



Water Efficiency Research Committee Projects - 2009

Project No. 5

Project Name: Audit of Maximum Performance (MaP)-tested toilet fixtures

Description:

Over 1,000 different toilet fixtures have been MaP tested in a laboratory setting and the results reported on various water utility websites for the benefit of customers, specifiers, retailers, plumbers, government, water utilities and others. These individuals and organizations rely upon the performance data to make specification and purchase decisions. Feedback received by the authors of the MaP reports indicate that a small number of models available at retail or at supply houses do not appear to perform satisfactorily, even though they met the MaP test results for flushability. There is some doubt that the models supplied to and sold at these outlets are not necessarily the same physically as the model (of the same name and number) originally MaP tested. If true, models not identical to the tested models need to be identified and the situation rectified. Various venues are available. A more complete scope of work for the proposed audit process is shown on the following pages.

Type of Research: Laboratory

Expected Term to Complete the Research: Approximately 6 months

Estimated Cost Threshold: Medium

Current Status: Unfunded

SCOPE OF WORK

A Field Audit of MaP-Tested Toilet Fixture Models Conducted by Veritec Consulting Inc. and Koeller and Co. (Flush Performance) June 2009

Purpose

To measure and compare the MaP flushing performance of sample toilet fixture models purchased at retail outlets (i.e., randomly selected samples) vs. samples of similar models provided for testing by product manufacturers (i.e., potentially ‘cherry picked’ samples) and to determine if the test samples originally provided by manufacturers are indicative of the product available in the marketplace.

Approach

Previously tested fixture models will be selected from a list comprised of the following:

- (1) Fixtures sold at retail that are alleged by third party organizations (e.g., water utilities, competing manufacturers, advocacy groups) to be different than those originally tested by Veritec or IAPMO under the MaP test protocol.
- (2) Fixtures sold at retail that were originally tested more than two years previous by either Veritec or IAPMO under the MaP test protocol.
- (3) Fixtures sold at retail for which customer complaints have been received by the authors of MaP testing.
- (4) Fixtures designated by retailers as requiring testing in support of their point-of-purchase displays or other reasons.

Fixtures will be obtained at typical retail outlets (e.g., big box stores, conventional hardware and fixture retailers, plumbing supply houses, showrooms, etc.) either through retail purchase or from participating retailers that provide the fixtures free-of-charge exclusively for the purpose of MaP testing.

Test results, comparisons, and the reports on same will be made available to the sponsors of the field audit and, when permitted, will be posted for viewing on a free-access website. The field audit team will publicize the test results to the water efficiency and green building communities, to consumer and environmental advocates, to manufacturers, and any other interested parties.

Methodology

The field audit will generally proceed along the following steps, although modifications may occur as sponsors step forward and toilet fixture models are identified for testing:

Task 1: Identify Audit Model Candidates

Compile a short-list of potential field audit toilet models from the long-list of previously MaP tested toilet models. Consider such variables as regional availability in the North

American marketplace of certain products, extent of concerns over specific fixture models as expressed by third parties, type of fixture flushing technology, date of original MaP test by Veritec or IAPMO, current availability and market penetration of specific fixture models.

Task 2: Purchase Audit Models

Locate, randomly select, and purchase fixture model candidates at retail venues as appropriate. Initially, one of each model will be purchased, however, the field audit may purchase or secure additional quantities of the same model if (a) examination of that model indicates that it physically different (e.g., different tank trim, bowl design, etc.) from the originally tested model OR (b) if MaP test results (in Task 3) reveal a significant disparity between the original MaP score and the MaP score of the audit model.

Task 3: Inspection and Testing of Audit Models

Each model obtained for field audit testing will undergo the following:

- a. A full physical inspection to ascertain that, to the inspector's satisfaction, the model is unchanged from the fixture in the original MaP test. Non-cosmetic discrepancies that could affect flush performance will be identified, documented and reported to the manufacturer; the manufacturer will be queried as to the reason for the discrepancies. In the event that response from the manufacturer is not forthcoming or is unsatisfactory, the model will be removed immediately from the master MaP database and no further testing of the audit model will take place. In the case of WaterSense-certified fixtures, the U.S. EPA WaterSense Program will be immediately notified of the failure to resolve the discrepancies and it will be recommended that the certification of the model be questioned or, in some cases, be rescinded.
- b. Models that successfully complete item a. above will next be subjected to the full MaP testing protocol as described in the most current version of the MaP report, Appendix A. Depending upon the geographic location of the purchased fixture model, testing may be conducted either by Veritec (Mississauga, Ontario) or IAPMO (Ontario, California). The decision as to location will be made exclusively by the organization performing this field audit.

Where the MaP performance of the field audit model is significantly less than the original MaP test results (i.e., over 20 percent less OR where audited performance falls below 350 grams), the manufacturer will be notified and given an opportunity to respond. However, the manufacturer will NOT be permitted to submit their own fixture as a substitute for the field audit model. Rather, the manufacturer and field auditor may jointly and randomly select and obtain/purchase additional field audit models at one or more retail outlets of their choosing in order to continue testing and obtain additional data. One-half of the costs of these additional audit model purchases shall be borne by the manufacturer in question.

If it is concluded, after MaP testing the field audit model, that performance has decreased by more than 20 percent OR fallen below 350 grams, the entry in the MaP report will be revised to reflect the new, lower score. Furthermore, the manufacturer will NOT be permitted to re-submit the same model for MaP testing

for a subsequent period of two years to allow depletion of the existing stock of inferior fixtures.

In those cases where the MaP performance of a WaterSense-certified fixture falls below 350 grams (with uncased media), the U.S. EPA WaterSense Program will immediately be notified and asked to sponsor a re-testing of the model for certification.

Task 4: Reporting

All of the findings of Task 3, together with recommendations for improvement in the audit process, shall be documented by the field audit team in status reports issued no less frequently than every six months. The reports shall be made public and available on one or more free-access websites.

Estimated Costs

For the most part, costs of the field audit effort relate directly to the number of audit models selected and tested. Purchase costs for tested HET fixtures can generally range between \$200US and \$500US, although some models are significantly more expensive. Currently, the MaP testing (Task 3.b) cost ranges between \$750 and \$950 per fixture (not including costs related to purchasing the fixture or to shipping). In addition, this field audit requires physical inspection and comparison of the audit model with the originally tested model (Task 3.a). Assuming an initial audit of 30 fixture models of average cost, the cost for the field audit would be approximately as follows (in U.S. dollars):

Task 1: Identify	\$ 10,000
Task 2: Purchase (30 models at \$350)	10,500
Shipping to laboratories	3,000
Task 3: Inspection and testing	
a. Inspection (30 models at \$200)	6,000
b. Testing (30 models at avg \$800)	24,000
Task 4: Reporting	<u>10,000</u>
TOTAL ESTIMATED COST (30 audit models)	\$ 63,500