ENGINEERING MATERIALS SESSIONAL

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Experiment No.	11	ASTM	C 190

TITLE

Determination of Compressive Strength of hydraulic cement mortars

INTRODUCTION

This test covers determination of Compressive Strength of hydraulic cement mortars using 2" [50 mm] cube specimens

SIGNIFICANCE

- Means of determining the Compressive Strength of hydraulic cement and other mortars
- This method is referenced by other methods and specifications

APPARATUS

- Weights and weighing device
- Glass graduates
- Specimen mold [2" cube; shall have not more than 3 cube compartments]
- Mixer, bowl and paddle
- Flow table, flow mold

APPARATUS

- Tamper
- Trowel
- Moist Cabinet
- Testing machine

Testing Machine

Mortar Mixer

Cube Mould

PROCEDURE

1. Preparation of Specimen mould

a) Apply oils and greases using cloths or other means
b) Wipe the mould faces and base plate to remove any excess release agent and to achieve an even coating on the interior surfaces
c) Seal the surfaces where the halves of the mould join by applying a coating
d) After placing the mould on its base plate carefully remove with a dry cloth any excess oil or grease from the surface and base plate to which a sealant is used

PROCEDURE

2. Composition of mortar

a) The standard proportion shall be 1 part of cement to 2.75 parts of sand by weight

b) Use w/c ratio as 0.485

PROCEDURE

3. Preparation of mortar

a) Mechanically mix in accordance with practice C 305

PROCEDURE

4. Molding the Specimen

a) Place a layer of mortar of 1" in all cubes. Tamp the mortar in cube 32 times
b) Tamping pressure is to ensure the uniform filling of the mould
c) Fill the next layer and tamp as before
d) After tamping, the tops of all cubes should extend slightly above
e) Cut and smooth the top surface by trowel
f) Keep all the cubes in moist closet or moist room for 20 to 72 hours

PROCEDURE

5. Loading

a) Remove from the moulds
b) Keep these for curing
c) Wipe the surfaces
d) Place the sample in the testing machine below the centre of the upper bearing block
e) Take load reading at failure

CALCULATION

Weight of cement = 500 gm
w/c ratio = 0.485
Weight of water = ?????
Cement : Sand = 1 : 2.75
Weight of Sand = ?????

Standard Sand		
Sieve No.	Percent Retained	Weight (gm)
30	2	????
40	26	????
50	45	????
100	27	????

Table 11.1: Stress Calculation

Curing [days]	Sample No.	Load [N]	Area [mm^2]	Stress [MPa]	Average Stress [MPa]
3	1	????	????	????	Stress = 0.9*Ave. to 1.1*Ave. Then Average or Not Averaged
3	2	????	????	????	
3	3	????	????	????	
7	1	????	????	????	Stress = 0.9*Ave. to 1.1*Ave. Then Average or Not Averaged
7	2	????	????	????	
7	3	????	????	????	

RESULT

Compressive strength of cement mortar at 3 days = ???? Mpa
Compressive strength of cement mortar at 7 days = ???? Mpa

DISCUSSION

- Before loading, check the surfaces for curvature, if it has, grind the face
- Start molding the specimens within a total of not more than 2 min. 30 sec. after completion of original mixing of mortar batch