CONFORMITY CERTIFICATE

Ground Granulated Blastfurnace Slag Produced at **Scunthorpe** Works

Sample Period **March 2019**

Certificate of Conformity of GGBS to EN 15167-1:2006

Spot samples of GGBS were taken and tested to determine conformity to the autocontrol requirements of EN 15167-1:2006 "Ground granulated blastfurnace slag for use in concrete, mortar and grout" following the methods given in that standard. The values reported are mean values for the monthly production period.

Scunthorpe GGBS Only

Results		Product	EN Limit
Fineness m^2/kg		521	min. 275
Magnesium Oxide MgO %		9	max. 18
Sulfate SO_3 %		0.4	max. 2.5
Sulfide S^{2-} %		0.8	max. 2.0
Chloride Content Cl^- %		0.02	max. 0.10
Moisture Content %		0.1	max. 1.0
Corrected Loss on Ignition %		0.7	max. 3.0
Aluminium Oxide Al_2O_3 %		12.9	to 1 d.p.
Note: If the value of Al_2O_3 is ≥ 14.5% the '+SR' restriction will be exceeded if the C_3A of the CEM I is >10%.			
Alkalis as Na_2O equ. (acid soluble)			
Guaranteed Alkali limit %		≤ 1.0	
Certified Average Alkali (Last 25) %		0.65	
Declared Mean : Mean last 25 + (SD last 25 x 1.64) %		0.73	
COMBINATION OF 50% LABORATORY STOCK CEM I PORTLAND CEMENT AND 50% GGBS			
Initial Setting Time min.		225	not > than 2 x PC
Activity Index %	7 days	63	min. 45
	28 days	87	min. 70
LABORATORY STOCK CEM I PORTLAND CEMENT ONLY			
The stock CEM I Portland cement used in these tests was supplied by Hanson Ribblesdale works and the following results were obtained from that sample			
Initial Setting Time min		180	
Compressive Strength N/mm^2	7 days	48.5	
	28 days	59.3	

The GGBS contained no additional materials other than those permitted. The above results and other tests demonstrate the conformity of the material sold during the month to the requirements of EN 15167-1:2006

Certificate of Conformity of Combinations of GGBS and CEM I Portland Cement to Annex A of BS 8500-2:2015

Portland Cement Source:

Titan

For combinations of GGBS supplied from the above works with the above CEM I Portland cement the permitted proportions conforming to the requirements given in annex A of BS 8500-2:2015 are:

Strength Class	Not Less Than**	Not More Than**
52.5L	6	34
42.5L	19	56
32.5L	48	77
Conformity Evaluation Period (if less than 6 months)	N/A	month(s)
Combination Designation (Table 1 BS 8500-2:2015)		
CIIA-S	6	20
CIIB-S	21	35
CIIIA	36	65
CIIIB	66	80
	** % GGBS	

Results of tests in accordance with BS EN 196-1 for 50% GGBS in combination with 50% CEM I Portland cement shown above

Age	7 Days	28 Days
Compressive Strength N/mm^2	25.2	55.2

The samples of LKAB Minerals GGBS and the CEM I Portland cement were bulk average monthly samples for the works specified

CE

1333-CPR-00194

Signed: L. Bontoft

L Bontoft - Technical Manager GGBS