



CERAMIC TILE INSTITUTE OF AMERICA, INC.
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CTI FIELD REPORT 73-1-3 (R-85)

SUBJECT: Graded Extra Fine Sand Aggregate

I. Introduction

- A. "Graded Sand" This is the impact message for this Field Report. The extra fine sand, for spacing mix in ceramic mosaic tile and for wide portland cement grout joints, must be graded. Ceramic Tile Institute has developed a standard for the sand, it is Standard CTI-70-6, Specification for Graded Extra Fine Sand.
- B. Much misunderstanding exists regarding this sand, its importance and just what the tile industry needs.
- C. Sand with only one sized grit should not be used and will not do a proper job.
- D. The tile industry needs both white and gray extra fine graded sand.
- E. To prove its value some compressive tests on 2' x 2' cubes of mortar, made with extra fine graded sand, have been conducted by the Ceramic Tile Institute. More comprehensive studies are available in masonry and plastering manuals.
- F. These studies show shrinkage increases and both compressive and tensile strengths decline when there is a predominance of either fine or coarse particles present.
- G. When there is a blend of particles of proper sizes, which supplies the prescribed grading, the compressive and tensile strengths are dramatically increased.

.. An additional one-third in PSI is the added strength in compressive tests.

.. An additional two-thirds in PSI is the added strength in tensile tests.

- H. Standard CTI-70-6 should be used to obtain the recommended grading. This includes sand 100% of which passes through a 16 mesh sieve. It also contains requirements for 30, 50, 100 and 200 mesh sieves.

II. Standard CTI-70-6

- A. The standard is ASTM C 144 with a different scope and grading requirements.
- B. The more coarse sized particles have been omitted and the finer particles adjusted to make the proper gradation.

III. Availability

- A. Gray extra fine graded sand is available wherever there is a supply of good sand and a screen with a mesh with holes the size of a window screen. However, this will as a rule, not conform to CTI 70-6, but will be much better than one grit silica sand.
- B. Usually, we do not name manufacturers, but in this case, we do because of the limited supply. As other companies become known, they will be published.
- C. "70 Tile" sand will pass the grading requirements. Crystal Silica Company's "70 Tile" sand is white.

IV. USES

- A. What is done in the joints of the ceramic mosaic tile during the installation has much to do with the finished grout job. There is a definite danger in using a one grit sand, even if cement has been added into it for half and half. This is true even if it is a fine grit and worse if it is a coarser grit. Don't use one grit silica sand. During the clean-up, water will remove the cement from between the grains because there are no fines to hold it there.
- B. Half and half means just exactly that; half Portland cement and half fine graded sand. Don't guess; measure out the sand and the cement and then place them in the proper size container and mix. Pouring them at the same time will help blend them together. After the half and half is well mixed dry, it is best to moisten it before applying it to the tile. Again mix well to get uniformly moistened half and half.
- C. After the floor is beat in and the paper removed the half and half must be removed to allow a uniform and adequate depth of grout in the joint. If the finished job is going to have white joints special care must be taken in the cleaning to be sure no dark sand or cement shows through the finished white joints. White cement and white graded sand can be used for the half and half.
- D. The graded sand is usable in any required proportions for use in job site mixed grouts.