ThermOmegaTech®

SELECTING THE RIGHT TEPID WATER SYSTEM

TEPID WATER DELIVERY SYSTEMS FOR SAFETY SHOWER AND FACE/EYEWASH STATIONS

Industrial manufacturing facilities are often inherently unsafe environments – working machines, heavy equipment, and a fast-pace of operation combine in a perfect storm for accidents to occur. Due to this, safety regulations are a primary concern for oil refineries, chemical/petrochemical facilities, and nuclear power plants to maintain proper working conditions for their employees.

For facilities where employees may encounter debris or hazardous materials, safety showers and face/eyewash stations are critical components for safety.

Regulations Governing Tepid Water Delivery

There are a variety of standards and regulations governing tepid water delivery systems to ensure proper worker safety in industrial environments. The most often sited regulations are from OSHA 1910.151, ANSI Z358.1, and ASSE 1071.

OSHA's 1910.151 sets the groundwork and mandates that "where the eyes or body of any person may be exposed to injurious corrosive materials, suitable facilities for quick drenching or flushing of the eyes and body shall be provided within the work area or immediate emergency use." This states that a safety shower or face/eyewash stations is required in facilities where employees are exposed to injurious corrosive materials, but does not specific details with respect to the location, installation, nature, and maintenance of the equipment.

The ANSI Z358.1 standard, published by the International Safety Equipment Association (ISEA) goes further, establishing "minimum performance and use guidelines for eyewash and shower equipment." Key features of this standard include the maximum distance from a worker's station to the emergency fixture and required temperature range.

For a facility to be in compliance, the emergency equipment needs to be installed in a location that "should take [no] longer than 10 seconds to reach" when walking at a normal pace of about 55ft. per 10 seconds.

The standard also mandates that the station's water be tepid, defined as between 60°F and 100°F. Water below this range will be too cold, inhibiting the user from using the equipment for the full 15 minutes; water that is too hot can cause burns and/or a worsened chemical reaction.

ASSE 1071 adds additional regulations in the event of system malfunction. Should the water supply be dangerously overheated, the "device shall have a means to limit the maximum outlet temperature." In addition, the station should "provide full cold-water flow" in the event of a valve or supply failure (also known as 'failing cold') and automatically stop flow "in case of cold-water loss" to prevent accidental scalding.

These regulations governing tepid water delivery systems keep workers safe and steer the development of new products in a more safety-conscious direction.

Tepid Water Delivery System Considerations

A common misconception about tepid water supply for safety fixtures is that merely heat-tracing water supply lines and shower piping eliminates the need for a proper tepid water delivery system. This is incorrect as this setup would not provide sufficient gallons per minute (GPM) flow and may result in water temperature spikes or drops that could make it difficult for the user to use the station for the required 15 minutes.

With recent pushes in the industrial market towards safety-centric practices and equipment, there is no shortage of tepid water delivery systems to choose from.

Selecting the appropriate system depends on a variety of factors including installation conditions and restrictions, available energy (steam, electricity, etc.) sources, and budget.

Currently Available Systems and Solutions

There are a variety of tepid water delivery options currently available including: ASSE 1071 mixing valves, turnkey systems, instantaneous electric, and steam heaters.

ASSE 1071 mixing valves are valves that mix together existing supplies of hot and cold water to produce tepid water. They are offered in a variety of sizes, making them suitable for installations with space restrictions.

These mixing valves may support multiple shower and face/eyewash stations, but will require a source of hot water with sufficient GPM flow. When placed outdoors, ASSE 1071 mixing valves will require freeze protection.

For facilities that do not have an available source of hot water, turnkey systems can be used to provide one. Typically comprised of a pre-packaged, self-contained heater and mixing valve, turnkey solutions are simple to install, but oftentimes have a large footprint, usually requiring dedicated areas for the unit to occupy. If installed outdoors, the unit may require freeze protection.

Instantaneous electric systems are also used for facilities that do not have an available source of hot water. Typically installed on the wall, this option has a relatively small footprint, but very high electric requirements. While the unit only uses energy when there is demand, this can result in higher utility costs and may require special insulation in hazardous or explosion-proof locations.

Instantaneous electric systems normally support only a single combination shower and face/eyewash station and will require additional freeze protection precautions if installed outdoors.

Instantaneous steam heater systems utilize a facility's existing steam supply to instantly heat water to appropriately tepid temperatures. Compactly designed, these systems normally have a relatively small footprint and are simple to install. They use steam only when there is demand and function 100% mechanically, making them ideal for explosive-proof environments as there is no need to insulate them.

These systems have built-in freeze protection and can be placed outdoors with no additional protection, but normally can support only a single combination shower and face/eyewash station.

Additional Points To Consider

Cold weather can freeze water-carrying pipes, leading to burst lines or interrupted systems.

Mixing valves, instantaneous electric, and some turnkey systems will typically require freeze protection when placed outdoors or in non-temperature regulated environments to ensure successful operation in cold weather.

Water-carrying pipes can also easily become overheated by the sun in hot weather or malfunctioning heat tracing throughout the year. Instantaneous steam heater systems utilize built-in over-temperature protection, but it is recommended that other tepid watery delivery solutions implement scald protection valves if the supplier has not already.

Selecting the correct tepid water delivery system is vital to ensuring a safe working environment for your personnel and is not a decision to be made without thorough consideration of your facility's capabilities and restrictions.

However, with appropriate planning and research, your facility will be equipped with the appropriate system that will meet your OSHA-approved tepid water delivery needs.