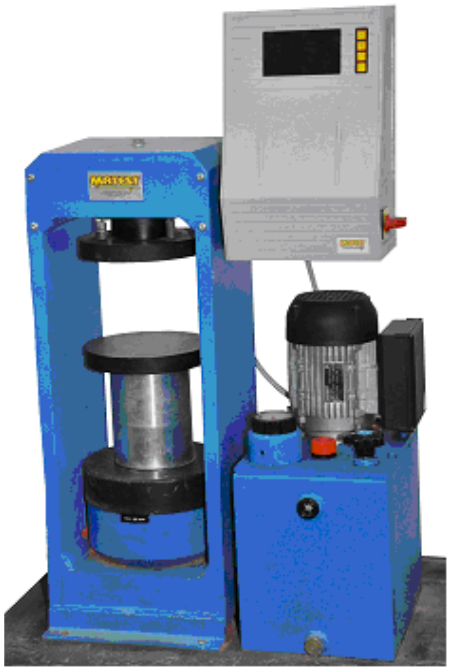
Department of Building Egineering

EXERCISE No.11

Buildings ceramics – marking compressive strength

11.1. Marking compressive strength of ceramic elements



The sample for testing should be set coaxially with the center platen. Should not be used any spacer materials.

Recommended load increment given in the table 11.1.

Tab. 11.1. The recommended load increment of the test compressive strength

Expected compressive strength (N/mm^2)	Increment load (N/mm^2)/s
<10	0,05
11 do 20	0,15
21 do 40	0,3
41 do 80	0,6
>80	1,0

Fig. 11.1. Hydraulic press for testing compressive strength

Initially, apply a load increment, usually used. When it reaches about half of the expected maximum load, adjust the increment, so that the maximum load has been reached not less than about 1 minute.

The calculation and presentation of results.

The compressive strength f_c of the sample should be calculated by **dividing the maximum load by the field of load surface.**

The result should be given to the nearest 0,1 N/mm^2.

The compressive strength can be converted to standard strength for computational purposes f_b. The resulting compressive strength of the element should be multiplied by the shape coefficient δ, and by the multiplier dependent on the seasoning method α:

$$f_b = f_c \times \alpha \times \delta [MPa] \qquad (11.1)$$

where: f_c – compressive strength [MPa],

α – multiplier depends on the seasoning method:
α = 1,0 for air - dry condition and for humidity to 6%,
α = 0,8 for dried to constant weight,
α = 1,2 for wet condition (immersion in water),

δ – shape coefficient according to the table 11.2.

Tab. 11.2. Shape factor δ, taking into account the dimensions of the samples after surface preparation

Height [1) mm] \ Width mm	50	100	150	200	≥ 250
40	0,80	0,70	-	-	-
50	0,85	0,75	0,70	-	-
65	0,95	0,85	0,75	0,70	0,65
100	1,15	1,00	0,90	0,80	0,75
150	1,30	1,20	1,10	1,00	0,95
200	1,45	1,35	1,25	1,15	1,10
≥ 250	1,55	1,45	1,35	1,25	1,15
Note: Linear interpolation between adjacent shape coefficients is allowed. [1)] height after surface preparation					

Compressive strength classes of ceramic masonry elements may be classified according to the standardized compressive strength classes according to the table 11.3.

Tab. 11.3. Classes of compressive strength ceramics elements

Class of compressive strength	Normalized of compressive strength N/mm^2 not less than
5	5,0
7,5	7,5
10	10,0
12,5	12,5
15	15,0
20	20,0
25	25,0
30	30,0
35	35,0
40	40,0
45	45,0
50	50,0
60	60,0
75	75,0

Team: Date……

1. ……
2. ……
3. ……
4. ……

Exercise 11

MARKING COMPRESSIVE STRENGTH OF CERAMIC ELEMENTS

Product name:……

Compressive strength of the product:……

Calculation of the shape coefficient *δ:*

Linear interpolation

$$H(x) = f(x_1) + \frac{f(x_2) - f(x_1)}{x_2 - x_1}(x - x_1)$$

For height *δ:*

For width *δ:*

Shape coefficient *δ:*

Sample	Load increment	Field surface compression	Maximum load	Compressive strength	Normalized strength	Class of compressive strength
	$(N/mm^2)/s$	mm^2	kN	N/mm^2	N/mm^2	
1						

Conclusions:……..……

……..…