

# 2 urinals



Airflush® waterless urinal courtesy of green building store

Uncontrolled urinal flushing can easily account for most of the water used in public and commercial buildings. Fitting flush controllers or waterless urinals overcomes this problem. Waterless urinals that use no water, other than for daily cleaning, are now widely available and the best designs effectively eliminate odour and trap blockage problems. Either option can be a cost effective solution for reducing the amount of water used.

## Urinal controls

Many urinal installations do not have controls and so flush continuously, and often at a higher rate than specified by the regulations. For an office with a 40-hour working week this means that 76 per cent of the flushing occurs when the building is unoccupied.

Under the Water Regulations, urinals should use no more than 7.5 litres per bowl per hour (10 litres for a single bowl) and should have a device fitted to prevent flushing when the building is not being used. In practice, flow rates are rarely measured and will drift with time, or are deliberately increased in a usually vain attempt to solve odour problems.

Many designs of flush controller are available. These either use a timer to match the hours of use or detect the presence of people. This is typically achieved by means of infrared movement detectors or door switches. Mechanical designs use water flow or variations in pressure caused by taps being used, to open a valve to the urinal cistern.

Some controls allow the urinal cistern to fill slowly unless no activity has been detected for a preset period.

**Chesswood Middle School saved nearly 900m<sup>3</sup> per year (a 68 per cent reduction in the total amount of water used by the school) by fitting urinal flush controllers<sup>9</sup>.**

Urinal flush controllers proved to be the most cost effective of a range of water efficiency measures installed throughout the school. Similar savings have been seen in many other case studies.

Water use due to urinals	1314 m <sup>3</sup> per year
After fitting controllers	419m <sup>3</sup>
Water saved	895m <sup>3</sup>
Money saved	£1414 per year
Cost of installation	£960
Payback	Around eight months

Other designs allow the cistern to fill quickly, causing it to flush when people are detected. An electronic delay prevents further flushing for a preset period. Each method has its advantages. Where a large number of urinals are installed with a quick-fill system, separate controllers may be needed to prevent all the bowls flushing when one person enters the room.

Whatever system is installed, it must be correctly set up, tested and maintained. Monitoring at Worthing High School found the urinals were responsible for over 40 per cent of the schools total water use. This rose to 80 per cent as the trial progressed. The problem was traced to faulty urinal controllers, and the situation might have continued undetected had the school not been carrying out a detailed water audit.

The same circuitry can control lights and shut off the water supply when the washroom is unoccupied, therefore saving energy as well as water.

<sup>9</sup> Water Efficient Schools: Chesswood Middle School Project, Magada Styles and Terry Keating, Southern Water 2000

## Flush-per-use systems

The Water Regulations allow the use of single urinal bowls with pressure-flushing valves and a flush volume no greater than 1.5 litres. Each office urinal might serve between one and 30 male workers<sup>10</sup>. The graph shows how flush per use systems can be more economical when each urinal serves less than about 15 users, assuming the automatically flushed urinals are correctly controlled and adjusted.

## Waterless urinals

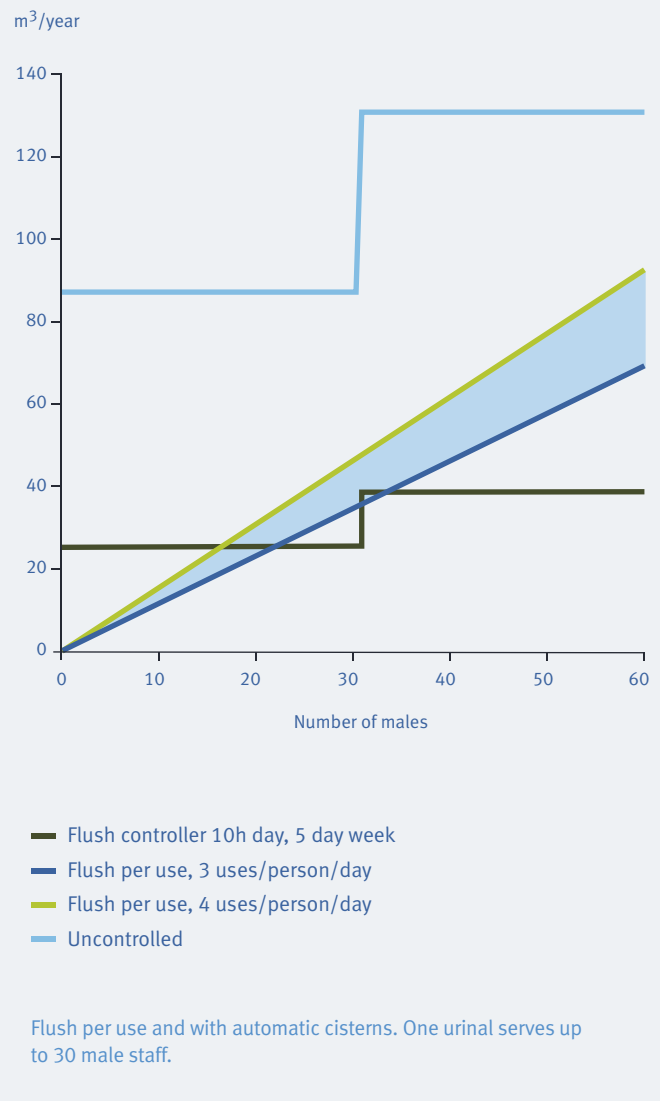
As the name suggests, waterless urinals work without using any water other than for routine cleaning. Some systems are supplied as a complete unit, while others can be retrofitted to standard bowls and troughs.

As well as offering significant water savings, waterless urinals also claim to address some of the problems associated with conventional urinals, namely scale, odour, blockage, and subsequent flooding. Hard water from flushing can form an absorbent layer of lime scale on the bowl, which is thought to contribute to odour. Waterborne lime scale also makes traps and drains block more quickly and the resulting solids are very difficult to remove. Simply turning off the water does not cause odour and may reduce blockages in hard water areas<sup>11</sup> provided the traps are sluiced at least once per week.

Unlike toilet flushing, even normal urinal flushing is not fast enough to clear out the trap and prevent blockages. Waterless designs deal with blockages in a number of ways. Some use a removable disposable trap that retains the urine salts, while others replace the trap with a one-way valve so that urine is not retained and crystals do not have time to form. Some systems retain the conventional tubular trap but prescribe daily or weekly sluicing with water and detergent to flush away solids.

As odour is perceived to be a problem with waterless urinals, most manufacturers offer a countermeasure, usually in the form of a scented block, stick or pad. In reality, odours are usually caused by trap leaks or general hygiene problems around the urinals rather than the lack of water<sup>12</sup>.

**Figure 3:**  
Theoretical water consumption for correctly installed urinals.



## Other advantages

Urinals that do not need water eliminate frost-and-vandal-prone plumbing and avoid flooding when bowls block due to scale or sabotage. Washroom control systems save energy and can help prevent damage by automatically turning off the water supply to unoccupied washrooms.

<sup>10</sup> British Standard, 6465 Part 1, 2006. BSI.

<sup>11</sup> Unpublished BRE research, John Griggs 1979 and experiments by the Author.

<sup>12</sup> Ibid.