After 250,000 flushes, Western engineered toilet valve now saving water

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When Masco Canada was looking to expand one of its tried and true products with an environmental feature, the plumbing giant tagged a pair of engineers from The University of Western Ontario to flush its problem away.

Tony Straatman and Kamran Siddiqui, two Western Engineering professors who specialize in mechanical engineering, were asked to re-configure a mechanical valve known as the Teck II that has been used in toilets for more than 80 years. The goal was to add a dual flush function, allowing for both 'short' and 'long' flushes, but without changing the look or size of the valve assembly. Masco offers customers a dual flush system on electronic 'flushometer' products, but modifying the Teck II will allow tens of thousands of manually operated toilets to save water too.

"Basically, Masco wanted to keep one of its bestsellers relevant while producing a more accurate flush system for water conservation," says Straatman, who explained that many competitors of Masco have faced problems with their mechanical dual flush models. If a user doesn't hold or use the handle correctly, the water savings can be either reduced or entirely lost.

Straatman and Siddiqui started work immediately on the development of a novel secondary bleed valve that can be actuated to reduce the water use for a short flush, and then automatically reset itself prior to the next flush.

“The development of the valve required us to fill in some scientific voids; we were then able to come up with a very elegant solution to the problem”, says Straatman. The pair worked with the team at Western’s University Machine Services to create some sample valves for testing (each one is only the size of a stack of six dimes). A few minor modifications and 250,000 flushes later (the amount required to achieve certification), and the valve was approved by the Canadian Standards Association (CSA). It is already in hundreds of toilets across southwestern Ontario.

Siddiqui says, “Basically, the valves were typically set for six litres per flush and the change we made allows it to be set for four litres on a small flush and six litres on a big flush, so it’s big water savings in high-traffic lavatories.”

For a typical commercial toilet with five small flushes and five big flushes per day, a total of 3,650 litres (803 gallons) per year will be saved. For example, Western’s Spencer Engineering Building with 100 toilets could save 80,000 gallons of water per year.

“Not only did Tony and Kamran bring an expertise to solving this problem but when we were ready to cut prototypes, we could use University Machine Services to do the work. The team there is outstanding,” says Frank Stauder, Masco's Director of Engineering. “They did a great job coming through on timelines and product.”

Provided by University of Western Ontario