

THE COMPANY'S FACTORY PRODUCTION CONTROL SYSTEM (FPC)

FPC 0: Background

Pending the publication of harmonised European standards relating to reinforcing steel, Kontrollrådet has seen it necessary to produce this guideline to elaborate on the requirements to FPC included in the European standards. The following requirements are based on the previous Kontrollrådet's "Technical provisions for Class K", as well as the work done by the Sector Group 14 (SG14) of the Advisory Group of Notified Bodies (AGNB) prior to EN 10080 being withdrawn as the harmonised European standard.

Companies that have established quality systems in accordance with NS-EN ISO 9001:2000/2008, and which have taken into account the requirements of relevant product standards, will also normally satisfy the following requirements.

For product certification within Class K in accordance with the relevant product specifications that cover the production of indented/ribbed bars, wire, reinforcing steel straightened from a coil, prestressing steel and lattice girders, the following requirements for a factory production control system (FPC) shall be taken into account.

Definitions:

a)	FPC:	Factory Production Control System. This refers to all or part of the Company's quality system that satisfies the requirements laid out in this document, as well as the relevant product standards.
b)	The Company:	The entity which produces the product or products that are covered by the certification.
c)	The Supplier:	The company or organisation which supplies the raw material that goes into the Company's products.
d)	Registered results:	Result(s) from an accomplished process, a test or other activity used for documenting conformity with specified requirements.

FPC 1: Factory Production Control System

FPC 1.1 – General

The Company shall prepare, implement and maintain a documented factory production control system (FPC) that satisfies the requirements in this document, as well as the product standards covering the products. In this context, "documented" means there shall be a written FPC including procedures, instructions and routines.

The scope of the products covered by the certification shall be described in the FPC.

FPC 1.2 – Maintenance

The Company's production management shall implement a systematic review and maintenance of the FPC at least once a year and in accordance with a fixed and documented routine, which as a minimum shall ensure that the FPC

- a) is totally adequate in relation to existing, new or amended requirements in the technical specifications for the product(s)
- b) is appropriate for the Company and its factory production
- c) provides the necessary effectiveness
- d) gives products that conform with the technical specifications
- e) provides an adequate basis for the Company's use of results from the FPC for making improvements.

Registered results from such review/maintenance shall be documented. As a minimum, these shall contain the results from evaluations and conclusions reached.

FPC 1.3 – Document control

A documented routine shall be established describing how the control of documents is to be implemented to ensure that all documents

- have validity status before they are distributed
- are always available wherever and whenever required
- are discarded when they are no longer required or become obsolete

Documents in this context include technical specifications, FPC documents, basic production documents and other documents that are relevant to the quality of the product.

FPC 1.4 – Registered results

The Company shall decide on which registered results shall be taken and filed. As a minimum, this shall include the registered results required in this document or in relevant product standards. The routine for how this is to be implemented shall be documented. Registered results relating to FPCs shall be kept for a minimum of 5 years.

All registered results shall be documented in such a way that availability or readability does not change during the period specified for maintaining such information.

FPC 2: Organisation

FPC 2.1 – Responsibility, authority and working relations

Responsibility, work tasks, authority and working relations shall be stipulated and documented for all personnel who:

- manage, perform or control works that affect product quality
- follow up the requirements laid out in this document.

FPC 2.2 – Management representative

The Company shall appoint a representative with the necessary freedom, responsibility and authority to implement and maintain the factory production control system. The representative shall be given adequate resources for implementation, following up and maintenance of the factory production control system described in FPC 1.

FPC 2.3 – Training

The Company shall decide on, define and document competence levels and training for personnel who manage, perform or control works that affect product quality. The Company shall keep up-to-date and registered results from training. These shall also give details about relevant experience.

FPC 3: Technical specifications

The Company shall ensure that technical specifications covering the products shall always be the latest authorised version. The FPC shall include a separate documented register for the necessary technical specifications.

FPC 4: Raw materials

FPC 4.1 – Procurement

Raw materials shall be used that

- are subject to certification in accordance with a relevant product standard or
- are approved by the Company based on a documented system for evaluation and following up of the Supplier. Registered results shall be kept from the evaluation and following up of the Supplier.

The FPC shall include a documented list of approved raw material suppliers. Providing specifications of raw materials are not covered by any standard or some other technical documentation, the Company shall establish documented specifications for raw materials used in production.

FPC 4.2 – Reception control

The Company shall establish a documented procedure that describes how deliveries of raw materials shall be controlled with a view to ensuring the quality of the finished product. This procedure shall ensure that

- raw materials are delivered by the correct supplier and that they satisfy the requirements specified in subsection 4.1
- deliveries are controlled regularly and to an extent described in the FPC
- deliveries are accompanied by relevant certificates or other suitable documentation to ensure correct quality before the raw materials are used.
- non-conforming raw materials are isolated and marked to avoid them being mistaken for satisfactory materials.

In terms of method, extent and frequency, delivery control shall be implemented in accordance with procedure for

- all raw materials covered by FPC 4.1
- every delivery of raw materials. The frequency can be reduced by agreement with the certification body providing stability in the deliveries can be documented.

FPC 5: The production process

FPC 5.1 – Equipment

The Company shall ensure adequate production equipment resources. This equipment shall be subject to systematic maintenance to ensure stable production and quality of the finished products. The scope of this maintenance shall be specified and the Company should be able to document that such maintenance has been performed.

FPC 5.2 – The process

The Company shall identify and describe the production process in a documented procedure, flow chart or other type of documentation. The main process shall be divided into relevant sub-processes from delivery of raw materials up to and including the finished product.

The Company shall decide on which controls or inspections are to be implemented during the production process. This shall be documented and as a minimum describe

- the frequency of the controls or inspections
- the method to be used providing this is not already described in a technical specification
- which acceptance criteria shall apply
- which registered results shall be documented
- the circumstances mentioned in FPC 2.1

Registered results from the controls or inspections shall be available on file.

FPC 6: Finished product

FPC 6.1 – Final control

The Company shall establish a documented procedure/control plan that describes the scope and frequency of controls or tests that the Company has stipulated shall be implemented on a finished product. The procedure/control plan shall as a minimum include

- all the controls or tests that are described in Annex 1 for the relevant product
- references to relevant testing methods. Providing such methods do not exist, the Company itself shall describe the method or methods to be used
- which registered results shall be documented
- the routine for segregating and marking of non-conforming products
- the circumstances mentioned in FPC 2.1

Registered results shall be maintained from the controls or tests that cover the criteria described in a procedure/control plan. The registered results must contain all the information necessary to satisfy the requirements stated under FPC 6.3 and 7.

FPC 6.2 – Control of measuring, testing and control equipment

The Company shall define and describe the maintenance and controls/calibrations that are to be implemented for all measuring, testing and control equipment. This includes the equipment to be used for the controls, tests or inspections described in FPC 5.2 and 6.1.

The Company shall establish and maintain a register of relevant measuring, testing and control equipment that are subject to maintenance or control/calibration. This register shall as a minimum provide information about

- the equipment's identification number
- the frequency of maintenance or control/calibrations
- which acceptance criteria shall be applied
- relevant methods are given in any standard or other technical specification. Providing such methods do not exist, the Company itself shall describe the method or methods to be used.
- how the equipment shall be marked with a view to information about control/calibration status.

The results from completed controls/calibrations shall be registered.

Equipment that does not satisfy the requirements or the stated acceptance criteria shall be marked in order to avoid it being used.

FPC 6.3 - Traceability and marking

Routines shall be established to ensure traceability from the finished product to the raw materials used. This includes the marking of finished products and semi-finished products with a view to provide the necessary information about traceability.

As a minimum, finished products shall be marked with

- a) traceability to the steel's chemical composition (production number)
- b) the technical specification on which it is based
- c) the quality of the steel in accordance with the designation stated in the documentation (in accordance with b) above)
- d) dimension and/or designation
- e) the registration mark of the certification body

FPC 6.4 – Statistical evaluation

The Company shall implement a statistical evaluation in accordance with the frequency stated in this document or the technical specifications for the product. This is to ensure conformance with characteristic values given in the standard(s). Providing the technical specification does not state the frequency of the evaluation, then as a minimum this shall be carried out once per calendar year. The results from the evaluation shall be registered, including the evaluations and conclusions reached by the Company.

FPC 7: Management of non-conformities and corrective actions

Measures shall be implemented when the Company exposes non-conforming products or non-conformities regarding the FPC described in this document. The management of non-conformities shall be implemented in accordance with a documented procedure.

Customer complaints shall be part of the management of non-conformities.

By management of non-conformities is meant the exposing and registering of non-conformities, analysis of cause and an evaluation of requirements for the implementation of measures to ensure that similar non-conformities does not occur again.

All management of non-conformities shall be registered.

The procedure for management of non-conformities shall describe the routine or routines that is/are to be followed with the isolating and marking of non-conforming products or raw materials.

As part of the management of non-conformities, the Company shall also establish routines to expose requirements for implementation of preventive actions.

FPC 8: Improvements

The Company shall utilise the registered results from the factory production control's clauses 5.2, 6.2, 6.4 and 7 with a view to making improvements to products or processes. The Company shall produce a report relating to this evaluation.

ANNEX 1:

References to relevant sections/sub-sections or tables in current technical specifications

Product	Type of testing		Requirements in FPC			Statistical evaluation
	Requirement	Evaluation ^{b)}	Scope	Frequency	Evaluation ^{b)}	
Reinforcing - bars - coils	NS-EN 10080 8.2.1.1 + tables 11 and 12	^{a)} NS 3576-1 and -2, Tables 5 and 6 ^{a)} NS 3576-3 Tables 5, 6 and 7, for coils also table 12 and 13	^{a)} NS 3576-1 and 2 clause 8.1 ^{a)} NS 3576-3 clause 9.1	NS-EN 10080 8.1.2.1.1	^{a)} NS 3576-1 and 2 Tables 5 and 6 ^{a)} NS3576-3 tables 5, 6 and 7, for coils also table 12 and 13	NS-EN 10080 8.5
Reinforcing after straightening	NS-EN 10080 8.2.1.2 + table 12	^{a)} NS 3576-1 and -2 Tables 5 and 6 ^{a)} NS 3576-3 tables 5, 6 and 7	NS-EN 10080 8.1.2.1.2	NS-EN 10080 8.1.2.1.2	^{a)} NS 3576-1 and 2 Tables 5 and 6 ^{a)} NS 3576-3 tables 5, 6 and 7	NS-EN 10080 8.5
Welded fabric	NS-EN 10080 8.2.1.3 + tables 13 and 14	^{a)} NS 3576 Tables 5 and 6 ^{a)} NS 3576-3 tables 5, 6 and 7	NS-3576-4 8.1	NS-EN 10080 8.1.2.1.3	^{a)} NS 3576-1 and -2 Tables 5 and 6 ^{a)} NS 3576-3 tables 5, 6 and 7	NS-EN 10080 8.5
Lattice girders	NS-EN 10080 8.2.1.4 + table 15	NS-EN 10080 8.1.3	NS-EN 10080 8.1.2.1.4 + table 10	NS-EN 10080 8.1.2.1.4	NS-EN 10080 8.1.3	NS-EN 10080 8.5
Prestressing steels	prEN 10138-1 8.2 + table 3	prEN 10138-1 7.2.1, 7.2.2 and 7.3	prEN 10138-1 8.3.2.1 + tables 5, 6 and 7	prEN 10138-1 8.3.2.1 + tables 5, 6 and 7	prEN 10138-1 8.3.2.2	prEN 10138-1 8.3.2.3

a)

- NS 3576 – 1 (quality B 500NA) or
- NS 3576 – 2 (quality B 500NB) or
- NS 3576 – 3 (quality B 500NC)

b) "Evaluation" refers to the requirements set by the standard and which the Company shall follow in connection with evaluation of its results from the factory production control.