

<b>GNB-CPD</b> <b>SG13</b>	<b>Guidance from the Group of Notified Bodies  for the Construction Products Directive  89/106/EEC</b>	<b>NB-CPD/SG13/10/076</b> Issued: 27 April 2010 <b>APPROVED –  GUIDANCE</b>
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## **GNB-CPD position paper from SG13 - All harmonized standards for precast concrete products**

### ***Certification of FPC of precast concrete products under M100 (as amended)***

#### **General scope, limitations and aim of this guidance for notified bodies**

This position paper contains guidance for Notified Bodies (NBs) involved in the attestation of conformity of FPC of concrete products according to mandate M100. The purpose is to help NBs work equivalently and come to common judgments. This guidance contains informative material (which NBs should or may follow) and/or normative guidance (which NBs shall follow or at least work equivalently to as circumstances demand).

The primary document for NBs is the edition of the relevant harmonized standard that is currently cited in the Official Journal of the EU to which the manufacturer works. This guidance is thought necessary to provide clarity and completeness for NBs so that they can work equivalently to the harmonized standards. It **supplements and makes practical for NBs** the harmonized standards, approved Advisory Group guidance, and Standing Committee guidance in the form of GPs, which also apply - unless otherwise explicitly stated in this guidance. This position paper should **not** contradict nor extend the scope of the work and role of a NB, nor impose additional burdens on the manufacturer, beyond those laid down in the CPD and the harmonized standards.

This guidance should be considered valid until the relevant standards are amended to include the guidance (as thought fit by the CEN/TC); or until guidance from Commission, SCC or AG has changed on relevant matters. Whereupon, the paper should be considered for withdrawal/revision and be replaced by new guidance as necessary.

This position paper was considered approved by SG13 on 3 December 2008 and by Advisory Group on 9 March 2010.

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## 1 Foreword

The scope of this document is the initial assessment of the factory production control (FPC) and the continuous surveillance once the certificate has been issued. Initial type testing (ITT), [including where applicable initial type calculation (ITC)], sampling and retesting do not fall under the tasks of the notified body but they have to be documented.

To maintain equivalent use and interpretation of this document by the NBs it is important that any questions are communicated to the secretary of the GNB-CPD/SG13. The address of the secretary can be found on the CIRCA web site.

## 2 Scope and field of application

This document defines and describes the sequence of the main operations for granting and maintaining a certificate of factory production control under system 2+ for the precast concrete products under the harmonized standards under mandates M100, M126 and M139 on the basis of the requirements of Annex ZA of the hENs and of the documents mentioned in the reference list.

## 3 Reference list

All the harmonized standards prepared under mandates M100 (and its addendum January 2004), M126 and M139.

EN 13369:2004, *Common rules for precast concrete products*

NOTE: *In addition, relevant information from CEN/TC 229 on future amendments of EN 13369 will be made available on the CIRCA Website [SG 13 - What's New]*

*([http://circa.europa.eu/Members/irc/nbg/cdpqnb/library?l=/sector\\_groups/sg13\\_precast\\_concrete/sg13\\_what\\_s\\_new&vm=detailed&sb=Title](http://circa.europa.eu/Members/irc/nbg/cdpqnb/library?l=/sector_groups/sg13_precast_concrete/sg13_what_s_new&vm=detailed&sb=Title)).*

Commission Guidance Paper 'B', *The definition of Factory Production Control in Technical Specifications for Construction Products*

Commission Guidance Paper 'K', *The Attestation of Conformity Systems and the Role and Tasks of the Notified Bodies in the field of the Construction Products Directive*

Commission Guidance Paper 'L', *Application and use of Eurocodes*

Commission Guidance Paper 'M', *Conformity Assessment under the CPD: Initial type-testing and Factory production control*

Position Paper NB-CPD/AG/03/001, *Numbering of certificates of conformity*

Position Paper NB-CPD/AG/03/002, *Guidance to notified bodies on the attestation of conformity under the Construction Products Directive 89/106/EEC*

## 4 Terminology

Terms used in this document are generally defined in the documents listed in clause 3. The following information is added:

### 4.1 Deviations

At the 27<sup>th</sup> GNB-CPD Advisory Group (AG) meeting, it was agreed that AG will not define grades of nonconformity (or deviation) and that sector groups can not impose such schemes on NBs. However, it was agreed that SG13 could propose the following scheme, based on experience of certification of precast concrete products, for those NBs that wish to use it:

#### **Observation:**

Deviation which affords no risk to the functioning of the factory production control but must be dealt with before the next inspection of the factory production control;

#### **Minor non-conformity:**

Deviation which affords no risk to the effective functioning of the factory production control when dealt with within a limited period of time, for example 2 months;

#### **Major non-conformity:**

Deviation that affects the functioning and the effectiveness of the factory production control in such a way that products that do not comply with the relevant standard can be put on the market. This kind of deviation normally makes it necessary to repeat all or part of the inspection of the factory production control as soon as possible after that the manufacturer has reported that he had corrected the deviations.

Further details of the grading of non compliance are regulated in further (national) standards or regulations.

## 4.2 CE marking method

Method(s) chosen by the manufacturer to declare the performances or values accompanying the CE marking on the basis of Annex ZA of the product standards concerned.

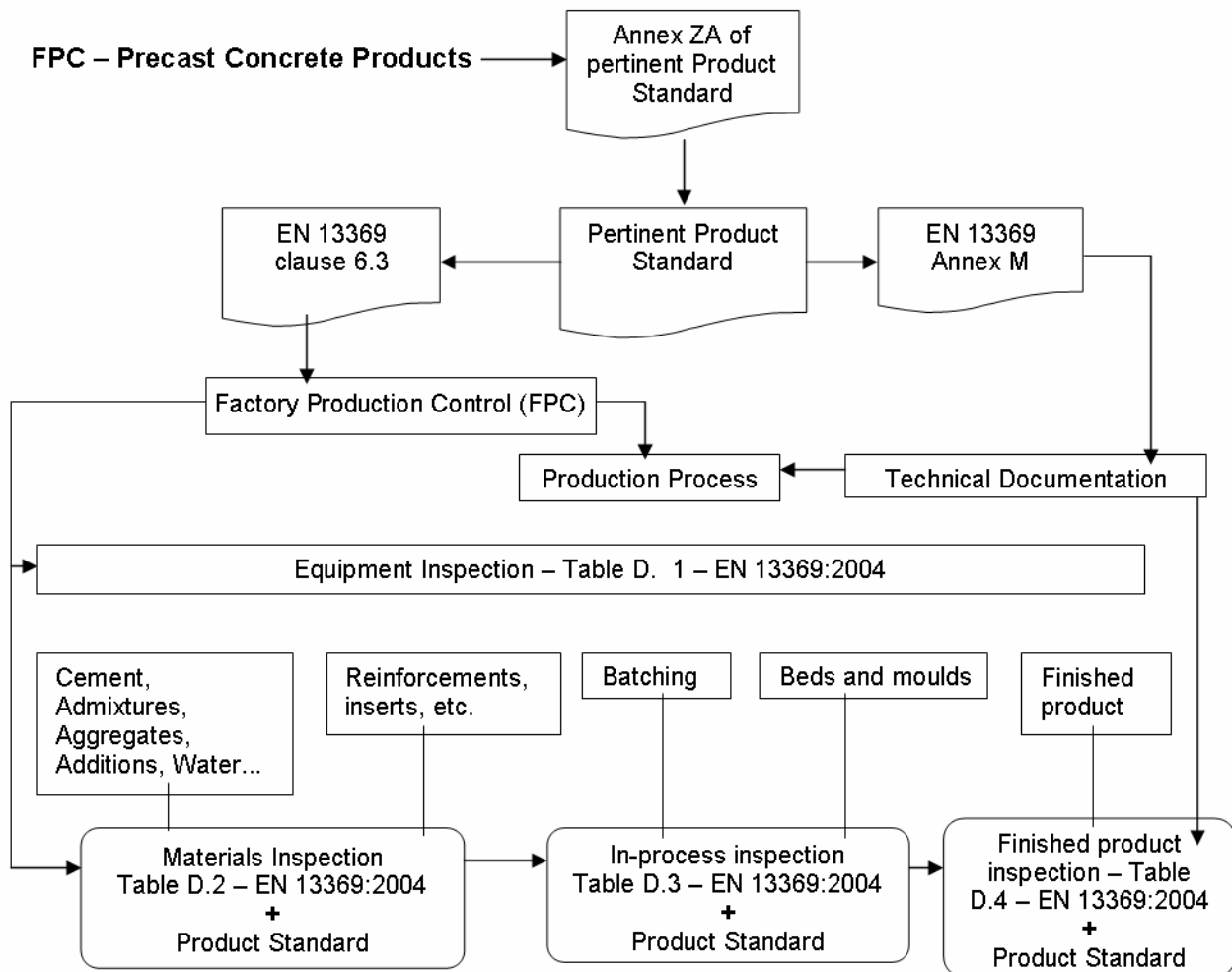
# 5 Application

## 5.1 Responsibility

General responsibilities for CE marking to harmonized standards under attestation of conformity system 2+ are set out in Position Paper NB-CPD/AG/03/002.

This scheme summarizes the relationship between the main relevant documents for the certification of the FPC of precast concrete products.

**Scheme of the production control activities by the manufacturer**



## 5.2 Non-conformities of finished products

EN 13369 §6.3.7 applies.

## 6 Certification process

The scheme to be followed by the Notified Body to grant and maintain the Certificate of Factory Production Control is divided into four main “operative phases”:

- the application (see chapter 7),
- the initial inspection of the factory and the FPC (see chapter 8) and
- the issuing of the certificate (see chapter 9),
- the continuous surveillance of FPC (see chapter 11).

## 7 Application for certification

General guidance on applications for certification is given in Position Paper NB-CPD/AG/03/002.

An application for the certification of precast concrete products must set out the list of relevant products and/or product families, and the CE marking method(s) [1, 2, 3a and/or 3b] used to determine properties relative to the essential requirements for each product or product family.

*NOTE* When a manufacturer wants to use a new CE marking method, he must inform the Notified Body in advance.

## 8 Initial inspection of the factory and the factory production control

General guidance on initial inspection of the factory and the factory production control is given in Position Paper NB-CPD/AG/03/002.

Before carrying out the initial inspection of the factory and the FPC, the Notified Body verifies whether all articles described in §6.3 “Factory production control” of all the reference standards, with their references to EN 13369, are dealt with appropriately in the factory production control manual and related documents.

If this is not the case the Notified Body shall inform the manufacturer about the deviations found and request corrective actions and an updated version of the documents.

The NB shall expect the documented factory production control of the manufacturer to include notably the following items:

- Description and checking of raw material and components.
- Checking of mechanical and/or fire resistance calculation for products or product families covered by CE marking methods 2 and 3b.

*NOTE* Where the relevant calculation is sub-contracted, evidence must be available that the manufacturer’s Factory Production Control covers the supervision of calculation.

- Controls and examinations that have to be performed during the production at fixed intervals.

- Proofs and examinations on the finished product that have to be performed at appropriate intervals.
- Relevant calibrations that shall be performed at regular intervals with precisely determined measurements and testing instruments and the recording of these.
- Records that shall be kept for a period in accordance with the legal requirements of the Member State and at least five years and shall be available to the Notified Body.
- Where applicable, relevant subcontracting (see Commission Guidance Paper 'B' §3.2.1) activities location and conditions (a contract shall be established).

A checklist, prepared by the Notified Body, should support the inspector in this task. The NB may find it helpful to classify items found not to be in compliance as observations, minor nonconformities or major nonconformities. Any items found not to be in compliance shall be reported at the end of the initial inspection. Examples of checklists are given in Annex C.

Routines and procedures for the initial type testing (ITT), including where applicable the initial type calculation (ITC), are part of the factory production control system and shall be documented. The procedures shall include, where relevant, the identification of the nationally determined parameters (method 2) or identification of the design specification (including the national application document) to be applied (method 3b). The notified body should check that these routines and procedures exist and assess that they are applied. The results of applying these routines and procedures are not part of the Notified Body's tasks.

Previous type tests performed before the date of availability of the pertinent product standard, on the same product, may be considered according to the conditions given in the said standard.

Shared ITT (except ITT on concrete) and/or ITC may be used provided their representativeness is documented.

The notified body shall see evidence of ITT (including, where applicable, ITC). Test results from FPC must comply with the requirements of the product specification and be consistent with ITT. The manufacturer stated values and a procedure for the evaluation of the test results must therefore be part of the production control manual of the manufacturer.

Test methods used by the manufacturer during FPC should be the methods prescribed in the relevant standards. However, alternative methods can be used if the results of those methods have a reliable correlation with the results of the reference method. Determination of the correlation of test results shall be carried out by the manufacturer on a regular basis using a procedure described in the factory production control manual (EN 13369 §6.3.9). The Notified Body should examine that the correlation is documented and established regularly. Results of production control tests of the products or family of products mentioned in the application form must be available for at least one product or product family at the time of the initial inspection.

A report containing the results of the assessment of the factory production control manual and related documents and the initial inspection of the factory shall be sent to the manufacturer within an agreed time after the initial inspection, normally not longer than 6 weeks. If the Notified Body requires the manufacturer to make changes, these shall be stated in the report, with an appropriate time limit set for making the changes.

The manufacturer should inform the Notified Body about the corrective actions taken by him within the time limit mentioned in the report.

If the Notified Body classifies the corrective actions as not sufficient the Notified Body should cease the application procedure process, and shall inform the applicant of the reasons for this decision.

## 9 Issue of the certificate

General guidance on issuing a certificate of factory production control is given in Position Paper NB-CPD/AG/03/002. NB-CPD/AG/03/001 sets out the proposed numbering system for certificates.

A certificate is issued covering one product, a list of products or one or more families of products from the product standard(s) in chapter 3 as long as the products are manufactured under the same system of factory production control. The certificate shall identify for each product, list of products or families and the declaration method(s) [1, 2, 3a and/or 3b] used by the manufacturer (see Commission Guidance Paper 'L' and Annex ZA of the standard).

The certificate should follow the examples available for attestation of conformity system 2+ in several languages on GNB-CPD CIRCA, in subfolders of "AG Guidance - Horizontal Guidance & Information" ([http://circa.europa.eu/Members/irc/nbg/cdpqnb/library?l=/pendingsreferencesinsoj/guidance\\_horizontal&vm=detailed&sb=Title](http://circa.europa.eu/Members/irc/nbg/cdpqnb/library?l=/pendingsreferencesinsoj/guidance_horizontal&vm=detailed&sb=Title)). An example of a product description for a certificate for precast concrete products is given in Annex B.

## 10 Extension of a certificate

A certificate may be extended, or additional certificates granted, for additional types or families of precast concrete products manufactured under the same system of FPC as set out in NB-CPD/AG/03/002.

An extended certificate shall be issued in accordance with chapter 9.

## 11 Continuous surveillance of FPC

General guidance on continuous surveillance of FPC is given in Position Paper NB-CPD/AG/03/002.

All relevant aspects of the FPC shall be assessed at least every year. Each inspection should be announced.

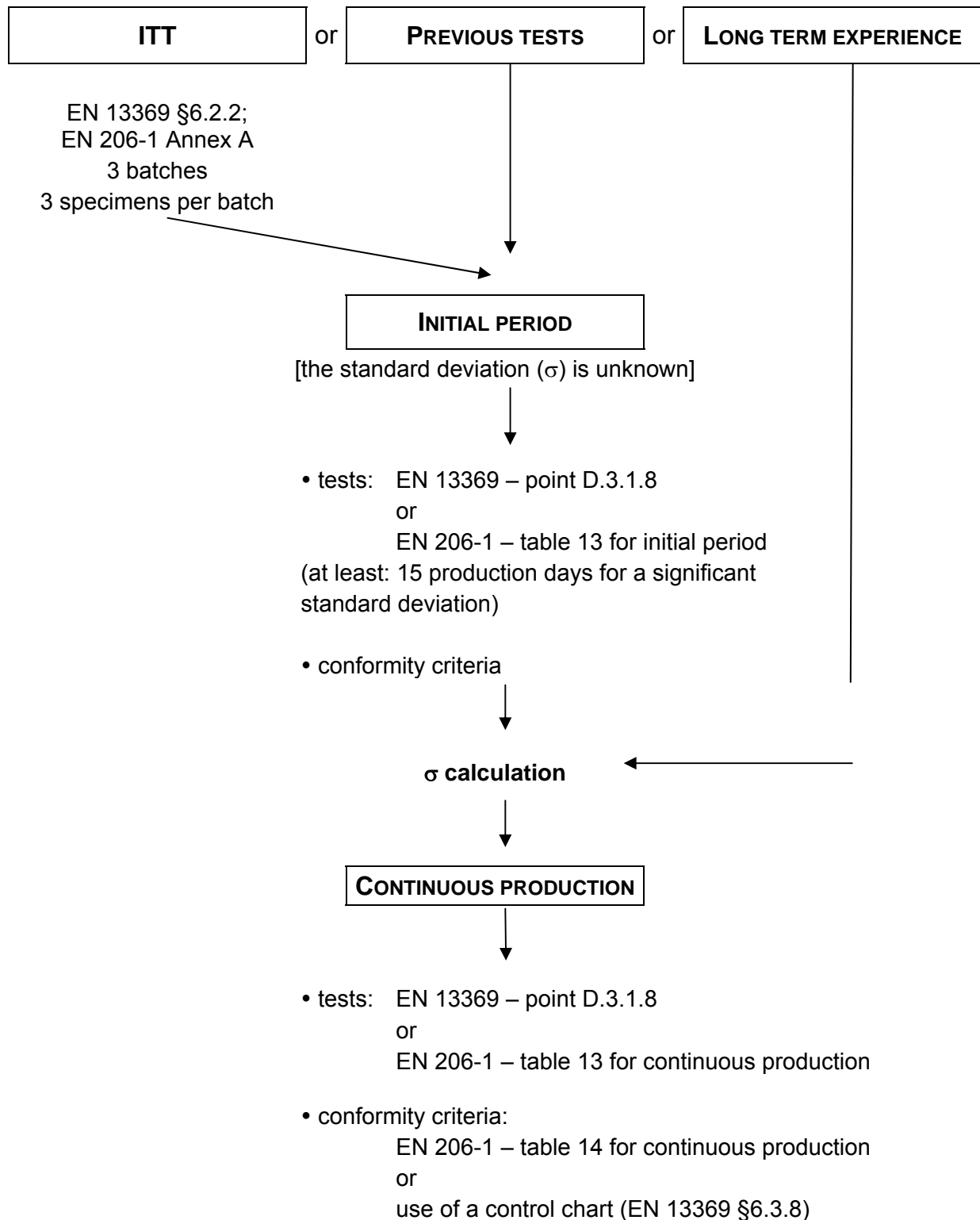
Guidance on the frequencies of testing required by the manufacturer according to the factory production control for the product is contained in each product standard. Guidance for the control of concrete strength is given in Annex A.

## 12 Marking and traceability

Individual products and the relevant details of the production shall be identifiable and traceable in order to allow the manufacturer to implement the corrective actions possibly needed according to §6.3.7 of EN 13369. The Notified Body shall check it.

Reminder: the manufacturer marks the construction product itself, the delivery note, the packaging or the delivery documents with the CE marking as well as with a reference to the certification, provided that the technical specifications do not prescribe something else. (See table).

## Annex A Concrete compressive strength – Principle of control



- For initial period and continuous production types of concrete may be grouped into documented families (EN 13369 §6.2.1 and EN 206-1 §8.2);
- Previous type tests performed on the same product before the date of availability of the pertinent product standard may be considered if they comply with the requirements of the product standard (EN 13369 §6.2.2 and EN 206-1 Annex A);

- The manufacturer may perform test before 28 days to evaluate the potential compressive strength (EN 13369 §4.2.2.2.2);
- The manufacturer may use direct structural strength or indirect structural strength to confirm potential strength (EN 13369 §4.2.2.1);
- The manufacturer is responsible for concrete he uses. Requirements for FPC should be the same whether he uses concrete from a supplier or made by himself.

## **Annex B Example of a product description for a certificate of FPC based on the EN “structural products” series of standards**

This Annex gives an example of a product description for a certificate of FPC based on the EN “structural products” series of standards (attestation of conformity system 2+). The certificate should follow the examples available in several languages on GNB-CPD CIRCA, in

subfolders of “AG Guidance - Horizontal Guidance & Information” ([http://circa.europa.eu/Members/irc/nbq/cdpqgnb/library?!=/pendingsreferencesinsoj/guidance\\_horizontal&vm=detailed&sb=Title](http://circa.europa.eu/Members/irc/nbq/cdpqgnb/library?!=/pendingsreferencesinsoj/guidance_horizontal&vm=detailed&sb=Title)).

### **STRUCTURAL PRODUCTS**

characterised as

**precast concrete products types/families**

Declaration method(s) used for each of them

Reference standard(s)

## **Annex C Examples of check lists for initial inspection of FPC**

### **Annex C.1 Example 1: checklist for precast concrete products – Linear structural elements**

**Factory Production Control (FPC) evaluation report – 2+ CE Marking  
EN 13225 Precast concrete products – Linear structural elements**

D: documented in FPC A: application C: conform - O: observation - MNC: minor non-conformity - NC: major non-conformity - NA: not applicable

N°	Points examined	YES	NO	CE marking declaration method				Comments
				1	2	3a	3b	
<b>List of products/product families</b>								
1	<b>Types of products manufactured in the factory:</b> ✓ Reinforced columns; ✓ Prestressed columns; ✓ Reinforced structural beam; ✓ Prestressed structural beam; ✓ Reinforced floor beam; ✓ Prestressed floor beam; ✓ Reinforced secondary beam; ✓ Prestressed secondary beam; ✓ Reinforced foundation beam; ✓ Prestressed foundation beam;							

N°	Points examined	YES	NO	Comments
2	List of the products covered by CE marking [Cf. Annex ZA and Linear structural elements application rules];			
3	<b>Product specifications:</b> <ul style="list-style-type: none"> <li>✓ Definition of the concrete(s) compressive strength at 28 days (potential strength);</li> <li>✓ Definition of ultimate tensile and tensile yield strength of steel (prestressing and reinforcing steel);</li> <li>✓ durability against corrosion (concrete cover and concrete composition); <ul style="list-style-type: none"> <li>- definition of the applicable ambient condition(s);</li> <li>- corresponding exposition class(es);</li> </ul> </li> <li>✓ composition of concrete specifications</li> <li>✓ NPD option (No Performance Determined);</li> </ul>			

N°	Points examined	YES	NO	Comments
4	<b>Initial Type Test (ITT):</b>			
	<ul style="list-style-type: none"> <li>✓ of finished products (detailing);</li> <li>✓ of mechanical and/or fire resistance calculation (methods 2 and 3b only)</li> <li>✓ of concrete (determination of the declared compressive strength at 28 days);</li> <li>✓ of steel (supplier certificate of conformity)</li> </ul>			
5	ITT results $\geq$ values declared in FPC;			
6	Definition of criteria to decide whether a new ITT is necessary in case of modification of the product or process;			
7	Content of the accompanying documents related to CE Marking; Content of the technical information;			
8	<b>Content and application of the FPC</b>			
	<b>Management responsibility</b>			
8.1	Management commitment;			
8.2	Scope of the FPC (products concerned);			
8.3	Definition of the responsibilities and substitutions for the personnel concerned with the FPC (substitutions for the key positions);			
8.4	Designation of a management representative for the FPC (substitution);			
8.5	Internal communication;			
8.6	Management review;			

N°	Points examined	YES	NO	Comments
<b>FPC documentation system</b>				
8.7	Description of the composition of the FPC documentary system (procedures, instructions, records);			
8.8	Document control;			
8.9	Record control;			
<b>Management of resources</b>				
8.10	Competence and training of staff covered by the FPC (identification - recording);			
8.11	Description of the production means;			
8.12	Means of production control;			

(Add equipment inspection table as appropriate)

N°	Points examined	D	A	Comments
<b>Production</b>				
8.13	Definition of the specifications of the product described in the FPC or in the referenced product files;			

N°	Points examined	D	A	Comments
8.14	Purchases and supplies (including subcontracting): <ul style="list-style-type: none"> <li>✓ Definition of the requirements;</li> <li>✓ Possible subcontracting (contracts);</li> <li>✓ Control and testing on reception;</li> </ul>			

(Add materials inspection table as appropriate)

N°	Points examined	D	A	Comments
8.15	Production management: existence of production documents (plans, instructions);			
8.16	For declaration methods 2 and 3b: mechanical and/or fire resistance calculation			
	Consistency of FPC results with ITT and declared values;			
8.17	Concrete composition; ✓ number of concrete types used (1 concrete type = 1 composition/heat treatment couple); ✓ method of protection against drying out: - without addition of water; - keep the concrete moist by addition of water; - use of curing compounds (in this case initial testing showing that the strength reached with curing compounds is of the same order as the strength obtained by one of the means above).			

(Add process inspection/concrete table as appropriate)

N°	Points examined	D	A	Comments
8.18	Process;			

(Add process inspection/other process subjects table as appropriate)

N°	Points examined	D	A	Comments
8.19	Marking – labelling - traceability: ✓ labelling procedure (where, when, how, what); ✓ only authorized products or models are CE marked; ✓ conformity of the marking; ✓ traceability from materials to product delivery (including subcontracting)			
8.20	Handling – storing (in particular stability of the products) and Segregation of non conforming products;			
8.21	Delivery - transportation ✓ documents provided to the customer to ensure handling and storage;			
8.22	Testing and measuring equipment management: ✓ availability of the equipment necessary to carry out the tests specified in the FPC;			

(Add finished product inspection table as appropriate)

N°	Points examined	D	A	Comments
<b>Testing – analysis - improvement</b>				
8.23	Inspection and testing: ✓ subcontracting of some tests, if yes: - testing laboratory; - existence of a contract; - conformity of the test reports. ✓ Use of a control chart;			
8.24	Non conforming products: ✓ Non conforming product are clearly identified, segregated and dealt with; If the products are repaired, control after fixing (recording of the results);			
8.25	Management of the customers complaints: ✓ the complaints on the products are recorded, treated and corrective actions are carried out when justified; ✓ number of complaints on CE marked products (and in connection with the range of CE marking) since last audit. Specify their nature.			
8.26	Analysis of the test results			
8.27	Corrective actions			

## Annex C.2 Example 2: General checklist for precast concrete products under Mandate M100 as amended.

This Check-list can be used as a basis to establish operational check-lists adapted to the relevant product standard(s) to carry out inspections on site.

It takes into account the requirements of the CPD, of Commission Guidance Papers 'B' and 'K', and the indications given by the GNB-CPD Sector Group 13.

It has been developed from the GNB-CPD general FPC checklist, NB-CPD/AG/03/004 (adapted to AoC system 2+).

It is not a legally binding document, but for information only.

It is divided in three parts:

1. QUESTIONNAIRE FOR INITIAL INSPECTION
2. QUESTIONNAIRE FOR SURVEILLANCE
3. EXAMPLE OF CHECK LIST TO BE FILLED OUT IN EVALUATION AND SURVEILLANCE

The NB's Auditor may use the relevant part according to the type of visit.

Company	
Type of product	
Reference Standard	
Production Unit	
Auditor	
Type of visit	<input type="checkbox"/> Initial Inspection <input type="checkbox"/> Surveillance
Date	
Auditor's Signature	

**N.B:** auditor shall attach copy of the FPC Manual assessment and copy of the audit plan.

# 1 QUESTIONNAIRE FOR INITIAL INSPECTION

## 1.i General Questions

N°	Questions	Answers and Comments
1.a	For which product/product family and Standard(s) is a factory production control established and has an initial type test (ITT) [including initial type calculation (ITC) for mechanical and/or fire resistance for declaration methods 2 and 3b] been carried out?	Application for certification
1.b	Which is (are) the declaration method(s) used for each product/product family and Standard(s)?	
2	<p>Does the manufacturer have a certified ISO 9001 quality management system?</p> <p>If yes,</p> <ul style="list-style-type: none"> <li>• Is the certificate valid? By whom is it issued?</li> <li>• Is the factory production control for the products subjected to CE marking integrated in the certificate?</li> </ul> <p><i>NOTE There is no requirement under the CPD for manufacturers to have ISO 9001 certification.</i></p>	
3	<p>Has a factory production control manual been established that includes or references the procedures by which the requirements of the FPC are fulfilled?</p> <p>Indicate the edition and the date of the manual</p> <p>.....</p>	
4	<p>Did the documental review give a positive result?</p> <p>Indicate the date of the documental review:</p> <p>.....</p>	
5	<p>If any remarks have been raised in the documental review have these been solved?</p> <p>(If not the problem must be formalized by the inspector)</p>	
6	<p>Are the methods and the equipment used to carry out the ITT documented?</p>	
7	<p>Have some of the activities of manufacturing, testing and verification of the manufacturer been sub-contracted out?</p> <p>If Yes, which of them?</p> <p>If Yes, was a control of these activities established in order to retain overall responsibility for all the sub-contracted activities?</p>	
8	<p>Is there a formalized contract between the manufacturer and the sub-contractor?</p>	
9	<p>Is the organization chart of the responsibilities of the production personnel defined and effective?</p>	

N°	Questions	Answers and Comments
10	<p>Has a person responsible for the FPC been appointed for each production unit?</p> <p>Does this person have the authority to ensure that all requirements of the FPC are respected and carried out?</p>	
11	<p>Is it foreseen that the FPC system will be reviewed at least once a year in order to ensure its continuous suitability, and that such review is recorded?</p>	
12	<p>Is there a document and data management procedure, described or referenced in the Production Control Manual, regarding the procedures and responsibilities for the approval, issue, distribution, change and management of documents and of internal and external data?</p>	
13	<p>Do the documents subject to control procedures include also documents concerning checking activities on materials and on supplied products, on manufacturing, on calculation of mechanical and/or fire resistance for declaration methods 2 and 3b and on inspection of finished products?</p>	
14	<p>Did the manufacturer prepare a checking programme that includes the type and frequency of the tests, and respects the minimum requirements of the standard?</p>	
15	<p>Did the manufacturer include in the documents of the factory production control the criteria for increasing or decreasing test frequencies?</p>	
16	<p>Does the FPC define the responsibility of the producer in relation to delivery and storage?</p>	
17	<p>For the products in question, does the producer have an adequate documented system concerning product complaints received, and is it integrated in the FPC?</p>	

**1.ii Specific questions according to the referred European harmonized Standards**

N°	Questions	Answers and Comments
18	<p>Are the values declared by the manufacturer for the harmonized characteristics covered by ITT (possibly including ITC)</p>	
19	<p>Is the consistency between ITT results and declared values documented?</p>	
20	<p>Does the verification of finished products take place using the test methods given by the relevant standards?</p>	
21	<p>If alternative methods are used, is the existence of a correlation between the results obtained with the standard methods, and the alternative methods, demonstrated and available?</p>	

## 2 QUESTIONNAIRE FOR THE SURVEILLANCE INSPECTION

### 2.i General Questions

N°	Questions	Answers and Comments
101	Have some products been added and/or eliminated since the previous audit? If affirmative, which?	Application for certification
102	Have the production system and/or the technical specifications changed since the last visit carried out on the products/product family?	
103	If there have been significant changes of the raw materials, or of the production process, or if new products have been introduced, have the appropriate initial type tests and/or initial type calculations been carried out?	
104	Are the methods and the equipment used to carry out the new ITT those required by the appropriate standards?	
105	Has the factory production control manual changed since the last audit?  Indicate the edition and the date of the manual  .....	
106	Did the review of possible documental changes give a positive result?	
107	Have some of the manufacturer's activities of manufacturing, testing and verification been subcontracted out?  If Yes, which of them?  If Yes, was control of these activities established in order to retain overall responsibility for all the subcontracted activities?	
108	Is there a formalized contract between the manufacturer and subcontractor?	
109	Has the organization chart of the responsibilities of the production personnel been modified?	
110	Does a responsible person have the authority to ensure that all requirements of the FPC are respected and carried out?	
111	Has the FPC been reviewed in order to assure its continuous suitability?	
112	Is the document and data management procedure, inserted or referenced in the Production Control Manual regarding the procedures and responsibilities for the approval, issue, distribution, change and management of documents and of internal and external data and documents, applied?  Has the procedure been modified since the last audit?	

N°	Questions	Answers and Comments
113	If Yes, do the documents subject to the procedure still include documents concerning checking activities on materials and on supplied products, on manufacturing and on finished products inspections?	
114	Has the manufacturer changed the control programme? If Yes, does the new control programme specify the type and frequency of the tests and does it respect the minimum requirements of the standard?	
115	Has the manufacturer included in the documents of the factory production control the criteria for increasing and decreasing test frequencies?	
116	Does the FPC define the responsibility of the producer in relation to storage and delivery?	
117	For the products in question, does the producer apply an adequate documented system concerning the complaints received, and is it integrated in the FPC?	

## 2.ii Specific questions according to the referred European harmonized Standards

N°	Questions	Answers and Comments
118	Do the initial type tests cover the essential characteristics given in Annex ZA of the relevant standard? (see Annex A)	
119	Does the audit of the finished products take place using tests methods given by the relevant product standards?	
120	Does the initial type testing cover calculation of mechanical and/or fire resistance where declared under methods 2 and 3b?	
121	If alternative methods are used, is the existence of a correlation between the results obtained with the standard methods and the alternative methods demonstrated and available?	
122	Are the CE marking of products and the accompanying documents in accordance with EN YYY standard for the declaration method(s) adapted?	

**3 EXAMPLE OF A CHECK LIST TO BE FILLED OUT IN EVALUATION AND IN SURVEILLANCE**

For structural concrete elements the technical or design documentation shall include:

- Design calculations (only for Method 2 and 3b)
- Production specification

(1) organizational (2) technical	YES	NO (1)	NO (2)	NA
<ul style="list-style-type: none"> <li>- The production instructions detail the operative procedures referring to the phases of:                             <ul style="list-style-type: none"> <li>- Cleaning and treatment of the moulds/beds</li> <li>- Laying of the reinforcement and of the inserts</li> <li>- Detailing of reinforcement</li> <li>- Preparation and closing of the moulds</li> <li>- Tensioning of prestressing steel</li> <li>- Concreting</li> <li>- Vibration, compaction and finishing</li> <li>- Curing</li> <li>- Detensioning of prestressing steel</li> <li>- Demoulding and lifting</li> <li>- Handling and Movement</li> <li>- Further operations and finishing</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Instructions on handling, storage and transport

	YES	NO (1)	NO (2)	NA
<ul style="list-style-type: none"> <li>- Such documents detail the operative procedures related to the phases of:                             <ul style="list-style-type: none"> <li>- Loading on trucks</li> </ul> </li> </ul>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Production specification consists of:**

- **Complete production drawings**
- **Production data with material properties, tolerances and weights**

	YES	NO (1)	NO (2)	NA
- Are all the necessary measures and the complete description of the detailing of reinforcement/prestressing in the production drawings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are production and assembly tolerances indicated on the production drawings or on the attached documents?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the characteristic strength of concrete given in the production drawings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	YES	NO	NA
- Is the compressive strength of concrete specified at demoulding, at transfer of prestressing force, and at post tensioning time for post tensioned elements given in the production drawings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are the characteristics of the steel to be used given in the production drawings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	YES	NO (1)	NO (2)	NA
- Does the technical information contain a description of each product and country of destination? (Method 2 or 3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the technical information contain sketches with the principal dimensions and indications of the relevant performances of each product according to its use?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Materials inspection:**

**Inspection of supplied products (only where EN 13369 D.2.2 applies)**

	YES	NO (1)	NO (2)	NA
- Is there an inspection programme to carry out on materials/products at their arrival in the factory according to what foreseen in Table D2?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the manufacturer carry out tests and the necessary inspections before using the supplied products (according to Table D2)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are the necessary test/inspections carried out to ascertain that the total content of chloride in concrete does not exceed the limits foreseen by EN 206?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are tests required to be carried out on other materials for the concrete mix? Lightening materials/isolations – Fibres – Finishing aggregates - Other	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are tests required to be carried out on materials and finishing products applied in the factory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are tests required to be carried out on outsourced product components?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are the tests carried out registered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Laboratory equipment**

	YES	NO	NA
- Does the laboratory have a testing programme for the equipment that it uses for tests and measurements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the equipment used in a way to assure that its measuring uncertainty is adequate for the measurements to be carried out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is all the equipment for testing and measuring clearly identified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are calibrations and/or tests of all equipment carried out with the specified frequency?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the laboratory evaluate the validity of measurements made previously if the equipment is found to be out of calibration?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

## Production process

	YES	NO	NA
- Is there an exhaustive scheme that illustrates the significant processes and the parameters monitored?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is there a programme in operation of all checks to be carried out during production?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the correspondence between the expected concrete mixture and that produced verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the water content of the concrete verified? Is the value verified by the inspector within the given tolerances?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- In case of doubt, is the chloride content in concrete calculated again when the components change?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the water/cement ratio verified through calculation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- When requested, is the air content in concrete verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the correctness of mixing operations verified periodically?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the number of specimens for each produced mix specified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the casting date and composition number shown on the specimen?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is there a composition register with the retention of historical data?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is there a register of the daily inspections carried out on specimen with numbered pages, authentication and precise date?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are structural strength tests on specimens carried out before demoulding?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Did the acceptance inspection of the previous month show a valid result for each mix?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- If not, have measures been taken?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are the results of the resistance tests carried out during the Inspectors visit, consistent with those for the previous period?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the density of concrete verified (especially for light and heavy weight concrete)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is there a correspondence between the actual reinforcement (normal and/or prestressed) and production drawings?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are welding operations verified at appropriate stages?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are possible straightening operations of steel rolls verified?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are moulds and beds adequately verified? Does the positioning and closure of the moulds take place according to the documented methods?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the tightening of the tendons and its inspection take place according to the documented methods (tension, straightening)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	YES	NO	NA
- Before casting, have all the appropriate inspections been carried out with positive results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is casting authorized by the responsible person?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the concrete casting take place according to documented procedures in order to guarantee the compaction?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- If necessary, are efficient procedures applied to avoid fast drying of the concrete?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are the procedures of accelerating maturity inspected adequately?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the prescribed maturation cycle followed?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the demoulding of products take place according to the documented procedures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- For prestressed elements, does the release of tendons take place when the prescribed resistance is attained?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are the elements uncovered according to the documented procedures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the shortening of tendons verified after the transfer of the prestressing?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is a register maintained of inspections carried out?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- During the tests and inspections carried out, did the responsible persons follow the appropriate practice for carrying out the required tests and inspections?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- When the products are provided "free on board" at erection site, are the operations of loading and unloading checked?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Calculation process (mechanical and/or fire resistance) where method(s) 2 and/or 3b are applied**

	YES	NO	NA
- Does the ITT include calculation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the FPC cover calculation?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are calculation data (e.g. concrete characteristic strength) confirmed by FPC results?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Precast elements preservation**

	YES	NO	NA
- Are there operative rules that allow maintaining unaltered the conformity of the products in the different phases: identification, movement, packaging, storage and protection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

	YES	NO	NA
- In particular, are there documented requirements concerning the movement and storage procedures in the factory?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Do such documented requirements also include instructions to prevent excessive deformations over short or long terms?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are there any documented requirements regarding possible instructions in relation to the maturity of products (to ensure, for example, that products yet not suitable for transport/assembling are not delivered)?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Is the handling machinery (included that of any third parties) used during storage and transport adequate?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Do the personnel responsible know the procedures and operating instructions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are procedures and operating instructions applied?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are there written instructions with prearranged frequency and procedures for inspection for any deterioration of stored elements?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Do the procedures carried out (labels, ink, and other) consent the continuing of identification for a necessary time or anyhow, for the components, until delivered?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Do procedures for loading (maximum unsupported span, positioning on truck, tripods etc.) and devices for the maintenance of the position of the components during transportation (ropes, blocking devices, supporting devices and other) guarantee that these will not be damaged?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Do the operations checked by the Inspector follow the written procedures?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the manufacturer protect the vulnerable parts of his products adequately until his responsibility finishes?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

### Surveillance on non-conforming products

	YES	NO	NA
- Does the manufacturer generate and maintain written procedures for the management of non-conforming products?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Are there any examples of the application of such procedures and the consequent actions?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- In particular, does the manufacturer set out the appropriate treatment and/or the re-manufacturing carried out on products found to be non-conforming by the inspection?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the manufacturer verify again the repaired products so as to demonstrate their conformity to the specified characteristics?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
- Does the manufacturer adopt appropriate actions as regards to real or potential effects resulting from products that have been found to be non-conforming after despatch or when in service?	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>