

## AENOR CTC-015 "Cementos"

## CERTIFICADO DE EVALUACIÓN ESTADÍSTICA DE LA PRODUCCIÓN

**Empresa:** HEIDELBERG MATERIALS HISPANIA CEMENTOS S.A.

**Fabrica:** ARRIGORRIAGA

**CEMENTO:** V/A (S-V) 32,5 N/SRC

CEM V/A (V-S) 32,5 N



UNE 80303-1:2017

UNE-EN 197-1:2011

**Periodo estudiado:** 12/2022 - 11/2023

**Certificado AENOR:** 015/001754



Este producto está certificado con la marca AENOR  para cementos. La Marc  es un distintivo de calidad de carácter voluntario acreditado por ENAC, según UNE-EN ISO/IEC 17065, que cumple con las exigencias recogidas en la Instrucción para la recepción de cementos en vigor. La evaluación estadística que se muestra a continuación corresponde a los resultados obtenidos en el periodo de estudio considerado.

### CARACTERÍSTICAS DEL CEMENTO

#### Composición Nominal declarada por el fabricante(%):

| Clinker | Puzolana | Ceniza | Escoria | Caliza | Esquisto | Humo | Comp. Min. |
|---------|----------|--------|---------|--------|----------|------|------------|
| 54      |          | 18     | 23      |        |          |      | 5          |

#### CONTROL POR VARIABLES

##### Control de producción

**Nº de muestras:** 123

Especificación  
Nº ensayos  
Valor medio  
Desviación típica  
V. característico inf.  
V. característico sup.

| Resistencias (MPa) |               | Fraguados (min.) |       |
|--------------------|---------------|------------------|-------|
| a 7 días           | a 28 días     | I.F.             | F.F.  |
| ≥ 16               | 32,5 < > 52,5 | ≥ 75             | ≤ 720 |
| 123                | 123           | 123              | 123   |
| 29,7               | 46,4          | 259              | 324   |
| 1,8                | 1,95          | 32               | 39    |
| 26,2               | 42,6          | 210              | 264   |
| 32,5               | 49,4          | 308              | 384   |

Especificación  
Nº ensayos  
Valor medio  
Desviación típica  
V. absoluto inferior  
V. absoluto superior

Riesgo del consumidor < 3,25 %

##### Muestras de contraste

**Nº de muestras:** 11

| Resistencias (MPa) |               | Fraguados (min.) |       |
|--------------------|---------------|------------------|-------|
| a 7 días           | a 28 días     | I.F.             | F.F.  |
| ≥ 16               | 32,5 < > 52,5 | ≥ 75             | ≤ 720 |
| 11                 | 11            | 11               | 11    |
| 28,6               | 45,3          | 229              | 296   |
| 1,36               | 1,49          | 26               | 30    |
| 26,5               | 43,5          | 180              | 230   |
| 31,0               | 49,0          | 260              | 335   |

#### CONTROL POR ATRIBUTOS (características físicas y químicas):

##### Control de producción

**Nº de muestras:** 123

Especificación  
Nº de ensayos  
Valor medio  
Nº defectos  
Nº defectos admitidos

| P.F. (%) | R.I. (%) | CL <sup>-</sup> (%) | SO <sub>3</sub> (%) | EXP (mm) | C3A | C4AF+C3A |
|----------|----------|---------------------|---------------------|----------|-----|----------|
|          |          | ≤ 0,1               | ≤ 3,5               | ≤ 10     | ≤ 8 | ≤ 25     |
|          |          | 123                 | 123                 | 123      | 19  | 19       |
|          |          | 0,01                | 2,89                | 0,1      | 6,1 | 18,6     |
|          |          | 0                   | 0                   | 0        | 0   | 0        |
|          |          | 6                   | 6                   | 6        | 0   | 0        |

##### Muestras de contraste

**Nº de muestras:** 9

Especificación  
Nº de ensayos  
Valor medio  
Nº defectos  
Nº defectos admitidos

| P.F. (%) | R.I. (%) | CL <sup>-</sup> (%) | SO <sub>3</sub> (%) | EXP (mm) | C3A | C4AF+C3A |
|----------|----------|---------------------|---------------------|----------|-----|----------|
|          |          | ≤ 0,1               | ≤ 3,5               | ≤ 10     | ≤ 8 | ≤ 25     |
|          |          | 11                  | 11                  | 11       | 11  | 11       |
|          |          | 0,02                | 2,97                | 0,7      | 4,9 | 17,9     |
|          |          | 0                   | 0                   | 0        | 0   | 0        |
|          |          | 0                   | 0                   | 0        | 0   | 0        |

Característica complementaria de Cr(VI) soluble en agua certificada según la norma UNE-EN 196-10 de acuerdo a lo establecido en el Reglamento (CE) nº 1907/2006, entrada 47. El contenido de Cr(VI) soluble en agua es conforme con el límite máximo de 0,0002% .En caso de usar agente reductor de Cr (VI) el cumplimiento de este requisito se ha evaluado al final de periodo de eficacia de dicho agente declarado por el fabricante.

Este informe tiene validez hasta el 1 de julio de 2024

Fdo: MANUEL PEREZ BORDA

Fecha: 01/04/2024

## AENOR CTC-015 "Cements"

## CERTIFICATE OF STATISTICAL ASSESSMENT OF CEMENT PRODUCTION

**Company:** HEIDELBERG MATERIALS HISPANIA CEMENTOS S.A.

**Cement Plant:** ARRIGORRIAGA

**CEMENT:** V/A (S-V) 32,5 N/SRC  
CEM V/A (V-S) 32,5 N

UNE 80303-1:2017  
UNE-EN 197-1:2011

**Evaluated period:** 12/2022 - 11/2023

**AENOR Certificate:** 015/001754



This product holds the AENOR marking. The AENOR mark is a voluntary quality mark accredited by ENAC, according to UNE-EN ISO/IEC 17065, which complies with the requirements contained in the current Instruction for the reception of cements. This statistical assessment shows the outcomes within the evaluated period as summarized below:

### CHARACTERISTICS OF CEMENT

#### Nominal composition (declared by the producer) (%):

| Clinker | Pozzolana | Fly ash | Blast furnace slag | Limestone | Burnt shale | Silica fume | Minor constituents |
|---------|-----------|---------|--------------------|-----------|-------------|-------------|--------------------|
| 54      |           | 18      | 23                 |           |             |             | 5                  |

#### INSPECTION BY VARIABLES

##### Autocontrol samples

**Number of samples** 123

|                            | Strength (MPa) |               | Setting time (min.) |       |                      |
|----------------------------|----------------|---------------|---------------------|-------|----------------------|
|                            | a 7 días       | a 28 días     | Initial             | Final |                      |
| Specification              | ≥ 16           | 32,5 < > 52,5 | ≥ 75                | ≤ 720 | Specification        |
| Number of tests            | 123            | 123           | 123                 | 123   | Number of tests      |
| Average value              | 29,7           | 46,4          | 259                 | 324   | Average value        |
| Standard deviation         | 1,8            | 1,95          | 32                  | 39    | Standard deviation   |
| Lower characteristic value | 26,2           | 42,6          | 210                 | 264   | Lower absolute value |
| Upper characteristic value | 32,5           | 49,4          | 308                 | 384   | Upper absolute value |

Consumer's risk < 3,25 %

##### Audit samples

**Number of samples** 11

|                            | Strength (MPa) |               | Setting time (min.) |       |                      |
|----------------------------|----------------|---------------|---------------------|-------|----------------------|
|                            | a 7 días       | a 28 días     | Initial             | Final |                      |
| Specification              | ≥ 16           | 32,5 < > 52,5 | ≥ 75                | ≤ 720 | Specification        |
| Number of tests            | 11             | 11            | 11                  | 11    | Number of tests      |
| Average value              | 28,6           | 45,3          | 229                 | 296   | Average value        |
| Standard deviation         | 1,36           | 1,49          | 26                  | 30    | Standard deviation   |
| Lower characteristic value | 26,5           | 43,5          | 180                 | 230   | Lower absolute value |
| Upper characteristic value | 31,0           | 49,0          | 260                 | 335   | Upper absolute value |

#### INSPECTION BY ATTRIBUTES (Physical and chemical characteristics):

##### Autocontrol samples

**Number of samples** 123

|                         | Loss on Ignition (%) | Insoluble residue (%) | Chloride (%) | SO3 (%) | Soundness (mm) | C3A | C4AF+C3A |
|-------------------------|----------------------|-----------------------|--------------|---------|----------------|-----|----------|
| Specification           |                      |                       | ≤ 0,1        | ≤ 3,5   | ≤ 10           | ≤ 8 | ≤ 25     |
| Number of tests         |                      |                       | 123          | 123     | 123            | 19  | 19       |
| Average value           |                      |                       | 0,01         | 2,89    | 0,1            | 6,1 | 18,6     |
| Nº of defaults          |                      |                       | 0            | 0       | 0              | 0   | 0        |
| Nº of defaults admitted |                      |                       | 6            | 6       | 6              | 0   | 0        |

##### Audit samples

**Number of samples** 9

|                         | Loss on Ignition (%) | Insoluble residue (%) | Chloride (%) | SO3 (%) | Soundness (mm) | C3A | C4AF+C3A |
|-------------------------|----------------------|-----------------------|--------------|---------|----------------|-----|----------|
| Specification           |                      |                       | ≤ 0,1        | ≤ 3,5   | ≤ 10           | ≤ 8 | ≤ 25     |
| Number of tests         |                      |                       | 11           | 11      | 11             | 11  | 11       |
| Average value           |                      |                       | 0,02         | 2,97    | 0,7            | 4,9 | 17,9     |
| Nº of defaults          |                      |                       | 0            | 0       | 0              | 0   | 0        |
| Nº of defaults admitted |                      |                       | 0            | 0       | 0              | 0   | 0        |

Complementary characteristic of water-soluble Cr(VI) is certified according to UNE EN 196-10 in accordance with the provisions of Regulation (EC) No. 1907/2006, entry 47. The water-soluble Cr(VI) content complies the limit of 0,0002%. Whether Cr(VI) reducing agent is being used, the compliance of this requirement is assessed at the end of its own shelf life period for such agent as declared by the manufacturer.

\*Additional Specification:

This report is valid until 1 July 2024

Signature: MANUEL PEREZ BORDA

Date: 04/01/2024 (MM/DD/YYYY)