MeeFog Systems

# EVAPORATIVE COOLING FOR HEAT EXCHANGERS

## Increase cooling capacity and reduce energy use with MeeFog Systems

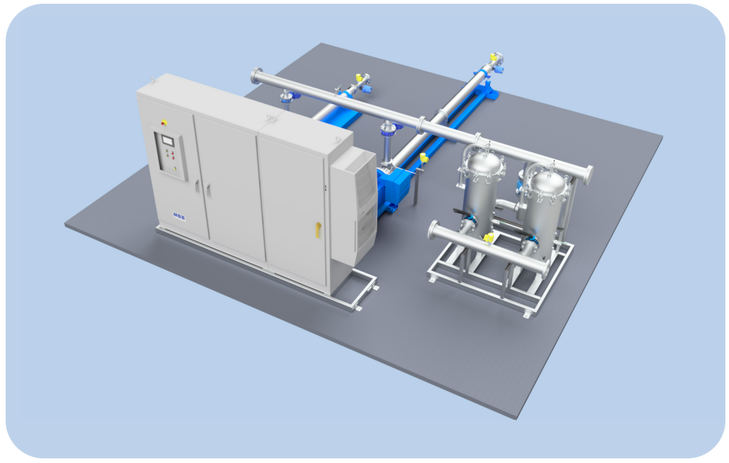
# Increase Cooling Capacity by 20°F or More

## MeeFog precooling for heat exchangers

- Cut energy costs by 30% or more.
- Reduce strain and extend heat exchanger equipment life.
- Reduce the footprint of heat exchangers in new construction.
- Improve process performance.
- Fast project execution - rapid return on investment.

### Potential Cooling by Climate Zone

| Climate Zone | Cooling °F | Cooling °C |
|---|---|---|
| **Hot arid desert climates** | 30°F + | 17°C |
| **Temperate climates** | 20°F to 30°F | 11°C |
| **Humid, tropical regions** | 10°F to 20°F | 5.5°C |



The MeeFog pump skid provides high pressure water to fog nozzle manifolds.

# Over 10,000 MeeFog Systems Installed Worldwide

Over the past 56 years, Mee Industries has installed fog systems for a wide variety of commercial, industrial and agricultural applications, including many installations on heat exchangers.

## MeeFog heat exchanger cooling projects

**Data Center – Memphis, TN**
Installation scheduled for 2026
Fog cooling for heat exchangers for water cooled computer servers.
Water flow rate of 2,600 gpm (295 $m^3$/hr).

**Rooftop Chiller Condenser - Guadalajara, MX**
Installed in 2018
Fog cooling for two large air conditioning condensers using RO water.
Water flow rate of 10 gpm (2.3 $m^3$/hr).

**Power Plant Heat Exchanger- Queens, NY**
Installed 2014
Fog cooling for heat exchanger with 24 air fans using demin water.
Water flow rate of 700 gpm (160 $m^3$/hr).

**Steam Condenser - Bogotá, Colombia**
Installed in 2010
Large steam condensing heat exchanger at combined cycle power plant. Reduces condensate temperature which reduces back pressure on the steam turbine by an average of to 2 inHg abs.
Water flow rate of 20 gpm (4.6 m3/hr).

**Natural Gas Aftercooler - Ontario Canada**
Installed in 2022
Fog cooling (5°C) for a natural gas aftercooler.
Water flow rate of 7 gpm (1.6 $m^3$/hr).

*"We have dry coolers on the roof, so we don't have the benefits of evaporation. If we have 1,000 tons of refrigeration at 100°F, when it goes to 110°F, capacity drops and we are just shy of what we need. On very hot days when it gets above 110°F on the roof, which we reached about ten days last year, the units would have tripped offline on high head pressure."*

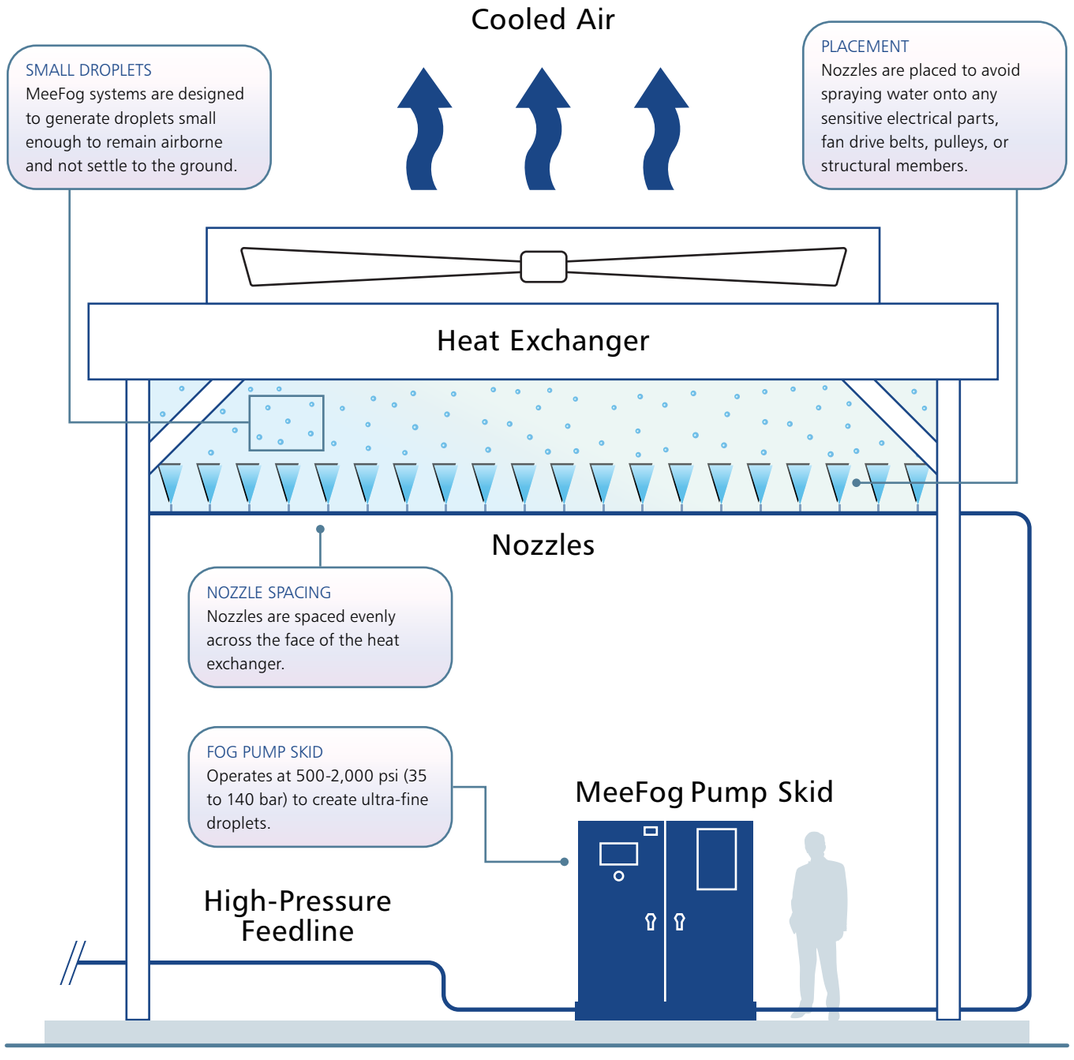
- Data center assistant chief engineer

# Cool Down, Improve Performance with MeeFog

## Heat exchanger precooling system

Heat exchanger precooling is a performance enhancement method that injects atomized water (fog) into the heat exchanger inlet airflow. MeeFog systems generate a cloud of micron-sized water droplets that evaporate quickly to cool the inlet airflow.

The fog droplets are small enough to stay suspended in the airstream until they reach the heat exchanger fins. Any remaining droplets evaporate from the heat exchanger fins without excessive water dripping back to the ground.



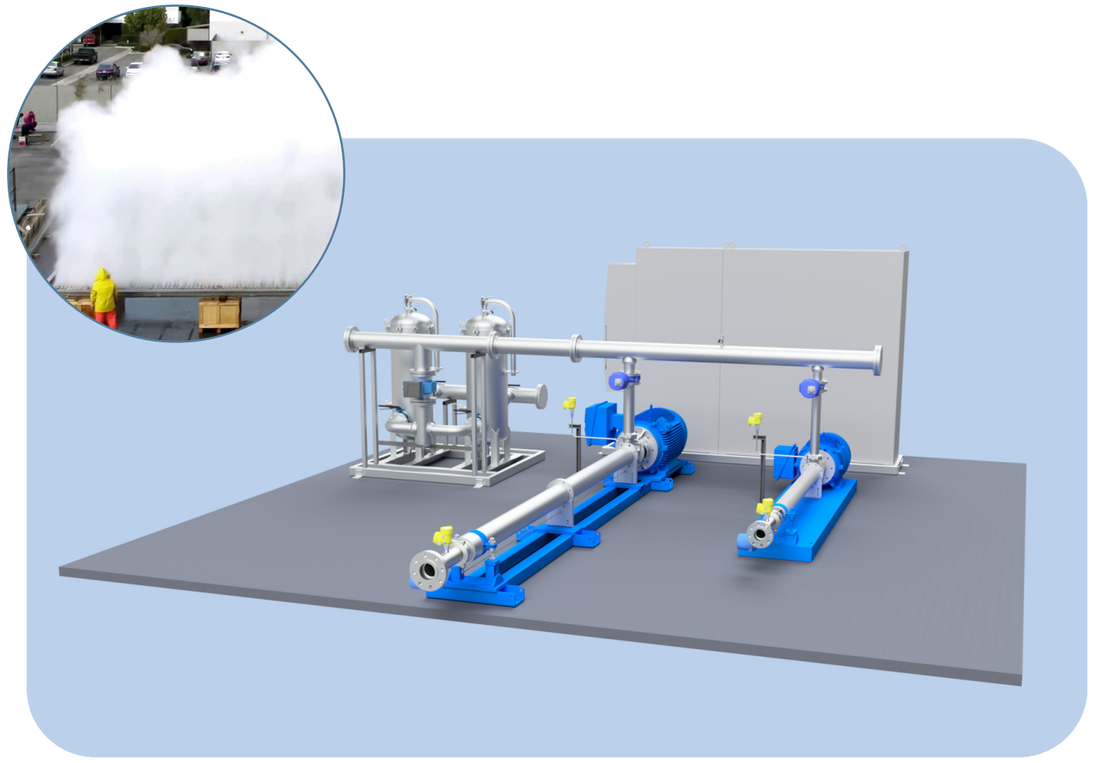

# MeeFog High-Pressure Pump Skid

## Pump skid

- Stainless steel welded frame with easy access for maintenance.
- Oversized inlet water filter with 10-micron filters.
- All wetted parts are stainless steel or plastic.
- 500 to 2,000 psi pumps.

## Controls

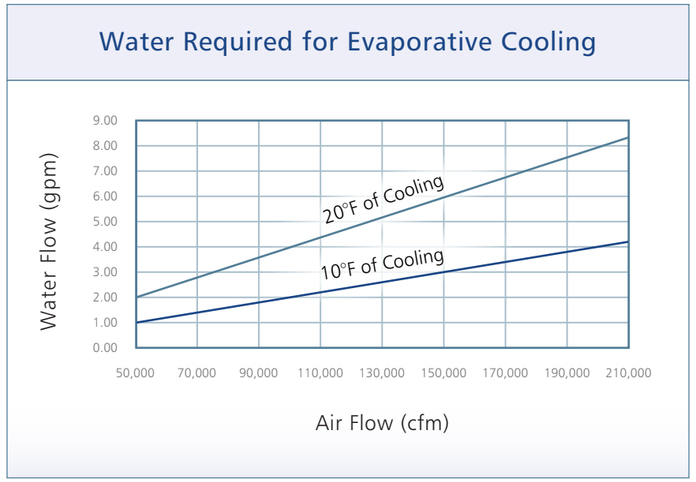
- Optional weather station for automatic control based on ambient conditions.
- Programmable logic controller with interface panel.
- Easy to use, open-source software.
- Easy connectivity to BMS or DCS or remote PC controller.



# MeeFog System Water Requirements

## How much water is needed to cool a heat exchanger?

Water consumption is determined by the desired amount of cooling and the volume of air being moved by the fans. Refer to the charts provided below to estimate how much water may be required.




$$\frac{\text{Airflow (cfm)}}{500{,}000} \times \text{Degrees °F of cooling} = \text{Water required (gpm)}$$

$$\frac{\text{Airflow (m}^3\text{/min)}}{35{,}0000} \times \text{Degrees °C of cooling} = \text{Water required (m}^3\text{/hr)}$$

## What water quality is required?

Softened or demineralized water should be used to avoid buildup of mineral deposits such as calcium carbonate on the heat exchanger coils. MeeFog systems have operated for many years with softened water with no adverse effects to the heat exchanger.

## Will fog degrade the heat exchanger or the fans and fan motors?

Fog does not degrade the heat exchanger fins or tubes, provided the water is properly treated. Mee Industries builds water treatment systems and has decades of experience with treating fog system supply water. We can help ensure water is properly treated.



# 10 Micron Droplets

## MeeFog nozzles produce droplets that are micro in size, macro in benefits

The tiny droplets from a MeeFog nozzle evaporate quickly, and 100% efficient evaporative cooling can be accomplished in just a few seconds. Air pressure drop through the nozzle manifolds is negligible.

- Average droplet is less than 10 microns, about one tenth the diameter of a single strand of hair.
- Fog droplets remain airborne and stay suspended in the airstream.
- Nozzles have a useful life of more than 30 years when used with properly treated water.


## The MeeFog Advantage:
## Experience Based in Science and Innovation

For over 50 years Mee Industries Inc. has been the leader of innovative water fog technology. MeeFog Systems are used to humidify and cool industrial, commercial, and agricultural processes and to create dynamic special effects.

Thomas Mee Jr. who founded Mee Industries in 1969 started his career as a Cornell University research scientist. The company originally manufactured high-tech, meteorological instruments. The first MeeFog Systems were used to study natural cloud phenomena. By the early 1980's, high-pressure water fogging had become the company's main focus. An active research & development effort ensures MeeFog's continual technological improvement.

Today the company is owned and operated by Thomas Mee III and D'Arcy Mee Sloane, who continue their father's tradition of running an innovative and ethical company for the benefit of customers and team members.

The MeeFog team looks forward to discussing your project with you.

MeeFog Systems

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