Once-Through Water-Cooled Refrigeration, Ice-Making and Air Conditioning

New York City restaurants, groceries, food stores and other similar establishments that store and prepare food may have cold boxes, ice-makers, beer and soda cases, freezers and other equipment that is cooled by City water. This type of machinery consumes large volumes of water that flows "once-through," and is then disposed of into the sewer, resulting in higher than necessary water and sewer bills for food-related businesses. When the equipment is properly maintained it can use between 100 and 1,000 gallons of water daily. Unfortunately, once-through water-cooled equipment is often not well-maintained and consumes more water (and electricity) than required for the cooling process.

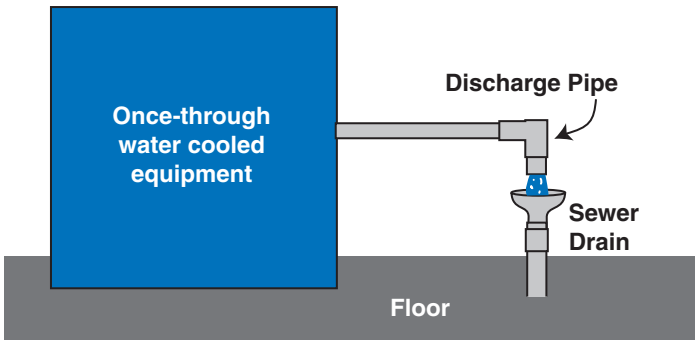
What Does This Mean for My Water/Sewer Bills?

This table illustrates the amount of water and electricity used by a standard 800 pound per day ice making machine, depending on the temperature of the incoming cooling water. Please note that the water/sewer costs are predicated upon the most recent fiscal year charges (FY 2004).

Water and Energy Consumption Increases with High Water Temperatures

Incoming Water Temperature	Daily Cooling Water Use	Annual Water/Sewer Cost	Annual Electricity Cost at 12¢/kwh
50° F	500 gallons	$965	$2,060/year
70° F	1,000 gallons	$1,929	$2,370/year
90° F	2,000 gallons	$3,858	$2,680/year

Even when properly maintained, the relatively small beer and soda cases located in small food stores throughout the City use several hundred gallons of water a day. Basic maintenance can avoid unnecessary water use. The table also illustrates the benefit of basic maintenance such as insulating the water pipes to the water-cooled equipment, particularly if the pipes run through warm spaces.



The Importance of Maintenance

The flow of once-through cooling water is usually controlled by a small valve, called a "solenoid." When the refrigeration or air-conditioning compressor turns on, the valve opens to allow water to cool the compressor. When the compressor cycles off, the solenoid valve should close, ending the flow of cooling water until it is needed again. The largest problem occurs when the solenoid control valve fails, usually in an open position. This means that water continues to flow through the equipment 24-hours a day. When this occurs, the equipment can use (and waste) thousands of gallons of water. In almost every case where a food-related business contacts the New York City Department of Environmental Protection (DEP) about high water and sewer costs, water-cooled equipment, and usually a failed solenoid control valve, are the primary cause.

You can often tell if the control valve has failed, by reaching down the drain where the used cooling water flows to the sewer. Look for a small hole in the floor to the side or behind the refrigeration equipment with a pipe leading to, but not connected to, another pipe. If you see water flowing , test the temperature with your fingers. If the water is warm, the compressor is working and the cooling water is doing its job. If it's cool, the cooling water flowing to the sewer is wasted.

Refrigeration, ice-making and air-conditioning equipment which use once-through cooling water should have maintenance checks at least once a year.

Routine Maintenance Tips

1. Make sure the control valve's function is checked at least annually.
2. Keep walk-in freezer or cooler doors closed. Avoid propping them open.
3. Insulate cold water piping leading to water-cooled equipment, particularly if it is located in a warm space.
4. Make sure that interior lights in walk-in freezers or coolers are turned off when no one is inside. A single 100-watt light bulb left on for ten hours a day, five days a week will add as much additional cooling requirement as would be provided by a large window air conditioner.
5. Keep the exposed cooling coils clean and free of debris.
6. Make sure all seals on refrigeration case doors and cases are in good condition. They protect cold air from leaking out of equipment in the same way weather stripping on windows keeps cold air out.
7. Install plastic inner door strips in walk-in coolers and freezers to seal in cold air.

Check With DEP and/or YOUR LOCAL ENERGY PROVIDER

DEP offers free water audit services to small commercial property owners and proprietors such as food stores, restaurants, as well as to residential property owners. The purpose of the audit is to identify the type of water-using fixtures within the premises and to determine if they are operating efficiently, could be operated more efficiently, or upgraded and/or replaced. Conservation suggestions are offered to the property owner/proprietor in a summary letter that is sent shortly after the audit is performed. If you are interested in this service, please send an email to rgunthorpe@dep.nyc.gov or fax a request to (718) 595-4625. We need the business name, address, a contact name, phone number, and DEP account number.

Finally, you may wish to contact the following resources to obtain more information regarding energy efficient appliances, conservation strategies, and related advice and assistance:

- NYSERDA – The New York State Energy Research and Development Authority www.GetEnergySmart.org and 1-877-NY-SMART)
- CEE – Consortium for Energy Efficiency www.cee1.org and (617) 589-3949
- WaterWiser Information Clearinghouse: AWWA – American Water Works Association www.awwa.org/waterwiser

Click the "Help Center" link at www.nyc.gov/dep for information on:

- Water/sewer billing information and Water Board regulations
- Viewing/printing recent water/sewer bills
- Business compliance with environmental regulations
- Grease disposal tips and rules
- Environmental compliance for dry cleaners
- Pollution prevention efforts
- The Environmental Economic Development Assistance Unit

For information on all non-emergency city services dial 311.

Mayor Michael R. Bloomberg
Acting Commissioner David B. Tweedy

New York City Department of Environmental Protection
59-17 Junction Blvd., Flushing, NY 11373

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