

# Hospitals

Large hospitals employ many water-use functions, such as those of the hospitality industry, food service, industrial laundry, image processing for x-rays, morgue, sterilizing, water purification, vacuum systems, cooling towers and boilers, as well as hygiene practices for patients, staff, and facilities.

## Plumbing

Appropriate technologies include high-efficiency toilets requiring not more than 1.3 gallons per flush and urinals which flush with 1 gallon or less (no automatically timed flushing systems), as well as self-closing faucets with flows of 0.5 gallons per minute (gpm) for hand washing. If available, and where codes and health departments permit, non-potable water may be used for flushing.

## Cooling and Heating Systems

Refer to the “Office Buildings” and “Schools” summaries for recommendations on evaluating cooling towers *versus* air-cooling, open- *versus* closed-loop systems, and heat and hot-water system practices.

## Water Treatment

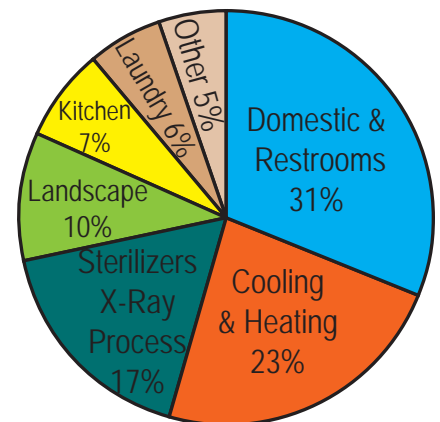
Use water treatment only when necessary.

## Special Purposes and Equipment

All stand-alone steam sterilizers should be equipped with condensate-tempering systems. All vacuum sterilizers should be equipped with mechanical vacuum systems. Promote use of condensate-return systems for sterilizers.

For X-rays, MRI, CT scans, and other imaging, employ digital technologies that allow images to be displayed on electronic video screens and stored on computer files. Where film imaging is required, use self-contained “mini-lab” image-developing units that require no plumbing or washing to develop the film. Produce paper or film copies of images using laser or ink-jet printing technology. Where large x-ray film technologies are retained, employ Water Saver/Plus™ recycling technology to vastly reduce water waste.

**Hospitals combine the functions of hotels, food service operations, industrial laundries, and more. With so many water uses, efficiency can result in significant savings.**



Typical water use in hospitals



Install dry-vacuum systems instead of liquid-ring pumps. All vacuum and compressor systems should be air-cooled or use a radiator cooler or a chilled-loop or cooling-tower system.

Generally, all equipment should be energy-efficient to reduce waste heat, which may otherwise require larger water technologies such as cooling towers.

Air cooling is more water efficient rather than recirculating cooling-water systems. Absolutely avoid once-through cooling with potable water.

**Cleaning and sanitation are important operations in hospitals and clinics of all sizes. Equipment used in floor cleaning should be designed for efficiency in use, as well as effectiveness for sanitation purposes.**

### *Ice Machines*

Ice machines are located in many places throughout hospitals. Select:

- ◆ ice-making machines that are air-cooled, using remote heads to expel warm air outside the work space and customer areas. Air-cooled machines are preferred over cooling-tower loops.
- ◆ energy-efficient flake or nugget machines rather than cube-ice machines. If cube-ice machines are used, those that meet CEE Tier 2 efficiency standards are preferred. Tier 3 machines are even more efficient (CEE Commercial Kitchens).

### *Floor Cleaning*

Recommendations for floor cleaning include:

- ◆ may use wet methods, but wasteful open hoses are discouraged.
- ◆ install drains close to areas where liquid discharges are expected.
- ◆ arrange equipment for easy use of a mop and squeegee system or floor-cleaning machine.
- ◆ install self-closing nozzles, limiting flow to 5 gpm on wash-down hoses.



## Submetering

Major water-using systems and building areas should be separately metered. Submetering helps ensure that the costs of water use and, where feasible, wastewater disposal are equitably dispersed and accounted for accurately. Reflecting actual use and costs often offers a reliable incentive for water-use efficiency.

## Other

Other recommendations include:

- ◆ installing automatic shutoff and solenoid valves on all hoses and water-using equipment.
- ◆ installing faucets on set tubs and janitorial sinks with flows not to exceed 2.2 gpm.

As well as the measures identified here, additional water-efficiency practices are covered in other summaries. For therapeutic pools and landscapes, refer to the summary for **“Water Features, Pools and, Landscapes.”** For kitchens and food service areas, refer to **“Restaurants and Fast-Food Outlets.”** Relevant recommendations are also found in the summary for **“Laboratories.”**

TIP: Conspicuously mark fire-protection plumbing so no connections will be made other than those for fire protection. Install flow-detection meters on fire services to reveal unauthorized water flows.



*Many modern imaging techniques use electronic technologies that go straight to film or computer files that can be displayed or printed on paper. These avoid using water-based processes, saving both water use and wastewater generation.*