

LAB 3: Testing of cement – part II.

1. Preparation:

- flexural strength – (chapter 13.2.1 – p. 69)¹
- compressive strength (chapter 13.2.2 – p. 70)
- mechanical and physical requirements for cement (tab.31, p. 71)

2. Procedure

Bulk density of the hardened cement mortar:

- find your test samples, dry them and mark them
- measure the samples sizes with an accuracy of 0,1 mm
- weight the samples with an accuracy of 0,01 g

Flexural strength test:

- place the prism in the testing machine according the teachers instructions and carry out the test according the instruction

Compressive strength test:

- the test is carried out with the prism halves after the test of the flexural strength
- centre the prism halves laterally to the auxiliary platens and place it into the testing machine according the teachers instructions
- carry out the test according the instructions

3. Protocol

Tested cement:

Task: Estimate the class of the tested cement!

Bulk density:

- count the mean value of the bulk density from the three particular values
- bulk density is calculated according the formula $\rho_V = m / V$, where m is mass of the samples and volume V is calculated from the sizes of the samples.

Flexural strength

- calculate flexural strength for all samples (p. 69)
- calculate the mean value and put it into the protocol

¹ Vimrová A., Výborný J. : Building materials, ČVUT Prague, 2005.

Compressive strength

- calculate the compressive strength for each half
- make an evaluation of the test validity from six particular values of the compressive strength (p. 71)
- determine the final value of the compressive strength

Setting times

- information about the initial and final setting time will be given by the teacher from the automatic Vicat apparatus

Conclusions.

- decide, if the test is valid
- if the test is valid, find the class of tested cement, according to the initial setting time and compressive strength (Tab.31, p.71)

Given cement: class 42,5

Task: Decide, if the given cement conforms to the class CEM I - 42,5 !

- calculate the flexural and compressive strength of the given cement same way as the tested cement
- decide, if the test is valid
- if the test is valid, decide, if the given cement conforms to the class CEM I - 42,5, according to the final value of the compressive strength (Tab.31, p.71)

For protocol you can use the form attached. If you use the hand made form, it has to be similar to this form.

LAB 3: Cement II - setting time and strenght

Name:		PIN:	
Signature:		Study group:	
Date:		Number of annexes : (all calculations, given data)	

Results:			
Tested cement – unknown class			
Bulk density	[kg/m ³]		
Flexural strength	[MPa]		
Initial setting time	[min]		
Final setting time	[min]		
Particular compressive strength	[MPa]		
		6 samples	5 samples (after evaluation)
Mean compressive strength	[MPa]		
Tolerated interval (± 10%)	[MPa]		
Final compressive strength	[MPa]		
Conclusions:	Test is / is not valid		Cement class:
Given cement - class 42,5			
Bulk density	[kg/m ³]		
Flexural strength	[MPa]		
Particular compressive strength	[MPa]		
		6 samples	5 samples (after evaluation)
Mean compressive strength	[MPa]		
Tolerated interval (± 10%)	[MPa]		
Final compressive strength	[MPa]		
Concl usion:	Test is / is not valid.		
	Cement conforms / does not conform to the EN 197-1.		