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Fasteners — Types of inspection documents

Fixations — Types de documents de contrôle

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 2, *Fasteners*, Subcommittee SC 7, *Reference standards*.

Introduction

This document specifies the fastener inspection documents which can be supplied when requested at the time of the order.

Before publication of this document, inspection documents according to ISO 10474 or EN 10204 were also applied for fasteners. This document was developed specifically for fasteners, as a preferred alternative to ISO 10474 or EN 10204.

Data in inspection documents may be collected from in-process control during the manufacture of the fasteners and/or from final control on the finished fasteners based on sampling. In-process control during manufacture within a certified quality assurance system operated by the manufacturer gives the most reliable information about conformance of the fasteners (for more information regarding acceptance inspection or quality assurance for fasteners, see ISO 3269 or ISO 16426).

Inspection documents for fasteners may include material, mechanical, physical, dimensional, functional and finish-coating properties, as agreed at the time of the order.

Fasteners — Types of inspection documents

1 Scope

This document specifies the different types of fastener inspection documents issued by the fastener manufacturer or distributor and/or by the external authorized representative on specific request of the purchaser at the time of the order.

— declaration of compliance (F2.1);

— test reports (F2.2, F3.1 and F3.2).

NOTE The term "certificate" is in common use, however for fastener inspection documents the terminology to be used is "test report".

This document specifies requirements for the content of each fastener inspection document, in conjunction with the order, the relevant standards and/or specified requirements.

This document is applicable to finished fasteners such as bolts, screws, studs, nuts, washers, pins, rivets, etc. made of steel, stainless steel, non-ferrous metal or non-metallic material.

This document does not apply to special-purpose or specially engineered applications requiring other types of procedures (e.g. initial samples).

Examples of inspection documents are given in Annex A. An example of a coding system identifying the sections in fastener inspection documents is given in Annex B.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 898-1, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 1: Bolts, screws and studs with specified property classes — Coarse thread and fine pitch thread*

ISO 898-2, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 2: Nuts with specified property classes — Coarse thread and fine pitch thread*

ISO 898-3,[1] *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 3: Flat washers with specified property classes*

ISO 898-5, *Mechanical properties of fasteners made of carbon steel and alloy steel — Part 5: Set screws and similar threaded fasteners with specified hardness classes — Coarse thread and fine pitch thread*

ISO 1891-4:2017, *Fasteners — Terminology — Part: 4: Control, inspection, delivery, acceptance and quality*

ISO 2320, *Fasteners — Prevailing torque steel nuts — Functional properties*

ISO 2702, *Heat-treated steel tapping screws — Mechanical properties*

ISO 3269, *Fasteners — Acceptance inspection*

ISO 3506-1, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 1: Bolts, screws and studs*

1) Under preparation.

ISO 3506-2, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 2: Nuts*

ISO 3506-3, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 3: Set screws and similar fasteners not under tensile stress*

ISO 3506-4, *Mechanical properties of corrosion-resistant stainless steel fasteners — Part 4: Tapping screws*

ISO 10666, *Drilling screws with tapping screw thread — Mechanical and functional properties*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 1891-4 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— IEC Electropedia: available at http://www.electropedia.org/

— ISO Online browsing platform: available at http://www.iso.org/obp

3.1
authorized representative
person who is authorized as a quality assurance representative to validate and sign inspection documents on behalf of the supplier or the purchaser

3.2
external authorized representative
third party agreed between the purchaser and the supplier or a purchaser's requested inspection representative, or an inspection representative designated by an official regulation

3.3
validation
confirmation by the *authorized representative* (3.1) or the *external authorized representative* (3.2) of the content of the inspection document and final approval by means of signature

3.4
pass-through distributor
fastener distributor who sells the original manufacturer's fasteners as received, without altering the fasteners or the packages

[SOURCE: ISO 1891-4:2017, 3.6.4]

3.5
alteration distributor
fastener distributor who alters fasteners prior to delivery

[SOURCE: ISO 1891-4:2017, 3.6.6]

4 Inspection

4.1 Types of inspection documents for material

For material inspection documents 2.1, 2.2, 3.1 and 3.2, see ISO 10474 or other relevant technical specifications (e.g. EN 10204).

4.2 Types of inspection for fasteners

4.2.1 Non-specific inspection for fasteners

Inspection carried out in order to verify that the fasteners comply with the order and relevant standards and/or specified requirements. The fasteners inspected and/or tested are not necessarily part of the actually delivered fasteners provided that they

— are in accordance with the same standard or technical specification,

— are manufactured from the same material designation,

— are manufactured with the same manufacturing sequences and under same conditions,

— have the same shape, and

— have similar dimensions, where the differences do not impact the test results.

4.2.2 Specific inspection for fasteners

Inspection carried out before delivery, on the fasteners from the original manufacturing lot and in accordance with the product specification, in order to verify that the fasteners comply with the order and relevant standards and/or specified requirements.

4.3 Types of inspection documents for fasteners

4.3.1 General

The types of inspection document for fasteners are summarized in Table 1.

Table 1 — Inspection documents for fasteners

Type and name of fastener inspection document		When	Content	Validation
F2.1	Fastener declaration of compliance	Requested by the purchaser at the time of the order	Declaration of conformance for the **delivered fasteners**, **without results**	The manufacturer or distributor authorized representative
F2.2	Fastener test report	Requested by the purchaser at the time of the order	Declaration of conformance for the **delivered fasteners**, with results based on **non-specific** inspection	The **manufacturer** authorized representative
F3.1	Fastener test report	Specifically requested by the purchaser and agreed at the time of the order	Declaration of conformance for the **delivered fasteners**, with results from **specific** inspection	The **manufacturer** or **distributor** authorized representative
F3.2	Fastener test report	Specifically requested by the purchaser and agreed at the time of the order	Declaration of conformance for the **delivered fasteners**, with results from **specific** inspection	The **manufacturer** or **distributor** authorized representative **and** either the **purchaser** authorized representative or the **external** authorized representative

4.3.2 Fastener declaration of compliance F2.1

Document issued by the manufacturer or distributor declaring that the delivered fasteners are in compliance with the order and relevant standards and/or specified requirements without inclusion of results.

F2.1 inspection document shall be validated by either the manufacturer's authorized representative or the distributer's authorized representative.

4.3.3 Fastener test report F2.2

Document issued by the manufacturer declaring that the delivered fasteners are in compliance with the order and relevant standards and/or specified requirements, and in which results based on non-specific inspection are supplied.

It is the responsibility of the manufacturer to determine the correlation between the results on the inspection document and the delivered fasteners in order to demonstrate conformance.

Results shall be taken from raw material certificates, fastener in-process control and/or final inspection which shall be performed by (a) suitably qualified person(s).

The resulting data shall be assessed and transferred into the inspection document by (a) suitably qualified person(s).

F2.2 inspection document shall be validated by the manufacturer's authorized representative.

4.3.4 Fastener test report F3.1

Document issued by the manufacturer or distributor declaring that the delivered fasteners are in compliance with the order and relevant standards and/or specified requirements and in which results from specific inspection are supplied.

Results shall be taken from raw material certificates (3.1 or 3.2), fastener in-process control and/or final inspection which shall be performed by (a) suitably qualified person(s).

The resulting data shall be assessed and transferred into the inspection document by (a) suitably qualified person(s).

F3.1 inspection document shall be validated by either the manufacturer's authorized representative or the distributor's authorized representative.

4.3.5 Fastener test report F3.2

Document issued by the manufacturer or distributor declaring that the delivered fasteners are in compliance with the order and relevant standards and/or specified requirements, and in which results from specific inspection are supplied.

Results shall be taken from fastener inspection which shall be performed by (a) suitably qualified person(s). Results for raw material(s) shall be taken either from the raw material certificate(s) (3.1 or 3.2) or from the fastener inspection.

F3.2 inspection document shall be validated by **both** the manufacturer's or distributor's authorized representative **and** either the purchaser's authorized representative or the external authorized representative.

5 Requirements for fastener inspection documents

5.1 General

Inspection document in accordance with this document is only supplied on request of the purchaser. The type of inspection document, F2.1, F2.2, F3.1 or F3.2 shall be agreed at the time of the order.

Fasteners produced in accordance with a product standard (and/or technical specification) shall meet all the applicable requirements, regardless of which controls are performed during manufacturing and/or final inspection. It is the responsibility of the manufacturer and distributor to apply suitable

methods of their choice, such as in-process control or final inspection, to ensure that the manufactured lot does conform to the specified requirements.

Even when receiving an inspection document, the purchaser is responsible for the approval of the delivered fasteners by acceptance inspection procedures in accordance with ISO 3269 unless otherwise agreed.

The inspection documents F2.1 and F2.2 should include the fastener manufacturing lot number of the delivered fasteners, however a trace lot number may replace or complement the manufacturing lot number. The inspection documents F3.1 and F3.2 shall include the fastener manufacturing lot number of the delivered fasteners.

Each inspection document is only valid for the as-delivered condition of the related fasteners referenced in the inspection document. Any further processing after delivery (e.g. coating) altering the fasteners may invalidate all or part of the content of the inspection document.

5.2 Maintenance of data for inspection documents

The fastener supplier issuing an inspection document shall maintain in-process control and/or final test/inspection records either in hardcopy or electronically for a minimum period of three years.

5.3 Traceability

Fasteners shall be fully traceable by the manufacturing lot number (or trace lot number), and to maintain lot integrity, manufacturing lots shall not be commingled.

NOTE For the definitions of manufacturing lot number, trace lot number and commingling, see ISO 1891-4.

The purchaser who receives the fastener inspection document is responsible for maintaining subsequent traceability when required. Upon opening the original packaging, the purchaser assumes full responsibility for all subsequent traceability.

In case of dispute, the supplier shall be able to provide all necessary documentation and test/inspection records related to the manufacturing lot number (or trace lot number).

5.4 Inspection document sources

The fastener manufacturer is allowed to

— generate F2.1, F2.2, F3.1 or F3.2 inspection documents, and

— transfer the original data from suppliers into the manufacturer inspection document, provided that full traceability is ensured; the test/inspection results of the original inspection document shall not be modified.

The pass-through distributor and repackaging distributor are allowed to

— generate F2.1 or F2.2 inspection documents only by transferring data from F2.1 or F2.2 from the manufacturer,

— generate F3.1 or F3.2 inspection documents,

— supply the incoming inspection document F2.1, F2.2, F3.1 or F.3.2 from the manufacturer, and

— transfer the original data from F3.1 of the manufacturer into the distributor F3.1 inspection document, provided that full traceability is ensured; the test/inspection results of the original inspection document shall not be modified.

The alteration distributor is allowed to

— generate F2.1 inspection documents only by transferring data from the manufacturer,

— generate F2.2 inspection documents by transferring data from F2.2 from the manufacturer provided that the reported properties have not been altered, by testing the altered properties and by adding his own test results,

— generate F2.1, F3.1 or F3.2 inspection documents, and

— transfer the original data from F3.1 of the manufacturer into the distributor F3.1 inspection document after it has been determined that the considered property has not been altered and provided that full traceability is assured; the transferred test/inspection results of the original inspection document shall not be modified.

The alteration distributor shall test and/or inspect the properties which have been altered.

Data transferred from an external source shall be validated by the supplier before inclusion into the supplier inspection document. The supplier shall be responsible for the conformity and traceability of the data from the external source.

Transferring of non-specific test/inspection results from F2.2 (or from 2.2 for material) into an F3.1 inspection document is not allowed.

5.5 Subcontracted tests and/or inspection

Suppliers may subcontract tests and/or inspection to an external source. Those results can be either included as an attached complete report or transferred into the inspection document under the responsibility of the supplier issuing the inspection document. Data transferred into the inspection document shall be identified in accordance with 5.7.

The subcontracted tests and/or inspection from external source shall be traceable. The test sample(s) shall be traceable using manufacturing lot number (or trace lot number). The subcontracted tests and/or inspection report shall reference the manufacturing lot number (or trace lot number).

5.6 Sampling

The manufacturer and the distributor shall apply suitable sampling plans to ensure that the results included in the inspection document are representative of the manufacturing lot. For test reports F2.2, F3.1 and F3.2, the quantity of tested/inspected parts shall be included in the test reports for each test, except when all test results are reported.

If a specific quantity of parts to be tested is required by the purchaser for one or more specific tests, it shall be agreed at the time of the order.

In case of test reports F3.2, sampling is under the responsibility of either the purchaser authorized representative or the external authorized representative.

5.7 Reporting of test/inspection results

The control methods are left to the choice of the supplier, unless otherwise requested in a standard or technical specification and/or agreed at the time of the order.

Table 2 specifies the minimum requirements for reporting the test/inspection results in the test reports. More information may be included at the discretion of the manufacturer, distributor and/or external authorized representative issuing the inspection document, e.g. all individual values, mean value, dispersion, etc.

Each measured value shall be given with its unit specified in the standard or technical specification.

Table 2 — Minimum requirements for reporting test/inspection results

Type of requirement		Type of inspection document			
Method of control	**Required limit(s) expressed as:**	**F2.1**	**F2.2**	**F3.1**	**F3.2**
Measurement	min	Not applicable	Minimum value measured	Minimum value measured	All individual values measured
	max		Maximum value measured	Maximum value measured	
	min/max		Minimum and maximum value measured	Minimum and maximum value measured	
Attribute (gauge, proof load ...)	Go		Conform	Conform	Conform/ Non-conform
	No-Go				
	Go/No-Go				
Inspection (visual inspection ...)	–		Conform	Conform	Conform/ Non-conform

The code identifying the test facility type where the test has been performed shall be specified in accordance with the following:

— S result from the **S**upplier (material, component, coating, etc.);

— M result from the fastener **M**anufacturer (in-process control or final inspection);

— D result from the fastener **D**istributor (final inspection);

— L result from external **L**aboratory (final inspection).

5.8 Minimum results to be included for each type of fasteners

Table 3 specifies the test/inspection for at least one of the most important mechanical and/or functional properties related to each type of fasteners.

Test reports F2.2, F3.1 and F3.2 shall include the test/inspection results specified in Table 3 in accordance with the type of fastener and the specification of the standards referenced.

When more tests/inspections are requested by the purchaser, all technical and additional economical details shall be agreed between the purchaser and the supplier at the time of the order.

For fasteners not listed in Table 3, the purchaser shall specify the properties to be tested/inspected at the time of the order.

Table 3 — Minimum test/inspection results for fasteners

Fasteners	Results to be included in test reports F2.2, F3.1 and F3.2 Type of control	
	Material, mechanical, physical and/or functional properties	Dimensional properties
Bolts, screws, studs with ISO metric thread ISO 898-1	Chemical composition except for F2.2 (M) Tensile strength[a] (M) Hardness for quenched and tempered property class (M) Thread acceptance (A)	—
Bolts, screws, studs with ISO metric thread ISO 3506-1	Chemical composition except for F2.2 (M) Tensile strength and Elongation (M) Hardness for fasteners made of martensitic and ferritic stainless steel (M) Thread acceptance (A)	—
Nuts ISO 898-2	Chemical composition except for F2.2 (M) Proof load (A) Hardness for quenched and tempered property classes (M) Thread acceptance (A)	—
Nuts ISO 3506-2	Chemical composition except for F2.2 (M) Proof load (A) Hardness for fasteners made of martensitic and ferritic stainless steel (M) Thread acceptance (A)	—
Prevailing torque nuts ISO 898-2 and ISO 2320	Chemical composition except for F2.2 (M) Proof load (A) Hardness for quenched and tempered property classes (M) Prevailing torque properties (M) Thread acceptance (A)	—
Set screws ISO 898-5 or ISO 3506-3	Chemical composition except for F2.2 (M) Hardness Thread acceptance (A)	—
Tapping screws ISO 2702 or ISO 3506-4	Drive test (A/M) Torsional breaking torque (M)	—
Drilling screws ISO 10666	Drill drive test (A/M) Torsional breaking torque (M)	—
Thread-forming and self-cutting screws	Thread-forming torque (A/M) Torsional breaking torque (M)	—
Flat washers ISO 898-3	Chemical composition except for F2.2 (M) Hardness (M)	Clearance diameter d_1 (M) Thickness (M)
Washers other than flat washers	Chemical composition except for F2.2 (M) Hardness (M)	Clearance diameter d_1 (M) Thickness (M)
Blind rivets	Chemical composition except for F2.2 (M) Shear load (M)	Diameter of the rivet body (M)

Table 3 *(continued)*

Fasteners	Results to be included in test reports F2.2, F3.1 and F3.2 Type of control	
	Material, mechanical, physical and/or functional properties	Dimensional properties
Plain rivets	Chemical composition except for F2.2 (M) Tensile strength or hardness (M)	Diameter of the rivet body (M)
Pins	Chemical composition except for F2.2 (M) Shear load (M) or hardness (M)	Pin diameter (M)
(M) = Measurement (A) = By attribute [a] Tensile strength shall be tested on full-size fasteners to test programme FF in accordance with ISO 898-1, when feasible. When none of the tensile tests specified in ISO 898-1 is feasible, the substitutive test to be carried out shall be agreed at the time of the order.		

5.9 Validation of the inspection document

The validation of the inspection document by the authorized representative consists of the following steps:

a) confirmation that all the required information are included (e.g. fastener description, traceability, manufacturing lot number, completion of the required tests/inspections, etc.) in accordance with this document;

b) confirmation that the test/inspection results are in accordance with the relevant standards and/or technical specifications;

c) signature of the authorized representative approving the inspection document.

The signature can be by means of

— handwritten signature,

— scanned handwritten signature,

— electronic signature,

— other unique symbol of identification traceable to the author, except for the external authorized inspection representative.

6 Required content for each type of fastener inspection document

6.1 General

This subclause does not specify the format of the inspection documents; examples of inspection documents are given in Annex B for information.

Optionally, the following information may be added where appropriate:

— the name of the purchaser;

— the number and date of the purchaser's order;

— the quantity of parts delivered;

— comments on the test/inspection results.

Other information and/or test/inspection results may be included at the discretion of the supplier or if requested by the purchaser at the time of the order.

6.2 Content of the fastener declaration of compliance F2.1

Inspection document F2.1 shall include the information required in Table 4.

Table 4 — Required content for F2.1

General information related to the supplier
— The type of inspection document: "F2.1 Fastener declaration of compliance".
— The reference to this document: ISO 16228.
— The name and address of the fastener supplier who establishes the inspection document.
General information related to the delivered fasteners
— The full designation of the fasteners in accordance with the product standard (and/or technical specification), including coating if any.
— The delivery note or manufacturing lot number (if any) or trace lot number, as defined in ISO 1891-4.
Validation
— The supplier shall provide a declaration of conformance, including the following sentence: "The fasteners delivered are in compliance with the order and with the relevant standards and/or specifications." — The name, date of issue and signature of the authorized representative.

6.3 Content of the fastener test report F2.2

Inspection document F2.2 shall include the information required in Table 5.

Table 5 — Required content for F2.2

General information related to the supplier
— The type of inspection document: "F2.2 Fastener test report".
— The reference to this document: ISO 16228.
— The name and address of the fastener supplier who establishes the inspection document.
General information related to the delivered fasteners
— The full designation of the fasteners in accordance with the product standard (and/or technical specification), including coating if any.
— The manufacturing lot number (or trace lot number) of the delivered fasteners, as defined in ISO 1891-4.
— The information about the origin of the test/inspection results used: original report number(s) and date(s) of issue as required in 4.3.3.
— The fastener marking, if any (e.g. for bolts in accordance with ISO 898-1, manufacturer identification (trade) mark and property class).
Test/inspection results for material properties
— For fasteners made of steel or stainless steel and with ISO metric thread: — the fastener reference standard (e.g. ISO 898-1, ISO 3506-2, etc.) and date of publication; — the material category, grade and/or designation (e.g. alloy steel for property class 10.9, A2 for stainless steel, etc.).
— For other fasteners made of steel or stainless steel such as washers, tapping screws, blind rivets, pins, etc. The same information than those listed for fasteners with ISO metric thread shall be included, unless not relevant.

Table 5 *(continued)*

— For non-ferrous metal and non-metallic fasteners: — the reference standard and date of publication; — the material category, grade and/or designation (e.g. AW-5154, PA6.6, etc.).
— If no reference standard exists, a product standard or technical specification should be applied.
Test/inspection results for mechanical, physical, dimensional, functional and/or finish-coating properties
For each reported property: — the mechanical or physical property, its symbol if any, the test method, the reference standard or technical specification and its date; — the dimensional property and its symbol[a] if any; — the code identifying the test facility type where the test has been performed in accordance with 5.7; — the quantity of tested parts, except when all test/inspection results are reported; — the required limits(s), if any; — the test/inspection result(s) in accordance with 5.8 and the date of testing. These items shall also be included when functional and/or finish-coating properties are specified in the relevant product standard (and/or technical specification) and/or by the purchaser.
Validation
— The supplier shall provide a declaration of conformance, including the following sentence: "The fasteners delivered are in compliance with the order and have been manufactured in accordance with the relevant standards and/or specifications. The test/inspection results are not specifically related to the delivered fasteners but are representative of the manufacturing process." — The name, function, date of issue and signature of the authorized representative.
[a] For dimensional symbols, see for example ISO 225.

6.4 Content of the fastener test report F3.1

Inspection document F3.1 shall include the information required in Table 6.

Table 6 — Required content for F3.1

General information related to the supplier
— The type of inspection document: "F3.1 Fastener test report". — The reference to this document: ISO 16228. — The name and address of the fastener supplier who establishes the inspection document.
General information related to the delivered fasteners
— The full designation of the fasteners in accordance with the product standard (and/or technical specification), including coating if any. — The manufacturing lot number of the delivered fasteners, as defined in ISO 1891-4. — The fastener marking, if any (e.g. for bolts in accordance with ISO 898-1, manufacturer identification (trade) mark and property class).

Table 6 *(continued)*

Test/inspection results for material properties
— For fasteners made of steel or stainless steel: — the fastener reference standard (e.g. ISO 898-1, ISO 3506-2, etc.) and date of publication; — the material category, grade and/or designation (e.g. alloy steel for property class 10.9, A2 for stainless steel, etc.); — the code identifying the test facility type where the chemical analysis of the material has been performed in accordance with 5.7; — the heat, cast, lot number of the material, or the trace number to the material lot, the chemical analysis which shall include the chemical elements, the required chemical composition limit(s) and the test results. The elements specifically required by the reference standard shall be reported, however other elements may be included; the chemical analysis can also be a copy of the original material inspection document attached to the fastener inspection document.
— For non-ferrous metal fasteners: — the reference standard and date of publication, if any; — the material category, grade and/or designation; — the heat, cast, lot number of the material, or the trace number to the material lot; — the chemical analysis which shall include the chemical elements, the required chemical composition limit(s) and the test results, when required in the reference standard or product standard (and/or technical specification) or if requested by the purchaser at the time of the order.
— For non-metallic fasteners: — the reference standard and date of publication, if any; — the lot number of the material, or the trace number to the material lot; — the material category, grade and/or designation (e.g. PA6.6). If no reference standard exists, a product standard or technical specification should be applied.
Test/inspection results for mechanical, physical, dimensional, functional and/or finish-coating properties
For each reported property: — the mechanical or physical property, its symbol, if any, the test method, the reference standard or technical specification and its date; — the dimensional property and its symbol[a], if any; — the code identifying the test facility type where the test has been performed in accordance with 5.7; — the quantity of tested parts, except when all test/inspection results are reported; — the required limits(s), if any; — the test/inspection result(s) in accordance with 5.8. These items shall also be included in F3.1 when functional and/or finish-coating properties are specified in the relevant product standard (and/or technical specification) and/or by the purchaser.
Validation
— The supplier shall provide a declaration of conformance, including the following sentence: "The inspection/tests were performed on samples representative of this manufacturing lot number. The fasteners delivered are in compliance with the order and have been manufactured in accordance with the relevant standards and/or specifications." — The name, function, date of issue and signature of the authorized representative.
[a] For dimensional symbols, see for example ISO 225.

6.5 Content of the fastener test report F3.2

Inspection document F3.2 shall include the information required in Table 7.

Table 7 — Required content for F3.2

General information related to the manufacturer
— The type of inspection document: “F3.2 Fastener test report”.
— The reference to this document: ISO 16228.
— The name and address of the fastener manufacturer who establishes the inspection document.
General information related to the delivered fasteners
— The full designation of the fasteners in accordance with the product standard (and/or technical specification), including coating, if any.
— The manufacturing lot number of the delivered fasteners, as defined in ISO 1891-4.
— The fastener marking, if any (e.g. for bolts in accordance with ISO 898-1, manufacturer identification (trade) mark and property class).
— The manufacturer identification (trade) marks of the labelling, if any, unless identical to the fastener marking.
Test/inspection results
— Test/inspection results for material, mechanical, physical, dimensional, functional and/or finish-coating properties specified in 5.8 shall be included, as well as for the properties agreed with the purchaser at the time of the order. They shall be reported in accordance with 6.4.
Validation
— The supplier shall provide a declaration of conformance, including the following sentence: “The inspection/tests were performed on samples representative of this manufacturing lot number. The fasteners delivered are in compliance with the order and have been manufactured in accordance with the relevant standards and/or specifications.”
— The name, function, date of issue and signature of the authorized representative.
— The purchaser authorized representative, or the external authorized representative shall provide a declaration of conformance, including the following sentence: “The inspection/tests were performed on samples from this manufacturing lot number and in accordance with the relevant standards and/or technical specifications. The properties tested (are/are not) in compliance with the specified requirements.”
— The name, function, date of issue and signature of the purchaser authorized representative or the external authorized representative.

7 Amendment to inspection documents

Amendments to inspection documents after issue shall be made only in the form of a further inspection document which includes this statement “Supplement to inspection document (number)” or equivalent form of wording.

Such amendment shall meet all the requirement of this document. If it is necessary to issue a completely new inspection document, it shall be uniquely identified and shall contain a reference to the original that it replaces.

8 Transmission of inspection documents

The transmission of inspection documents shall be in a format that prevents alteration or corruption, in electronic file or paper form at the discretion of the supplier.

Annex A
(informative)

Examples of inspection documents

The inspection documents in this annex are only examples of format which can be used for inspection documents. An example of inspection document using the coding system is given in B.3.

A.1 Example of fastener declaration of compliance F2.1: Nuts in accordance with ISO 4032 and ISO 898-2

F2.1	Fastener declaration of compliance	ISO 16228

Information related to the supplier and purchaser	
Name and address of the fastener supplier	Any Co Ltd. PO Box 23, B-1070

Information related to the fasteners	
Fastener designation	Hexagon regular nut ISO 4032 - M12 - 8
Delivery note or manufacturing lot number, if any, or trace lot number	25L401

Validation			
The fasteners delivered are in compliance with the order and with the relevant standards and/or specifications.			
Name of the authorized representative	Ian Scott Otway	Date	2016-12-31
		Signature	

A.2 Example of test report F2.2: Flat washers in accordance with ISO 7089 and ISO 898-3

F2.2	Fastener test report ISO 16228	Report N°
		22/1506

Information related to the supplier and purchaser	
Name and address of the fastener supplier	Any Co Ltd. PO Box 23, B-1070

Information related to the fasteners			
Fastener designation	Washers ISO 7089 - 16 - 300HV		
Manufacturing lot number (or trace lot number) of the delivered fasteners	36M512		
Original test report(s) and date(s) of issue	22/0058 (2017-11-28)	Fastener marking *(if any)*	No marking
		Label marking	XYZ

Material properties			
Dated reference standard	ISO 898-3	Material category, grade and/or designation	Steel C45

Mechanical and physical properties					
Properties		Test facility	Quantity of tested parts	Specification	Results
Hardness	ISO 898-3 §7.1	M	5	HV min 300	324 HV30

Dimensional properties				
Properties	Test facility	Quantity of tested parts	Specification	Results
Clearance diameter d_1, mm	M	5	min 17,00 max 17,27	min 17,13 max 17,19
Thickness h, mm	M	5	min 2,7 max 3,3	min 2,80 max 2,91

Validation				
The fasteners delivered are in compliance with the order and have been manufactured in accordance with the relevant standards and/or specifications. The test/inspection results are not specifically related to the delivered fasteners but are representative of the manufacturing process.				
Authorized representative	Name	Ian Scott Otway	Date	2017-12-31
	Function	Quality manager	Signature	

A.3 Example of fastener test report F3.1: Bolts in accordance with ISO 4014 and ISO 898-1

F3.1	Fastener test report	ISO 16228	Report N°
			31/0120/00951

Information related to the supplier and purchaser	
Name and address of the fastener supplier	Any Co Ltd., PO Box 23, B-1070

Information related to the fasteners			
Fastener designation	Hexagon head bolt ISO 4014 - M16x120 - 10.9		
Manufacturing lot number (or trace lot number)	0k0040I	Fastener marking *(if any)*	XYZ 10.9
		Label marking	XcellentYZ 10.9

Material properties													
Dated reference standard	ISO 898-1:2013			Material category, grade and/or designation	Alloy steel for pc 10.9								
Cast number	31967			Test facility	S								
Chemical analysis % (m/m)	C		Si	Mn	P	S	Cr	Mo	Ni	Al	B	Cu	Ti	V
Specification	min 0,20	max 0,55	–	–	max 0,025	max 0,025	0,30[a]	0,20[a]	0,30[a]	–	max 0,003	–	–	0,10[a]
Results	0,33		0,18	0,64	0,012	0,009	1,00	0,16	0,12	0,026	0,0025	0,17	0,004	–
	[a] Cr 1,00 + Mo 0,16 + Ni 0,12 = 1,28 > 70 % (Cr 0,30 + Ni 0,30 + Mo 0,20) Conform													

Mechanical and physical properties	Test facility	Dated reference standard		ISO 898-1:2013
		Quantity of tested parts	Specification	Results
Minimum tensile strength R_m	M	5	min 1 040 MPa	1 107 – 1 132
Wedge tensile test ISO 898-1:2013 §9.1				No crack under head
Hardness	M	5	min 304 HB max 361 HB	min 350 / max 360
ISO 898-1:2013 §9.9 HBW $F = 30\ D^2$				

Functional properties	Test facility	Quantity of parts	Specification	Results
Thread acceptance	M	8	M16x2 : 6h	Go/NoGo: Conform
ISO 6157-1:1988				

Validation				
The inspection/tests were performed on samples representative of this manufacturing lot number. The fasteners delivered are in compliance with the order and have been manufactured in accordance with the relevant standards and/or specifications.				
Authorised representative	Name	Ian Scott Otway	Date	2017-12-31
	Function	Quality manager	Signature	

A.4 Example of fastener test report F3.1: Blind rivets AlA/St in accordance with ISO 15977

F3.1	Fastener test report ISO 16228	Report N°
		31/2012–33211

Information related to the supplier and purchaser	
Name and address of the fastener supplier	Any Co Ltd., PO Box 23, B-1070

Information related to the fasteners			
Fastener designation	Blind rivet ISO 15977 - 4x12 - AlA/St - H		
Manufacturing lot number (or trace lot number)	#21030249	Fastener marking *(if any)*	–
		Label marking	XcellentYZ

Material properties												
Dated reference standard	ISO 15977:2002			Material category, grade and/or designation				Rivet body AW-5154				
Cast number	3815822											
Chemical analysis % (m/m)	Si	Fe	Cu	Mn	Mg	Cr	Ni	Zn	Al	Ti	Others each	Others total
Specification	0,25 max	0,40 max	0,10 max	0,10 max	3,1/ 3,9	0,15/ 0,35	–	0,20 max	Re-main-ing %	0,20 max	0,05 max	0,15 max
Results	0,21	0,35	0,08	0,09	3,5	0,22	–	0,11	Re-main-ing %	0,12	–	–

Mechanical and physical properties	Dated reference standard		ISO 14589:2000	
	Test facility	Quantity of parts	Specification	Results
Minimum shear load	M	3	min 1 250 N	1 522 – 1 644 N

Dimensional properties	Test facility	Quantity of parts	Specification	Results
Rivet body Ø d mm	M	10	min 3,85 – max 4,08 mm	3,92 – 4,01 mm

Validation				
The inspection/tests were performed on samples representative of this manufacturing lot number. The fasteners delivered are in compliance with the order and have been manufactured in accordance with the relevant standards and/or specifications.				
Authorized represent-ative	Name	Ian Scott Otway	Date	2017-12-31
	Function	Quality manager	Signature	

Annex B
(informative)

Code numbers applicable to fasteners

B.1 General

This annex provides a standardized code number system applicable to fasteners inspection documents in accordance with this document. It is intended to improve the method of communicating information contained in fastener inspection documents.

NOTE This annex is based on the standardized material code number system; see EN 10168.

These code numbers are established to ease the identification of the different sections in the fastener inspection documents. Each code number identifying the sections in B.2 is unique. Other codes than those listed in B.2 should not be used.

NOTE The fact that a code number exists in B.2 does not presume that the relevant section should be included; this depends on the requirements of this document and agreement at the time of the order.

Information included in the inspection document is organized in accordance with the following groups:

— Group A General information related to the inspection document, the supplier and purchaser;

— Group B General information related to the delivered fasteners;

— Group C Test/inspection results for material, mechanical and physical properties of the fasteners;

— Group D Test/inspection results for dimensional properties;

— Group E Test/inspection results for functional properties, if any;

— Group F Test/inspection results for coating and/or finish, if any;

— Group G Others, if any;

— Group Z Validation.

If there is insufficient space in a section for the required information, a reference to a supplement is possible (e.g. at the end of the inspection document) under the same corresponding code number.

An example of a fastener inspection document using this code number system is given in B.3.

B.2 Code number and section designation for fasteners

Codes relevant for fasteners are in bold characters in the first column of Table B.1 to B.7.

Table B.1 — Group A: General information related to the supplier and purchaser

EN 10168		Application to fasteners in accordance with this document
Code number	Section designation	
A01	Manufacturer's works	*Not necessary for fasteners*
A02	Type of inspection document	Type and name of the fastener inspection document (e.g. F3.1 Fastener test report) and reference to this document (i.e. ISO 16228)
A03	Document number	Report number
A04	Manufacturer's mark	Logo of the fastener supplier who establishes the fastener inspection document, if different from the labelling of the fasteners *(see B06)*
A05	Originator of the document	Name and address of the fastener supplier who establishes the fastener inspection document
A06	Purchaser/consignee	Name of the purchaser
A07	Purchaser's order number	Order number of the purchaser, date of the order
	Where applicable item number	*Not necessary for fasteners (see B07)*
A08	Manufacturer's works order number	*Not necessary for fasteners (see B07)*
A09	Purchaser article number	Purchaser fastener number
A10 to A99	Supplementary information	**A10** Reference of the quality system(s) operated by the fastener supplier

Table B.2 — Group B: General information related to the delivered fasteners

EN 10168		Application to fasteners in accordance with this document
Code number	Section designation	
B01	Product	Full designation of the fasteners
B02	Steel designation	*Not necessary for fasteners, see C4 to C6*
B03	Any supplementary requirements	—
B04	Product delivery condition	*Not necessary for fasteners*
B05	Reference (heat) treatment of samples	*Not relevant for fasteners*
B06	Marking of the product	Marking of the fastener, if any (manufacturer trade mark, property class) Manufacturer (trade) mark shown on the label (when different)
B07	Identification of the product	Delivery note, manufacturing lot number or trace lot number
B08	Number of pieces	Quantity of delivered fasteners
B09 to B11	Product dimensions	*Not relevant for fasteners (see B01)*
B12	Theoretical mass	*Not relevant for fasteners*
B13	Actual mass	*Not necessary for fasteners*
B14 to B99	Supplementary information	**B14** for F2.2 only: Original report number(s) and date(s) of issue

In Tables B.3 to B.6 and for each test/inspection results related to mechanical, physical, functional and/or finish-coating properties, the following information should be reported in addition, when relevant:

— the name of the property and its symbol;

— the test method, the dated reference standard and relevant clause;

— the test temperature when different from ambient temperature (10 °C to 35 °C);

— the test facility symbol (see 5.7);

— the quantity of tested parts (only when not all the test results are reported);

— the requirement(s) of the reference standard and/or technical specification, including minimum and/or maximum value(s);

— the test program, if any (e.g. FF1 of ISO 898-1);

— the test result(s) and its unit and comments, if any.

If no fastener reference standard exists, a product standard or technical specification should be applied.

Table B.3 — Group C: Test/inspection results for material, mechanical and physical properties of the fasteners

EN 10168		Application to fasteners in accordance with this document
Code number	Section designation	
C00	Identification of the sample	*Not relevant for fasteners*
C01	Location of the sample	*Not relevant for fasteners*
C02	Direction of the test pieces	*Not relevant for fasteners*
C03	Test temperature	*Not relevant for fasteners* *If temperature should be reported, it shall be attached to each test result*
C04 to C09	Supplementary information	**C04** Material category, grade and/or designation according to the fastener reference standard[a]
		C05 Fasteners dated reference standard (e.g. ISO 3506-2:2009)
		C06 Material cast number or batch number
C10	Shape of the test piece	*Not relevant for fasteners (see C11, C12, C13)*
C11	Yield or proof strength	**C11A** Yield strength (e.g. $R_{p0,2}$, R_{eL} or R_{pf})
		C11B Proof load
C12	Tensile strength	e.g. tensile test on full size fastener or wedge tensile test, R_m
C13	Elongation after fracture	**C13A** Elongation after fracture (e.g. A_f or $A_{\%}$)
		C13B Reduction of area after fracture (e.g. $Z_{\%}$)
C14 to C29	Supplementary information	—
C30	Hardness: Test method	e.g. Vickers hardness HV10
C31	Individual values	Hardness test results
C32	Mean value	—
C33 to C39	Supplementary information	—
C40	Impact test	e.g. Charpy impact test, KV, at –20 °C
C41	Width of test piece	Specimen dimension for the impact test, when other than full specimen
C42	Individual values	Impact test results
C43	Mean value	—
C44 to C49	Supplementary information	—

Table B.3 *(continued)*

EN 10168		Application to fasteners in accordance with this document
Code number	Section designation	
C50 to **C69**	Supplementary information	**C50** Breaking torque (e.g. for ISO metric screws, tapping screws)
		C51 Shear load (e.g. for rivets, pins) or shear strength
		C52 Head to shank integrity (e.g. head soundness for screws)
		C53 Carburization/Decarburization conditions
		C54 Reduction of hardness after retempering
		C55 Surface integrity (e.g. see ISO 6157)
		C56 Case hardening/induction hardening results (e.g. for drilling screws)
		C57 Other mechanical results for externally threaded fasteners (bolts, screws, studs, tapping screws, etc.)
		C58 Other mechanical results for nuts
		C59 Other mechanical results for rivets (e.g. mandrel head retention capability, mandrel push-out resistance, mandrel break load)
		C60 Other mechanical results for washers
		C61 Metallographic or similar physical test results
		C62 to **C69** Other mechanical or physical test results
C70	Steelmaking process	*Not necessary for fasteners*
C71 to **C92**	Chemical composition	In addition to C04 to C06: — test facility in accordance with 5.7 — symbol of the element in the specified following order (non-reported elements may be omitted): **C71** Carbon (C) **C72** Silicium (Si) **C73** Manganese (Mn) **C74** Phosphorus (P) **C75** Sulfur (S) **C76** Chromium (Cr) **C77** Molybdenum (Mo) **C78** Nickel (Ni) **C79** Aluminium (Al) **C80** Arsenic (As) **C81** Boron (B) **C82** Cobalt (Co) **C83** Copper (Cu) **C84** Nitrogen (N) **C85** Niobium (Nb) **C86** Lead (Pb) **C87** Antimony (Sb) **C88** Titanium (Ti) **C89** Vanadium (V) **C90** Tungsten (W) **C91** Zirconium (Zr) **C92** Other