

Table 7 Hot-Water Demands and Use for Various Types of Buildings*

Type of Building	Maximum Hourly	Maximum Daily	Average Daily
Men's dormitories	3.8 gal/student	22.0 gal/student	13.1 gal/student
Women's dormitories	5.0 gal/student	26.5 gal/student	12.3 gal/student
Motels: Number of units ^a			
20 or less	6.0 gal/unit	35.0 gal/unit	20.0 gal/unit
60	5.0 gal/unit	25.0 gal/unit	14.0 gal/unit
100 or more	4.0 gal/unit	15.0 gal/unit	10.0 gal/unit
Nursing homes	4.5 gal/bed	30.0 gal/bed	18.4 gal/bed
Office buildings	0.4 gal/person	2.0 gal/person	1.0 gal/person
Food service establishments			
Type A: Full-meal restaurants and cafeterias	1.5 gal/max meals/h	11.0 gal/max meals/day	2.4 gal/average meals/day ^b
Type B: Drive-ins, grills, luncheonettes, sandwich, and snack shops	0.7 gal/max meals/h	6.0 gal/max meals/day	0.7 gal/average meals/day ^b
Apartment houses: Number of apartments			
20 or less	12.0 gal/apartment	80.0 gal/apartment	42.0 gal/apartment
50	10.0 gal/apartment	73.0 gal/apartment	40.0 gal/apartment
75	8.5 gal/apartment	66.0 gal/apartment	38.0 gal/apartment
100	7.0 gal/apartment	60.0 gal/apartment	37.0 gal/apartment
200 or more	5.0 gal/apartment	50.0 gal/apartment	35.0 gal/apartment
Elementary schools	0.6 gal/student	1.5 gal/student	0.6 gal/student ^b
Junior and senior high schools	1.0 gal/student	3.6 gal/student	1.8 gal/student ^b

*Data predate modern low-flow fixtures and appliances.

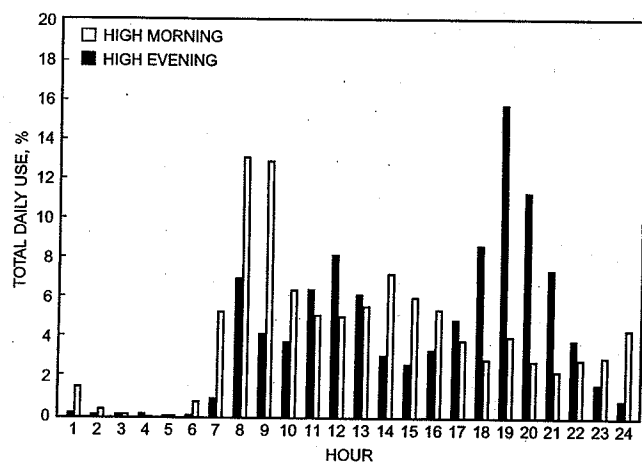
^aInterpolate for intermediate values.^bPer day of operation.

Fig. 13 Residential Hourly Hot-Water Use Pattern for Selected High Morning and High Evening Users

shown in Table 7; however, many of the studies showed higher consumption.

Dormitories. Hot-water requirements for college dormitories generally include showers, lavatories, service sinks, and clothes washers. Peak demand usually results from the use of showers. Load profiles and hourly consumption data indicate that peaks may last 1 or 2 h and then taper off substantially. Peaks occur predominantly in the evening, mainly around midnight. The figures do not include hot water used for food service.

Military Barracks. Design criteria for military barracks are available from the engineering departments of the U.S. Department of Defense. Some measured data exist for hot-water use in these facilities. For published data, contact the U.S. Army Corps of Engineers or Naval Facilities Engineering Command.

Motels. Domestic hot-water requirements are for tubs and showers, lavatories, and general cleaning purposes. Recommendations are based on tests at low- and high-rise motels located in urban, suburban, rural, highway, and resort areas. Peak demand, usually from shower use, may last 1 or 2 h and then drop off sharply. Food service, laundry, and swimming pool requirements are not included.

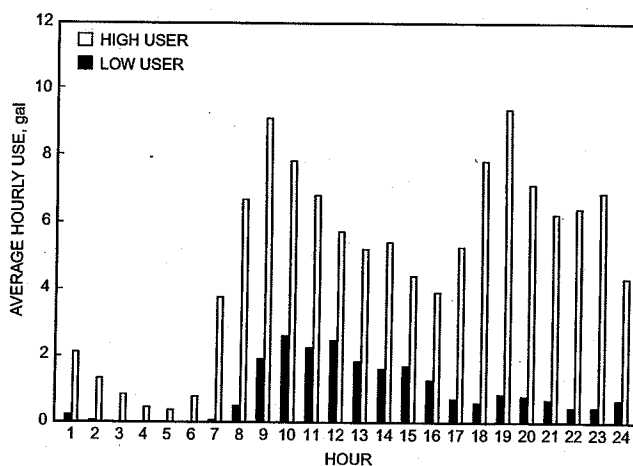


Fig. 14 Residential Average Hourly Hot-Water Use Patterns for Low and High Users

Nursing Homes. Hot water is required for tubs and showers, wash basins, service sinks, kitchen equipment, and general cleaning. These figures include hot water for kitchen use. When other equipment, such as that for heavy laundry and hydrotherapy purposes, is to be used, its hot-water requirement should be added.

Office Buildings. Hot-water requirements are primarily for cleaning and lavatory use by occupants and visitors. Older office buildings often use hot-water recirculation-loop systems and are thus good candidates for water-heating distribution system efficiency upgrades through more modern controls and/or addition of point-of-use water heaters. Hot-water use for food service in office buildings is not included.

Food Service Establishments. Hot-water requirements are primarily for dish washing. Other uses include food preparation, cleaning pots and pans and floors, and hand washing for employees and customers. Recommendations are for establishments serving food at tables, counters, booths, and parked cars. Establishments that use disposable service exclusively are not covered in Table 7.

Dish washing, as metered in these tests, is based on normal practice of dish washing after meals, not on indiscriminate or continuous