

Low flush, poor flush?

CSA will step up monitoring as two-thirds of six-litre toilets fail CWWA tests

By: Simon Blake

Continuing complaints of poor performance from some models of poor flush toilets have prompted CSA International to propose ongoing retesting.

“This would entail selection of samples for testing by CSA inspectors during their ongoing annual unannounced factory audits,” reports Andrew Wagar, media relations officer for CSA Group in Etobicoke, Ont.

As well, the CSA Audits and Investigations Branch is examining a study conducted by the Canadian Water and Wastewater Association (CWWA) that found that only one-third of 38 low flush toilets that it tested worked properly. In an investigation that is expected to take 3-6 months, it will retest CSA certified six-litre models to verify compliance to the CSA 9-45-0-99 General Requirements for Plumbing Fixtures standard, said Wagar.

The Ottawa-based CWWA launched its investigation after municipalities, some of them offering subsidies to building owners to install low flush toilets, became concerned that they were not getting their money’s worth. “Anecdotal information was coming in from across the country ... that six-litre toilets didn’t work – many needed a

double flush,” explained Duncan Ellison, CWWA executive director.

“Our concern is that municipalities that are spending money to subsidize replacement programs in the expectation of having reduced wastewater generation are being deceived...” The other concern, he added, was possible damage to the credibility of CSA where CSA International certified toilets were not functioning properly.

CSA tests simulated

The CWWA tests were intended to duplicate those that 6-litre toilets undergo to gain CSA certification. All toilets were randomly purchased off-the-shelf.

There were four tests:

- The first was for water volume. All toilets were flushed many times at three different hydrostatic pressures to determine actual water use. (A five-percent margin of error was allowed. Therefore, any toilet that flushed 6.3 litres or less passed.)
- The second procedure determined whether the bowl emptied effectively. Blue coloring was added to the water and the toilet was flushed to see if it disappeared.

- The third was a ‘wash test’ in which colored “jelly powder” crystals were sprinkled in the bowl and would stick to the sides. The toilet was then flushed to see if the water introduced around the rim would clean the sides of the bowl.
- The fourth was a ‘removal-of-solids’ test. In this test, CSA uses expensive sponges that are uniform in size and density and can only be purchased from CSA. CWWA didn’t want to exceed its budget by ordering a large quantity. CWWA officials learned that the Department of the Environment in California uses Cheerios for its ‘solids’ test. CWWA decided to adopt that procedure after a comparison test showed that Cheerios and CSA sponges produced similar results. A defined quantity, about a cup, was dumped into each toilet, the toilet was flushed and the remaining Cheerios were counted.

The results! The 38 toilets fell into three categories, said Ellison:

Fourteen passed with flying colors. Designated Tier 1 toilets by CWWA, these flushed with 6.3 litres or less, evacuated virtually all of the Cheerios (leaving no more than 4 in the bowl) and passed the colored dye and wash tests. A few left a hint of blue coloring, but that wasn’t considered as critical as whether they met the other requirements, noted Ellison.

Seven fell into Tier 2. These were toilets that flushed at 6.3 litres or less, but didn’t fully evacuate the bowl, typically leaving 20-40 Cheerios. “They clearly weren’t functioning properly,” said Ellison.

Seventeen toilets were categorized Tier 3. These met the solids test criteria of Tier 1, but used more than 6.3 litres per flush – up to eight litres in some cases.

Ellison added that it wasn’t unusual for three different toilet models from one manufacturer to produce very different results.

Repair part disaster

Another concern for municipalities was whether the toilets would continue to meet the low flush requirements if they had to be repaired using parts a plumber or homeowner might typically install.

Therefore, CWWA next tested all toilets with universal replacement flushing mechanism (“flappers”). In what has to be a strong argument for genuine factory replacement parts, this resulted in more water use for the majority of toilets, with many jumping to 9-10 litres per flush, reports Ellison. One model that flushed at 3.8 litres in the initial test used 13 litres with the universal mechanism.

The CWWA presented its findings to the CSA Audits and Investigations Branch and also forwarded them to the manufacturers.

Ellison emphasized that the testing was not intended to undermine the CSA. But, he added, “If we are going to have certified products, then let’s have products that meet the implicit criteria of these standards: that they will flush at six litres or less and will do so effectively. This, after all, is what the purchases expect.”