



CEMENTOS ALFA, S.A,

Plant: MATAPORQUERA

ER Certificate: ER-0572/1998



QUALITY ANALYSIS CERTIFICATE - CEMENT

TYPICAL RESULTS

Cement Type: CEM I 42,5 R (EN 197-1)

PERIOD: MAY 2014

CE: 0099/CPR/A33/0154

N: 015/001358

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 %                             | 2,62    | ≤ 5,0                  |
| SiO <sub>2</sub> %                             | 19,66   |                        |
| Al <sub>2</sub> O <sub>3</sub> %               | 5,45    |                        |
| Fe <sub>2</sub> O <sub>3</sub> %               | 2,16    |                        |
| CaO %  | 62,70   |                        |
| MgO %  | 1,67    |                        |
| Na <sub>2</sub> O %                            | 0,21    |                        |
| K <sub>2</sub> O %                             | 1,10    |                        |
| Insoluble Residue %                            | 0,56    | ≤ 5,0                  |
| Sulphates (SO <sub>3</sub> ) %                 | 3,42    | ≤ 4,0                  |
| Chlorides %                                    | 0,00    | ≤ 0,10                 |
| <b>Physical and Mechanical Characteristics</b> |         |                        |
| Normal Consistency Water %                     | 30,3    |                        |
| Initial Setting Time min                       | 165     | ≥ 60                   |
| Final Setting Time min                         | 215     |                        |
| Soundness (Le Chatelier) mm                    | 0,5     | ≤ 10                   |
| Specific Surface (Blaine) cm <sup>2</sup> /g   | 3770    |                        |
| Compressive Strength at 2 days MPa             | 32,9    | ≥ 20,0                 |
| Compressive Strength at 28 days MPa            | 56,5    | 42,5-62,5              |
| <b>Other Characteristics</b>                   |         |                        |
| Na <sub>2</sub> O equiv. %                     | 0,93    |                        |
| <b>Bogue Composition (mineral phases) *</b>    |         |                        |
| C <sub>3</sub> S %                             | 54,4    |                        |
| C <sub>2</sub> S %                             | 20,0    |                        |
| C <sub>3</sub> A %                             | 12,3    |                        |
| C <sub>4</sub> AF %                            | 7,1     |                        |

\* Corresponding to clinker composition

R-25-4-52/5-Z

Quality Manager

Barrio la Estación, s/n.  
39410 Mataporquera (Cantabria)  
Tel. 942 770 058  
Fax 942 770 243  
info@alfainforma.com



GRUPO CEMENTOS PORTLAND VALDERRIVAS