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NS: ka

Norm Smith, Test Technician

*[Signature]*

Evaluated by,

Kris Adlukito, PE, Manager Fixture Testing

*[Signature]*

Reviewed by,

By our signatures below we certify that all the testing and sample preparation for this report was performed under continuous, direct supervision of IAPMO Testing and Services, LLC.

Conclusion: The sample tested of the Models ZF-201 and ZF-101 wall-hung urinal from Zero Flush complied with the applicable sections of CSA T1L (Technical Information Letter) MSE-43 entitled, "Plumbing Fixture- for Non-water Consuming Urinal".

Scope of Testing: The purpose of the testing was to determine if the waterless urinal samples tested complied with the applicable requirements of CSA T1L (Technical Information Letter) MSE-43 entitled, "Plumbing Fixture- for Non-water Consuming Urinal".

Primary Standards: CSA T1L (Technical Information Letter) MSE-43 entitled, "Plumbing Fixture- for Non-water Consuming Urinal". The outlet housing was made of plastic and connected to drain coupler which allows urine to sink through the layer and discharged to a sewer line. The urinal was made of vitreous china. The urinal used a special trap cartridge. This cartridge used a odor barrier liquid (lighter than other liquids) which allows urine to sink through the layer and discharged to a sewer line.

Sample Description: Samples of model ZF-101 rectangular shape and ZF-201 oval shape waterless/ non-flushing, water-free vitreous china wall-hung urinal.

Date of Testing: December 21, 2005 through February 1, 2006.

Source of Samples: The samples were received in good condition by IAPMO Testing & Service on December 21, 2005.

Client: Zero Flush Inc  
3200 NW 60<sup>th</sup> St  
Ocala, FL 34475  
Contact: Mr. Judy Mannella

Report Issued: February 2, 2006  
IT&S Project No.: 12796

Report Number: 776-05002-A

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# TEST REPORT



**Sections Tested/Evaluated:**

CSA 311 (Technical Information Letter) MSF-43 entitled, "Plumbing Fixture- for Non-water Consuming Urinal"

- Clause 1.1 Construction and Material
- Clause 1.2 Integral Trap and Outlet Assembly
- Clause 1.3 Outlet Pipe Size
- Clause 1.4 Ridges and ledges
- Clause 2.1 Resistance to Stoppage
- Clause 2.2 Tightness test of Removable trap
- Clause 2.3 Odor evaluation test
- Clause 2.4 Marking
- Clause 2.5 Installation Instructions

CSA B45-02 entitled, "General Requirements for Plumbing Fixtures" and CSA B45-02 entitled, "Ceramic Plumbing Fixtures"

**Section Tested: Construction and Material of CSA B45.0-02**

- Clause 4.1 Material
- Clause 4.2 Surface Finish
- Clause 4.3 Quality of Work
- Clause 4.4 Dimensional Tolerances
- Clause 4.6 Trap Seal Depth
- Clause 4.7 Fitting
- Clause 4.9 Warpage
- Clause 11 Urinals
- Clause 14.4 Load on Unsupported Area
- Clause 14.5 Area-Impact Load

**CSA B45.1-02**

- Clause 3.1 Material
- Clause 3.3 Glazed Surfaces
- Clause 3.4 Blemishes and Defects
- Clause 4.1 Red Ink Test
- Clause 4.3 Crazeing Test

**Test Results:** All tests and evaluations were conducted per the written procedures in the specified standards.

CSA 311 (Technical Information Letter) MSF-43 entitled, "Plumbing Fixture- for Non-water Consuming Urinal"

**Clause 1.1-Construction and Material -- COMPLIED**

The construction and materials of non-water consuming urinal met the applicable requirements of CSA Standard B45 Series-02. Please refer to the CSA B45 clauses.

Clause 1.2 Integral Trap and Outlet Assembly - COMPLETED

The waterless urinals had an integral trap with a liquid seal and outlet assembly for connection to the drainage system.

Clause 1.3 Outlet Pipe Size - COMPLETED

The outlet pipe is connected to flange coupler that can be connected to a 2" line.

Clause 1.4 Ridges and ledges - COMPLETED

The urinal did not have ridges or ledge that would retain raw urine

Clause 2.1 Resistance to Stoppage- COMPLETED

With the fixture installed on a test stand in accordance with the manufacturer's installation instructions, two unfiltered cigarette butts 38 mm +/- 2.5 mm were dropped into the urinal and tap water added to the unit at a flow rate of 0.125 gpm. This procedure was repeated, alternating between the cigarette butts and water until a total of twenty cigarette butts and ten pints of water had been added. The cigarette butts were removed and the test repeated five times alternating between unfiltered and unfiltered crumpled cigarettes.

Findings: There was no evidence of stoppage or clogging during the test.

Clause 2.2 Tightness Test of Removable Trap - NOT APPLICABLE

The urinal did not use a removable trap. It is a bell trap. The trap was filled with water and odor barrier liquid.

Clause 2.3 Odor Removal Test - COMPLETED

The urinal tested must meet the odor evaluation test when tested per section 7.8.3.1 of the standard. The urinal was evaluated over five (5) weeks period by 5 laboratory personnel for 261 times.

Reading 1, acceptable 258 times

Reading 2, barely acceptable 3 times

Reading 3, not acceptable 0 times

Requirement: 95 % of all readings shall be either 1 or 2.

Clause 2.4 Marking - COMPLETED

The urinal was legibly, visibly and permanently marked per the drawing with the following:

- (a) The manufacturer name that legibly and visible after installation.
- (b) The fixture was legibly and visibly marked with the UPC.

Clause 2.5 Installation Instructions - COMPLETED

The urinal was accompanied by the manufacturer's installation instructions which include pre-installation, preparation of site and step-by-step installation.

The maintenance instruction was included in the installation instructions, and include the cleaning method, frequency rates, replacement of parts, recommended cleaning agent, trouble shooting of problem and other related information that will render the operation of the urinal effective.

CSA B45.0-02

Clause 4.1 Materials - COMPLETED.

4.1.1 The urinal materials were free from deficiencies that would affect the fixtures intended purpose.

Clause 4.2 Surface Finish - COMPLETED.

The urinal had a smooth, hard, corrosion-resistant surface, free from blemishes and defects to the extent specified in CSA B45.1.

Clause 4.3 Quality of Work - COMPLETED.

The urinals did not have any exposed sharp or jagged edges, burrs, cracks, or defects that might affect their use and serviceability.

Clause 4.4 Dimensional Tolerances - COMPLETED.

The urinal dimensions were within the dimensional tolerances.

Clause 4.6 Trap Seal Depth - COMPLETED.

The urinal had a trap seal of more than 38 mm.

Findings: Actual trap seal was 51 mm.

Clause 4.7 Fitting - NOT APPLICABLE

The waterless urinal did not use flushometer or supply flushing mechanism and integral trap.

Clause 4.9 Wapage - COMPLETED.

The urinal wapage met the requirements of CSA B45.1. Refer to CSA B45.1, Clause 3.5 within this report.  
Clause 11 Urinals

- Clause 11.1 Urinal Test Pressure – NOT APPLICABLE - The urinal tested was waterless
- Clause 11.2 Mechanism and Hardware – NOT APPLICABLE - The urinal tested was waterless
- Clause 11.3 Type of Urinal – COMPLETED - The urinal tested was a wall-mounted type with wall bracket.
- Clause 11.4 Spud Connection – NOT APPLICABLE - The urinal tested was waterless .
- Clause 11.5 Urinal
- Clause 11.5.1 Construction – NOT APPLICABLE - The urinal tested was waterless
- Clause 11.5.2 Water Change Capability Test – NOT APPLICABLE - The urinal tested was waterless.
- Clause 11.5.3 Rim Wash Test – NOT APPLICABLE - The urinal tested was waterless
- Clause 11.5.4 Water Consumption – NOT APPLICABLE - The urinal tested was waterless
- Clause 11.5.5 Residual Trap Seal Depth – NOT APPLICABLE - The urinal tested was waterless

Clause 14.4 Loads on Unsupported Area – NOT APPLICABLE

The urinal tested was made from vitreous china, see clause 14.1

Clause 14.5 Area-Impact Loads – NOT APPLICABLE

The urinal tested was made from vitreous china, see clause 14.1

CSA B45.1 - 02

Clause 3.1 Materials – COMPLETED.

The materials shall meet the requirements of Clause 4.

Clause 3.2 Thickness – COMPLETED

The thickness of the ceramic material shall not be less than 6.35 mm / 0.25 inch at any point.

Findings: Minimum thickness found, exclusive of the glaze, was 0.25 inch on top of the back wall for model ZF 201. Model ZF 101 thickness was 0.27 inch on top side of the back wall.

Clause 3.3 Glazed Surfaces – COMPLETED.

The glaze was thoroughly fused to the body of the urinal. All exposed surfaces were glazed except those coming in contact with walls and floors.

Clause 3.4 Blemishes and Defects - Complied.

3.4.1 The urnal did not contain any discolored areas, dull or eggshell finish, dunts, exposed body, fire cracks, large blisters, or projections.

3.4.2 The urnal was examined for blemishes and defects on all visible surfaces in accordance with Clause 15.3 of CSA B45.0 and Tables 1 of CSA B45.1.

Findings:

The wavy finish, spots, medium blisters, pinholes, small blisters or specks on the bowl were less than the maximum allowed in Table 1 of the standard.

Clause 3.5 Warpage Tolerances - COMPLIED.

Warpage did not exceed 20mm/m for the back when tested per Clause 15.5 of CSA B45.0.

Findings: Actual warpage found was 2.12 mm/m for model ZF-201 and 2.91 mm/m for model ZF-101

Clause 4.1 Red Ink Test - COMPLIED.

When tested per Clause 7.1, the test sample shall not show any discoloration through the glaze and did not show absorption, when broken, to a depth greater than 3 mm below the fracture at any point.

Clause 4.2 Water Absorption Test - COMPLIED.

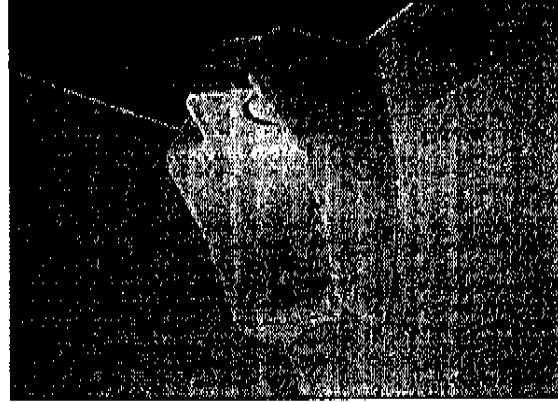
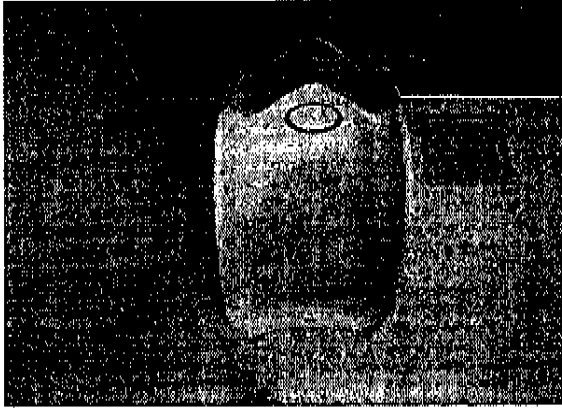
When tested according to Clause 5.2, the average water absorption of the test samples shall not exceed 0.50%.

Findings: Average absorption observed was 0.35%.

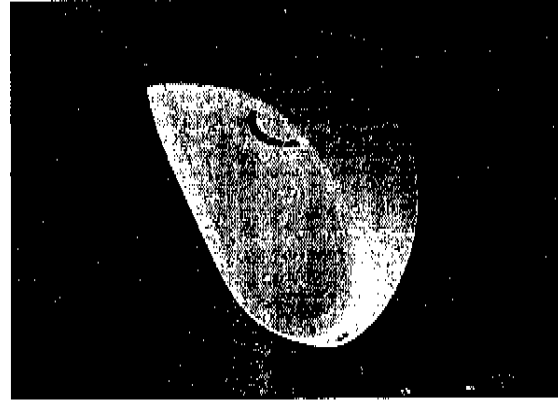
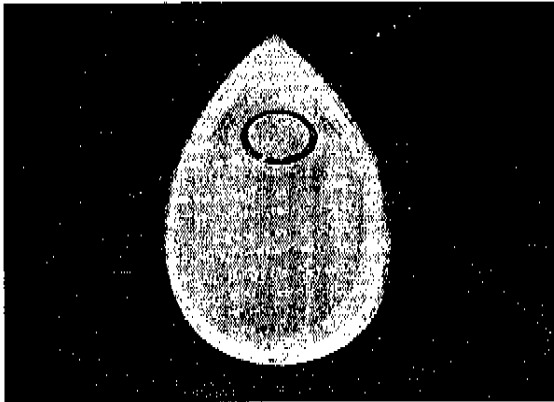
Clause 4.3 Crazeing Test - COMPLIED.

When tested according to Clause 7.3, no crazeing shall be found.

ZF-101



ZF-201



Photograph of Sample Tested: