

## (6) TENSILE AND COMPRESSIVE TESTS.

The strength of Portland cements shall be determined by testing neat cement and, if required, a mixture of neat cement and quartz sand. The tests shall be made in a uniform manner (both for tension and compression) with briquettes of the same form and same cross section and with the same apparatus.

NEAT CEMENT.—Neat tests, except where fineness, specific gravity and hot bath blowing tests are also made, are misleading as to the value of a cement. Briquettes of neat cement, in which these characteristics have been determined and found to be satisfactory, shall bear a tensile stress of 250 lbs. per square inch at 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 ten percent 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 twenty-four hours, when they shall be immersed in water and shall then bear a tensile stress of 125 lbs. per square inch after submersion for six days and 200 lbs. per square inch 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.