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Guidance on Factory Production Control for the CE Marking (Attestation of Conformity 2+) of designed masonry mortars

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National foreword

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English Version

Guidance on Factory Production Control for the CE Marking (Attestation of Conformity 2+) of designed masonry mortars

Guide de contrôle de la production en usine pour le marquage CE (attestation de conformité 2+) des mortiers de maçonnerie performanciels (formulés)

Anleitung zur werkseigenen Produktionskontrolle für die CE-Kennzeichnung (Konformitätsnachweisverfahren 2+) von Mauermörteln nach Eignungsprüfung

This Technical Report was approved by CEN on 12 August 2005. It has been drawn up by the Technical Committee CEN/TC 125.

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Contents

Foreword

This Technical Report (CEN/TR 15225:2005) has been prepared by Technical Committee CEN/TC 125 "Masonry", the secretariat of which is held by BSI.

1 Introduction

This CEN Technical Report has been developed by CEN TC 125 and is aimed at providing guidance regarding factory production control (FPC) for designed masonry mortars (conformity system 2+).

For prescribed masonry mortar, plaster and rendering mortar (conformity system 4) there is no requirement for involvement by Notified Bodies (NBs). Manufacturers of prescribed masonry mortars can use the guidance given in this document as a basis for establishing suitable factory production control procedures to enable demonstration of conformity with the standard and the declared values.

The aim of this Guidance is to assist manufacturers in their work leading to CE marking of designed mortars.

The guidance consists of

— A general elaboration of Clause 8.3, factory production control, which is common to all the FPC references for the work of Notified Bodies and manufacturers to be found in Annex ZA, and

— An inspection scheme containing specific checklists for designed masonry mortar, which is to be considered informative.

NOTE This guidance document can be used for the evaluation of factory production control of other types of mortar that are produced in the same factory.

2 Specifications

2.1 General

These specifications are for the elaboration of FPC according to the instructions in Table ZA.3 in EN 998-2/ Annex ZA, which refer to Clause 8.3 - Factory Production Control.

Manufacturers having a factory production control system which complies with EN ISO 9001:2000 and which addresses the requirements of the harmonised standard EN 998-2, are recognised as satisfying the FPC requirements of the Directive.

The manufacturer shall establish, document and maintain a factory production control system to enable continuing conformity with the standard and the declared values of the products placed on the market.

The responsibility, authority and interrelation of all personnel who manage, perform and verify work affecting the quality of designed masonry mortar products shall be defined in the documentation of the factory production control system and keep effective.

The factory production control system shall describe the procedure of production, the regular inspections by the manufacturer and the testing. Controls and tests should address the characteristics of raw materials and finished products, as well as the production procedures, the production equipment or machines, the test equipment and the marking of the product.

All the test results shall be recorded.

Actions to be taken when the control test values or criteria do not meet those specified shall be documented by the manufacturer.

The conformity of the product shall be determined by testing according to the requirements of the harmonized standard EN 998-2 and correlated to the values and parameters stated in the factory production control manual.

2.2 Process control

2.2.1 Incoming raw materials

As appropriate, the manufacturer shall define the acceptance criteria of raw materials, and the procedures operated to ensure that these are met.

Manufacturer’s inspection scheme for raw materials is given in Table 1.

2.2.2 Production process

The relevant features of the production processes shall be defined giving the frequency of the manufacturer’s inspection checks, together with the required criteria and the required in-progress product characteristics. Actions to be taken when the criteria or the product characteristics are not achieved shall be specified by the manufacturer within the FPC documentation.

All production equipment that has an influence on the declared values shall be controlled and regularly inspected according to the documented procedures, frequencies and criteria.

Manufacturer’s inspection schemes for production equipment are given in Table 2.

2.3 Finished product conformity

2.3.1 Tests on the finished product

The factory production control system shall incorporate a sampling plan and which shall respect the required frequency of testing of the finished product. The results of testing shall be recorded.

The sample shall be representative of the production.

The tests shall be carried out in accordance with the methods described in the EN 998-2, if given, and with the agreed FPC documentation.

Alternative methods of test to the reference methods specified in the standard may be adopted, except for initial type testing and in case of dispute, provided that these alternative methods satisfy the following:

a) A relationship can be shown to exist between the results from the reference test and those from the alternative test, and

b) The information on which the relationship is based is available.

The results of testing shall meet the specified compliance criteria and shall be recorded.

For production evaluation the manufacturer could define the conformity criteria in the FPC documentation. The conformity of the production may be evaluated in a number of ways including acceptance by variables, assessment by attributes or assessment based on individual results. One method of satisfying this for production processes is to use the approach given in ISO 12491.

Manufacturer's inspection scheme for finished product testing is given in Table 3.

The frequency of testing given in the inspection scheme may be reduced where it may be shown that the required compliance values are consistently achieved. Thus where a higher level of consistency is achieved, a lower level of testing may be adopted.

2.3.2 Test equipment

All weighing, measuring and testing equipment that has an influence on the declared values shall be calibrated and regularly inspected according to the documented procedures and frequencies, as stated in the factory production control manual.

Manufacturer's inspection schemes and the calibration criteria for equipment are given in Table 4.

2.4 Statistical techniques

Where and when possible and applicable, the results of inspections and testing shall be interpreted by means of statistical techniques, by attributes or by variables, to verify the product characteristics and to determine if the production conforms with the compliance criteria and the product conforms with the declared values.

2.5 Traceability – marking and stock control of products

The marking and stock control shall be documented. Products should be identifiable and traceable with regard to their production origin. Only conforming products shall be CE marked.

Manufacturer's inspection scheme for the manufacturer for marking and stock control is given in Table 5.

2.6 Non-conforming products

The procedure for dealing with non-conforming products shall be documented. Products that do not conform to the requirements shall be segregated and marked accordingly. However, these may be reclassified by the manufacturer and given different declared values. The manufacturer shall take action to avoid a recurrence of the non-conformity.

3 Inspection schemes

The checklists in these tables are to be used as guidance to Notified Bodies and manufacturers. The frequencies given in these tables represent the initial position and they may be reduced on the basis of satisfactory long-term product test performance. The inspections may be made directly by the manufacturer or under the responsibility of the manufacturer.

The announced surveillance inspections by the Notified certification Body shall be carried out at least once per year.

Table 1 — Inspection of raw materials

Subject	Purpose of inspection	Method/procedure	Frequency of inspection by manufacturer
Binder	Identification of suitable raw materials	- Inspection of delivery note	- Every delivery
		- Visual inspection or other appropriate procedures	- At appropriate time intervals as given in the FPC documentation
Aggregate	Identification of suitable raw materials	- Inspection of delivery note	- Every delivery
		- Visual inspection or other appropriate procedures	- At appropriate time intervals as given in the FPC documentation
Additives	Identification of suitable raw materials	- Inspection of delivery note	- Every delivery
		- Visual inspection or other appropriate procedures	- At appropriate time intervals as given in the FPC documentation
Admixtures	Identification of suitable raw materials	- Inspection of delivery note	- Every delivery
		- Visual inspection or other appropriate procedures	- At appropriate time intervals as given in the FPC documentation
Mixing water	Establishment of suitability for production of mortar	- Visual inspection or other appropriate procedures	- At appropriate time intervals as given in the FPC documentation
Storage of raw materials	To check storage of materials for contamination in areas designated by the manufacturer	- Visual inspection or other appropriate procedures	- At appropriate time intervals as given in the FPC documentation

NOTE 1 The delivery, transportation and storage systems may not always allow access to visual inspection (e.g. dry materials in closed tank and pipe systems).
NOTE 2 Visual inspections may have to be integrated with periodical tests on the relevant materials to ascertain their suitability.

Table 2 — Inspection of production equipment

Subject	Purpose of inspection	Method/procedure	Frequency of inspection by manufacturer
Weighing equipment and volumetric dosing equipment	Correct functioning	Visual inspection or other appropriate procedures	- Daily
	Controlling of the manufacturer's declared accuracy	**Weighing equipment**: Calibration with apparatus, which is calibrated in accordance with the national calibration requirements	- On (re) installation - once in two years
		Volumetric dosing equipment: Calibration by appropriate methods	- On (re) installation - once in two year
Mixer	Control-of correct operation	Visual inspection or other appropriate procedures	- Weekly

Table 3 — Tests on finished product (designed masonry mortars in accordance with EN 998-2)

Subject	Purpose of inspection	Reference method/ procedure	Frequency of test by manufacturer
Properties of fresh mortar			
Chloride content [1)] (for masonry mortars intended for reinforced masonry)	Conformity with the declared value, if any	- EN 1015-17	Every 2500 m^3 or every 4000 tons, with - a minimum of once every 4 weeks and - a maximum of three times every 4 weeks
Hardened mortar properties			
Compressive strength	Conformity with the category or declared value	- EN 1015-11	Every 2500 m^3 or every 4000 tons, with - a minimum of once every 4 weeks and - a maximum of three times every 4 weeks
Bond strength [2)] (for designed masonry mortars intended to be used in elements subject to structural requirements)	Conformity with the tabulated value or declared value	EN 1052-3 or by declaration from EN 998-2, annex C	- Once a year,
Water absorption [2)] (for masonry mortars intended to be used in external elements)	Conformity with the declared value if any	EN 1015-18	- Initial type testing
Water vapour permeability [2)] (for masonry mortars intended to be used in external elements)	Conformity with the tabulated value or declared value, if any	EN 1745 or by declaration from EN 1745, Table A.12	- Initial type testing
Thermal conductivity [2)] (for masonry mortars intended to be used in elements subject to thermal insulation requirements)	Conformity with the tabulated value or declared value, if any	EN 1745 or by declaration from EN 1745, Table A.12	- Initial type testing
Reaction to fire [2)] (for masonry mortars intended be used in elements subject to fire requirements)	Conformity with the declared euroclass, if any	EN 13501-1	-Initial type testing
Durability	Conformity with the declared value, if any	Reference to the provisions valid for the intended use	- At appropriate time intervals as given in the FPC documentation

NOTE The table includes mandatory properties, listed in the Table ZA.1 of EN 998-2 and these are subject to certification by the Notified Bodies. The manufacturer does not necessarily have to declare a value against every property and some may be on the basis of, for example, tabulated values. Where the declared value is from a tabulated value the Notified Bodies are only required to check against the tabulated value.

[1)] If the water soluble chloride content of the sand is known to be less than 0.1 %, eg as in most inlandquarries, that value may be used in the calculation of the overall chloride content as an alternative to carrying out a test determination.

[2)] Only when declared by the manufacturer.

Table 4 — Inspection of test equipment

Subject	Purpose of inspection	Method/procedure	Frequency of calibration by manufacturer
Strength testing equipment	Correct functioning and accuracy	-Calibration in accordance with specified[1)] calibration instruction / manual	- On (re) installation, - after major repair[2)] but - once every 2 years
Weighing scales	Correct functioning and accuracy	- Calibration in accordance with specified[1)] calibration instruction/manual	- Once a year
Dimension measuring equipment	Correct functioning and accuracy	- Calibration in accordance with specified[1)] calibration instruction/manual	- Once a year
Temperature and moisture measuring equipment in the laboratory and in the climate room	Correct functioning and accuracy	- Calibration in accordance with specified[1)] calibration instruction/manual	- Once a year
Sieves	Correct functioning and accuracy	- Calibration in accordance with specified[1)] calibration instruction/manual	- Once a year
Apparatus for the determination of workable life	Correct functioning and accuracy	- Visual inspection or other appropriate procedures	- Once a year
Flow table	Correct functioning and accuracy	- Visual inspection or other appropriate procedures	- Once a year
Moulds	Correct functioning and accuracy	- Measurement: Any requirements or dimensional tolerances of the mortar test specimens shall be fulfilled	- Once a year
Ovens	Correct functioning and accuracy	Calibration in accordance with specified [1)] calibration instruction/manual	- Once a year
Air content apparatus	Correct functioning and accuracy	Calibration in accordance with the specified [1)] calibration instruction/manual	- Once a year

NOTE 1 The equipment only needs to be inspected if it is relevant to the testing methods.

NOTE 2 External laboratories can be used to carry out the testing.

[1)] Calibration to National requirements may be to an EN or ISO standard where they exist

[2)] This includes repairs that affect the accuracy of the machine.

Table 5 — Marking and stock control

Subject	Purpose of inspection	Method/procedure	Frequency of inspection by manufacturer
Product marking	Product marking for product identification in conformity with the requirements of EN 998-2, including traceability	Visual inspection	- Daily or - After every change of product
Stock Control	To check separate storage of non-conforming products	Visual inspection	As given in the FPC documentation

NOTE All over Europe mortar manufacturers have a wide range of different products and manufacturing processes differ widely. Many manufacturers have sophisticated process control system; others have finished product control system or a combination of both. When manufacturers have developed an alternative FPC-system, this alternative FPC system, to the reference system specified in this Position Paper; may be adopted, provided this alternative FPC-system satisfy the following:

a) A relationship can be shown to exist between the result from the reference FPC-system and the alternative FPC-system.

b) The same level of product compliance can be demonstrated.

c) The information on which the relationship is based is available.

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