



CERAMIC TILE INSTITUTE OF AMERICA, INC.

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CTIOA Field Report 83-12-1 (R-85)

SUBJECT: REINFORCING WIRES FOR CERAMIC TILE BACKINGS

I. INTRODUCTION

A. For over two decades, paper backed reinforcing wire was not recommended by the Ceramic Tile Institute.

1. Because of the way the wire was made, the lapping of the wire was not being performed properly when installed.

2. The guage of the wire was not consistent and qualities varied.

B. The tile installed over improperly lapped reinforcing wire within the mortar beds were cracking.

C. The reasons for not promoting these reinforcing materials were printed in a CTI Field Report No. CTI 73-4-1.

D. CTI Field Report No. CTI 83-12-1 primarily addresses the use of the newly improved wires, which provide the needed one full mesh wire to wire reinforcing lap.

II. DISCUSSION

- A. The ceramic tile industry was plagued with failures to their finished installations when paper backed wire was used as the reinforcing material.

- B. When inspectors from the Technical and Job Problem Committee investigated the reasons for the obvious cracks through the tile and loose tile in predictable patterns, the causes were the result of the paper preventing a proper lap of the two pieces of wire.

- C. When the mortar bed cracks because of the improper lap, tile cracks.

- D. Contractors lodged complaints that paper removal was too costly, but needed to properly lap the wire and paper on the paper backed wire.
 - 1. To tear the perforated paper from the wire sufficiently to get a full mesh lap of the wire is time consuming.

 - 2. The installing of paper and wire, each of which is a separate operation, became more cost effective for the conscientious installer compared to the paper removal.

- E. K-Lath, a division of Tree Island Steel, Inc., heard about these problems, and came to the Ceramic Tile Institute with a desire to have their materials tested; both with the old design style and the new improved design.

- F. The purpose of the tests were to determine:
 - 1. First, if paper backed wire could be properly lapped to achieve sufficient reinforcing within a mortar bed onto which ceramic tile would be bonded.

 - 2. Second, to determine the modulus of rupture (flexure) values of various reinforcing materials.

3. Thirdly, to determine the correlation between support spacing of 12", 16" and 24".

4. To achieve quality test data, stringent controls were set to remove any variables that could effect the gathering of accurate results.

G. The tests clearly point out that when paper backed wire reinforcing was improperly lapped, the test samples broke prematurely.

1. The position of the breaks within the samples positively correlates with the breaks we have found in the field when the installers did not make proper laps.

2. These cracks have caused an unknown cost in repairs to ceramic tile installers as well as other finishers, including color coat plasterers.

III. CONCLUSION

A. The Ceramic Tile Institute does not recommend any reinforcing materials when they are installed over studs that are greater than 16" on center.

B. CTI recommends that if a mortar bed is to be machine applied as opposed to hand troweled, it may be necessary to insist that the span be less than or equal to 12" on center to achieve the desired deflection of less than $1/360$.

C. CTI recommends that all reinforcing materials be properly lapped.

D. The newly improved modified K-Lath is one of those recognized reinforcing materials, that when properly lapped, will suffice to strengthen ceramic tile mortar beds.

- E. To verify that the correct material is chosen, look for the Ceramic Tile Institute's Tested Material Logo on the packaging, cartons or material. This logo is a mark of distinction for building inspectors and professionals to recognize that the tile industry has tested and approved it's use.

- F. The reinforcing material and the tile installation must conform with the Standards of the Tile Trade.

- G. Ceramic Tile Institute encourages other manufacturers of reinforcing wires to submit their wire for consideration so that they can also be listed.