Pergamon

Cement and Concrete Research, Vol. 25, No. 8, pp. 1803-1804, 1995

0008-8846/95 $9.50+.00

DISCUSSIONS

A Discussion of the Paper "CARBONATION AND POROSITY OF MORTAR SPECIMENS WITH POZZOLANIC AND HYDRAULIC CEMENT ADMIXTURES" by Ch. Malami, V. Kaloidas, G. Batis and N. Kouloumbi[*]

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With interest we have read the paper by Ch. Malami et al. and since for a long time we have been investigating physical structure modifications of blastfurnace mortar cement due to SO_3 content and curing duration,we would like to quote some preliminary results.

It is possible for us to confirm that the blastfurnace slag cement is greaty penalized by a not adequate maturation time. Moreover, from our studies it is possible to assert that high slag blastfurnace cement mortars, when properly matured, show total porosity values comparable to those of the Portland cement mortars. It is important to note that the total porosity is very much influenced by the gypsum content present in these blastfurnace cement mortar specimens (Table 1).

However, the above mentioned equivalence in the porosity values which highly influences mechanical strength and chemical resistance, does not involve carbonation behavior also. In fact,

Table 1
Total Porosity (%) after 7 Days Wet Curing

$\%SO_3$	2	3	4
OPC	12.6	13.3	12.9
BSC	12.0	13.8	14.9

Table 2
Carbonation Depth (mm) after 1 Year Exposure in Industrial Environment

$\%SO_3$	2	3	4
OPC	1.3	1.2	1.4
BSC	5.5	6.3	9.2

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[*] CCR 24(8), 1444-1454 (1994).

cement mortars with a high slag content show a carbonation rate higher than those prepared with Portland cement, all conditions being equal (Table 2).

Since pore size distribution values (Table 3a, b; c) do not reveal differences adequate to justify those seen in the carbonation depth values (Table 2), it would be very difficult to ascribe the higher tendency to carbonation showed by blastfurnace cement mortars definitely to the porosity. Therefore, it would be more reasonable to ascribe the different carbonation behaviour of high slag blastfurnace cement mortars, compared to that of Portland cement, to the smaller amount of hydrated lime and consequently to the lower ability of stopping CO_2 diffusion.

Table 3a
Percentage of Total Cumulative Volume of Pores
($R_p < 1000Å$)

$\%SO_3$	2	3	4
OPC	67	87	84
BSC	76	89	89

Table 3b
Percentage of Total Cumulative Volume of Pores
($1000 < R_p < 10000Å$)

$\%SO_3$	2	3	4
OPC	28	7	9
BSC	17	5	9

Table 3c
Percentage of Total Cumulative Volume of Pores
($R_p < 10000Å$)

$\%SO_3$	2	3	4
OPC	5	6	7
BSC	7	6	3