



CERAMIC TILE INSTITUTE OF AMERICA, INC.

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CTIOA FIELD REPORT 81-7 (R-98)

**SUBJECT: Suggested Standard Test Method for
COUNTER TOP GLAZED AND UNGLAZED CERAMIC TILE**

PREFACE

1. There is an ongoing effort to arrive at acceptable standards for ceramic tile for kitchen counter top installations. The following report is based on initial testing results and input from knowledgeable individuals from all areas of the tile industry. This report is not to be used as an accepted document, but rather a general guideline. This guideline to be used as the basis for further testing and as a general interim criteria for evaluation.
2. The document and requirements were developed with the idea that manufacturers and distributors can do their own preliminary testing, the materials are easy to obtain. Fresh lemon juice can be used in preliminary tests instead of the 10% citric acid solution.

COUNTER TOP GLAZED AND UNGLAZED CERAMIC TILE

TEST PROCEDURE CTIOA-81-7 (R-98)

I SCOPE AND DEFINITIONS

1.1 These tests set requirements for glazed and unglazed ceramic tile for use on counter tops.

1.2 Ceramic tile for counter tops shall pass the requirements of this CTIOA-81-7 test and may be of any type tile passing the requirements of A137.1 - 1988 or

CTIOA-69-5 (R-98).

1.3 Tile that pass these test requirements, which are basically for counter tops, are also suitable for wall surfaces.

1.4 Tile may be non-vitreous, semi-vitreous, vitreous or impervious. When tested as described in ASTM C373, the average water absorption shall not be greater than 15%.

1.5 Definitions are those listed in ANSI A137.1-1988 or CTIOA-69-5 (R-98)

II SECTION OF TILE FOR TESTING

2.1 Tile specimens shall be selected at random from the lot or shipment to be tested.

2.2 Not less than eighty tile shall be selected for conducting the tests.

2.3 Each separate lot or shipment of tile shall have the proper number of tile taken and separate tests and reports shall be made on each.

III MOHS SCALE SCRATCH TEST

3.1 When tested as described in appendix A, both the tile surface and the tile bisque shall be tested. The MOHS hardness for the bisque shall not be less than 4.0, and to resist normal scratches the surface shall be greater than 6.0, and for light duty scratch resistance the surface shall be greater than 5.0.

IV ACID RESISTANCE TEST

4.1 When tested as described in appendix B, there shall be no evidence of etching or staining.

V WATER PENETRATION THROUGH THE GLAZE

5.1 When tested as described in appendix C, there shall be no evidence of moisture penetration through the glaze.

VI CLEANABILITY

6.1 When tested as described in appendix D, there shall be no evidence of stains on the surface of the tile.

VII BREAKING STRENGTH

7.1 When tested as described in ASTM C648, the tile shall have a breaking strength not less than 90 load pounds.

VIII CRAZING - Glazed tile only

8.1 When tested as described in ASTM C424, using 150 psi steam pressure, tile shall show no evidence of crazing for one cycle.

IX FREEZE/THAW RESISTANCE - Exterior counters only

9.1 When tested as described in ASTM C1026, tile shall not show any damage after 15 cycles.

X IMPACT RESISTANCE

10.1 When tested as described in ASTM C368 (modified) using 1/16" diameter striker, the minimum value for edge chipping resistance shall be greater than 0.02, and the minimum value for impact resistance on the surface shall be greater than 0.06.

XI MARKING RESISTANCE TO METALS

11.1 Tile shall not retain marks from metal utensils after cleaning with neutral pH cleaner.

APPENDIX "A" STANDARD TEST METHOD MOHS HARDNESS SCALE FOR DETERMINING GLAZE AND BISQUE HARDNESS OF CERAMIC TILE

I SCOPE

1.1 The Mohs hardness scale is employed to rate the hardness of both glaze and bisque of ceramic tile.

II APPARATUS

2.1 A set of Mohs hardness minerals. This consists of a set of pencil like tools with increasingly hard and dense minerals cemented into the ends of pieces of the minerals in the Mohs scale.

III TESTING PROCEDURES

3.1 Five tile would be selected at random and the test administered.

Beginning with a medium mineral hardness progress by applying mediumhard pressure until the tested surface is scratched. At that point a hardness value is given the tile glaze or bisque. That value is the hardest mineral not to scratch the surface.

APPENDIX "B" TEST FOR GLAZE SURFACE STAINING WITH 10% CITRIC ACID

I SCOPE

1.1 This procedure is designed to test ceramic tile glazes for potential etching problems when used on kitchen counter tops. The 10% citric acid will test the tile for its resistance to common acids from oranges, lemons, fruits and vegetables used on counter tops.

II MATERIALS AND EQUIPMENT

- 2.1 A 10% citric acid in aqueous solution.
- 2.2 Watch glasses to cover the acid solution during the test period.

III TESTING PROCEDURE

3.1 The 10% citric acid solution is applied in a small puddle, then it is covered so as to slow evaporation. The specimens are allowed to set for 16 hours. At that time the specimens are washed thoroughly and inspected for evidence of etching or staining.

APPENDIX "C" STANDARD TEST METHOD FOR TESTING THE RESISTANCE TO PENETRATION OF WATER OR LIQUIDS ON GLAZED TILE WHEN USED ON COUNTER TOPS

I SCOPE

1.1 To determine if the glaze is resistant to the penetration of water and liquids.

II APPARATUS AND PROCEDURE

- 2.1 Set up a water head on the glazed surface of the tile.
- 2.2 The water is colored with a dye.
- 2.3 A section of plastic pipe is placed in the center of the tile and silicone caulking is used to seal the pipe to the tile.
- 2.4 A sheet of white bond paper is placed underneath the tiles to be tested.
- 2.5 The water is allowed to be in contact with the tile surface for 16 hours. At the end of the time period the paper is checked for any sign of water penetration.

III REPORT

3.1 Sign of water penetration would indicate failure of that glaze for use on counter top installations.

APPENDIX "D" STANDARD TEST FOR CLEANABILITY OF CERAMIC TILE FOR USE ON COUNTER TOP INSTALLATIONS

I SCOPE

1.1 To determine the ability of ceramic tile to resist staining when used on kitchen counter tops and subjected to foods commonly used in kitchens.

II MATERIALS AND PROCEDURES

2.1 Mustard, ketchup, animal fat and vegetable oil are placed in spots on the surface of the tile, leaving clean areas to use for comparison to any possible stains that develop.

2.2 The products are allowed to remain on the surface of the tile for a 24 hour period.

2.3 The products are thoroughly washed off of the tile surface with common household cleaning materials at the end of the testing period.

III REPORT

3.1 Evidence of staining constitutes failure of that tile for use on kitchen counter tops.