TRIS. 197-198

R.617. Compression tests on 'oatmeal' bricks

In an attempt to obtain more meaningful results from compression testing, one hundred 'oatmeal' bricks were selected from a local supplier and divided at random into four groups.

Group A 24 bricks, divided into two groups of twelve and individually crushed with plywood capping.

Group B 24 bricks, crushed two at a time with plywood interleaving.

Group C 36 bricks, crushed three at a time with plywood interleaving.

Croup D 12 bricks, refired in the laboratory to 1,100°C and then crushed individually with plywood capping.

The compression rate was stabilised at a fixed value for all tests and the results calculated on gross area.

RESULTS

Group A

Series 1		Series 2	
Brick No.	Compressive Strength (lb/in^2)	Brick No.	Compressive Strength (lb/in^2)
1	2,410	31	2,160
4	2,350	33	2,780
5	2,280	39	2,430
12	2,410	66	2,250
13	3,330	67	2,380
20	2,760	68	1,890
21	2,630	69	2,110
22	2,630	71	2,600
23	2,970	84	2,320
24	2,130	85	1,470
26	2,660	87	2,020
27	2,010	88	3,020
Average:	2,550 lb/in^2	Average:	2,290 lb/in^2
C Value:	2,140	*C* Value:	1,830

Group B

Brick Nos.	Compressive Strength (lb/in^2)	Brick Nos.	Compressive Strength (lb/in^2)
9 - 29	2,170	17 - 19	2,070
8 - 62	1,860	79 - 80	1,840
34 - 38	1,820	14 - 32	1,380
7 - 36	1,830	52 - 42	1,820
43 - 37	1,740	58 - 18	1,940
30 - 58	2,180	45 - 76	2,220

Average: 1,910 lb/in^2
C Value: 1,670

Group C

Brick Nos.	Compressive Strength (lb/in^2)	Brick Nos.	Compressive Strength (lb/in^2)
63 - 86 - 78	1,710	74 - 35 - 47	1,670
55 - 57 - 70	1,680	10 - 65 - 73	1,780
16 - 25 - 48	1,850	61 - 40 - 41	1,780
81 - 75 - 89	1,710	51 - 53 - 77	1,480
49 - 72 - 56	1,780	11 - 2 - 3	1,890
64 - 28 - 54	2,020	46 - 50 - 60	1,940

Average: 1,770 lb/in^2
C Value: 1,620

Group D

Brick No.	Compressive Strength (lb/in^2)	Brick No.	Compressive Strength (lb/in^2)
X1	3,820	X7	3,930
X2	3,410	X8	3,140
X3	3,600	X9	3,770
X4	3,080	X10	3,950
X5	3,600	X11	3,390
X6	3,860	X12	3,500

Average: 3,590 lb/in^2
C Value: 3,270

	Standard Deviation	*Coefficient of Variation*
Group A (24 bricks)	395	16%
Group B	220	12%
Group C	140	8%
Group D	280	8%

CONCLUSION

Compression testing bricks in groups rather than individually gives lower results and also lowers the coefficient of variation. It is significant that Group D, a laboratory fired group (part of a programme relating to physical testing and compression) gives a similarly low coefficient of variation which suggests compression tests are significant only in relation to the firing cycle of each individual brick.