




CONFORMITY CERTIFICATE			
Ground Granulated Blastfurnace Slag Produced at		Scunthorpe	Works
Sample Period		February 2019	
Certificate of Conformity of GGBS to EN 15167-1:2006		Certificate of Conformity of Combinations of GGBS and CEM I Portland Cement to Annex A of BS 8500-2:2015	
<p>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.</p>		Portland Cement Source:	
Scunthorpe GGBS Only		Titan	
<p>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:</p>			
Results	Product	EN Limit	
Fineness m ² /kg	516	min. 275	
Magnesium Oxide MgO %	8	max. 18	
Sulfate SO ₃ %	0.2	max. 2.5	
Sulfide S ²⁻ %	0.8	max. 2.0	
Chloride Content Cl ⁻ %	0.01	max. 0.10	
Moisture Content %	0.1	max. 1.0	
Corrected Loss on Ignition %	1.0	max. 3.0	
Aluminium Oxide Al ₂ O ₃ %	13.1	to 1 d.p.	
<p>Note: If the value of Al₂O₃ is ≥ 14.5% the '+SR' restriction will be exceeded if the C₃A of the CEM I is >10%.</p>			
<i>Alkalis as Na₂O equ. (acid soluble)</i>			
Guaranteed Alkali limit %	≤ 1.0		
Certified Average Alkali (Last 25) %	0.65		
Declared Mean : Mean last 25 + (SD last 25 x 1.64) %	0.72		
COMBINATION OF 50% LABORATORY STOCK CEM I PORTLAND CEMENT AND 50% GGBS			
Initial Setting Time min.	230	not > than 2 x PC	
Activity Index %	7 days	67	min. 45
	28 days	89	min. 70
LABORATORY STOCK CEM I PORTLAND CEMENT ONLY			
<p>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</p>			
Initial Setting Time min	145		
Compressive Strength N/mm ²	7 days	44.0	
	28 days	55.6	
<p>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</p>			
Strength		Not Less Than**	Not More Than**
Class			
52.5L		6	33
42.5L		17	56
32.5L		47	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			
<p>Results of tests in accordance with BS EN 196-1 for 50% GGBS in combination with 50% CEM I Portland cement shown above</p>			
Age	7 Days	28 Days	
Compressive Strength N/mm ²	24.5	49.7	
<p>The samples of LKAB Minerals GGBS and the CEM I Portland cement were bulk average monthly samples for the works specified</p>			
			
1333-CPR-00194			

Signed: 

L Bontoft - Technical Manager GGBS