

the end of three days ; 400 lbs. per square inch at the end of seven days, and 500 lbs. per square inch at the end of 28 days. All briquettes shall be one day in air, under a damp cloth or in a damp chamber, and submerged in clean water for the remainder of the time periods. Any cement which shows a decrease in strength on or before the twenty-eighth day is to be rejected. The decisive tests shall be considered as the average of five briquettes, although for ordinary practice two or more briquettes may be sufficient and, in the latter case, only the highest test of the group is to be taken as the strength of the cement.

In determining the tensile strength of a briquette, the area of the broken surface shall be measured with great accuracy, as errors sometimes exceeding 10 per cent. are possible unless such measurements are insisted upon.

SAND AND CEMENT. - In sand tests, the sand and cement must be thoroughly mixed together while dry. After the water has been added, either for neat or sand tests, the mortar shall be thoroughly mixed for a uniform time ; suitable periods being two minutes for machine mixing and five minutes for hand mixing.

Briquettes made of one part cement and three parts standard sand, shall remain in a damp atmosphere for 24 hours, when they shall be immersed in water and shall then bear a tensile stress of 125 lbs. per square in. after submersion for six days, and 200 lbs. per square in. after submersion for twenty-seven days.

At the end of the same period the minimum compressive strength of a mixture of one part cement to three parts sand shall be 2,000 lbs. per square inch.

[NOTE.—Quick setting cements generally show a lower strength than that specified above].

The tensile strength of briquettes, mixed in the proportion of 3 to 1, or of other sand briquettes, shall not show a decrease either on the twenty-eighth day or subsequently.

In every case the quantity of water used in mixing shall be stated in the report.

The quantity of water to be used in neat tests varies with the kind of cement, fineness, etc., and hence no arbitrary quantity can be specified, the correct method being to bring all mortars to the same degree of plasticity. An apparatus, similar to "Vicat's," and consisting of a needle having an area of 0.4 square inches, weighted to about 11 oz., may be used.

"The tests are made as follows : A ring, 1½-in. in height and 3-in. in diameter, made of non-absorbing material, is placed on a glass plate and filled with the mortar to be tested, the consistency being such that the needle does not entirely pierce it. (Trans. Amer. Soc. Civil Engineers, Oct., 1893).