

1.06 GALLON TOILETS.....WHY NOT SUITABLE IN ALL APPLICATIONS?

Currently, nearly 200 tank-type toilet models qualify as MaP PREMIUM fixtures. To qualify for the PREMIUM designation, toilet models have a rated flush volume of 1.1 gallons per flush (G) or less – most are rated at 1.06G (4.0 Litres per flush - L). Furthermore, all PREMIUM models must achieve a Maximum Performance (MaP) score of at least 600 grams and be certified to the WaterSense® specification for tank-type toilets. As such, PREMIUM models are exceptionally water-efficient and achieve excellent flush performance.

However, achieving high MaP scores and being certified to WaterSense® do NOT, by themselves, qualify these toilet models as suitable for all types of installations – specifically in certain non-residential installations where external factors dictate whether or not they will perform satisfactorily as a component of the total building's waste removal system. For example:

- 1) Without sufficient supplementary water (clothes washers, showers, baths, dishwashers, process water, food service operations, sinks, etc.), 1.06G (4.0L) may be insufficient to move solid waste completely through the building drain pipes. While supplementary water is typically available in residential installations, this is not necessarily the case in non-residential applications where toilets and urinals are typically isolated from supplementary sources and where lavatory faucets in the toilet room are limited to a flow rate of only 0.5 gallons per minute or less.
- 2) The PERC (Plumbing Efficiency Research Coalition) study has determined that flush volumes at 1.0G and below in non-residential applications could lead to drainline stoppages (depending upon other variables) and are not recommended.
- 3) Application of a single threshold maximum to both residential and non-residential applications assumes conditions in the two types of buildings to be essentially identical. Such is not the case. For example, non-residential buildings tend to have larger drain pipe diameters, shallower pipe slopes, longer pipe runs, and less supplementary flows – all of which negatively impact the flow of waste through building piping. Unlike residential toilets, non-residential fixtures are sometimes required to flush paper toilet seat covers, paper towels, or excessive amounts of toilet paper. As such, the viability of maximum flush volume thresholds for non-residential applications should be considered separately from those of residential. While most single-family residential applications may be suited to the 1.06G toilet models, commercial and some multi-family residential applications may not be.
- 4) Application of a single threshold maximum to both new and existing building structures fails to recognize that the built environment was constructed largely to code criteria developed well over a half-century ago. As recently as 40 years ago, quantities of water delivered to the drainage system were about 3 times that delivered today (see table¹). It is virtually impossible to alter existing building drain pipes in the built environment to accommodate flush volumes at 1.06G and less. On the other hand, new construction could, in some cases, be designed specifically to accommodate very low flush volumes and flow rates.

For the reasons identified above, we maintain that it is inappropriate to mandate a single maximum 1.06G flush volume equally for all residential and non-residential toilet fixture installations.

¹ Source: Plumbing Efficiency Research Coalition, 2012. *Drainline Transport of Solid Waste in Buildings*, Table 2-A, page 10.

**TABLE 2-A. WATER CONSUMPTION BY WATER-
USING PLUMBING PRODUCTS AND APPLIANCES –
1980 TO 2012**

Water-using Fixture or Appliance	1980s Water Use	1990 Requirement	EPAct 1992 Requirement	2009 Baseline Plumbing Code	2012 'Green Code' Requirement	% Reduction in avg water use since 1980s
Residential Bathroom Lavatory Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	2.2 gpm	1.5 gpm	57%
Showerhead	3.5+ gpm	3.5 gpm	2.5 gpm	2.5 gpm	2.0 gpm	43%
Toilet – Residential	5.0+ gpf	3.5 gpf	1.6 gpf	1.6 gpf	1.28 gpf	74%
Toilet - Commercial	5.0+ gpf	3.5 gpf	1.6 gpf	1.6 gpf	1.6 gpf ¹	68%
Urinal	1.5 to 3.0+ gpf	1.5 to 3.0 gpf	1.0 gpf	1.0 gpf	0.5 gpf	67%
Commercial Lavatory Faucet	3.5+ gpm	2.5 gpm	2.2 gpm	0.5 gpm	0.5 gpm	86%
Food Service Pre-rinse Spray Valve	5.0+ gpm	No requirement	1.6 gpm (EPAct 2005)	No requirement	1.3 gpm	74%
Residential Clothes Washer	51 gallons/load	No requirement	26 gallons/load (2012 standard)	No requirement	16 gallons/load	67%
Residential Dishwasher	14 gallons/cycle	No requirement	6.5 gallons/cycle (2012 standard)	No requirement	5.0 gallons/cycle (ASHRAE S191P)	64%

gpm: gallons per minute

gpf: gallons per flush