

METU – CE
CE 344 LABORATORY I
TESTS ON PORTLAND CEMENTS

DATA SHEET

1. The following data have been obtained from density and Blaine fineness tests performed on different Portland cement samples. Answer the questions below, accordingly.

Sample	Le Chatelier Flask Initial Reading (ml)	Le Chatelier Flask Final Reading (ml)	Density (g/ml)	Temperature (°C)	T (sec)	Fineness (cm ² /g)
<i>Reference Cement</i>	<i>1.0</i>	<i>21.5</i>	<i>3.12</i>	<i>24</i>	<i>85</i>	<i>3500</i>
A	0.5	20.8		24	97	
B	1.2	22.2		24	106	
C	0.1	20.9		24	118	
D	0.3	21.0		24	80	

- Calculate the density of each cement sample.
(Refer to ASTM C 188, for your calculations)
- Calculate the fineness of each cement sample.
(Refer to ASTM C 204, use equation #4 for your calculations)

2. The following data have been obtained from flow test (ASTM C1437) on a fresh mortar sample. Calculate the percent flow of this mortar.

1 st measurement	2 nd measurement	3 rd measurement	4 th measurement
20.5 cm	21.2 cm	20.7 cm	21.6 cm

3. The following data have been obtained from compression and flexural strength tests. Calculate the compression and flexural tensile strengths according to your mechanics of materials knowledge. (The span length is 10 cm for flexural tensile strength test with mid-point loading.)

Note: ASTM standards can be downloaded from METU Library web page>e-Resources>Databases>ASTM Standards (IHS Standard Expert) or ASTM Standards and Engineering Digital Library (American Society for Testing and Materials)

Sample Label	Specimen Type	Max Load at Fracture (kN)	Loading Type	Compression Strength (MPa)	Flexural Tensile Strength (MPa)
1	Beam 4×4×16cm	2.7	Flexural Tension	-	
2	Beam 4×4×16cm	2.9	Flexural Tension	-	
3	Beam 4×4×16cm	3.3	Flexural Tension	-	
1	Cube 4×4×4cm	67.2	Compression		-
2	Cube 4×4×4cm	73.6	Compression		-
3	Cube 4×4×4cm	76.8	Compression		-
4	Cube 4×4×4cm	68.8	Compression		-
5	Cube 4×4×4cm	69.6	Compression		-
6	Cube 4×4×4cm	75.2	Compression		-

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