CAT PUMPS®

The Pumps with Nine Lives

Misting, Cooling and Fogging Equipment

Exceptional Life for any Environmental System

Product Quality, Reliability and Support You Expect

www.catpumps.com

Photo provided by Modern Misting Systems Inc.

Misting and Fogging

The process of misting or fogging is used in a variety of applications to control humidity and temperature, improve air quality, and even provide visual effects. High pressure misting is accomplished by spraying water through nozzles with tiny orifices which are specially selected for each type of application. Each misting or fogging system is different in design and sophistication. A basic system will include a high pressure pump, motor, atomizing nozzles, and plumbing including some form of water quality control. As systems become more complex additional nozzles, fans, pumps, or controls may be added.

Misting or fogging systems typically run at pressures of 1000 to 3000 psi and are significantly more cost effective than traditional cooling systems. A mine site, for example, may use misting or fogging to improve worker health and safety by reducing the dust in the air. The mine will also see the added benefit of longer equipment life while minimizing the risk of explosions. Cat pumps are a pivotal part to these systems as seals typically last 2 to 3 times longer than the competition. This not only reduces the cost of the repair components, but also maximizes the up time for operations.

It is important to understand how temperature, humidity and air quality affect the design of each system. It is best to work with someone who knows your specific needs to assure your system delivers optimum performance. A dependable Cat Pump is the heart of a good high pressure misting or fogging system and we can connect you with the expert in your application.

Benefits from Misting and Fogging

- Provide more uniform humidification and cooling
- Improve energy efficiency
- Decrease water consumption and need for chemicals
- Improve indoor and outdoor air quality and comfort
- Help minimize brittleness and static electricity
- Increase germination and propagation
- Diminish the risk of respiratory infections
- Control unwanted odors
- Enhance surroundings
- Minimize damage to equipment and materials in a fire

Humidity-Moisture Control

Misting or fogging systems are commonly used to maintain proper moisture and/or consistent humidity. They eliminate static electricity, suspend airborne dust, and ensure that product and materials are less susceptible to brittleness and fracturing. These systems are typically more cost effective then other humidification systems. In fact, when looking at energy consumption, a misting or fogging system may use as little as 1% of the energy needed for a more traditional steam system.

One of the challenges in misting or fogging is the varying demand on the pumps as the system responds to the changes in temperature and humidity. Cat Pumps have the proven track record of performance and dependability whether the pump needs to operate at its minimum or maximum rpm, flow or pressure.

Typical Applications:

- Nurseries
- Greenhouses
- Air handling units at Hospitals and Universities
- Potatoes and other vegetable storing
- Mushroom/Bean/Pea Growing
- Vegetable Storage
- Wine Barrel Storage
- Meat Processing Rooms
- Textile/Paper Processing
- Print shops
- Concrete Curing
- Lumber Conditioning

"The applications I serve often require the pumps to perform at the edge of their operating limits. Cat Pumps are the only pumps that can handle the application variation and still meet the demands in life that customers need."

Ali Erturk • Aniks

Photo provided by Modern Misting Systems Inc.

Evaporative Cooling-Temperature Control

Evaporative cooling uses the process of evaporation to control the temperature in an environment. A high pressure pump system and nozzles spray atomized water into the air. The atomized water droplets, which are less than 10 micron, convert quickly to a gas as they absorb the heat from the air. As the air loses heat the temperature drops. This process not only impacts the air but also lowers the temperature of nearby objects as their radiant heat is also absorbed. The efficiency of this cooling method on both the air and nearby objects is what makes evaporative cooling a fantastic means to control temperature.

Evaporative cooling is used in a variety of applications to increase the amount of usable space and control the temperature of the environment. For example, a restaurant will be able to use an outdoor patio even on a hot summer day. The results of this type of cooling are dramatic and can lower the temperature of a patio over 30 degrees with a minimal amount of energy.

Typical Applications:

- Outdoor dining and waiting areas
- Hotels, resorts, and theme parks
- Sporting events
- Warehouses and loading docks
- Poultry barns
- Recreational areas
- Kennels and veterinary hospitals
- Hospitals
- Universities and libraries
- Site tents for cooling workers

> "Cat Pumps are a durable, robust design and our maintenance team is very impressed with the minimal service."
>
> Pete Divone • Unilever R&D

% Relative Humidity

Air Temperature	2	5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80
75	54	55	57	58	59	61	62	63	64	65	66	67	68	69	70	71	72
80	57	58	60	62	63	64	66	67	68	69	71	72	73	74	76	76	77
85	61	62	63	65	67	68	70	71	72	73	74	75	76	77	79	81	
90	64	65	67	69	70	72	74	76	77	78	79	81	82	83	84	86	
95	67	68	70	72	74	76	78	79	81	82	84	85	87				
100	69	71	73	76	8	80	82	83	85	87	88						
105	72	74	77	79	81	84	86	88	89								
110	75	77	80	83	85	87	90	92									
115	78	80	83	86	89	91	94										
120	81	83	86	90	93	95											
125	83	86	90	93	96												

Temperature Delivered by Evaporative Coolers

Photo provided by Modern Misting Systems Inc.

Odor and Pest Control

Misting and fogging systems are commonly used in eliminating unwanted odors and pests. Unlike traditional odor control systems, such as chemical scrubbers and bio filters, misting and fogging systems are significantly less expensive to purchase and operate while providing better performance. Misting and fogging also work effectively to reduce the amount of chemicals applied to many pest control applications. It's the reduction of water, chemical's, and expense with the added benefit of cooling the environment through evaporation that make misting or fogging a great choice for odor and pest control.

Typical Applications:

- Recycling and landfills
- Waste transfer stations
- Trash collection sites
- Water treatment facilities
- Rendering plants
- Food waste sites
- Livestock and poultry sites
- Sanitation
- Paper mills

"We have installed many systems in the effluent treatment industry and have been impressed with the flawless performance of Cat Pumps."

Wayne Hunter • EC Chemicals

Photo provided by Modern Misting Systems Inc.

Special Effects

Misting or fogging systems are used for special effects typically to simulate fog or smoke and create ambiance or intrigue. This, in turn, helps draw a crowd and increases revenue for an event. The added advantage of cooling and humidification also improves the comfort of guests thereby extending their stay in a given place.

Particle size is the key to creating the effect of natural precipitation. Heavy rain, for example, has a particle size of 1000-5000 micron where mist is 30-100 micron. Fog however is even smaller at 1-30 micron. To simulate these natural conditions it is important to select the right nozzle to create the desired effect. Misting or fogging systems are a great way to improve the customer experience and drive additional revenue from a guest's visit.

Typical Applications:

- Theme parks
- Zoos
- Hotels and resorts
- Gardens
- Pool areas
- Motion picture productions

"Cat Pumps have been installed in our botanical garden's fogging system for years. We never touch them which are important with our small maintenance staff."

Ken Henderson • Minnesota Zoo

Mist Dust Suppression

Misting or fogging is used in a variety of applications to control the amount of dust particles in the air. There are two types of systems where misting or fogging is primarily used. The first is wet dust suppression, which uses a mist or fog cloud to wet materials so they are less likely to disperse into the air. The second is airborne dust capture, which uses atomized water droplets to envelope dust particles creating a mass which becomes too heavy to remain airborne and drops to the ground.

The result of these misting techniques is the improvement in air quality and hazardous working conditions for workers. In mining, for example, misting can suppress or remove breathable fugitive dust particles ranging from .1 to 1000 microns to improve the air quality for employees. It also results in equipment life improvements while making it easier for maintenance.

Typical Applications:

- Mining
- Conveyor systems
- Crushing and grinding
- Demolition
- Steel mills
- Stockpiles
- Grain and powder transfer
- Animal buildings

Process Cooling

Process cooling is the use of evaporative cooling and temperature control, typically in a manufacturing environment. Misting and fogging systems are used to replace or augment existing systems including forced air/fans, heat exchangers, air conditioning units, and liquid emersion systems.

Misting or fogging systems benefits can be quite dramatic in improving the quality of products, working environment, while reducing production downtime. For example misting or fogging systems can be used to cool gas turbines to increase the output of the combustion turbines by as much as 20%. It also may eliminate downtime for chemical plants where there are concerns over liquids turning to gases during the transfer process. A misting or fogging system would keep the system temperature down even on hot summer days.

Typical Applications:

- Gas turbine cooling
- HVAC systems
- Cooling towers
- Equipment and electronic rooms
- Manufacturing plants
- Injection molding
- Steel casting-machining
- Food processing
- Air scrubbing

Water Mist Fire Protection

Misting systems are a great means to put out a fire, and are less costly and much more environmentally friendly then chemical alternatives. Unlike traditional systems such as sprinklers or gas extinguishers, misting systems help rapidly lower the temperature and oxygen within a fire while minimizing re-ignition, thermal shock, and the smoke around a blaze. This is a result of the atomization process which generates 8000 droplets of water which would be equivalent in size to 1 droplet from a sprinkler system. These tiny droplets evaporate much faster and therefore are able to cool the fire much more quickly. The efficiency gains also reduce the water consumption to put out the fire by up to 90%. This major reduction in water minimizes property damage and destruction. Overall misting systems have many benefits for fire protection.

Typical Applications:

- Commercial buildings
- Industrial buildings
- Computer facilities
- Government buildings
- Equipment rooms
- Marine ships and platforms
- Transportation tunnels and terminals

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CAT PUMPS
1681 - 94TH LANE N.E. MINNEAPOLIS, MN 55449-4324
PHONE (763) 780-5440 — FAX (763) 780-2958
e-mail: techsupport@catpumps.com
www.catpumps.com

For International Inquiries go to www.catpumps.com and navigate to the “Contact Us” link.

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