



CERAMIC TILE INSTITUTE OF AMERICA, INC.

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CTIOA Field Report 88-5-1 (R-98)

SUBJECT: TILE CHIPPING AND PITTING

SUBJECT:

The subject of tile chipping has been a provocative topic in our industry for many years. This report deals with a manufactured tiles ability to resist chipping.

A glaze is cracked and/or broken when an impact is forced upon it. The fracture is evident initially by a small mark slightly lighter in color than the glaze color. As the pit becomes more pronounced, more of the glaze is fractured and removed. If the impact is severe, some tile's under glaze or bisque will be visible.

The pits can be caused from various items such as a knife, fork or spoon falling from the counter or table. Pits can also be caused from a small stone embedded in a sole or heel of a shoe or a protruding nail.

It may require testing, therefore, to determine the fine line of durability for the intended uses of each tile.

The impact tester used for testing dinnerware in ASTM C368 was modified to test tile. The original tester used a blunt striker which appeared to be too broad to duplicate the type of impact pits found in the field. Extensive testing was carefully analyzed using the blunt, 1/8" diameter, 1/16" diameter and **1/32"** diameter strikers for the impactor.

The 1/16" striker provides a glaze impact similar to those found in the field on problem tile.

When the bisque and glaze Mohs hardness has a deviation that is greater than 2, it is

usual to find the glaze easily chipped if the resistance to the impact point of ASTM C368 modified is low.

The tile surface can easily be chipped if the, ASTM C368 (modified), test procedure is performed using a 1/16 inch diameter point and having values that are less than 0.07 foot pounds.

The edges will usually chip easily when the tile test values are less than 0.05 when using a 1/16 inch point.

CONCLUSION

The CTIOA, Inc. feels that many considerations must enter into the decision making process when evaluating tile for floor use. Even light duty residential floor tile received their share of use and abuse and high gloss glazed tile is a product which by its nature is least capable of resisting wear.

When there is a sizable deviation in the hardness of the glaze and the bisque of a glazed tile, the tile appear to chip more readily than those with the same Mohs hardness.

CTIOA, Inc. suggests the minimum value for edge chipping to be 0.05 or greater for the tile to be acceptable.

Also, CTIOA, Inc. suggests the minimum value for impact resistance on the surface to be 0.07 or greater to be acceptable.