operations through spray cooling</p>	<p><b>1991</b></p> <p>Developed MOMOJet® self-cleaning, flat pattern spray nozzle</p>	<p><b>1997</b></p>  <p>Received Progress Award from The Institute of Electrostatics Japan for the development of and contributions via our an anti-static system</p>	<p><b>2000</b></p> <p>Developed GBIM large-spray-capacity pneumatic nozzle with ultra-low air-to-water ratio</p> <p>Developed quick-attachable and -detachable nozzles</p>
<p><b>1973</b></p> <p>Developed and began production of metal spray nozzles</p>	<p><b>1975</b></p> <p>Developed full cone spray nozzles with uniform distribution and clog prevention</p>	<p><b>1984</b></p> <p>Developed plastic nozzles for the electronics industry</p>	<p><b>1991</b></p> <p>Developed pneumatic nozzle header with BIMV nozzles for use in steel surface treatments</p>	<p><b>1997</b></p> <p>Received Progress Award from The Institute of Electrostatics Japan for the development of and contributions via our an anti-static system</p>	<p><b>2000</b></p> <p>Developed GBIM large-spray-capacity pneumatic nozzle with ultra-low air-to-water ratio</p> <p>Developed quick-attachable and -detachable nozzles</p>
<p><b>1954</b></p> <p>Established as a trading firm</p>	<p><b>1961</b></p> <p>Opened original Kure Factory in Hiroshima, Japan</p>	<p><b>1979</b></p> <p>Opened Nishiwaki Hori Factory in Hyogo, Japan</p>	<p><b>1983</b></p> <p>Opened second Kure Factory</p>	<p><b>1987</b></p> <p>Established subsidiary IKEUCHI TAIWAN CO., LTD. in Taipei, Taiwan</p>	

1960

1990

2000

## Historical Background

### 1960s

Pivotal industries such as steel, shipbuilding and petrochemicals grow, contributing to Japan's era of high economic growth.

### 1970s

The oil crises prompts a shift from resource-intensive industry to energy-efficient industry. The steelmaking industry moves towards increased recovery of byproduct gases, utilization of continuous casting process, and similar changes.

### 1970s

Japan creates and establishes the Energy Conservation Act in order to rationalize energy usage.

### 1980s

The risk of global warming begins to receive more widespread public recognition.

### 1980s

Japan experiences rapid integrated circuit technology advances and high-tech industry growth. Organized, systematic education and implementation for electrostatic countermeasures are started in the semiconductor sector.

### 1990s

Discussions on worldwide measures against global warming are held at The United Nations Conference on Environment and Development (UNCED / Earth Summit).

### 1990s

Japan amends the Energy Conservation Act. The new legislation includes a basic policy and additions such as the requirement for regular reporting from designated energy management factories.

### 1990s

The Ministry of Health and Welfare creates guidelines on preventive measures for dioxin emissions in waste treatment processes and notifies prefectural governments.

### 1990s

The Act on Special Measures Against Dioxins is created, establishing environmental standards, environmental measures, etc.



2001



Developed water-conserving, long-lifespan TDSS descaling nozzle for the steelmaking industry

2005



Developed COOLJetter® fan + fog cooling unit for use in environmental measures and work-environment improvements

2008



Developed AKIMist® "E" energy-efficient humidifier equipped with new Dry Fog nozzle AKI03

2010



Launched Cooling Business to provide integrated service for everything from onsite inspections to after-sales services

2012



Developed Semi-Dry Fog® inlet air cooling system for increasing power output and fuel economy

2014



Developed COOLSAVE-D for cooling air-conditioner outdoor units

2018



Developed Clezia® hypochlorous acid water and strong alkaline water generator

2003



Developed ARS Filter, the world's first spray-jet self-cleaning filter

2006



Developed LYOHM System® for use in environmental measures against the urban heat island effect, global warming, etc.

Received Osaka City Environment Award in recognition of our water- and electricity-conserving technologies and successes in solving and mitigating environmental problems

2011



Developed greenhouse cooling and humidification system, which eliminates problems caused by wetting of crops and facilities

2013



Developed COOLJetter® Dome energy-efficient cooling system for large spaces and semi-outdoor spaces



Developed COOLJetter® ULM Semi-Dry Fog® indoor cooling and humidification system

2016



Developed CoolPescon® automated greenhouse cooling, humidification and pest control system

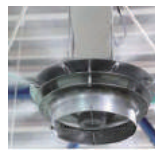
2017



Developed Dry-Fog HIGHNOW® backpack-style disinfection and deodorization device



Developed ULM® Semi-Dry Fog® humidification unit for humidity control in various facilities and living spaces



Developed AirULM® energy-efficient hydraulic humidification system

2001 Established a representative office in Shanghai, China  
2003 Expanded and upgraded the Nishiwaki Hori Factory  
2005 Established IKEUCHI VIETNAM CO., LTD. in Hanoi, Vietnam

2006 Established IKEUCHI (SHANGHAI) CO., LTD. in Shanghai, China and IKEUCHI USA, INC. in Ohio, United States

2007 Merged the Kure factories to create a new Kure Factory  
2008 Established IKEUCHI EUROPE B.V. in Amsterdam, the Netherlands

2012 Established the Suzhou Branch and Tianjin Branch of IKEUCHI (SHANGHAI) CO., LTD. in China

2013 Established PT. IKEUCHI INDONESIA in Jakarta, Indonesia

2016 Established the Shenzhen Branch in China  
Established representative offices in Turkey, Thailand, and UAE

2018 Established SIAM IKEUCHI CO., LTD. in Bangkok, Thailand and Wuhan Branch in China  
2019 Opened Nishiwaki Kamihie Factory in Hyogo, Japan

2010

2000s

Japan amends the Energy Conservation Act. The new legislation subjects large office buildings and similar facilities to standards similar to those applied at large factories.

2000s

The Outline of the Policy Framework to Reduce Urban Heat Island Effects is created. Support is provided for energy-saving investments.

2000s

The Kyoto Protocol is adopted.

2000s

The paints and coatings industry calls for measures to prevent workplace accidents caused by electrostatic discharges.

2010s

Following the Great East Japan Earthquake, electricity supply and demand becomes a matter of greater urgency for society. In order to ensure stable electricity supplies, operators focus increasingly on the use of inlet air cooling systems to prevent performance declines during the summer at gas-turbine generator facilities.

2010s

The Outline of the Policy Framework to Reduce Urban Heat Island Effects is revised. The new version includes measures to mitigate harmful effects on human health caused by the urban heat island phenomenon.



Note: Views and opinions on historical matters and developments may vary. IKEUCHI picked up some from standard, widespread explanations and examples.

## Corporate information

Date established: November 8, 1954

Paid-up capital: 90 million yen (Shareholder's equity 5.5 billion yen)

Representative: Shiro Nakai, President & COO

Business description: Manufacturing, sales, export and import of spray nozzles, humidifiers,  
related products and system equipment

Number of employees: 600 (including subsidiaries)



“The Fog Engineers”

**H. IKEUCHI & CO., LTD.**

### Headquarters

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ISO9001: 2015 certified  
(H. IKEUCHI & CO., LTD., Japan only)

