



D7.76 – GUIDELINES FOR THE ASSESSMENT OF POLICY INSTRUMENTS

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Project acronym: ECO-CEMENT

Issue Date:	August 2013
WP Number:	WP 7
Status :	Delivered

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Document History			
Version	Date	Author	Description
<u>1</u>	29/11/2012	<u>Neapolis</u>	<u>1ST Version</u>
<u>2</u>	08/02/2013	<u>Neapolis</u>	<u>2nd Version</u>
<u>3</u>	13/02/2013	<u>Neapolis</u>	<u>3rd Version</u>
<u>4</u>	<u>08.08.2013</u>	<u>Neapolis</u>	<u>4th Version</u>

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SUMMARY

The concern of the international community on environmental issues has been reflected in international Declarations with the most important may be the Kyoto Protocol followed by the Marrakech Accords.

The Kyoto Protocol was adopted to the United Nations Framework Convention on Climate Change (UNFCCC) on 11 December 1997 in Kyoto, Japan, and entered into force on 16 February 2005. In September of 2011, 191 states have signed and ratified the protocol. The United States signed but did not ratify the Protocol and Canada withdrew from it in 2011.

The European Community and many industrialized countries under the Kyoto Protocol commit themselves to limit or reduce their emissions of four greenhouse gases (GHG) (carbon dioxide, methane, nitrous oxide, sulphur hexafluoride) and two groups of gases (hydrofluorocarbons and perfluorocarbons). The Marrakech Accords is a set of agreements reached at the 7th Conference of the Parties (COP7) to the United Nations Framework Convention on Climate Change, held in 2001, on the rules of meeting the targets set out in the Kyoto Protocol.

These international declarations forced national and regional legislative bodies to form a strict framework of prerequisites for an environmentally acceptable industrial production. These provisions should be met from the cement industry which is considered as one of the most harmful for the environment.

On the other hand, the multiple use of cement in various applications has lead to the development of a complex legislative framework which includes specifications for the certification of the strength and the mechanical properties of cement for different applications.

The present report collects some of the most important provisions related to cement production and standardization adopted by several international and regional organizations, including the European Committee for Standardization (CEN), the American Society for Testing and Materials International (ASTM), the United States Environmental Protection Agency (US-EPA), and the International Organization for Standardization (ISO).

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1 INTRODUCTION

1.1. Purpose of this document

The purpose of this document is to collect international and regional provisions and standards regarding: (i) the institutional framework for environmental protection in industrial production, (ii) the management of industrial waste, (iii) methods of standardization of cement.

The production of eco-efficient environmental cement through the revalorization of industrial waste that is the main objective of the ECO-CEMENT project should be based on meeting a series of legislative parameters:

- Modern concepts of environmentally friendly production should be met.
- Management of industrial waste from cement production should be consistent with existing legislation.
- The mechanical and physical properties of the cement should meet international standards in order to be considered as an improved version of other cement types already in use.

1.2. Document structure

The report has been developed into seven chapters:

- Chapter 1 contains the introduction where the main objectives and the contents of the report are presented.
- Chapter 2 presents the criteria on which the selection of standards has been based and the activity plan.
- Chapter 3 describes the intention of the research team to identify possible shortcomings, omissions or even mistakes of the existing legislative framework.
- Chapter 4 contains international and regional normative documents applicable to cement production.
- Chapter 5 contains international and regional normative documents applicable to cement standardization.
- Chapter 6 contains some major conclusion drawn from the normative search.
- Chapter 7 contains a limited portion of the references used to form the present report.

1.3. Relations to the other activities in the project

The role of this document is very important in the development of research activity, as well as the satisfaction of international regulations on three levels, as presented above, is not only legally required but will determine to a large extent the success of the objectives of the research program.

2 NORMATIVE AND STANDARDS RESEARCH

2.1. Activity plan

The development of the normative research was based on collaboration of the several parts, i.e., Essentium Grupo SL, Solintel M&P SL and the Neapolis University of Cyprus. The research was conducted with the help of the internet mostly on international standards while national standards were provided by Essentium and Solintel for Spain and Neapolis University for Cyprus. Indicatively national standards for England were studied, also.

However, eventually since an effort is made, at least at a European level, to harmonize national regulations, only those national regulations that differ from their European counterparts were kept.

2.2. Selection criteria

As already mentioned at the introductory chapter, there were three main categories considered in the normative search:

- *Environmental Issues.* The relevant norms consider subjects including; prevention and remedying of environmental damage; air pollution; limitation of emissions; greenhouse gas emission reductions; restrictions on the marketing and use of certain dangerous substances, etc.
- *Waste Management.* The relevant norms consider subjects including; classification, packaging and labelling of dangerous substances; supervision and control of shipments of waste; landfill of waste; incineration of waste; export and import of dangerous chemicals, etc.
- *Standardization and Testing of Cement.* The relevant norms consider subjects including; methods of testing cement; determination of flexural and compressive strength; tests for chemical properties, etc. The selection of the proper testing method is strongly related to the structural usage of the cement produced.

It should be noted also that there is a variety of national and international provisions for the standardization of other materials related to cement and the production of concrete, such as aggregates; however, since this report is oriented to the production of cement, the legislative collection has been focused strictly in the area of cement production, testing and standardization.

2.3. Selection of standardization bodies

The international community in light of the given international concern on environmental issues and the significant contribution of the cement industry to increase greenhouse emissions held a series of norms. These provisions were offered by heterogeneous organizations and national governments. Among those included in this study are the following:

- American Society for Testing and Materials International (ASTM)
- European Committee for Standardization (CEN)
- United States Environmental Protection Agency (US-EPA)
- International Organization for Standardization (ISO)
- Cyprus Legislation
- British Legislation
- German Legislation
- Italian Legislation
- Irish Legislation
- Spanish Legislation

Aim was to include the regulations of the participating countries in the ECO-CEMENT program, the broader European legislation and the requirements of major international organizations such as ISO and ASTM.

The National Standards Authorities of the participating European countries transpose EN standards into National Standards and update them in a continuous process. All EN standards will eventually become national standards with the same reference numbers and titles but with the national prefixes, such as CYS, BS, IS, UNI, UNE.

An effort has been made to refer mainly to the original basic EN standards only and to those national standards that are different for each country.

3 IDENTIFICATION OF BLANK SPOTS AND BARRIERS

3.1. Finding barriers and opportunities in normative for Eco-Cement deployment

As will be shown in the following Chapters 4 and 5 there is a great number of provisions related to the production and standardization of cement. The research team intends to:

- synthesize international perceptions on the production process;
- identify possible shortcomings of the existing legislative framework;
- identify potential areas that are not covered by the present normative framework.

3.2. List of identified barriers and opportunities for Eco-Cement deployment

Opportunities

- benefits of high thermal coefficient (U value) and as a result high conductance. This is in accordance with the mainstream of all the European countries on energy efficient structures.
- with the eco cement can be produced self healing concrete
- it is self cleaning, with less coating needs
- recycle of materials for aggregates
- cement reduction (high energy demands)

Barriers

- the thermal coefficient factor must be checked if it is the same as the traditional concrete ($\alpha=10E-05$) that is the same with steel
- the potential oxidation of the reinforcement steel must be checked

4 NORMATIVE DOCUMENTS APPLICABLE TO THE PRODUCTION OF CEMENT**4.1. European Commission Legislation****4.1.1 European Regulations Regarding Environmental Issues**

- Council Directive **91/692/EEC** of 23 December 1991 standardizing and rationalizing reports on the implementation of certain Directives relating to the environment (OJ L 377, 31.12.1991, p. 48)
Amended by:
 - Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003 (L 284, 31.10.2003)Corrected by:
 - Corrigendum, OJ L 146, 13.6.2003, p. 52 (91/692/EEC)
- Directive **2001/42/EC** of the European Parliament and of the Council of 27 June 2001 on the assessment of the effects of certain plans and programmes on the environment OJ L 197, 21.7.2001, p. 30–37)
- Directive **2001/80/EC** of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants OJ L 309, 27.11.2001, p. 1–21
Amended by:
 - Council Directive 2006/105/EC of 20 November 2006 (L 363 20.12.2006)
 - M2 Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (L 140 5.6.2009)
 - Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic and the adjustments to the Treaties on which the European Union is founded (L 236 23.9.2003)Corrected by:
 - Corrigendum, OJ L 319, 23.11.2002, p. 30 (2001/80/EC)Repealed (from 01/01/2016) by:
 - Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Text with EEA relevance OJ L 334, 17.12.2010, p. 17–119
- Directive **2001/81/EC** of the European Parliament and of The Council of 23 October 2001 on national emission ceilings for certain atmospheric pollutants (OJ L 309, 27.11.2001, p. 22)
Amended by:
 - Council Directive 2006/105/EC of 20 November 2006 (L 363 20.12.2006)
 - Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (L 87, 31.3.2009)
 - Act concerning the conditions of accession of the Czech Republic, the Republic of Estonia, the Republic of Cyprus, the Republic of Latvia, the Republic of Lithuania, the Republic of Hungary, the Republic of Malta, the Republic of Poland, the Republic of Slovenia and the Slovak Republic and the adjustments to the Treaties on which the European Union is founded (L 236 23.9.2003)

- Directive **2003/4/EC** of the European Parliament and of the Council of 28 January 2003 on public access to environmental information and repealing Council Directive 90/313/EEC OJ L 41, 14.2.2003, p. 26–32.
- DIRECTIVE **2003/53/EC** of the European Parliament and of the council of 18 June 2003 amending for the 26th time Council Directive 76/769/EEC relating to restrictions on the marketing and use of certain dangerous substances and preparations (nonylphenol, nonylphenol ethoxylate and cement). Chromium in cement
- Directive **2003/87/EC** of the European Parliament and of The Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC.
Amended by:
 - Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 (L 338 18 13.11.2004)
 - Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 (L 8 3 13.1.2009)
 - Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (L 87 109 31.3.2009)
 - Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 (L 140 63 5.6.2009)
- Council Directive **2004/8/EC** on the promotion of cogeneration based on a useful heat demand in the integral energy market and amending Directive 92/42/EEC (11 February 2004).
- Directive **2004/35/CE** of the European Parliament and of the Council of 21 April 2004 on environmental liability with regard to the prevention and remedying of environmental damage OJ L 143, 30.4.2004, p. 56–75.
Amended by:
 - Directive 2006/21/EC of the European Parliament and of the Council of 15 March 2006 L 102 15 11.4.2006
 - Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 L 140 114 5.6.2009
- Commission Decision **2000/479/EC** of 17 July 2000 on the implementation of a European pollutant emission register (EPER) according to Article 15 of Council Directive 96/61/EC concerning integrated pollution prevention and control (IPPC).
- Directive **2004/101/EC** of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanisms Text with EEA relevance OJ L 338, 13.11.2004, p. 18–23.
- Directive **2004/107/EC** of the European Parliament and of The Council of 15 December 2004 relating to arsenic, cadmium, mercury, nickel and polycyclic aromatic hydrocarbons in ambient air (OJ L 23, 26.1.2005, p. 3).
Amended by:
 - Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (L 87, 31.3.2009).
- Commission Decision **2004/280/EC** of 19 March 2004 laying down transitional measures for the marketing of certain products of animal origin obtained in the Czech Republic, Estonia, Cyprus, Latvia, Lithuania, Hungary, Malta, Poland, Slovenia and Slovakia (Text with EEA relevance) (notified under document number C(2004) 845) OJ L 87, 25.3.2004, p. 60–61.

- Regulation (EC) No **166/2006** of the European Parliament and of the Council of 18 January 2006 concerning the establishment of a European Pollutant Release and Transfer Register and amending Council Directives 91/689/EEC and 96/61/EC (Text with EEA relevance) OJ L 33, 4.2.2006, p. 1–17)
Amended by:
 - Regulation (EC) No 596/2009 of the European Parliament and of the Council of 18 June 2009 (L 188 14 18.7.2009)
 - Commission Decision **2006/780/EC** of 13 November 2006 on avoiding double counting of greenhouse gas emission reductions under the Community emissions trading scheme for project activities under the Kyoto Protocol pursuant to Directive 2003/87/EC of the European Parliament and of the Council (notified under document number C(2006) 5362).
 - Regulation (EC) No **842/2006** of the European Parliament and of the Council of 17 May 2006 on certain fluorinated greenhouse gases (Text with EEA relevance) OJ L 161, 14.6.2006, p. 1–11.
Amended by:
 - Regulation (EC) No 1137/2008 of the European Parliament and of the Council of 22 October 2008 (L 311, 21.11.2008).
 - **IPPC Directive 2008/1/EC** of the European Parliament and of the Council of 15 January 2008 concerning integrated pollution prevention and control (Codified version) – Incorporates and repeals the Council Directive 96/61/EC of 24 September 1996 concerning Integrated Pollution Prevention and Control and all its amendments (Directive 2003/35/ EC (only Article 4 and Annex III), Directive 2003/87/EC (only Article 26), Regulation No 1882/2003 (only point (61) of Annex III) and Regulation No 166/2006 (only Article 21(2)) into a single “codified” text. OJ L 24, 29.1.2008, p. 8–29.
Amended by:
 - Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (L 140 114 5.6.2009)
- Repealed (from 07/01/2014) by:
- Directive 2010/75/EU of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Text with EEA relevance OJ L 334, 17.12.2010, p. 17–119.
- Directive **2008/50/EC** of the European Parliament and of the Council of 21 May 2008 on ambient air quality and cleaner air for Europe OJ L 152, 11.6.2008, p. 1–44
 - Directive **2008/101/EC** of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (Text with EEA relevance) OJ L 8, 13.1.2009, p. 3–21
 - Directive **2009/28/EC** of the European Parliament and of the Council of 23 April 2009 on the promotion of the use of energy from renewable sources and amending and subsequently repealing Directives 2001/77/EC and 2003/30/EC (Text with EEA relevance) OJ L 140, 5.6.2009, p. 16–62.
 - Directive **2009/29/EC** of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community (Text with EEA relevance) OJ L 140, 5.6.2009, p. 63–87.
 - Decision No **406/2009/EC** of the European Parliament and of the Council of 23 April 2009 on the effort of Member States to reduce their greenhouse gas emissions to meet the

Community's greenhouse gas emission reduction commitments up to 2020 OJ L 140, 5.6.2009, p. 136–148.

Amended by (Annex II from 01/07/2013):

- Act concerning the conditions of accession of the Republic of Croatia and the adjustments to the Treaty on European Union, the Treaty on the Functioning of the European Union and the Treaty establishing the European Atomic Energy Community - ANNEX III List referred to in Article 15 of the Act of Accession: adaptations to acts adopted by the institutions - 8. ENVIRONMENT (OJ L 112, 24.4.2012, p. 59–59)
- Regulation (EC) No **1005/2009** of the European Parliament and of the Council of 16 September 2009 on substances that deplete the ozone layer (Text with EEA relevance) OJ L 286, 31.10.2009, p. 1–30.
Amended by:
 - Commission Regulation (EU) No 744/2010 of 18 August 2010 (L 218, 19.8.2010).
- Regulation (EC) No **1221/2009** of the European Parliament and of the Council of 25 November 2009 on the voluntary participation by organisations in a Community eco-management and audit scheme (EMAS), repealing Regulation (EC) No 761/2001 and Commission Decisions 2001/681/EC and 2006/193/EC OJ L 342, 22.12.2009, p. 1–45.
- **Directive 2010/75/EU** of the EU Parliament and of the council of 24 November 2010 on industrial emissions (integrated pollution prevention control)
- **Directive 2011/92/EU** of the European Parliament and of the Council of 13 December 2011 on the assessment of the effects of certain public and private projects on the environment Text with EEA relevance OJ L 26, 28.1.2012, p. 1–21.
- Commission Decision **2011/278/EU** of 27 April 2011 determining transitional Union-wide rules for harmonized free allocation of emission allowances pursuant to Article 10a of Directive 2003/87/EC of the European Parliament and of the Council (notified under document C(2011) 2772).
Amended by:
 - **2011/745/**: Commission Decision of 11 November 2011 amending Decisions 2010/2/EU and 2011/278/EU as regards the sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage (notified under document C(2011) 8017).
 - **2012/498/EU**: Commission Decision of 17 August 2012 amending Decisions 2010/2/EU and 2011/278/EU as regards the sectors and subsectors which are deemed to be exposed to a significant risk of carbon leakage (notified under document C(2012) 5715).
- Commission Decision **2011/850/EU** of 12 December 2011 laying down rules for Directives 2004/107/EC and 2008/50/EC of the European Parliament and of the Council as regards the reciprocal exchange of information and reporting on ambient air quality (notified under document C(2011) 9068) OJ L 335, 17.12.2011, p. 86–106
- **Directive 2012/18/EU** of the European Parliament and of the Council of 4 July 2012 on the control of major-accident hazards involving dangerous substances, amending and subsequently repealing Council Directive 96/82/EC Text with EEA relevance OJ L 197, 24.7.2012, p. 1–37.
- Commission Regulation (EU) No **600/2012** of 21 June 2012 on the verification of greenhouse gas emission reports and tonne-kilometre reports and the accreditation of

verifiers pursuant to Directive 2003/87/EC of the European Parliament and of the Council
Text with EEA relevance

- COMMISSION REGULATION (EU) No **601/2012** of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council.

Corrected by:

- Corrigendum to Commission Regulation (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council (**OJ L 181**, 12.7.2012)

4.1.2 *European Regulations on Waste Management and Co-processing*

- Council Directive **67/548/EEC** of 27 June 1967 on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances OJ 196, 16.8.1967, p. 1–98.

The Annex I of Directive 67/548/EEC contains a list of harmonised classifications and labellings for substances or groups of substances, which are legally binding within the EU. This Annex has been amended by a large number of Directives within the years followed, with the most recent being:

- Commission Directive 2009/2/EC of 15 January 2009 amending, for the purpose of its adaptation to technical progress, for the 31st time, Council Directive 67/548/EEC on the approximation of the laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances (Text with EEA relevance) OJ L 11, 16.1.2009, p. 6–82.
- European Waste Catalogue (EWC), which was developed pursuant to Article 1(a) of Council Directive **75/442/EEC** on waste: Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance)
- European Parliament and Council Directive **94/62/EC** of 20 December 1994 on packaging and packaging waste OJ L 365, 31.12.1994, p. 10–23.

Amended by:

- Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003 (L 284 1 31.10.2003)
 - Directive 2004/12/EC of the European Parliament and of the Council of 11 February 2004 (L 47 26 18.2.2004)
 - Directive 2005/20/EC of the European Parliament and of the Council of 9 March 2005 (L 70 17 16.3.2005)
 - Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (L 87 109 31.3.2009)
 - Commission Decision **94/774/EC** of 24 November 1994 concerning the standard consignment note referred to in Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community OJ L 310, 3.12.1994, p. 70–76.
 - Commission Decision **97/622/EC** of 27 May 1997 concerning questionnaires for Member States reports on the implementation of certain Directives in the waste sector (implementation of Council Directive 91/692/EEC) OJ L 256, 19.9.1997, p. 13–19
- Amended by:
- Commission Decision 2007/151/EC of 6 March 2007 (L 67, 7.3.2007)
 - Council Directive **1999/31/EC** of 26 April 1999 on the landfill of waste OJ L 182, 16.7.1999, p. 1–19

Amended by:

- Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003 (L 284 31.10.2003)
- Regulation (EC) No 1137/2008 of the European Parliament and of the Council of 22 October 2008 (L 311 21.11.2008)
- Council Directive 2011/97/EU of 5 December 2011 (L 328 10.12.2011)
- Council Directive **1999/32/EC** of 26 April 1999 relating to a reduction in the sulphur content of certain liquid fuels and amending Directive 93/12/EEC OJ L 121, 11.5.1999, p. 13–18

Amended by:

- Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003 (L 284, 31.10.2003)
- Directive 2005/33/EC of the European Parliament and of the Council of 6 July 2005 (L 191, 22.7.2005)
- Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (L 87, 31.3.2009)
- Directive 2009/30/EC of the European Parliament and of the Council of 23 April 2009 (L 140, 5.6.2009)
- Directive **1999/45/EC** of the European Parliament and of the Council of 31 May 1999 concerning the approximation of the laws, regulations and administrative provisions of the Member States relating to the classification, packaging and labelling of dangerous preparations OJ L 200, 30.7.1999, p. 1–68

Amended by:

- Commission Directive 2001/60/EC of 7 August 2001 L 226 5 22.8.2001
- Regulation (EC) No 1882/2003 of the European Parliament and of the Council of 29 September 2003 (L 284 1 31.10.2003)
- Council Directive 2004/66/EC of 26 April 2004 L 168 35 1.5.2004
- Commission Directive 2006/8/EC of 23 January 2006 L 19 12 24.1.2006
- Council Directive 2006/96/EC of 20 November 2006 L 363 81 20.12.2006
- Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006 L 396 1 30.12.2006
- Regulation (EC) No 1137/2008 of the European Parliament and of the Council of 22 October 2008 L 311 1 21.11.2008
- Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 L 353 1 31.12.2008

Corrected by:

- Corrigendum, OJ L 6, 10.1.2002, p. 70 (1999/45/EC)
- Corrigendum, OJ L 43, 15.2.2007, p. 42 (2006/8/EC)
- Corrigendum, OJ L 136, 29.5.2007, p. 3 (1907/2006)
- Directive **2000/76/EC** of the European Parliament and of the Council of 4 December 2000 on the incineration of waste.

Amended by:

- Regulation (EC) No **1137/2008** of the European Parliament and of the Council of 22 October 2008 (L 311, 21.11.2008)

Corrected by:

- Corrigendum, OJ L 145, 31.5.2001, p. 52 (2000/76/EC)

Repealed (from 07/01/2014) by:

- Directive **2010/75/EU** of the European Parliament and of the Council of 24 November 2010 on industrial emissions (integrated pollution prevention and control) Text with EEA relevance OJ L 334, 17.12.2010, p. 17–119.
- Commission Decision **2000/532/EC** of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) OJ L 226, 6.9.2000, p. 3–24
Amended by:
 - Commission Decision 2001/118/EC of 16 January 2001 (L 47, 16.2.2001)
 - Commission Decision 2001/119/EC of 22 January 2001 (L 47, 16.2.2001)
 - Council Decision 2001/573/EC of 23 July 2001 (L 203, 28.7.2001)
- Commission Decision **2001/524/EC** of 28 June 2001 relating to the publication of references for standards EN 13428:2000, EN 13429:2000, EN 13430:2000, EN 13431:2000 and EN 13432:2000 in the Official Journal of the European Communities in connection with Directive 94/62/EC on packaging and packaging waste (Text with EEA relevance) (notified under document number C(2001) 1681) OJ L 190, 12.7.2001, p. 21–23.
Corrected by:
 - Corrigendum, OJ L 262, 2.10.2001, p. 38 (2001/524/EC)
- Directive **2004/42/CE** of the European Parliament and of the Council of 21 April 2004 on the limitation of emissions of volatile organic compounds due to the use of organic solvents in certain paints and varnishes and vehicle refinishing products and amending Directive 1999/13/EC (OJ L 143, 30.4.2004, p. 87)
Amended by:
 - Regulation (EC) No 1137/2008 of the European Parliament and of the Council of 22 October 2008 (L 311 1 21.11.2008)
 - Directive 2008/112/EC of the European Parliament and of the Council of 16 December 2008 (L 345 68 23.12.2008)
 - Commission Directive 2010/79/EU of 19 November 2010 (L 304 18 20.11.2010)
- Commission Decision **2005/270/EC** of 22 March 2005 establishing the formats relating to the database system pursuant to Directive 94/62/EC of the European Parliament and of the Council on packaging and packaging waste (notified under document number C(2005) 854) (Text with EEA relevance) OJ L 86, 5.4.2005, p. 6–12.
- Directive **2006/121/EC** of the European Parliament and of the Council of 18 December 2006 amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances in order to adapt it to Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency.
Corrected by:
 - Corrigendum to Directive 2006/121/EC of the European Parliament and of the Council of 18 December 2006 amending Council Directive 67/548/EEC on the approximation of laws, regulations and administrative provisions relating to the classification, packaging and labelling of dangerous substances in order to adapt it

- to Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) and establishing a European Chemicals Agency (OJ L 396, 30.12.2006) OJ L 136, 29.5.2007, p. 281–282
- Regulation (EC) No **1013/2006** of the European Parliament and of the Council of 14 June 2006 on shipments of waste OJ L 190, 12.7.2006, p. 1–98
 - Amended by:
 - Commission Regulation (EC) No 1379/2007 of 26 November 2007 (L 309, 27.11.2007)
 - Commission Regulation (EC) No 669/2008 of 15 July 2008 (L 188, 16.7.2008)
 - Regulation (EC) No 219/2009 of the European Parliament and of the Council of 11 March 2009 (L 87, 31.3.2009)
 - Commission Regulation (EC) No 308/2009 of 15 April 2009 (L 97, 16.4.2009)
 - Directive 2009/31/EC of the European Parliament and of the Council of 23 April 2009 (L 140, 5.6.2009)
 - Commission Regulation (EU) No 413/2010 of 12 May 2010 (L 119, 13.5.2010)
 - Commission Regulation (EU) No 664/2011 of 11 July 2011 (L 182, 12.7.2011)
 - Commission Regulation (EU) No 135/2012 of 16 February 2012 (L 46, 17.2.2012)
 - Corrected by:
 - Corrigendum, OJ L 299, 8.11.2008, p. 50 (1379/2007)
 - Corrigendum, OJ L 318, 28.11.2008, p. 15 (1013/2006) 2006R1013 - EN - 08.03.2012 — 007.001 — 1
 - Repealed by:
 - Commission Regulation (EU) No 135/2012 of 16 February 2012 amending Regulation (EC) No 1013/2006 of the European Parliament and of the Council on shipments of waste to include certain unclassified wastes in Annex IIIB (OJ L 46, 17.2.2012, p. 30–32)
 - Regulation (EC) No **1907/2006** of the European Parliament and of the Council of 18 December 2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), establishing a European Chemicals Agency, amending Directive 1999/45/EC and repealing Council Regulation (EEC) No 793/93 and Commission Regulation (EC) No 1488/94 as well as Council Directive 76/769/EEC and Commission Directives 91/155/EEC, 93/67/EEC, 93/105/EC and 2000/21/EC
 - Amended by:
 - Council Regulation (EC) No 1354/2007 of 15 November 2007 (L 304 1 22.11.2007)
 - Commission Regulation (EC) No 987/2008 of 8 October 2008 (L 268 14 9.10.2008)
 - Regulation (EC) No 1272/2008 of the European Parliament and of the Council of 16 December 2008 (L 353 1 31.12.2008)
 - Commission Regulation (EC) No 134/2009 of 16 February 2009 (L 46 3 17.2.2009)
 - Commission Regulation (EC) No 552/2009 of 22 June 2009 (L 164 7 26.6.2009)
 - Commission Regulation (EU) No 276/2010 of 31 March 2010 (L 86 7 1.4.2010)
 - Commission Regulation (EU) No 453/2010 of 20 May 2010 (L 133 1 31.5.2010)
 - Commission Regulation (EU) No 143/2011 of 17 February 2011 (L 44 2 18.2.2011)

- Commission Regulation (EU) No 207/2011 of 2 March 2011 (L 58 27 3.3.2011)
- Commission Regulation (EU) No 252/2011 of 15 March 2011 (L 69 3 16.3.2011)
- Commission Regulation (EU) No 253/2011 of 15 March 2011 (L 69 7 16.3.2011)
- Commission Regulation (EU) No 366/2011 of 14 April 2011 (L 101 12 15.4.2011)
- Commission Regulation (EU) No 494/2011 of 20 May 2011 (L 134 2 21.5.2011)
- Commission Regulation (EU) No 109/2012 of 9 February 2012 (L 37 1 10.2.2012)
- Commission Regulation (EU) No 125/2012 of 14 February 2012 (L 41 1 15.2.2012)
- Commission Regulation (EU) No 412/2012 of 15 May 2012 (L 128 1 16.5.2012)
- Commission Regulation (EU) No 835/2012 of 18 September 2012 (L 252 1 19.9.2012)
- Commission Regulation (EU) No 836/2012 of 18 September 2012 (L 252 4 19.9.2012)

Corrected by:

- Corrigendum, OJ L 136, 29.5.2007, p. 3 (1907/2006)
- Corrigendum, OJ L 141, 31.5.2008, p. 22 (1907/2006)
- Corrigendum, OJ L 36, 5.2.2009, p. 84 (1907/2006)
- Corrigendum, OJ L 49, 24.2.2011, p. 52 (143/2011)
- Corrigendum, OJ L 136, 24.5.2011, p. 105 (494/2011)
- Directive **2008/98/EC** of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives OJ L 312, 22.11.2008, p. 3–30
- Regulation (EC) No **689/2008** of the European Parliament and of the Council of 17 June 2008 concerning the export and import of dangerous chemicals OJ L 204, 31.7.2008, p. 1–35

Amended by:

- Commission Regulation (EU) No 15/2010 of 7 January 2010 (L 6 1 9.1.2010)
- Commission Regulation (EU) No 196/2010 of 9 March 2010 (L 60 5 10.3.2010)
- Commission Regulation (EU) No 186/2011 of 25 February 2011 (L 53 41 26.2.2011)
- Commission Regulation (EU) No 214/2011 of 3 March 2011 (L 59 8 4.3.2011)
- Commission Regulation (EU) No 834/2011 of 19 August 2011 (L 215 1 20.8.2011)
- Commission Regulation (EU) No 71/2012 of 27 January 2012 (L 26 23 28.1.2012)
- Regulation (EC) No **1272/2008** of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures, amending and repealing Directives 67/548/EEC and 1999/45/EC, and amending Regulation (EC) No 1907/2006 (Text with EEA relevance) OJ L 353, 31.12.2008, p. 1–1355.

Amended by:

- Commission Regulation (EC) No 790/2009 of 10 August 2009 (L 235 1 5.9.2009)
- Commission Regulation (EU) No 286/2011 of 10 March 2011 (L 83 1 30.3.2011)

Corrected by:

- Corrigendum, OJ L 16, 20.1.2011, p. 1 (1272/2008)
- EU Emissions Trading Directive (EU ETS)

4.2. United States Environmental Protection Agency (US-EPA) Standards for Cement Kiln Dust (CKD) Waste

CKD is categorized by EPA as a "special waste" and has been temporarily exempted from federal hazardous waste regulations under Subtitle C of the Resource Conservation and Recovery Act (RCRA). EPA is in the process of developing standards for the management of CKD and has published a set of proposed Subtitle D (i.e., non-hazardous, solid waste) regulations to govern CKD management.

On July 25, 2002, EPA publishes a notice of data availability (NODA) in the Federal Register (67 FR 48648). In addition to announcing the availability of new data to the public, the NODA explains that EPA is considering a new approach to CKD management whereby it would finalize the proposed CKD management standards as a RCRA Subtitle D (solid waste) rule and temporarily suspend the proposed RCRA Subtitle C (hazardous waste) portion of the proposed rule for 3 to 5 years to assess how CKD management practices and state regulatory programs evolve. Based upon this assessment, EPA will either formally withdraw or promulgate that portion of the 1999 proposed rule. For additional information, see:

- Additional Data Available on Wastes Studied in the Report to Congress on Cement Kiln Dust, July 25, 2002 (67 FR 48648)
- Federal Register NODA: Extension of Public Comment Period - November 8, 2002 (67 FR 68130)

On August 20, 1999, EPA publishes "Standards for the Management of Cement Kiln Dust; Proposed Rule" (64 FR 45632). EPA's proposed approach would allow CKD to remain a non-hazardous waste provided that the specified management standards are met. CKD not managed in compliance with the standards is proposed to be a "listed waste" and would need to comply with tailored RCRA Subtitle C management standards. For additional information, see:

- Standards for the Management of Cement Kiln Dust; Proposed Rule, August 20, 1999 (64 FR 45632)
- Environmental Fact Sheet: Management Standards Proposed for Cement Kiln Dust Waste (EPA530-99-F-023)
- Standards for the use or disposal of sewage sludge, Final Rule 40 CFR Part 503. Federal Register 58:9387-9401.

4.3. International Organization for Standardization, ISO Standards

- **ISO/IEC Guide 65:1996** General requirements for bodies operating product certification systems

Revised by:

- ISO/IEC 17065:2012 Conformity assessment -- Requirements for bodies certifying products, processes and services
- **ISO/IEC 17021:2011** Conformity assessment -- Requirements for bodies providing audit and certification of management systems
- **ISO/IEC TS 17021-2:2012** Conformity assessment -- Requirements for bodies providing audit and certification of management systems -- Part 2: Competence requirements for auditing and certification of environmental management systems
- **ISO 9001:2008** Quality management systems – Requirements
- **ISO/IEC 17025:2005** General requirements for the competence of testing and calibration laboratories
- **ISO 9277:2010** Determination of the specific surface area of solids by gas adsorption -- BET method
- **ISO/TR 1896:1991** Products in fibre-reinforced cement -- Non-combustible fibre-reinforced boards of calcium silicate or cement for insulation and fire protection
- **ISO 10426-2:2003** Petroleum and natural gas industries -- Cements and materials for well cementing -- Part 2: Testing of well cements
- **ISO 10426-5:2004** Petroleum and natural gas industries -- Cements and materials for well cementing -- Part 5: Determination of shrinkage and expansion of well cement formulations at atmospheric pressure
- **ISO 10426-1:2009** Petroleum and natural gas industries -- Cements and materials for well cementing -- Part 1: Specification
- **ISO 23210:2009** Stationary source emissions -- Determination of PM10/PM2,5 mass concentration in flue gas -- Measurement at low concentrations by use of impactors

4.4. Cyprus Republic Legislation

- **P.I. 32/2010** The Control of Atmospheric Pollution (Form Authorisation Application Emission Waste) Order 2010
For reasons of compliance with:
 - Law 187(I)/2002 The Control of Atmospheric Pollution
 - Law 85(I)/2007 The Control of Atmospheric Pollution (amending)
 - Law 10(I)/2008 The Control of Atmospheric Pollution (amending)
 - Law 79(I)/2009 The Control of Atmospheric Pollution (amending)
- **Law 215(I)/2002** The Solid and Hazardous Waste
For reasons of compliance with:
 - Council Directive 75/442/EEC of 15 July 1975 on waste OJ L 194, 25.7.1975, p. 39–41.
 - Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste OJ L 78, 26.3.1991, p. 32–37.
 - Commission Decision 94/3/EC of 20 December 1993 establishing a list of wastes pursuant to Article 1a of Council Directive 75/442/EEC on waste OJ L 5, 7.1.1994, p. 15–33.
 - Council Directive 91/689/EEC of 12 December 1991 on hazardous waste.
 - 94/904/EC: Council Decision of 22 December 1994 establishing a list of hazardous waste pursuant to Article 1 (4) of Council Directive 91/689/EEC on hazardous waste OJ L 356, 31.12.1994, p. 14–22.
 - Council Directive 1996/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) OJ L 243, 24.9.1996, p. 31–35.
 - Council Directive 75/439/EEC of 16 June 1975 on the disposal of waste oils OJ L 194, 25.7.1975, p. 23–25.
 - Council Directive 91/157/EEC of 18 March 1991 on batteries and accumulators containing certain dangerous substances OJ L 78, 26.3.1991, p. 38–41.
 - Council Directive 96/61/EC of 24 September 1996 concerning integrated pollution prevention and control OJ L 257, 10.10.1996.
 - Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste OJ L 182, 16.7.1999, p. 1–19
- **P.I. 157/2003** The Solid and Hazardous Waste (waste list)
For reasons of compliance with:
 - Council Directive 75/442/EEC of 15 July 1975 on waste OJ L 194, 25.7.1975, p. 39–41
 - Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste OJ L 78, 26.3.1991, p. 32–37
 - Commission Decision 2000/532/EC of 3 May 2000 replacing Decision 94/3/EC establishing a list of wastes pursuant to Article 1(a) of Council Directive 75/442/EEC on waste and Council Decision 94/904/EC establishing a list of hazardous waste pursuant to Article 1(4) of Council Directive 91/689/EEC on hazardous waste (notified under document number C(2000) 1147) (Text with EEA relevance) OJ L 226, 6.9.2000, p. 3–24

- **P.I. 158/2003** The Solid and Hazardous Waste (waste registry)
For reasons of compliance with:
 - Council Directive 75/442/EEC of 15 July 1975 on waste OJ L 194, 25.7.1975, p. 39–41
 - Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste OJ L 78, 26.3.1991, p. 32–37
 - Council Directive 91/689/EEC of 12 December 1991 on hazardous waste

- **P.I. 159/2003** The Solid and Hazardous Waste (hazardous waste identification forms)
For reasons of compliance with:
 - Council Directive 91/689/EEC of 12 December 1991 on hazardous waste
 - Commission Decision 94/774/EC of 24 November 1994 concerning the standard consignment note referred to in Council Regulation (EEC) No 259/93 on the supervision and control of shipments of waste within, into and out of the European Community OJ L 310, 3.12.1994, p. 70–76

- **P.I. 160/2003** The Solid and Hazardous Waste (applications for waste management license)
For reasons of compliance with:
 - Council Directive 75/442/EEC of 15 July 1975 on waste OJ L 194, 25.7.1975, p. 39–41
 - Council Directive 91/156/EEC of 18 March 1991 amending Directive 75/442/EEC on waste OJ L 78, 26.3.1991, p. 32–37

- **P.I. 195/2004** The Control of Atmospheric Pollution (Limitation of Emissions of Certain Pollutants into Air from Large Combustion Plants)
For reasons of compliance with:
 - Directive 2001/80/EC of the European Parliament and of the Council of 23 October 2001 on the limitation of emissions of certain pollutants into the air from large combustion plants OJ L 309, 27.11.2001, p. 1–21

- **P.I. 284/2003** The Control of Atmospheric Pollution (Incineration of Wastes)
For reasons of compliance with:
 - Directive 2000/76/EC of the European Parliament and of the Council of 4 December 2000 on the incineration of waste.

- **Law 185(I)/2011** Waste
For reasons of compliance with:
 - Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives OJ L 312, 22.11.2008, p. 3–30
 - Council Directive 1996/59/EC of 16 September 1996 on the disposal of polychlorinated biphenyls and polychlorinated terphenyls (PCB/PCT) OJ L 243, 24.9.1996, p. 31–35
 - Council Directive 1999/31/EC of 26 April 1999 on the landfill of waste OJ L 182, 16.7.1999, p. 1–19
 - Directive 2002/96/EC of the European Parliament and of the Council of 27 January 2003 on waste electrical and electronic equipment (WEEE) - Joint declaration of the European Parliament, the Council and the Commission relating to Article 9 OJ L 37, 13.2.2003, p. 24–39

- Regulation (EC) No 1013/2006 of the European Parliament and of the Council of 14 June 2006 on shipments of waste OJ L 190, 12.7.2006, p. 1–98
- Directive 2006/66/EC of the European Parliament and of the Council of 6 September 2006 on batteries and accumulators and waste batteries and accumulators and repealing Directive 91/157/EEC (Text with EEA relevance) OJ L 266, 26.9.2006, p. 1–14
- Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment Text with EEA relevance OJ L 174, 1.7.2011, p. 88–110
- **Law 110(I)/2011** Establishing a Trading Scheme for Greenhouse Gas Emissions
National Execution Measures for compliance with:
 - Directive 2003/87/EC of the European Parliament and of the Council of 13 October 2003 establishing a scheme for greenhouse gas emission allowance trading within the Community and amending Council Directive 96/61/EC (Text with EEA relevance) OJ L 275, 25.10.2003, p. 32–46.
 - Directive 2004/101/EC of the European Parliament and of the Council of 27 October 2004 amending Directive 2003/87/EC establishing a scheme for greenhouse gas emission allowance trading within the Community, in respect of the Kyoto Protocol's project mechanismsText with EEA relevance OJ L 338, 13.11.2004, p. 18–23.
 - Directive 2008/101/EC of the European Parliament and of the Council of 19 November 2008 amending Directive 2003/87/EC so as to include aviation activities in the scheme for greenhouse gas emission allowance trading within the Community (Text with EEA relevance) OJ L 8, 13.1.2009, p. 3–21.
 - European legislation Directive 2009/29/EC of the European Parliament and of the Council of 23 April 2009 amending Directive 2003/87/EC so as to improve and extend the greenhouse gas emission allowance trading scheme of the Community OJ L 140, 5.6.2009.

4.5. Italian Legislation

- **D. Lgs 59/2005** (integrated with 128/2010)
 - The Directive 2010/75/UE (Industrial Emission Directive) ex IPPC will be transported in Italy in 2013
 - **D Lgs Incineration of waste**
 - **F Lgs 152/2006** Environmental standards
 - **DM 05/02/1998** recovery of non-hazardous waste
- For reasons of compliance with:
- Directive 2000/76/CE waste incineration. Integrated with 2011/5/CE (IED)
- **D Lgs 205/2010** modification of 152/ 2006
- For reasons of compliance with:
- Directive 2008/98/CE Waste Directive

4.6. Spanish Legislation

4.6.1 *Environmental Issues*

- **Law 7/2007**, of July 9, Integrated Management of Environmental Quality
- **Royal Decree Law 1/2008** of 11 January, approving the revised text of the Law on Environmental Impact Assessment of projects.
- **Law 16/2002** for environmental clearance, DR 653/2003 of 30 May on the incineration of waste is collected specific requirements for co-incineration facilities included in the scope of Law 16/2002.
- **Law 34/2007** of 15 November on air quality and atmospheric protection
- **Law 20/2009** of 4 December on environmental prevention and control activities.
- **Decree 833/1975**, of 6 February that develops LAW 38/1972 Atmospheric environment protection.
- The Ministry of Environment and the Cement Manufacturers Association of Spain (OFICEMEN) signed on November 28, 2001 a **voluntary agreement** with the aim to prevent, reduce and control pollution from cement plants by applying progressive Best Available Techniques. In it, they have set emission commitments for point sources.
- **Royal Decree 956/2008** of 6 June, approving the instruction for receiving cement (RC-08).

4.6.2 *Waste Revalorization*

- **Royal Decree 1481/2001**, of December 27, 2001, for regulating the disposal of waste by deposit in landfill.
- **Resolution of October 8, 2001**, approving the National Plan I used tires (2001-2006).
- **Resolution of 25 September 2001** approving the I National Plan to End of Vehicle Life (2001-2006).
- **Resolution of 14 June 2001** approving the National Plan R Construction Waste and Demolition (2001-2006).
- **Resolution of 14 June 2001** approving the National Plan I Sludge Wastewater (2001-2006).
- **Royal Decree-Law 4/2001** of 16 February 2001 on the rules applicable to administrative intervention energy recovery from animal meal obtained from processing of offal and carcasses animals.

- **Royal Decree 1911/2000**, of 24 November 2000 regulating the destruction of specified materials markets risk in relation to TSEs.
- **Resolution of 13 January 2000** approving the First National Urban Waste Plan (2000-2006).
- **Law 10/1998** of April 21, 1998, Waste.
- **Law 11/1997** of 24 April 1997 on packaging and packaging waste.
- **Resolution of 28 April 1995** approving the First National Hazardous Waste Plan (1995-2000).
- **Royal Decree 833/1988**, of July 20, 1988, by which approves the Regulations for the Implementation of the Law 20/1986, basic hazardous waste.
- **Decree 2414/1961**, of November 30, 1961, which approves the Regulation of troublesome, Unhealthy, Harmful and dangerous.
- **Order of March 15**, 1963, by approving an instruction which dictate complementary rules for the implementation of Regulation of troublesome, unhealthy, harmful and dangerous.

5 NORMATIVE DOCUMENTS APPLICABLE TO CEMENT STANDARDIZATION

5.1. European Committee for Standardization - CEN

In this section regulations adopted from the European Committee for Standardization – CEN are listed including testing methodologies for several cement types for identification of their mechanical characteristics. These European standards, EN, have been adopted in a great extend by national legislations, such as BS norms (British Standards), CYS norms (Cyprus Standards) and UNE norms (Una Norma Española).

5.1.1 CEN/TC 51 - Cement and building limes

CEN/TR 15697:2008	Cement - Performance testing for sulfate resistance - State of the art report
CEN/TR 196-4:2007	Methods of testing cement - Part 4: Quantitative determination of constituents
CR 13933:2000	Masonry cement - Testing for workability (cohesivity)
EN 12002:2008	Adhesives for tiles - Determination of transverse deformation for cementitious adhesives and grouts
EN 1348:2007	Adhesives for tiles - Determination of tensile adhesion strength for cementitious adhesives
EN 13639:2002	Determination of total organic carbon in limestone
EN 13639:2002/AC:2004	Determination of total organic carbon in limestone
EN 14216:2004	Cement - Composition, specifications and conformity criteria for very low heat special cements
EN 14647:2005	Calcium aluminate cement - Composition, specifications and conformity criteria
EN 14647:2005/AC:2006	Calcium aluminate cement - Composition, specifications and conformity criteria
EN 15743:2010	Supersulfated cement - Composition, specifications and conformity criteria
EN 196-1:2005	Methods of testing cement - Part 1: Determination of strength
EN 196-10:2006	Methods of testing cement - Part 10: Determination of the water-soluble chromium (VI) content of cement
EN 196-2:2005	Methods of testing cement - Part 2: Chemical analysis of cement
EN 196-	Methods of testing cement - Part 3: Determination of setting times and

3:2005+A1:2008	soundness
EN 196-5:2011	Methods of testing cement - Part 5: Pozzolanicity test for pozzolanic cement
EN 196-6:2010	Methods of testing cement - Part 6: Determination of fineness
EN 196-7:2007	Methods of testing cement - Part 7: Methods of taking and preparing samples of cement
EN 196-8:2010	Methods of testing cement - Part 8: Heat of hydration - Solution method
EN 196-9:2010	Methods of testing cement - Part 9: Heat of hydration - Semi-adiabatic method
EN 197-1:2011/	Cement - Part 1: Composition, specifications and conformity criteria for common cements
EN 197-2:2000	Cement - Part 2: Conformity evaluation
EN 413-1:2011	Masonry cement - Part 1: Composition, specifications and conformity criteria
EN 413-2:2005	Masonry cement - Part 2: Test methods
EN 459-1:2010	Building lime - Part 1: Definitions, specifications and conformity criteria
EN 459-2:2010	Building lime - Part 2: Test methods
EN 459-3:2011	Building lime - Part 3: Conformity evaluation
EN ISO 13504:2012	Dentistry - General requirements for instruments and related accessories used in dental implant placement and treatment (ISO 13504:2012)
EN ISO 3107:2011	Dentistry - Zinc oxide/eugenol cements and zinc oxide/non-eugenol cements (ISO 3107:2011)
EN ISO 9917-1:2007	Dentistry - Water-based cements - Part 1: Powder/liquid acid-base cements (ISO 9917-1:2007)
EN ISO 9917-2:2010	Dentistry - Water-based cements - Part 2: Resin-modified cements (ISO 9917-2:2010)

5.1.2 CEN/TC 104 - Concrete and related products

CR 13902:2000	Test methods for determining the water/cement ratio of fresh concrete
EN 12614:2004	Products and systems for the protection and repair of concrete structures - Test methods - Determination of glass transition temperatures of polymers
EN 13062:2003	Products and systems for the protection and repair of concrete structure

	- Test method - Determination of thixotropy of products for protection of reinforcement
EN 14117:2004	Products systems for the protection and repair of concrete structures - Test methods - Determination of time of efflux of cementitious injection products
EN 206-1:2000	Concrete - Part 1: Specification, performance, production and conformity
EN 206-1:2000/A1:2004	Concrete - Part 1: Specification performance, production and conformity
EN 206-1:2000/A2:2005	Concrete - Part 1: Specification performance, production and conformity
EN 206-9:2010	Concrete - Part 9: Additional Rules for Self-compacting Concrete (SCC)
EN 445:2007	Grout for prestressing tendons - Test methods
EN 446:2007	Grout for prestressing tendons - Grouting procedures
EN 447:2007	Grout for prestressing tendons - Basic requirements
EN 450-1:2012	Fly ash for concrete - Part 1: Definition, specifications and conformity criteria
EN 450-2:2005	Fly ash for concrete - Part 2: Conformity evaluation
EN 451-1:2003	Method of testing fly ash - Part 1: Determination of free calcium oxide content
EN 451-2:1994	Method of testing fly ash - Part 2: Determination of fineness by wet sieving
EN 934-2:2009+A1:2012	Admixtures for concrete, mortar and grout - Part 2: Concrete admixtures - Definitions, requirements, conformity, marking and labelling

5.1.3 CEN/TC 112 - Wood-based panels

EN 1128:1995	Cement-bonded particleboards - Determination of hard body impact resistance
EN 1328:1996	Cement bonded particleboards - Determination of frost resistance
EN 633:1993	Cement-bonded particleboards - Definition and classification
EN 634-1:1995	Cement-bonded particleboards - Specification - Part 1: General requirements
EN 634-2:2007	Cement-bonded particleboards - Specifications - Part 2: Requirements for OPC bonded particleboards for use in dry, humid and external

	conditions
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5.1.4 CEN/TR 125 - Masonry

CEN/TR 15124:2005	Design, preparation and application of internal gypsum plastering systems
CEN/TR 15125:2005	Design, preparation and application of internal cement and/or lime plastering systems
CEN/TR 15225:2005	Guidance on Factory Production Control for the CE Marking (Attestation of Conformity 2+) of designed masonry mortars
EN 1015-1:1998	Methods of test for mortar for masonry - Part 1: Determination of particle size distribution (by sieve analysis)
EN 1015-10:1999	Methods of test for mortar for masonry - Part 10: Determination of dry bulk density of hardened mortar
EN 1015-11:1999	Methods of test for mortar for masonry - Part 11: Determination of flexural and compressive strength of hardened mortar
EN 1015-12:2000	Methods of test of mortar for masonry - Part 12: Determination of adhesive strength of hardened rendering and plastering mortars on substrates
EN 1015-17:2000	Methods of test for mortar for masonry - Part 17: Determination of water-soluble chloride content of fresh mortars
EN 1015-2:1998	Methods of test for mortar for masonry - Part 2: Bulk sampling of mortars and preparation of test mortars
EN 1015-3:1999	Methods of test for mortar for masonry - Part 3: Determination of consistence of fresh mortar (by flow table)
EN 1015-4:1998	Methods of test for mortar for masonry - Part 4: Determination of consistence of fresh mortar (by plunger penetration)
EN 1015-6:1998	Methods of test for mortar for masonry - Part 6: Determination of bulk density of fresh mortar
EN 1015-7:1998	Methods of test for mortar for masonry - Part 7: Determination of air content of fresh mortar
EN 1015-9:1999	Methods of test for mortar for masonry - Part 9: Determination of workable life and correction time of fresh mortar
EN 13914-1:2005	Design, preparation and application of external rendering and internal plastering - External rendering
EN 13914-2:2005	Design, preparation and application of external rendering and internal plastering - Part 2: Design considerations and essential principles for internal plastering

EN 845-3:2003+A1:2008	Specification for ancillary components for masonry - Part 3: Bed joint reinforcement of steel meshwork
EN 846-2:2000	Methods of test for ancillary components for masonry - Part 2: Determination of bond strength of prefabricated bed joint reinforcement in mortar joints
EN 846-3:2000	Methods of test for ancillary components for masonry - Part 3: Determination of shear load capacity of welds in prefabricated bed joint reinforcement
EN 846-5:2012	Methods of test for ancillary components for masonry - Part 5: Determination of tensile and compressive load capacity and load displacement characteristics of wall ties (couplet test)
EN 846-6:2012	Methods of test for ancillary components for masonry - Part 6: Determination of tensile and compressive load capacity and load displacement characteristics of wall ties (single end test)
EN 846-7:2012	Methods of test for ancillary components for masonry - Part 7: Determination of shear load capacity and load displacement characteristics of shear ties and slip ties (couplet test for mortar joint connections)
EN 998-2:2010	Specification for mortar for masonry - Part 2: Masonry mortar

5.1.5 *CEN/TC 128 - Roof covering products for discontinuous laying and products for wall cladding*

EN 12467:2012	Fibre-cement flat sheets - Product specification and test methods
EN 15057:2006	Fibre cement profiled sheets - Impact resistance test method
EN 492:2012	Fibre-cement slates and fittings - Product specification and test methods
EN 494:2012	Fibre-cement profiled sheets and fittings - Product specification and test methods

5.1.6 *CEN/TC 154 - Aggregates*

EN 1744-6:2006	Tests for chemical properties of aggregates - Part 6: Determination of the influence of recycled aggregate extract on the initial setting time of cement
EN 933-9:2009	Tests for geometrical properties of aggregates - Part 9: Assessment of fines - Methylene blue test

5.1.7 *CEN/TC 164 - Water supply*

EN 14944-1:2006	Influence of cementitious products on water intended for human consumption - Test methods - Part 1: Influence of factory made cementitious products on organoleptic parameters
EN 14944-3:2007	Influence of cementitious products on water intended for human consumption - Test methods - Part 3: Migration of substances from factory-made cementitious products

5.1.8 CEN/TC 241 - Gypsum and gypsum based products

EN 13279-1:2008	Gypsum binders and gypsum plasters - Part 1: Definitions and requirements
EN 13279-2:2004	Gypsum binders and gypsum plasters - Part 2: Test methods
EN 13454-1:2004	Binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate - Part 1: Definitions and requirements
EN 13454-2:2003+A1:2007	Binders, composite binders and factory made mixtures for floor screeds based on calcium sulfate - Part 2: Test methods
EN 14190:2005	Gypsum plasterboard products from reprocessing - Definitions, requirements and test methods

5.1.9 CEN/TC 229 - Precast concrete products

EN 1169:1999	Precast concrete products - General rules for factory production control of glass-fibre reinforced cement
EN 1170-1:1997	Precast concrete products - Test method for glass-fibre reinforced cement - Part 1: Measuring the consistency of the matrix "Slump test" method
EN 1170-2:1997	Precast concrete products - Test method for glass-fibre reinforced cement - Part 2: Measuring the fibre content in fresh GRC, "Wash out test"
EN 1170-3:1997	Precast concrete products - Test method for glass-fibre reinforced cement - Part 3: Measuring the fibre content of sprayed GRC
EN 1170-4:1997	Precast concrete products - Test method for glass-fibre reinforced cement - Part 4: Measuring bending strength, "Simplified bending test" method
EN 1170-5:1997	Precast concrete products - Test method for glass-fibre reinforced cement - Part 5: Measuring bending strength, "Complete bending test" method
EN 1170-6:1997	Precast concrete products - Test method for glass-fibre reinforced cement - Part 6: Determination of the absorption of water by immersion and determination of the dry density
EN 1170-7:1997	Precast concrete products - Test method for glass-fibre reinforced

	cement - Part 7: Measurement of extremes of dimensional variations due to moisture content
EN 1170-8:2008	Test method for glass-fibre reinforced cement - Part 8: Cyclic weathering type test
EN 14649:2005	Precast concrete products - Test method for strength retention of glass fibres in cement and concrete (SIC TEST)

5.1.10 *CEN/TC 298 - Pigments and extenders*

EN 12878:2005	Pigments for the coloring of building materials based on cement and/or lime - Specifications and methods of test
EN 12878:2005/AC:2006	Pigments for the coloring of building materials based on cement and/or lime - Specifications and methods of test

5.1.11 *CEN/TC 336 - Bituminous binders*

EN 12848:2009	Bitumen and bituminous binders - Determination of mixing stability with cement of bituminous emulsions
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5.2. American Society for Testing and Materials International - ASTM Standards

- **C226 - 12** Standard Specification for Air-Entraining Additions for Use in the Manufacture of Air-Entraining Hydraulic Cement
- **C465 - 10** Standard Specification for Processing Additions for Use in the Manufacture of Hydraulic Cements
- **C688 - 08** Standard Specification for Functional Additions for Use in Hydraulic Cements
- **C1565 - 09** Standard Test Method for Determination of Pack-Set Index of Portland Cement
- **C185 - 08** Standard Test Method for Air Content of Hydraulic Cement Mortar
- **C227 - 10** Standard Test Method for Potential Alkali Reactivity of Cement-Aggregate Combinations (Mortar-Bar Method)
- **C1567 - 11** Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
- **C114 - 11b** Standard Test Methods for Chemical Analysis of Hydraulic Cement
- **C1356 - 07(2012)** Standard Test Method for Quantitative Determination of Phases in Portland Cement Clinker by Microscopical Point-Count Procedure
- **C1365 - 06(2011)** Standard Test Method for Determination of the Proportion of Phases in Portland Cement and Portland-Cement Clinker Using X-Ray Powder Diffraction Analysis

- C1556 - 11a Standard Test Method for Determining the Apparent Chloride Diffusion Coefficient of Cementitious Mixtures by Bulk Diffusion
- C1585 - 11 Standard Test Method for Measurement of Rate of Absorption of Water by Hydraulic-Cement Concretes
- C183 - 08 Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement
- C490 / C490M - 11 Standard Practice for Use of Apparatus for the Determination of Length Change of Hardened Cement Paste, Mortar, and Concrete
- C511 - 09 Standard Specification for Mixing Rooms, Moist Cabinets, Moist Rooms, and Water Storage Tanks Used in the Testing of Hydraulic Cements and Concretes
- C1005 - 10 Standard Specification for Reference Masses and Devices for Determining Mass and Volume for Use in the Physical Testing of Hydraulic Cements
- C1222 - 09 Standard Practice for Evaluation of Laboratories Testing Hydraulic Cement
- C115 - 10 Standard Test Method for Fineness of Portland Cement by the Turbidimeter
- C188 - 09 Standard Test Method for Density of Hydraulic Cement
- C204 - 11 Standard Test Methods for Fineness of Hydraulic Cement by Air-Permeability Apparatus
- C430 - 08 Standard Test Method for Fineness of Hydraulic Cement by the 45- μm (No. 325) Sieve
- C786 / C786M - 10 Standard Test Method for Fineness of Hydraulic Cement and Raw Materials by the 300- μm (No. 50), 150- μm (No. 100), and 75- μm (No. 200) Sieves by Wet Methods
- C186 - 05 Standard Test Method for Heat of Hydration of Hydraulic Cement
- C1702 - 09a Standard Test Method for Measurement of Heat of Hydration of Hydraulic Cementitious Materials Using Isothermal Conduction Calorimetry

Hydraulic Cements for General Concrete Construction

- C10 / C10M - 10 Standard Specification for Natural Cement
- C150 / C150M - 12 Standard Specification for Portland Cement
- C595 / C595M - 12e1 Standard Specification for Blended Hydraulic Cements
- C1157 / C1157M - 11 Standard Performance Specification for Hydraulic Cement
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Masonry Cement

- C91 / C91M - 12 Standard Specification for Masonry Cement
- C1328 / C1328M - 12 Standard Specification for Plastic (Stucco) Cement
- C1329 / C1329M - 12 Standard Specification for Mortar Cement

Miscellaneous Tests

- C1084 - 10 Standard Test Method for Portland-Cement Content of Hardened Hydraulic-Cement Concrete

Packaged Dry Combined Materials

- C928 / C928M - 09 Standard Specification for Packaged, Dry, Rapid-Hardening Cementitious Materials for Concrete Repairs
- C1107 / C1107M - 11 Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink)
- C1708 - 12 Standard Test Methods for Self-leveling Mortars Containing Hydraulic Cements

Performance of Cementitious Materials and Admixture Combinations

- C1679 - 09 Standard Practice for Measuring Hydration Kinetics of Hydraulic Cementitious Mixtures Using Isothermal Calorimetry

Polymer-Modified Concrete and Mortars

- C1438 - 11a Standard Specification for Latex and Powder Polymer Modifiers in Hydraulic Cement Concrete and Mortar

Ready-Mixed Concrete

- C1602 / C1602M - 12 Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete

Special Cements

- C806 - 12 Standard Test Method for Restrained Expansion of Expansive Cement Mortar
- C845 / C845M - 12 Standard Specification for Expansive Hydraulic Cement
- C1600 / C1600M - 11 Standard Specification for Rapid Hardening Hydraulic Cement

Specifications and Guidelines

- **C1097 - 07(2012)** Standard Specification for Hydrated Lime for Use in Asphalt Cement or Bituminous Pavements

Specifications and Test Methods for Accessories and Related Products

- **C897 - 05(2009)** Standard Specification for Aggregate for Job-Mixed Portland Cement-Based Plasters

Specifications and Test Methods for Gypsum Products

- **C61 / C61M - 00(2011)** Standard Specification for Gypsum Keene's Cement
- **C1629 / C1629M - 06(2011)** Standard Classification for Abuse-Resistant Nondecorated Interior Gypsum Panel Products and Fiber-Reinforced Cement Panels

Specifications for the Application of Gypsum and Other Products in Assemblies

- **C926 - 12a** Standard Specification for Application of Portland Cement-Based Plaster
- **C1063 - 12c** Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster

Strength

- **C109 / C109M - 12** Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50-mm] Cube Specimens)
- **C348 - 08** Standard Test Method for Flexural Strength of Hydraulic-Cement Mortars
- **C349 - 08** Standard Test Method for Compressive Strength of Hydraulic-Cement Mortars (Using Portions of Prisms Broken in Flexure)
- **C917 - 05(2011)** Standard Test Method for Evaluation of Cement Strength Uniformity From a Single Source

Sulfate Content

- **C265 - 08** Standard Test Method for Water-Extractable Sulfate in Hydrated Hydraulic Cement Mortar
- **C563 - 07** Standard Test Method for Approximation of Optimum SO₃ in Hydraulic Cement Using Compressive Strength
- **C1038 / C1038M - 10** Standard Test Method for Expansion of Hydraulic Cement Mortar Bars Stored in Water

Sulfate Resistance

- **C452 / C452M - 10** Standard Test Method for Potential Expansion of Portland-Cement Mortars Exposed to Sulfate
- **C1012 / C1012M - 12** Standard Test Method for Length Change of Hydraulic-Cement Mortars Exposed to a Sulfate Solution

Supplementary Cementitious Materials

- **C311 - 11b** Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for Use in Portland-Cement Concrete
- **C618 - 12a** Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete
- **C1240 - 12** Standard Specification for Silica Fume Used in Cementitious Mixtures
- **C1697 - 10** Standard Specification for Blended Supplementary Cementitious Materials
- **C1709 - 11** Standard Guide for Evaluation of Alternative Supplementary Cementitious Materials (ASCM) for Use in Concrete

Testing Fresh Concrete

- **C143 / C143M - 12** Standard Test Method for Slump of Hydraulic-Cement Concrete
- **C1064 / C1064M - 12** Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete
- **C1362 - 09** Standard Test Method for Flow of Freshly Mixed Hydraulic Cement Concrete
- **BS 1610:** Materials testing machines and force verification equipment.

Testing strength for hardened concrete

- **BS 1881-115** Testing concrete: Specification for compression testing machines for concrete.
- **BS 1881 - 116** Testing concrete: Method for determination of compressive strength of concrete cubes.
- **BS 1881 - 117** Testing concrete: Method for determination of tensile splitting strength.
- **BS 1881 -118** Testing concrete: Method for determination of flexural strength.
- **BS 1881 -Part 127** Testing concrete: Method of verifying the performance of a concrete cube compression machine using the comparative cube test.
- **BS 8110-1** Structural use of concrete: Code of practice for design and construction.

- **BS CP 110** The structural use of concrete (superseded by BS 8110).
- **BS EN 12390-3** Testing hardened concrete: Compressive strength of test specimens.
- **BS EN 12390-4** Testing hardened concrete: Compressive strength: Specification for testing machines.
- **BS EN 12390-5** Testing hardened concrete: Flexural strength of test specimens.
- **BS EN 12390-6** Testing hardened concrete: Tensile splitting strength of test specimens.
- **BS EN ISO 376** Metallic materials: Calibration of force-proving instruments used for the verification of uniaxial testing machines.

(Mortars, Litinas, 2008)

- **EN 1015-1** Methods of test for mortar for masonry: Determination of particle size distribution by sieve analysis
- **EN 1015-2** Methods of test for mortar for masonry: Bulk sampling of mortars and preparation of mortars
- **EN 1015-3** Methods of test for mortar for masonry: Determination of consistence of fresh mortar by flow table
- **EN 1015-6** Methods of test for mortar for masonry: Determination of bulk density of fresh mortar
- **EN 1015-7** Methods of test for mortar for masonry: Determination of air content of fresh mortar
- **EN 1015-8** Methods of test for mortar for masonry: Determination of water retentivity of fresh mortar
- **EN 1015-9** Methods of test for mortar for masonry: Determination of workable life and correction time of fresh mortar
- **EN 1015-10** Methods of test for mortar for masonry: Determination of dry bulk density of hardened mortar
- **EN 1015-11** Methods of test for mortar for masonry: Determination of flexural and compressive strength of hardened mortar
- **EN 1015-12** Methods of test for mortar for masonry: Determination of adhesive strength of hardened rendering and plastering mortars on substrates
- **EN 1015-17** Methods of test for mortar for masonry: Determination of water soluble chloride content of fresh mortar

- EN 1015-18 Methods of test for mortar for masonry: Determination of water absorption coefficient due to capillary action
- EN 1015-19 Methods of test for mortar for masonry: Determination for water vapour permeability of hardened rendering and plastering mortars
- EN 1052-3 Methods of test for mortar for masonry: Determination of initial shear strength

(New mortar standards, 2005)

- BS EN 998-1 Specification for mortar for masonry - Part 1: Rendering and plastering mortar
- BS EN 998-2 Specification for mortar for masonry - Part 2: Masonry mortar PD 6678 Guide to the selection and specification of masonry mortar
- BS EN 13318: Screed material and floor screeds - Definitions
- BS EN 13813: Screed material and floor screeds - Screed material – Properties and requirements
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(Technical References for mortar and associated topics, 2012)

Mortar Industry Association (MIA) Publications

- Data Sheet No. 1: May 2012 Factory-produced lime:sand mortar for masonry
- Data Sheet No. 2: May 2012 Factory-produced ready-to-use mortar for masonry
- Data Sheet No. 3: May 2012 Factory-produced silo mortar for masonry
- Data Sheet No. 4: May 2012 Factory-produced mortar for external rendering
- Data Sheet No. 5: May 2012 Factory-produced mortar for internal plastering
- Data Sheet No. 6: May 2012 Factory-produced lime:sand mortar for paving
- Data Sheet No. 7: May 2012 Factory-produced mortar for use at low/freezing temperatures
- Data Sheet No. 8: May 2012 Efflorescence and bloom on masonry
- Data Sheet No. 9: May 2012 Technical references for mortar and associated topics
- Data Sheet No. 10: May 2012 Guide to remedial measures associated with internal plastering
- Data Sheet No. 11: May 2012 The benefits of factory-produced lime:sand mortar for masonry
- Data Sheet No. 12: May 2012 Guide to minimising rain penetration through masonry walls
- Data Sheet No. 13: May 2012 Terms, descriptions and definitions
- Data Sheet No. 14: May 2012 Guide to best practice for external rendering

- **Data Sheet No. 15:** May 2012 Admixtures for mortar
- **Data Sheet No. 16:** May 2012 The use of ground granulated blastfurnace slag and fly ash in mortar
- **Data Sheet No. 17:** May 2012 Pigments for mortar
- **Data Sheet No. 18:** May 2012 The use of lime in mortar
- **Data Sheet No. 19:** May 2012 New mortar standards
- **Data Sheet No. 20:** May 2012 Health & Safety Product Data Sheet - Factory-produced Mortar
- **Data Sheet No. 21:** May 2012 Hydraulic Lime Mortars
- **Data Sheet No. 22:** May 2012 Screeds

Concrete Society Publications

- **CS 116:** 2000 (GCG3) Rendering - a practical handbook by W L Monks.
- **CS 159:** 2005 (GCG4) Mortars for masonry: Guidance on specification, types, production and use.
- **CAS24:** Rendering - Defects and Remedial Measures

British Cement Association (BCA) Publications

- **48.063** BCA guide to materials for masonry mortar.

British Standards Institution (BSI) Publications

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- **BS 476: Part 10:** 2009 Fire testing on building materials and structures. Guide to the principles, selection, role and application of fire testing and their outputs.
- **BS 476: Part 20:** 1987 (2012) Fire tests on building materials and structures. Method for determination of the fire resistance of elements of construction (general principles).
- **BS 476: Part 21:** 1987 (2011) Fire testing on building materials and structures. Methods for the determination of fire resistance of loadbearing elements of construction.
- **BS 743:** 1970 (2007) Specification for materials for damp-proof courses (partially replaced).
- **BS 4027:** 1996 (2007) Specification for sulfate-resisting Portland cement.

- **BS 4551: 2005 + A1 (2010)** Mortar. Methods of test for mortar. Chemical analysis and physical testing.
- **BS 4729: 2005 (2011)** Clay and calcium silicate bricks of special shapes and sizes. Recommendations.
- **BS 5502: Part 21:1990 (2009)** Buildings and structures for agriculture. Code of practice for selection and use of construction materials.
- **BS 5642: Part 1: 1978 (2010)** Sills and copings. Specification for window sills of precast concrete, cast stone, clayware, slate and natural stone.
- **BS 5642: Part 2: 1983 (2010)** Sills and copings. Specification for copings of precast concrete, cast stone, clayware, slate and natural stone.
- **BS 6100-0: 2010** Building and civil engineering vocabulary. Introduction and index.
- **BS 6100-6: 2008** Building and civil engineering vocabulary. Construction parts.
- **BS 6100-9: 2007** Building and civil engineering vocabulary. Work with concrete and plaster.
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- **BS 8000-3 2001 (2008)** Workmanship on building sites. Code of practice for masonry.
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- **BS 8221-1: 2000** Code of practice for cleaning and surface repair of buildings. Cleaning of natural stones, brick, terracotta and concrete.
- **BS 8221-2: 2000** Code of practice for cleaning and surface repair of buildings. Surface repair of natural stones, brick, terracotta and concrete.

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- **BS EN 413-2: 2005** Masonry cement: Test methods.
- **BS EN 450-1: 2005 + AI (2007)** Fly ash for concrete. Definition, specifications and conformity criteria.
- **BS EN 459-1: 2010** Building lime. Definitions, specifications and conformity criteria.
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- **BS EN 459-3: 2011** Building lime. Conformity evaluation.
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- **BS EN 480-2: 2006** Admixtures for concrete, mortar and grout. Test methods. Determination of setting time.
- **BS EN 480-5: 2005** Admixtures for concrete, mortar and grout. Test methods. Determination of capillary absorption.
- **BS EN 480-6: 2005** Admixtures for concrete, mortar and grout. Test methods. Infrared analysis
- **BS EN 480-8: 1997** Admixtures for concrete, mortar and grout. Test methods. Determination of the conventional dry material content
- **BS EN 480-10: 2009** Admixtures for concrete, mortar and grout. Test methods. Determination of water soluble chloride content.
- **BS EN 480-12: 2010** Admixtures for concrete, mortar and grout. Test methods. Determination of the alkali content of admixtures.
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- **BS EN 771-1: 2011** Specification for masonry units. Clay masonry units.
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- **BS EN 771-6: 2011** Specification for masonry units. Natural stone masonry units.
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- **BS EN 772-2: 1998** Methods of test for masonry units. Determination of percentage voids in masonry units (by paper indentation).
- **BS EN 772-3: 1998** Methods of test for masonry units. Determination of net volume and percentage of voids of clay masonry units by hydrostatic weighing.
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- **BS EN 772-19: 2000** Methods of test for masonry units. Determination of moisture expansion of large horizontally perforated clay masonry units.
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- **BS EN 1015-7: 1999** Methods of test for mortar for masonry. Determination of air content of fresh mortar.

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- **Brick Information Sheets Repointing of Brickwork**
- **Brick Information Sheets Bricklaying in Winter Conditions**
- **Brick Information Sheets Tinting Brickwork Colour Variation Information**
- **Brickwork Design & Detailing DN 7 Brickwork Durability**
- **Brickwork Design & Detailing DN 8 Rigid Paving with Clay Pavers**
- **Brickwork Design & Detailing DN 9 Flexible Paving with Clay Pavers**
- **Brickwork Design & Detailing DN 16 Resisting Rain Penetration with Facing Brickwork**
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- **Textbook BDA2 Creative Brickwork**

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- **C359 - 08** Standard Test Method for Early Stiffening of Hydraulic Cement (Mortar Method)
- **C451 - 08** Standard Test Method for Early Stiffening of Hydraulic Cement (Paste Method)
- **C807 - 08** Standard Test Method for Time of Setting of Hydraulic Cement Mortar by Modified Vicat Needle

Volume Change

- **C151 / C151M - 09** Standard Test Method for Autoclave Expansion of Hydraulic Cement
- **C596 - 09** Standard Test Method for Drying Shrinkage of Mortar Containing Hydraulic Cement
- **C1608 - 12** Standard Test Method for Chemical Shrinkage of Hydraulic Cement Paste

Volume Change

- **C157 / C157M - 08** Standard Test Method for Length Change of Hardened Hydraulic-Cement Mortar and Concrete
- **C341 / C341M - 06** Standard Practice for Length Change of Cast, Drilled, or Sawed Specimens of Hydraulic-Cement Mortar and Concrete
- **C827 / C827M - 10** Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures
- **C1090 - 10** Standard Test Method for Measuring Changes in Height of Cylindrical Specimens of Hydraulic-Cement Grout
- **C1698 - 09** Standard Test Method for Autogenous Strain of Cement Paste and Mortar

Workability

- **C187 - 11e1** Standard Test Method for Amount of Water Required for Normal Consistency of Hydraulic Cement Paste
- **C230 / C230M - 08** Standard Specification for Flow Table for Use in Tests of Hydraulic Cement
- **C305 - 12** Standard Practice for Mechanical Mixing of Hydraulic Cement Pastes and Mortars of Plastic Consistency
- **C1437 - 07** Standard Test Method for Flow of Hydraulic Cement Mortar
- **C1506 - 09** Standard Test Method for Water Retention of Hydraulic Cement-Based Mortars and Plasters
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- **ISO 390:1993** Products in fibre-reinforced cement -- Sampling and inspection
- **ISO 16402:2008** Implants for surgery -- Acrylic resin cement -- Flexural fatigue testing of acrylic resin cements used in orthopaedics
- **ISO 4179:2005** Ductile iron pipes and fittings for pressure and non-pressure pipelines -- Cement mortar lining
- **ISO 10426-3:2003** Petroleum and natural gas industries -- Cements and materials for well cementing -- Part 3: Testing of deepwater well cement formulations
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- **ISO 10426-6:2008** Petroleum and natural gas industries -- Cements and materials for well cementing -- Part 6: Methods for determining the static gel strength of cement formulations
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- **ISO 29581-1:2009** Cement -- Test methods -- **Part 1: Analysis by wet chemistry**
- **ISO 29581-2:2010** Cement -- Test methods -- Part 2: Chemical analysis by X-ray fluorescence
- **ISO 9597:2008** Cement -- Test methods -- Determination of setting time and soundness
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5.4. British Legislation for Standardization – British Standards, BS

- **BS 4027** Sulfate-resisting Portland cement [SRPC]
- **BS 6610** Pozzolanic pulverized-fuel ash cement
- **BS 4248** Supersulfated cement
- **BS 8500** Concrete: Complementary British Standard to BS EN 206 –1

5.5. German Legislation for Standardization – Deutsches Institut für Normung Standards, DIN

- **DIN EN 206-1/DIN 1045-2** applies to concrete that is used for site concrete buildings, prefabricated buildings and prefabricated buildings and civil engineering structures. DIN EN 206-1 includes the current amendment to EN 206-1/A2. The designations DIN 1045-2 and DIN 1045-3 describe the state of the edition from August 2008.

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6 CONCLUSIONS

In this section we attempt to present the legal framework associated with the industrial production of cement. The legislation are referred to some of the foremost international bodies such as CEN, ISO, ASTM and US-EPA and cover both environmental issues related to the production process, and methods of quality certification of the produced cement.

The continuing development, correction and evolution of legislation because of the change in international conditions and scientific concepts necessitates the ongoing study. The attempt of production of environmental-friendly cement within the ECO-CEMENT project should meet this legislative framework or identify its possible shortcomings and omissions in order to correct and/or complete them.

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