



CEMENTOS ALFA, S.A,

Plant: MATAPORQUERA

ER Certificate: ER-0572/1998



QUALITY ANALYSIS CERTIFICATE - CEMENT

TYPICAL RESULTS

Cement Type: CEM I 52,5 R ma (EN 197-1)

PERIOD: May 2014

CE: 0099/CPR/A33/0831

The Quality Management System adopted in our company for the production and commercialization of cements and clinker, complies with UNE-EN-ISO 9001:2008, and it is certified by AENOR. It is also certified under IQNet network.

TESTS	Results	Specification EN 197-1
<b>Chemical Characteristics</b>		
Loss on Ignition %	1,77	≤ 5,0
SiO <sub>2</sub> %	20,87	
Al <sub>2</sub> O <sub>3</sub> %	3,95	
Fe <sub>2</sub> O <sub>3</sub> %	3,10	
CaO %	64,22	
MgO %	1,36	
Na <sub>2</sub> O %	0,13	
K <sub>2</sub> O %	0,71	
Insoluble Residue %	0,57	≤ 5,0
Sulphates (SO <sub>3</sub> ) %	3,32	≤ 4,0
Chlorides %	0,00	≤ 0,10
<b>Physical and Mechanical Characteristics</b>		
Normal Consistency Water %	30,5	
Initial Setting Time min	155	≥ 45
Final Setting Time min	210	
Soundness (Le Chatelier) mm	0,5	≤ 10
Specific Surface (Blaine) cm <sup>2</sup> /g	4960	
Compressive Strength at 2 days MPa	41,5	≥ 30,0
Compressive Strength at 28 days MPa	67,4	≥ 52,5
<b>Other Characteristics</b>		
Na <sub>2</sub> O equiv. %	0,60	≤ 0,75
<b>Bogue Composition (mineral phases)</b>		
C <sub>3</sub> S %	62,3	
C <sub>2</sub> S %	17,4	
C <sub>3</sub> A %	4,7	
C <sub>4</sub> AF %	10,7	

R-25-4-52/5-Z

Quality Manager

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GRUPO CEMENTOS PORTLAND VALDERRIVAS