



CONFORMITY CERTIFICATE																																				
Ground Granulated Blastfurnace Slag Produced at		Aboño																																		
Sample Period		March 2020																																		
<b>Certificate of Conformity of GGBS to EN 15167-1:2006</b>		<b>Certificate of Conformity of Combinations of GGBS and CEM I Portland Cement to Annex A of BS 8500-2:2015</b>																																		
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.		Portland Cement Source:																																		
Aboño GGBS Only		<b>Cimpor</b>																																		
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:		<table border="1"> <thead> <tr> <th>Strength Class</th> <th>Not Less Than**</th> <th>Not More Than**</th> </tr> </thead> <tbody> <tr> <td>52.5L</td> <td>6</td> <td>35</td> </tr> <tr> <td>42.5L</td> <td>6</td> <td>63</td> </tr> <tr> <td>32.5L</td> <td>54</td> <td>78</td> </tr> <tr> <td>Conformity Evaluation Period (if less than 6 months)</td> <td>N/A</td> <td>month(s)</td> </tr> <tr> <td>Combination Designation (Table 1 BS 8500-2:2015)</td> <td colspan="2"></td> </tr> <tr> <td>CIIA-S</td> <td>6</td> <td>20</td> </tr> <tr> <td>CIIB-S</td> <td>21</td> <td>35</td> </tr> <tr> <td>CIIIA</td> <td>36</td> <td>65</td> </tr> <tr> <td>CIIBB</td> <td>66</td> <td>80</td> </tr> <tr> <td colspan="3" style="text-align: right;">** % GGBS</td> </tr> </tbody> </table>		Strength Class	Not Less Than**	Not More Than**	52.5L	6	35	42.5L	6	63	32.5L	54	78	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	CIIBB	66	80	** % GGBS		
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Alkalis as Na <sub>2</sub> O equ. (acid soluble)		The samples of LKAB Minerals GGBS and the CEM I Portland cement were bulk average monthly samples for the works specified																																		
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<table border="1"> <tbody> <tr> <td>Initial Setting Time min</td> <td>245</td> <td>not &gt; than 2 x PC</td> </tr> <tr> <td rowspan="2">Activity Index %</td> <td>7 days</td> <td>61</td> </tr> <tr> <td>28 days</td> <td>95</td> </tr> </tbody> </table>		Initial Setting Time min	245	not > than 2 x PC	Activity Index %	7 days	61	28 days	95	The stock CEM I Portland cement used in these tests was supplied by CEMENTOS TUDELA VEGUIN, S.A and the following results were obtained from that sample																										
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LABORATORY STOCK CEM I PORTLAND CEMENT ONLY		<table border="1"> <tbody> <tr> <td>Initial Setting Time min</td> <td>180</td> <td></td> </tr> <tr> <td rowspan="2">Compressive Strength N/mm<sup>2</sup></td> <td>7 days</td> <td>49.2</td> </tr> <tr> <td>28 days</td> <td>55.6</td> </tr> </tbody> </table>		Initial Setting Time min	180		Compressive Strength N/mm <sup>2</sup>	7 days	49.2	28 days	55.6																									
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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.		LKAB Minerals Ltd are acting as a dispatching centre in the distribution of the above GGBS and further details and certification are available on request																																		

Signed:

L Bontoft - Technical Manager GGBS