Guide for referencing standards in public procurement in Europe

December 2018

Funded by the European Commission

This Guide has been developed in the frame of the Joint Initiative on Standardisation within JIS Action 11 '*Pilot Project on Increased use of Standards in Public Procurement to better implement the public procurement Directives',* under the leadership of the Swedish Standards Institute (SIS), and has been financed by the European Commission.

The Guide has been drafted with inspiration gathered from similar guides published in Spain and in Denmark in 2017 and with the support of the consultancy organization DanSense. This material was redeveloped, evaluated and scrutinized by an expert panel in three separate rounds in 2018.

This Guide is intended to be used at national level. Its actual use in the next months will serve as a testing period and will generate input and feedback for its further improvement and validation in view of its future possible endorsement as a formal CEN Guide.

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Introduction

This guide aims at providing a better understanding of what standards are and how they can be referenced in public procurement. It also aims at providing ideas on how to reference standards in general, based on the EU procurement legislative framework.

Public procurement research shows that many public procurement officers are unfamiliar with standards and standardisation, and need guidance on how they should reference standards in procurement documents.

Referencing standards in technical specifications aims at increasing common understanding of procurement documents between buyers and suppliers. It may help to define works, supplies and services, contribute to reducing total costs, ensure equality, increase transparency and makes it easier to develop procurement documents.

Directive 2014/24/EU of the European Parliament and of the council of 26 February 2014 on public procurement and repealing Directive 2004/18/EC explicitly allows contracting authorities[1] to reference standards in technical specifications in the procurement process.

This guide will therefore explain:

- **What a standard is**
- **How it can be recognised**
- **How it can be referenced in the technical specifications.**

The guide is not legally binding and aims only to provide general recommendations and to reflect best practice. The ideas and proposals in this guide are without prejudice to national legislation. They should be read and adapted bearing in mind the legal framework for public procurement.

How to find relevant standards

Learning how to reference standards in public procurement must start with;

- Understanding what standardisation is
- Understanding what is a standard
- Learning where standards can be found
- Understanding how to reference standards.

[1] The expression 'contracting authorities' also applies throughout the guide to contracting entities as defined by directives 2014/23 and 2014/25 wherever appropriate.

What is standardisation?

Industry standards have existed for well over a century. The purpose of standardisation was and still is, primarily to reduce costs in production, and to increase trade through common understanding.

Standards are a way for buyers and sellers of goods, and services to agree on the characteristics of the supply, that the agreement covers (e.g. the quality, material, environmental impact, goods test, colour).

Thousands of standards exist in a European, and international standardisation context. In addition, there are also many national standards. A huge number of standards exist within works (construction and buildings), supplies (products) and services.

Most widely known among the many standards are probably the standards regarding Quality and Environmental management systems with more than 1.3 million certificates worldwide.

When talking about Standards[2] in this guide, it means:

- International standards developed by:
  - The International Organisation for Standardisation, **ISO**
  - The International Electrotechnical Commission, **IEC**
  - International Telecommunication Union, **ITU**.
- European standards developed by:
  - The European Committee for Standardisation, **CEN**
  - The European Committee for Electrotechnical Standardisation, **CENELEC**
  - The European Telecommunications Standards Institute, **ETSI**.
- National standards:
  - Developed by National Standardisation Bodies, **NSBs**.

Given the importance of global trade and the relevance of standards within the WTO TBT agreement[3], international standards are the preferable solutions to standardization needs. International standards are however, not always adopted in the EU, whereas a European standard (EN) is always adopted by the national standardization bodies[4] and carries with it the obligation of implementation as an identical national standard and the withdrawal of any conflicting national standard: one identical standard implemented in 34 countries. This is a requirement and an important principle for supporting the completion of the EU internal market.

Standards are reviewed regularly at specified intervals and updated as necessary.

Obsolete standards are withdrawn, but are still available for purchase. They are sometimes still referenced as best practice, despite being withdrawn.

What is a standard?

A standard (French: Norme, German: Norm) is a technical document designed to be used as a rule, a guideline or a definition. Standards are, in essence, an agreed way of achieving a set of objectives.

Standards exist for a wide range of products and services in many domains, like toys, machinery, health care, construction, transport, energy, as well as in the field of ICT (information and communication technology).

Standards are being developed to cover not only products and services but also systems, performance, symbols, terminology, and methods.

[2] See definitions in Regulation (Eu) No 1025/2012 on European standardisation.

[3] https://www.wto.org/english/tratop_e/tbt_e/tbt_e.htm

[4] All NSBs in EU member states plus the Former Yugoslav Republic of Macedonia, Serbia and Turkey and three countries of the European Free Trade Association (Iceland, Norway and Switzerland).

Standards form a common baseline for quality. When standards are referenced in public procurement whilst procuring **works**, **supplies** or **services**, focus can change from solely quality to comparing the value of the work, the supply or the service.

It is important to consider that the use of standards might also help save time in defining specifications since they have already been developed by users, and are well known in the respective fields.

While numerous European standards have been produced within some sectors, for example transport and the electrical sector, other sectors have only just started to realise the potential of using standards.

All standards are classified using an International Classification for Standards (ICS) code[5], and can be found by searching on the national catalogue of standards. Your National Standardisation Body will help you to identify what standards you need.

Basically, the ICS codes relate all relevant standards developed within the same field as for example, electronics, railway engineering, agriculture, etc. See examples in Annex 4 on accessibility, and a general approach to ICS codes in Annex 8.

Standards are developed as voluntary and consensus-based documents that meet the needs of industry, businesses and other interested parties.

A standard is created by bringing together as many interested parties as possible to produce the specific standard. It could include for example manufacturers, distributors, consultants and authorities with an interest in developing a standard for works, products (supplies), materials, processes or services.

Stakeholders interested in participating in standards development can refer to their National standardization bodies (National delegations Principle).

Defining the content of a new standard always starts with an idea based on a need. That need might be to increase the level of quality, avoid certain chemical substances, create better systems, minimize waste of resources etc. Sometimes the needs are purely national and then national standards are developed.

The process by which all interested parties (stakeholders) decide on a new standard is illustrated in figure B.

To comply with EU market needs, more and more standards are developed at European level as EN standards rather than at national level.

The European Standards organizations ensure that European standards are developed according to a well-defined process based on transparency, openness and consensus. The NSBs are invited to participate and comment on the new standard while it is being developed at European level.

[5] https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/international_classification_for_standards.pdf

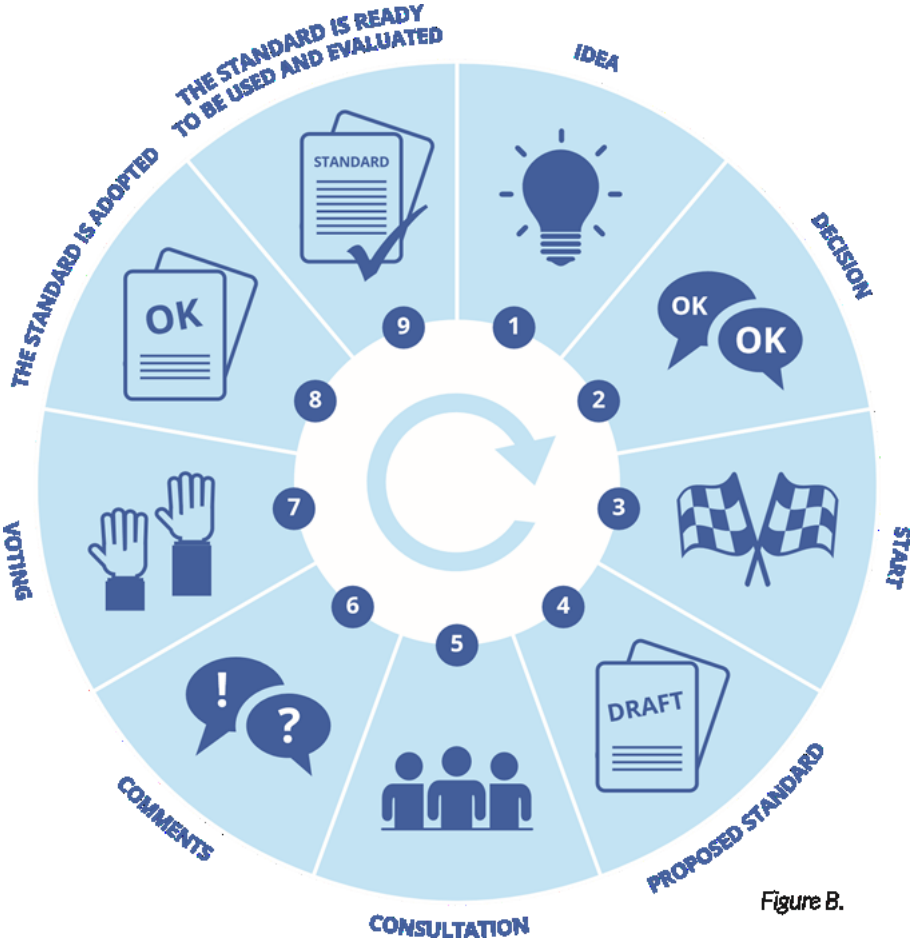

Figure B.

European standard (EN)

A European standard (EN) is identified by a specific code showing the number of the standard, when it was published, where it originates (European homegrown or ISO and/or IEC). A European standard adopted at national level contains also the national identifier. (Figure A).

UNE-EN ISO 12345-2:2018

UNE: National identifier (Spain)
EN: European identifier
ISO: International identifier
12345: Code number for the standard
2: Part
2018: Year it is published

Figure A: Example of an EN (adopting an ISO standard) implemented in Spain.

When a European Standard (EN) is published, it enters a system that ensures regular updates and revisions at defined intervals.

Once a European Standard has been published, it is automatically adopted by all the CEN and CENELEC national Members of 34 member-states. This means that the standard **will** be implemented nationally, and any conflicting national standards will be withdrawn.
Some European standards can have the status of **harmonised European standards,** i.e. adopted on the basis of a request made by the European Commission for the application of Union harmonisation legislation. The code and the title of the harmonised standards are cited in the *Official Journal of the European Union* under the relevant directive/regulation.

Compliance with harmonised standards remains voluntary, although the use of harmonised standards to gain presumption of **conformity** often may be the most cost-efficient, easiest and quickest means to meet the legal requirements in a tender.

Note also that other European deliverables exist with a lower status than an "EN". They are called TS (Technical Specification), TR (Technical Report), CWA (CEN or CENELEC Workshop Agreements). These kinds of deliverables will be elaborated later in this guide. "Lower status" refers in this context to the order of priority in Article 42 in the Public Procurement directive 2014/24[6] (refer to section on 'Order of Priority' in this guide).

OBSERVE:

Some European standards can have the status of Harmonised standards (hEN). Harmonised standards have the advantage that they help manufactures to meet requirements of EU legislation, thus promoting the same level of safety and quality across the EU.

How do I find a standard?

Whilst learning how to reference standards, the first step should be to contact the National Standardisation Body and get guidance on how to find relevant standards. Contact information, as well as their websites can be found in Annex 5.

In most European member-states, there is only one National Standardisation Body (NSB) which is a member of both CEN and CENELEC. In others, there are two NSBs, one of which is a member of CEN and the other of CENELEC. (See full list in Annex 5).

[6] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=celex%3A32014L0024

How do I reference standards in public procurement?

In a procurement exercise, a contracting authority may refer to specific standards on works, supplies or services to meet different requirements in the technical specification.

The contracting authority can choose to reference the standard as a whole, or specific part(s) of the standard, describing products, systems, performance, symbols, terminology, construction or methods.

The tenderers should document that their products and services comply with the relevant standard. The documentation, which can be a specific certificate, a test-report or other kind of documentation, proves conformity to the standard.
Before focusing on how to reference standards, special attention should be paid to the phrase "a technical specification". It should be noted that it is used slightly differently in the Directive 2014/24/EU on public procurement and by standardisation bodies.

Standardisation bodies use the term "technical specifications" to refer to a basic document that prescribes technical requirements to be fulfilled by a product, process or service, and that is not (yet) approved by a recognised standards body, whereas in the Directive 2014/24/EU a "technical specification" can refer to a set of documents describing **all** characteristics of works, services or supplies.

When referencing standards, it is necessary for the contracting authority to understand the **order of priority of standards referenced in article 42** of the Directive 2014/24/EU in order to avoid any conflicts in referencing standards.

Referencing standards in the public procurement directive 2014/24

In general, standards can be referenced in any procurement procedure. Standards can also be referenced in the pre-award procurement process while respecting basic procurement principles on equal treatment, mutual recognition, proportionality, non-discrimination, and transparency.

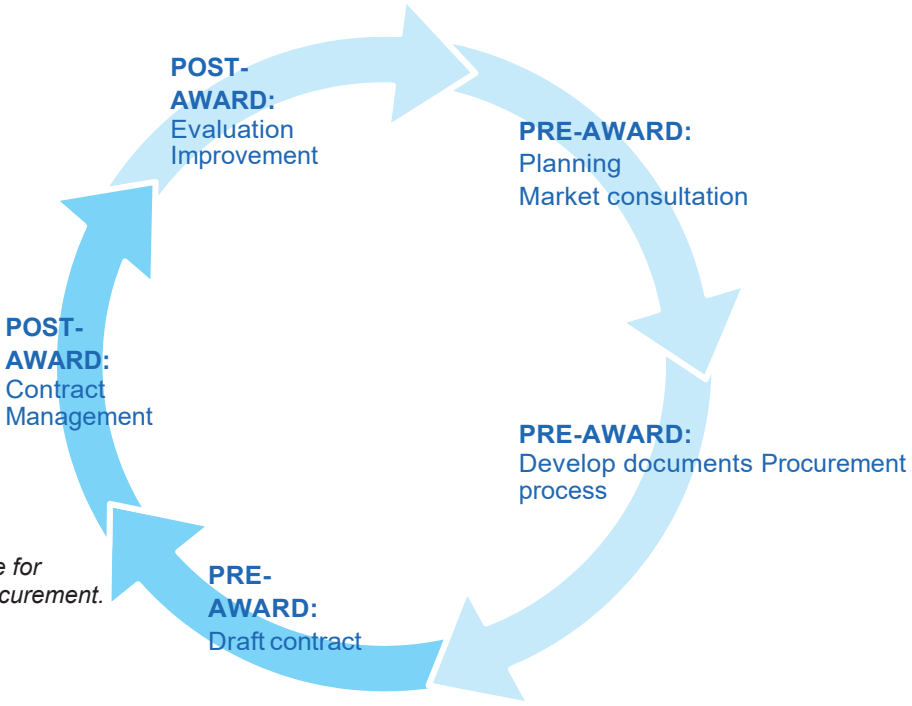

Figure C: Cycle for end-to-end procurement.

After contracting, the next phase is entered (called post-award) (figure C). In post-award no new standards can be referenced. Nevertheless, if the contracting authority has planned the tender correctly, numerous standards applying to, for example measurement, testing and documentation exist to ensure the proper implementation of the contract. It is recommended that these standards are referenced in the technical specification in the pre-award phase.

When the contracting authority writes the technical specification, it must be ensured that all characteristics required of the work, service or supplies (products) are described.

Characteristics can for example be quality level, environmental, climate, performance levels, design including accessibility, conformity assessment, specific processes or methods etc.

To ensure that standards referenced in the technical specification are implemented in the contract phase (post-award), the contracting authority should require during the procurement process that evidence is provided that the work, service, or supply complies with the agreed technical specification.

OBSERVE:

Before referencing standards, make sure that legislation is followed. Then reference standards where relevant.

In standardisation these characteristics and their measurement are covered by multiple different standards. The way to reference standards is defined in the EU-directive on Public Procurement 2014/24, Article 42.3.b. Below the order of priority for referencing standards is described.

Order of priority

The order of priority shown in (figure D) is determined by the way standards are used in Europe, by focusing first on European standards, and afterwards on less widely implemented standards cross-border. Most international standards are in that sense recognised and implemented in Europe.

In this guide the order of priority is named A-H to clearly differentiate the standards when pointing out the differences.

To ease the understanding of how national prefixes are used in standards, all examples shown in A-H bear different examples of prefixes from member- countries. National prefixes can also be found in Annex 1.

The contracting authority must especially comply with the conditions mentioned in Article 42 and Article 44 in the EU-directive on Public Procurement 2014/24, when referencing standards.

Firstly, it is important that standards F-H (below), **National standards, National Technical approvals** and **National Technical specifications must only be referenced if no standards A-E exist.**

The standards F-H are all **national standards** of different origin and have sometimes been created by a small group of interested parties within a specific country. In public procurement processes where tenderers from other countries can participate there is a risk that they do not know about the national standards. Therefore, when developing the technical specification in the procurement documents, a special effort should be made to inform possible tenderers when national standards are referenced.

Secondly, a reference to a standard should be accompanied by the words 'or equivalent'[7] with a reference to Article 44 (1) and (2) about the provision of other appropriate documentation. Documentation does not need to be in the form of a standard.

Regarding referencing a standard, the intention is to allow for different solutions and not reject a tender because the tenderer has not directly referenced a standard but believes that the solution complies with the technical specifications stipulated in the tender. It is the tenderer that must justify compliance with the technical specification.

Thirdly, when setting the requirements, **the contracting authority can always require documentation** in form of a certificate, a test report, a conformity assessment or other kind of documentation. The documentation should then prove that the offer conforms with the requirements of the common technical specifications.

The rules for requiring documentation are the same no matter which standard is referenced in the order of priority below. How to require documentation will be elaborated on later in the guide.

[7] Directive 2014/24/EU on public procurement, article 42.3.b.

Figure D: Order of priority.

Article 42.3 "without prejudice to mandatory national technical rules, to the extent that they are compatible with Union law, the technical specifications shall be formulated in one of the following ways":

In order of preference:

A: National standards transposing European standards
B: European Technical Assessments **C:** Common technical specifications **D:** International standards
E: Other technical reference systems established by the European standardisation bodies

... or if the above does not exist

F: National standards
G: National Technical approvals
H: National Technical specifications

Each reference accompanied by the words "or equivalent".

Referencing standards according to standards A-H

A: National standards transposing European standards

"National standards transposing European standards" simply means that in procurement documents they will be recognised as European standards (EN) as they are implemented in all member states.

When implemented nationally a national prefix will be added. As an example, British standards are issued with the prefix BS in front of EN as BS EN. The same EN standard is issued in Germany as DIN EN and in Bulgaria as BDS EN.

When an international standard (ISO) is implemented as a European standard (EN) it will automatically become a national standard in European countries (EN ISO). This means that it must also be implemented nationally for example an SFS/EN ISO, where SFS means in Finland.

To minimise potential confusion in writing the technical specifications in the procurement documents, it is recommended to cite the full code of standards, including the date and title of the standard.

Examples of designations of national standards for implementation of European standards and the way to cite them:

- *(Hungary):* MSZT-**EN** 197-1:2012, Cement – Part 1: Composition, specifications and conformity criteria for common cements.
- *(Germany):* DIN-**EN ISO** 14024:2018/ prA1:2015, Ecolabelling – Type 1 Eco-labelling – Principles and procedures.
- *(Sweden):* SS-**EN ISO/IEC** 27001:2017 – Information technology – Security techniques – Information security management systems – Requirements (ISO/IEC 27001:2013 including Cor 1:2014 and Cor 2:2015).
- *(Netherlands):* NEN-**EN ISO/IEC** 17065:2012, Conformity assessment **[harmonised by EU].**

ADVICE:

Writing the technical specification, using the full name of the standard can sometimes make it almost impossible to read and understand the content of the procurement documents if many standards are referenced. It is often best to simply reference the code of the standard (ex. EN ISO/IEC 27001:2017) in the core material and then add an Annex showing the title and other information.
EN ISO/IEC 27001:2017 – *Information technology – Security techniques – Information security management systems Requirements.*

All members of CEN and of CENELEC have an obligation to adopt all published European standards (EN) as national standards and withdraw any conflicting standards. This means that the contracting authority can be sure, that when referencing an EN-standard in the specification no other conflicting standard exists in Europe. This makes the EN-standard an exclusive document.

See also example 1 and 2 in Annex 1.

B: European Technical Assessments

"European Technical Assessments", ETA's are specifications related to Construction Products Regulation (CPR)[8].

An ETA is a common European approach to describe the performance of a construction product or system. It is a voluntary way of CE[9] marking construction products or construction systems for a specific application defined by the producer. (By affixing the CE marking to a product, a manufacturer declares that the product meets all the legal requirements for CE marking and can be sold throughout the EEA).

OBSERVE:

European technical assessments **can only be issued for construction products or construction systems** that are not governed by a harmonised European standard.

The basis of a European technical assessment is a European assessment document (EAD) prepared and published by the European Organisation for Technical Assessment (EOTA[10]). National ETA organizations can be found through EOTA, as well as a list of all (approximately 7000) published ETA´s.

National ETA-organisations exist in most countries in the EU. As of 2018, 25 countries are members in the EU and the European economic area.

ETA approved documents are recognised by;

- the ETA logo and
- an initial number as for example "European Technical Approval ETA-13/0689,
- a trade name as for example "Kerablock TEX 750 Watertight covering Kit".
- a holder of approval,
- a generic type and use of construction product,
- a validation date and
- a manufacturing plant.

As an example of innovative solutions, the latest ETA's, are now focusing on re-introducing used building materials (bricks) with a CE-label through an ETA-certificate. There has been an increasing awareness on the use of ETA's over the last few years.

If the procurement authority is planning new innovative solutions for the use of materials in construction, a good idea would be to contact the national ETA first, to see if it has any relevant ETA's to reference in the technical specification.

Note that national alternatives to the ETA's might exist, and this should be considered when developing the procurement documents.

C: Common technical specifications

Either on proposal from a Member State or on its own initiative the European Commission may decide to recognise ICT technical specifications that are not national, European or international standards, and which may be referenced, primarily to enable interoperability, in public procurement.

The phrase "Common technical specifications" applies exclusively to **alternative standards** within the Information Communication Technology **(ICT)** area, as defined by EU Regulation 1025/2012.

OBSERVE:

Common technical specifications refer to ICT technical specifications, but the tenders themselves might not necessarily be in the ICT area but can contain ICT specific standards.

[8] https://ec.europa.eu/growth/sectors/construction/product-regulation_en

[9] CE-marking: Marking of products for trade in the EEA. https://ec.europa.eu/growth/single-market/ce-marking_en

[10] https://www.eota.eu/en-GB/content/list-of-all-eota-members-for-searching-a-tab-please-see-page-eta-request/34/

To be identified as a Common Technical specification an ICT technical specification must comply with specific requirements[11] like for example market acceptance, support interoperability, specifications developed by non-profit organisations etc. Identified ICT Technical Specifications are listed in Commission Decisions which are published in the *Official Journal of the European Union*[12].

"Alternative standards" in this sense means that they are not necessarily developed inside recognised standardisation organisations like ISO, CEN, CENELEC or national standardisation bodies (NSB). They may also be developed as voluntary standards between interested parties, as for example ETSI.

As an example, when referencing common technical specifications, the public procurement officer (PPO) may, in a tender for a new electronic procurement system, list in the specification, some specific ICT-requirements for data-formats, exchange of data, etc.

Another example could be that a contracting authority needs to renew their fleet of healthcare vehicles and in the tender, specifies the requirements for
the vehicles and reference specific ICT standards to ensure best possible communication between the vehicles and relevant departments.

Note, that national alternatives to common technical specifications may exist, and this must be considered when developing the procurement documents.

D: International standards

International standards are developed by either the International Organisation for Standardisation (ISO), or the International Electrotechnical Commission (IEC) and can be recognised by the identifier ISO or IEC in the standards. When a country adopts an International standard, it adds its country's identifier or prefix in front of the standard.

- *(Belgium):* NBN **ISO** Guide 73:2014 Risk Management (Belgium)
- *(Estonia):* EVS **IEC** 60027-7:2010 Letter symbols to be used in electrical technology
- *(Italia):* UNI **ISO/IEC** 18000-4:2015, Information technology – Radio frequency identification for item management Part 4: Parameters for air interface communications at 2,45 GHz.

As an example, a new ISO management standard which has received a lot of attention recently within IT-security is the "EN ISO/IEC 27001:2017
– Information technology – Security techniques
– Information security management systems".
The standard is implemented in Europe and is right now at the centre of General Data Protection Regulation[13] (GDPR) work.

See also example 3, 9, 11, 13 etc in Annex 1.

When international standards are implemented in Europe as European standards (EN) they simply become European standards too.

It should be noted, that not all international ISO, IEC or ITU (International Telecommunication Union) standards are implemented as European standards. They might nevertheless be implemented in some countries in Europe and not in others.

OBSERVE:
National standards can exist even when there are ISO or IEC standards, but ISO or IEC standards take precedence over national standards in public tenders, if implemented nationally.

[11] Regulation (Eu) No 1025/2012, Annex II.

[12] https://ec.europa.eu/growth/industry/policy/ict-standardisation/ict-technical-specifications_en
https://joinup.ec.europa.eu/collection/ict-standards-procurement/identified-ict-specifications-procurement

[13] Regulation (Eu) 2016/679 on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.

E: Other technical reference systems established by European standardisation bodies

In a standardisation context “Other technical reference” documents are all European standardisation documents with different characteristics and purposes as mentioned below.

These documents can be European technical specifications (TS), technical reports (TR), documents of harmonisation (hEN) or CEN / CENELEC Work- shop Agreements (CWA) and guides.

Unlike European standards (EN) they do not specifically exclude competing national documents. When referencing the different technical references in public procurement it must be checked whether any national alternatives exist in competition with these standards.

Technical specifications (TS)

TS are specific types of documents prescribing technical requirements to be fulfilled by a product, process, service or a system, and which describe the products’ or services’ characteristics, the production methods, and for construction projects the methods and the criteria for assessing the performance of construction materials.

OBSERVE:

Always check that extra requirements besides the ones mentioned in the standard, are not already described to avoid double requirements that might be contradictory.

Referenced in the technical specification in the procurement document, they function to describe the minimum requirements of specified products, methods, systems etc.

Further requirements, that are not mentioned in the standard can be added in the procurement documents.

Examples on identifiers showing where a TS is described;

- *(Italy):* UNI/CEN/**TS** 12390-9:2006, Testing hardened concrete – Part 9: Freeze-thaw resistance – Scaling.
- *(France):* AFNOR/CLC/**TS** 50136-7:2017, Alarm systems – Alarm transmission systems and equipment – Part 7: Application guidelines.

Note. National standards can exist even when there are TS’s, but TS’s take precedence over national standards in public tenders.

Technical reports (TR)

TR’s differ from TS’s. They are generally drawn up by European standardisation bodies in order to create and share knowledge or to elaborate issues that are included in EN and TS publications. Normally, a technical report does not contain specific requirements or technical requirements.

- *(Turkey):* TSE CISPR **TR** 18-1:2017 Radio interference characteristics of overhead power lines and high-voltage equipment – Part 1 Description of phenomena.

A CEN or CENELEC TR is not necessarily published nationally by the NSBs. They are, however, always published by the European standardisation organisations. As such, the procurement authority should ensure that any tenderers have sufficient know- ledge about the existence of the TR when a TR is referenced.

Workshop Agreements (CWA)

CWA’s are developed within CEN and CENELEC. They are developed after preparation in a workshop model by stakeholders that have signed up for the work. The deliverable from a CWA is solely based on consensus from the participants in the workshop.

Example:

- *(Lithuania):* LST/**CWA** 15793 Laboratory biorisk management.

A CWA may not conflict with any other standardisation publications. If referencing CWA’s, the contracting authority should provide sufficient information to tenderers as these documents might not

be known to tenderers since publication is not a requirement.

Note, that national alternatives to the CWA might exist and this must be considered when developing the procurement documents.

Guides

Guides are only intended to provide guidance on standardisation to participants active in standardisation work, and they are therefore often not referenced as a standard.

Example:

- *(Switzerland):* SNV/CEN/CLC Guide 14:2010 Child Safety Guidance for its inclusion in standards.

If referenced, then the contracting authority should always provide sufficient knowledge to tenderers.

F: National standards

When referencing national standards as well as National technical approvals and National technical specifications in public procurement the following should be observed:

- Make sure that no conflicting European or inter- national standards exist in the specific area.
- Make sure that cross-national tenderers are specifically informed about the special national rules/specifications which are referenced in the procurement document.
- Make sure that tenderers understand national standards by introducing the relevant standards early in the dialogue or by giving access through the procurement process.

Guidance on how to ensure the above conditions are met, can be found by contacting the national standardisation organisation. See Annex 6 for initial help in the check list.

Example:

- *(Denmark)* DS 146:1981 Coniferous sawn timber
  – Cross section sizes and lengths.

National standards are per definition national and often only exist in the national language. Numerous similar standards might exist in other countries,
so special care should be taken when referencing national standards.

G: National Technical approvals

National technical approvals or schemes are developed and approved on a national level, typically **not by a standardisation organisation,** but by an alternative national organisation responsible for specific issues, as for example:

- A web-based information scheme regarding roofing underlays
- Voluntary scheme for mechanical and physical characteristics of materials and construction in compliance with national legislation.
- Conditions for use, as documentation for proving that products are suitable for use in construction.

National Technical approvals schemes can be either mandatory or voluntary.

When referencing **voluntary national technical approvals,** the contracting authority should always provide sufficient information to tenderers by ensuring access to relevant documents in the procurement process.

When referencing **mandatory national technical approvals,** the contracting authority should always ensure that tenderers are informed about mandatory national technical approvals.

H: National Technical specifications

Types of national technical specifications could be:

- guides in general
- calculation guides
- energy calculations
- engineering calculations
- industrial measurement
- heat loss calculations
- indoor climate and working environment guides etc.

All to be used within specific areas.

National technical specifications can be developed by national standardisation bodies (NSBs), trade associations or authorities.

When referencing National Technical specifications, the same precautions as required for National standards must be taken.

Concluding remarks for contracting Authorities in understanding order of priority

- Where in the hierarchy (A-H) is the standard you want to reference placed?
- Do any conflicting standards exist higher in the hierarchy? (Ask your national standardisation body if in doubt)
- Always reference standards from A-E if they exist, before referencing from G-H.
- Always consider if any kind of documentation as proof of deliverable is needed.
- If needed, decide the level of proof of documentation (test report, certificate, conformity assessment or other), and add this as a requirement in the procurement documents.
- Highlight that alternative documentation may be acceptable under the conditions set out in legislation and in the tender documents

02

Public procurement in praxis

How to reference standards, use labels and certificates plus ensuring conformity through requirements in the procurement

Referencing standards in the procurement process

Standards can be referenced in most stages of the procurement process (The pre-award process). In the contracting phase (the post-award), the use of standards can be assessed, but no new standards can be added. (Figure E).

When planning the tender, referencing standards must be done in the pre-award phase.

Standards can be referenced in the preliminary market consultation, as award criteria, in the technical specification, the draft contract, or when all procurement documents are ready, in the contract notice. Each of these steps in planning will be elaborated on in the following (and shown in Annex 6).

Preliminary market consultations

If doubts exist as to the dissemination and use of standards in the market, the contracting authority has the possibility early in the planning process, maybe even before writing the technical specification, to have a dialogue with potential tenderers, especially if a specific standard actually cover some or most of the needs for a specific service or a product.

After the dialogue, the contracting authority can consider if, and how to reference the standard. If potential tenderers have knowledge, and comply with the standard, it can be referenced in the technical specification. If knowledge of the standard is considered low, the standard can still be used, but then mostly as an aspiration and maybe by selecting a few requirements from parts of the standard. By taking such an approach the contracting authority indicates what solution it might want in the future. (See also Annex 1, example 1 and 2).

Figure E: Pre-award and post-award process.

Award criteria

Selecting award criteria opens, in most cases, the possibility to reference standards.

When selecting the **most economically advantageous** tender, the contracting authority identifies which of the three possible award criteria: **price, cost, or best price-quality ratio will be used.**

If the award criteria **"Price"** is chosen, then referencing standards is not relevant. It should be noted, in the technical specification that standards can still be referenced as minimum requirements.

If selecting the award criteria **"Cost"** the contracting authority can include life-cycle costs. Life-cycle costs include direct as well as indirect life-cycle costs, meaning that not only the cost while the product or service is owned/used, called Total cost of ownership (TCO), but also the costs referencing production, logistics and waste etc. after end of ownership, called indirect costs.

There is no international standard for life-cycle costs. However, EN ISO 14040:2008 Environmental management – Life cycle assessment – Principles and framework, contains a standardised approach to, and structure for life-cycle assessments. More specific information about data quality is available in *EN/ISO 14044:2008, Environmental management – Life cycle assessment – Requirements and guidelines*

If life-cycle costs are included, it is however, a requirement that the contracting authority indicates clearly in the contract notice, or in other procurement documents which costs are included in the calculation, so that this is clear to the tenderers. (Award: See also Annex 1, example 3.)

When selecting the **best price-quality ratio,** the criteria may include sub-criteria involving reference to standards for the fulfilment of requirements.

Standards may then be used as documentation of conformity, as long as the requirements are linked to the subject matter of the contract and they are proportionate with the scope of the contract.

Examples like referencing management systems are already widely used. Other award criteria could be any certificates drawn up by independent bodies attesting that the economic operator complies with certain quality assurance standards, like for example standards for including accessibility for disabled persons or referencing quality assurance systems based on the relevant European standards series and certified by accredited bodies. (Award: See also Annex 1, example 4-6).

It is important to be aware that if **parts** of a quality assurance system are used as award criteria, these parts must also be linked to the subject matter of the contract, proportionate with the scope of the contract.

It is also important to point out, that if certain parts of management standards are used for the suitability assessment, then these parts cannot be reused in their general form in the award criteria[14].

Processes within management standards can be used as part of sub-criteria when they are linked to the subject-matter of the public contract where they relate to the works, supplies or services. See also examples 4-6 in Annex 1.

Other standards like design standards, product standards, performance standards etc. can also be included in the award sub-criteria for "best price-quality ratio".

Technical specification (Requirements specification)

Standards can form part of the technical specification in various ways.

However, it is vital that the contracting authority evaluates whether the use of standards is proportionate to the subject matter of the contract and the contracting authority's specific and legitimate needs.

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[14] Directive 2014/24/EU on Public Procurement, Article 67.3.b

When referencing standards in the technical specification they are typically considered to be minimum requirements. Further supplementary requirements can be added to better describe the product characteristics or functions, in addition to the requirements set by the standard.

Whereas standards provide a common basis for understanding the works, supplies or services and a uniform language, “further supplementary requirements” enable the contracting authority to describe in more detail their requirements regarding the works, supplies or services.

Requirements that characterise the specific works, supplies or services, can be found within standardisation areas like design, products, systems, performance, symbols, terminology and methods.

For example, in a procurement process where the minimum requirements set to ensure hygiene requirements for food processing machinery according to EN 1672-2+A1:2009 are specified. There may be need for additional supplementary requirements for the use of special gloves (EN 455-1:2012 Medical gloves for single use – part 1) in connection with cleaning or handling of food. (See also Annex 1, example 7-10).

Draft contract

Referencing standards is also possible when preparing the draft contract.

The contracting authority may include minimum requirements for works, supplies (products) and services related to standards in the draft contract. When doing so it must be ensured that;

- there is a connection between the contract terms, the standard and the subject-matter of the contract, and that this is indicated in the call for tenders or in the technical specification.

For example, for the purchase of cleaning services in general for an office building, a specific part of the draft contract could include requirements for using special protective gloves that can resist chemicals according to a specific standard, when cleaning certain objects. (See also Annex 1, example 11-12).

Contract notice

As part of the company’s suitability assessment, standards can be referenced in the contract notice.

When posting the draft content of the contract on the EU TED database under “Technical and professional ability” in the contract notice, reference can be made to standards required by the contracting authority in connection with the suitability assessment. However, the contracting authority must be aware that proof of the companies’ technical and professional ability is limited to the type of documentation mentioned in Article 44(1) and (2).

For example, a contracting authority can request the tenderer to document its processes and therefore state, in the contract notice, that the supplier needs to be certified according to EN ISO 9001:2015 in respect of quality management systems in order to be eligible to bid. Alternative documentation is acceptable. (See also Annex 1, example 13).

OBSERVE:

Unless duly justified, the contracting authority shall in the procurement documents always consider accessibility criteria for persons with disabilities or design for all users. See Annex 4.

Referencing standards in the procurement procedures

Standards can also help in better describing requirements when implementing the five procurement procedures in the public procurement directive 2014/24:

- open procedure
- restricted procedure
- competitive procedure with negotiation
- competitive dialogue
- innovation partnership.

In open procedure and restricted procedure, reference to standards may basically be used as minimum requirements in the technical specification, enabling the focus to shift to the function of the product or the service.

As an example, a Danish ministry had problems de- scribing the minimum requirements in a tender on alarm systems and access to buildings and decided to reference 29 ICT standards as minimum requirements, and then focused on functional requirements. The procurement procedure was a success and multiple contracts were awarded without any problems. (See more examples in Annex 1, example 14-17).

Standards can also be referenced in the **electronic purchasing technique,** Dynamic Purchasing systems. Examples of which are provided in Annex 1, examples 18 and 19.

Use of certificates and ensuring conformity

With standards comes the need to make sure that standards are actually followed, hence the need for documentation by third-parties to prove conformity with the standard.

Documentation can be requested in several ways by setting requirements for test reports, third party inspections, approvals by conformity assessment bodies, or by issued certificates.

In the technical specification the procurement authority can require that the tenderer provides this kind of documentation.

What is a test report, a certificate or a conformity assessment?

Article 44 in the procurement directive 2014/24 states that *"Contracting authorities may require that economic operators provide a **test report** from a **conformity assessment body,** or a **certificate** issued by such a body as means of proof of conformity with requirements or criteria set out in the technical specifications, the award criteria, or the contract performance conditions".*

OBSERVE:

Be very specific in planning and writing the technical specification and setting the correct requirement for certificates, test reports, accreditations and conformity assessment to ensure conformity.

The overall aim of certificates and certification is to give confidence to all interested parties that a product, process or service fulfills specified requirements.

When producing procurement documents, it can be difficult for the public procurement officer to distinguish between what are conformity assessment documents, and what are certificates.

Looking at an example, ISO 45001:2018 “Occupational health and safety management system” a company can obtain a **certificate or other kind of proof,** after an external audit performed by a third-party **conformity assessment body** proving that the company conforms with the management standard.

Basically, the example above describes the process that must be performed in order to establish conformity with requirements or criteria set out in the technical specification.

In most cases, the contracting authority will need to demonstrate that they comply with the established standard and this is where the **Conformity Assessment Bodies** (CABs) come into play.

The CAB conducts a third-party evaluation/assessment.

The proof of an assessment/audit might be a certificate, a **test report,** a conformity assessment or other kind of documentation.

EXAMPLE:

A region planned a tender on wheelchairs and required that dimensions, mass and maneuvering space as a minimum requirement complied with ISO 7176- 5:2008 or equivalent.

No requirements were set on how to ensure “or equivalent”.

When bids were received the contracting authority found that four tenderers delivered alternative products, claiming themselves that they conformed with the standard.

Three provided self-declarations and only one delivered a test report from a conformity assessment body. The Region then had to compare three offers with the standard themselves, which was time consuming.

When requiring a test report the CAB that performs the inspection and develops the test report must be accredited itself to perform the specified evaluation/ assessment.

Examples:

- Testing of water quality for food safety shall be made by an accredited CAB that fulfill EN ISO/ IEC 17025[15].
- Inspection of lifts for safety shall be made by an accredited CAB that fulfills EN ISO/IEC 17020[16].

How and why do I require certificates in the technical specification?

When describing requirements in a technical specification it is possible, depending on the product or the service, to demand **certificates on persons (staff), products or systems.** This is one way of ensuring consistency between requirements and conformity to standards.

The contracting authority can therefore in the technical specification as proof of accreditation require that the conformity assessment body for example delivers a certificate.

Depending on the product (supply) or the service, another way could be to include the option of requiring a test-report in the draft contract. This helps to ensure that during the contract execution period the successful contractor is performing in accordance with the specified standards.

If for example, products like specific medical devices are required, it can also be requested in the draft contract, that **the contractor at any time must be able to demonstrate conformity** with the standards. This could be achieved with a certificate or a conformity assessment.

A conformity assessment body performs calibration, testing, certification and inspection activities and

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[15] EN ISO/IEC 17025:2017 General requirements for the competence of testing and calibration of laboratories.

[16] EN ISO/IEC 17020:2012 Conformity assessment – Requirements for the operation of various types of bodies performing inspection.

is **accredited** in accordance with the Regulation (EC) No 765/2008 of the European Parliament and of the Council.

For ETA's these conformity assessment bodies can be the EOTA[17] organisation members.

For specific sectors like for example welding and electricity etc. other conformity assessment bodies exist all over Europe. Conformity assessment bodies are often registered in different national organisations and sometimes also work cross-border[18]. They should all be able to deliver a certificate on the person, product or system in question.

OBSERVE:
Other ISO 17000 standards can ensure that the proper requirements within audit, bodies per- forming testing, certification and testing of calibration are met.
This aims to increase credibility in test-reports, assessments or other documentation.

Conformity Assessment Bodies (CABs) must comply with "EN ISO/IEC 17065:2012 "Conformity Assessment – requirements for bodies certifying products, processes and services" to become official CABs.

Therefore, when there is a need for a third-party documentation, as for example a certificate documenting a part of the contract, the contracting authority can rely on CABs to prove conformity to a standard.

How do I identify accreditations and certificates?

The CAB must have an accreditation decision from a national accreditation body that confirms that the CAB is accredited to perform the assessment laid out in the technical specification. A checklist of features of types of conformity assessment activities is provided in Annex 3.

Contracting entities often receive all kinds of certificates for certain products, processes or services. Sometimes it can be difficult to establish if the certificates are actually from accredited conformity bodies.

Three things should be checked:

- First, the conformity assessment body must be accredited by a national accreditation body. (Figure F on next page).
- Secondly, the name/logo of the CAB must be visible on the certificate issued from the conformity assessment body.
- Thirdly, the certificate should contain specific data proving that it conforms with existing rules. (See Annex 7).

[17] https://www.eota.eu/en-GB/content/list-of-all-eota-members-for-searching-a-tab-please-see-page-eta-request/34/

[18] An example: http://english.danak.dk/

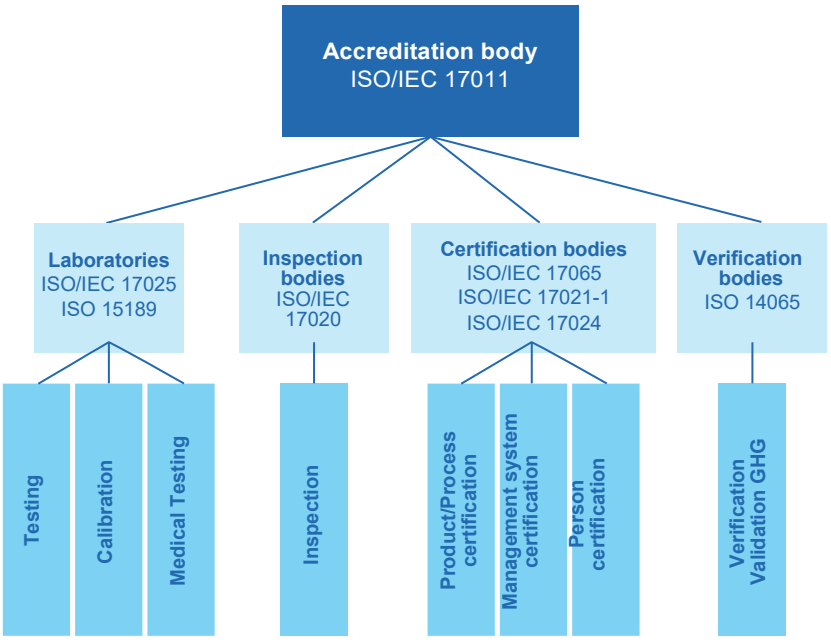

Figure F. Example on how to understand certification and accreditation. (Copyright Swedac).

Use of labels referencing standards

Where contracting authorities intend to purchase works, supplies or services with specific environmental, social or other characteristics they may, in the technical specifications, the award criteria, or the draft contract performance conditions, **require a specific label** as means of proof that the works, services or supplies correspond to the required characteristics

Today there are almost 500 different ecolabels that are widely known.

Less well known is the fact that some of the best- known eco-labels, like the EU-Eco-label, derive from, and are defined by an international standard. Out of the almost 500 eco-labels, less than 30 eco-labels are recognised globally as third party approved eco-labels that meet almost the same criteria as an international standard[19].

Minimum requirements for referencing labels are included in the EU-Directive on public procurement 2014/24, article 43. The requirements are almost aligned with the general requirements in the European standard for eco-labelling, EN ISO 14024:2000 "Environmental labels and declarations – Type I", which is the basis for eco-labelling globally.

So, when requesting eco-labels like the EU-Ecolabel or equivalent it is fair to compare these approximately 30 labels[20] as equals to an international standard, as long as it is always checked that the label requirements only concern criteria which are linked to the subject-matter of the contract and are appropriate to the characteristics defined in the contract. All Eco-labels have gone through a certification process, and suppliers can demonstrate compliance with a standard or requirement with a label.

Other known labels exist in different areas like Fair Trade, construction, health care etc.

The public procurement officer should ensure that these kinds of labels are compliant with Article 43 in the procurement directive when referencing alternative, yet recognised labels in public procurement.

[19] EN ISO 14024:2000 Environmental labels and declarations – Type I environmental labelling – principles and procedures.

[20] https://www.globalecolabelling.net/eco/green-certification-by-country/

03

Annexes

Annex 1
Examples on referencing standards in public procurement

Referencing standards in different procurement processes

In the following examples is shown how to reference different standards in the procurement process. All standards mentioned in these examples can be found on the National Standardisation Body's web-site (see Annex 5) or by contacting them. Remember, that whenever standards are referenced, other kinds of proof should always be accepted.

Note, that all national prefixes are randomly chosen and only figures as examples. The prefixes or acronyms can all be seen in annex 5

Preliminary market consultations

Example:

1. *A contracting authority wishes documented quality awareness demonstrated in bids for a public tender for office supplies. The contacting authority decides to have a market dialogue with stakeholders to establish if there is a reasonable uptake in the market for documenting environmental awareness with reference to LVS-EN ISO 9001:2015, Quality management systems – Requirements.*

   The market dialogue shows that there is a significant use of LVS-EN ISO 9001 in the market, hence the public authority can pre-qualify tenderers that are certified according to LVS-EN ISO 9001:2015 or equivalent. Alternative documentation must be accepted, so the contacting authority should remember to add in the procurement documents that equivalent documents such as for example certificates, test-reports of conformity assessments or other documentation is also acceptable.

Example:

2. *A municipality wishes to put up a tender on renovating/renewing all electrical installations in its building after a fire inspection has identified that in some of its buildings, electrical cables and other electrical installations no longer comply with national law. In the preliminary consultation the*

municipality presents a long list of standards that have been approved by the fire Department as compliant with the national law and proposed as minimum requirements in the technical specification. The market dialogue showed that all tenderers could deliver the requested products.

The same approach goes for other standards within construction, products, systems, performance, symbols, terminology or methods.

Award

Cost

Example:

3. *A municipality wants to buy new outdoor furniture for all kindergartens and whilst planning the tender it decides that the award criteria will be 'Cost', with reference to life-cycle costs. To ensure that the bids can be compared it references parts of the life cycle assessment standards MCCAA-EN ISO 14040:2008 on principles and framework and of MCCAA-EN ISO 14044:2008 on Requirements and guidelines.*

It is indicated in the procurement documents that this is the municipality's approach.

Price-quality ratio

Example of management standards, where the whole standard or parts of the standard may be referenced in the sub-criteria:

Example:

4. *IPQ-EN ISO 9001:2015, Quality Management, if there is an overall wish to ensure quality and documentation of supply, services or construction.*

Example:

5. *ASRO-EN ISO 50001:2018, Energy management systems – Requirements. If there is a desire to ensure documentation as well as to control energy management including deliverables or performance.*

Example:

6. *ISS-EN ISO/IEC 27001:2017, Information Management Systems where there is a general desire to ensure information security in the company, with supporting evidence of the assignment, delivery or performance.*

In addition to management standards, there are also other standards that may be **relevant to include in the sub-criteria** for "best price-quality ratio", e.g.

- Design standards, e.g. specific formats on products and /or data
- Product standards, e.g. shoes, office supplies, pipes
- Performance standards, e.g. security, access, dust.
- Symbol standards, e.g. graphical symbols, different labels or pictograms
- Terminology standards, e.g. vocabularies, ontology
- Test method standards, e.g. noise, calibration, chemical analyses and testing.

The contracting authority can specify appropriate sub- criteria, as long as they are linked to the subject matter of the draft contract. This makes it possible for the contracting authority to assess the tenders objectively.

Technical specification (Requirements specification)

Examples of minimum requirements referenced in standards in the requirements specification for works:

Example:

7. *In a tender for constructing a building where new and alternative building materials will be used, the tenderer must meet the performance requirements of the Non-combustibility test according to UNMS SR-EN ISO 1182:2010 – Reaction to fire test for products. It should be noted, that referencing* a standard shall always be followed by the words "or equivalent".

Example:

8. *When installing electrical wiring in new apartments, the contracting authority requires that certain cabling must comply with SIST-EN 50565-1:2014 Electric cables – low voltage energy cables of rated voltages up to and including 450/750 V. It should be noted, that referencing* a standard shall always be followed by the words "or equivalent".

Examples of minimum requirements referenced in standards **with supplementary requirements:**

Supplementary requirements are requirements which provide clarity to the supply, service or works referenced in the standard in the technical specification. It should be noted, that if the requirements are too specific, this might influence the level of competition

Example:

9. *In a tender for food products according to SNV-EN ISO 22000:2005 regarding requirements for any organisation in the food chain, and of delivery of prepared food, the specification includes minimum requirements for food which is produced on gas heated catering equipment according to BSI-EN 203-1:2014/AC:2016 Gas heated catering equipment – Part 1 General safety rules.*

Example:

10. *There may also be minimum requirements to ensure good working conditions for the kitchen staff according to SS-EN ISO 11201:2010 Acoustics – Noise emitted by machinery and equipment. A supplementary requirement could be a specific requirement on the maximum level of noise (dB(A))*

Draft contract

Example:

11. *In a tender for a major delivery of dairy products, a company in the contract must be certified to IST-EN ISO 22301 Societal security – Business continuity management systems – Requirements or alike system to document continuality in deliverables*

Example:

12. *In a tender for elderly care service including delivery of certain products, the contracting authority requires the urine collection bags comply with UNI-EN ISO 8669-2:1997 Urine collection bags – part 2 Requirements and test methods.*

Contract notice

Example:

13. *A contracting authority wishes to verify the selected tenderers' ability to document its processes, and states in the contract notice that the supplier needs to be certified according to BDS-ISO 45001:2018 Occupational health and safety management systems – Requirements with guidance for use or equivalent. If the selected tenderer has this certificate or any other appropriate documentation verified by a third party, the tenderer is considered to be able to perform this part of the overall assignment.*

Referencing standards in different procurement procedures

Open procedure

Example:

14. *When using standards as minimum requirements it is possible to include more innovative options with respect to the function of the supply, service or work (construction). Instead of describing a centrifugal pump and the conditions under which it shall pump, the contracting authority can set a minimum requirement (ASI-EN 733:1995) describing pump capacity and then focus on the function under which it should operate?*

Restricted procedure

Example:

15. *On a restricted procedure for construction trucks, besides requiring that the trucks must only be electrically powered, it is possible to determine, that the delivered trucks should comply with HZN-EN 1175-1 + A1:2010 Safety of industrial trucks – Electrical requirements – Part 1: General requirements for battery powered trucks.*

Competitive procedure with negotiation, competitive dialogue and innovation partnership

These procurement procedures can open new possibilities of negotiation in one or more rounds before closing the competition.

Example:

16. *(Innovation partnership) A contracting authority wants to find new solutions to increase the number of pedestrians in a shopping centre and at the same time extend the shopping centre. The innovative procedure is open for ideas, but minimum requirements are also set, as for example compliance with EVS-EN 117-1:2017 Safety*

of escalators and moving walks – Part 1: Construction and installation.

Example:

17. *(Competitive procedure with negotiation) A consultant is to bid for a building project. The building project is not restricted, but there are a number of basic prerequisites for the quality of the materials to be used, and the safety of emergency lighting in accordance with NQIS/ELOT-EN 1838:2013, Lighting applications – Emergency lighting.*

Dynamic purchasing Systems *(this is not a procurement procedure but a purchasing technique).* Despite not being a procurement procedure, more and more public authorities have started to use this purchasing technique along with using a restricted procedure approach as they can save time and money, especially when purchasing services.

When procuring electrical services, the minimum requirements for the products to be used can to a large extent be described by referencing existing standards for switches, cables etc.

Example:

18. *In a contract which requires furniture with electrical installations, the minimum requirements can be easily stipulated by requiring that the furniture with electrical installations must comply with IEC. 60364-7-713:2013 Requirements for special installations or locations. or equal. If needed, certificates proving compliance with the standard can be requested.*

Example:

19. *A Municipality has made a 10-year plan for renovating plumbing in their buildings. All plumbing companies in the area are invited to participate in the electronic process which is a part of the dynamic purchasing system. All companies which satisfy the selection criteria can bid whenever the Municipality publishes new parts of the renovation plan. As a part of the selection criteria the products to be used are described in a specific list (a catalogue). The products on this list are specified by referencing minimum requirements through specific standards.*

Annex 2
Standardisation and definitions in European and international context

In the following Abbreviations, terms and definitions mentioned in standardisation are explained.

Abbreviations

Some of the most commonly used abbreviations in standardisation are shown below:

CEN: European Committee for Standardisation. www.cen.eu

CENELEC: European Committee for Electrotechnical Standardisation. www.cenelec.eu

CWA: CEN or CENELEC Workshop Agreement. Agreements from workshops following the work in CEN and CENELEC.

EAD: European assessment document. A European **harmonised technical specification** in the form of legislation.

EN: European Standard

EOTA: European Organisation for Technical Assessment. www.eota.eu

ETA: European Technical Assessments. See EOTA.

ETSI: European Telecommunications Standards Institute.

ISO: International Organisation for

Standardisation

IEC: International Electrotechnical Commission

ITU: International Telecommunication Union.

TR: Technical reports. Informative document which can contain any kind of information of interest to the market.

TS: Technical specifications. Normative document that has a lower status than a standard.

Terms and Definitions

Accreditation

Third-party attestation related to a conformity assessment body conveying formal demonstration of its competence to carry out specific conformity assessment tasks. *(ISO 17000:2006)*.[21]

Accreditation body

Authoritative body that performs accreditation. *(ISO 17000:2006).* Can be national, European and International.

CE-marking

Marking which indicates the producer's declaration of conformity with the EC and EU directives or regulations in specific product areas. The marking is a prerequisite for bringing the product on the market in the European Union. The mark is the producer's declaration that the product complies with basic legal requirements for construction works (safety, health and environment). The declaration of conformity may be based on more or less extensive control stipulated in directive or in regulation. The CE marking procedure may therefore range from producers' declaration to a declaration by a designated third party.

Certification

Third-party attestation related to products, processes, systems or persons. *(ISO 17000:2006).*

Certification body

Body that performs certification services. Can be national, European and International.

Conformity assessment

Demonstration that specified requirements relating to a product, process, system, person or body are fulfilled *(ISO 17000:2006).*

Conformity assessment body

Body that performs conformity assessment services. *(ISO 17000:2006).*

Conformity assessment body – third party

Conformity assessment activity that is performed by a person or body that is independent of the person or organisation that provides the object, and of user interests in that object. *(ISO 17000:2006).*

"Common technical specification"

The technical specification in the field of **ICT** developed in accordance with Articles 13 and 14 of the Regulation (EU) No. 1025/2012.

"European technical assessment"

The documented assessment of the performance of a construction product in terms of its essential characteristics, in accordance with the relevant European assessment document, as defined in the article 2, point 12 of Regulation (EU) No 305/2011, of the European Parliament and the Council.

Technical Committee

A Technical committee (TC) is within CEN and ISO the committee responsible for developing a standard. A new committee is appointed for each new standardisation area developed and the participation in the committee is depending on the interested parties in the new standardisation area.

"Technical reference"

Any document produced by European bodies of standardisation, other than European standards, in accordance with procedures adapted to the evolution of market needs.

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[21] EN ISO/IEC 17000:2006 Conformity assessment – Vocabulary and general principles

Technical specification

In standardisation a technical specification means a document that prescribes technical requirements to be fulfilled by a product, process, service or system and which lays down the characteristics required of a product or a service, production methods and processes or the methods and the criteria for assessing the performance of construction products[22].

22 Regulation (EU) No 1025/2012 on European standardisation

Annex 3
Types of conformity assessment activities

Certification

The certification is a “verification” made by a third party, relating to products, processes, systems and people. Its objective is to provide confidence to the client of a company, or the buyer of a product or service that this company, service or product meets certain requirements.

There are three basic types of certification:

1: Certification of Management systems

This certification makes it possible to ensure that the system implemented by a contracting authority in terms of quality, environment, safety, etc., complies with the requirements of current standards (for example: standards EN ISO 9001 for quality, EN ISO 14001 for the environment, EN ISO 22000 for food security). The **accreditation of bodies** that perform these certifications is based in the series of standards EN ISO / IEC 17021.

2: Certification of products, processes or services

This can refer to a product (energy-saving light bulbs), a process (organic farming, traceability of the origin of a wood) or a service (public transport of passengers). The principles to be respected by the certifying bodies are defined in the International Standard EN ISO/IEC 17065.

3: Certification of people/staff

It verifies the competence of the certified persons to carry out specific technical activities. The EN ISO/IEC 17024 defines the requirements to be respected by the certifying bodies of persons.

Examples on verification

Greenhouse gas verification. This is the assessment of the veracity of a statement made by a company on the amount of greenhouse gas emissions it produces. In order to ensure reliability and comparability to these estimates at an international level, the statements are required to be verified by a national conformity assessment body.

Environmental verification is the action of checking and monitoring if the environmental policy, the environmental system, the environmental management system, the internal environmental audit of an organisation or its application comply with the requirements of the EMAS Regulation.

Once this verification has been carried out, an environmental declaration will be validated. The environmental verifiers must demonstrate compliance of the requirements established in the Regulation CE No. 1221/2009 in order for the tenderer to be accredited.

Annex 4
Sector specific example on Accessibility and referencing standards

This Annex is developed as an example of referencing standards in a specific sector. It is built on 3 keystones which are; scope, legal requirements and use of standards in public procurement.

Scope

This Annex aims to clarify a way to reference Accessibility standards, specifically when preparing technical specifications. It also aims to clarify the requirements of the Public Procurement directive 2014/24 in respect of documentation of conformity with the requirements of a standard[23]).

Legal Requirements

In Article 42 of the Public Procurement directive 2014/24 it is required, that all procurement intend- ed for natural persons shall take in to consideration accessibility criteria for persons with disabilities or design for all users.

Besides considerations of accessibility in relation to the technical specification in Article 42 of the public procurement directive, attention must also be given by the contracting authority as per Article 62 when requiring certificates drawn up by independent bodies attesting that the economic operator complies with certain quality assurance standards related to accessibility for persons with disabilities or older people.

When determining requirements and writing specifications, consideration must therefore be given to ensuring that supplies (products), work (construction) and services can be accessed, understood and used by the widest range of users, including persons with disabilities. In doing so, the entire end-to-end chain needs to be considered as few products and services exist in isolation.

[23] Directive 2014/24/EU on Public Procurement, Article 44.

Example of end-to-end chain relationships: In order to make a train journey, a user obtains information about train times and facilities (pre-sale), purchases a ticket, accesses departure and destination stations and facilities, boards, uses and leaves the train and may require support or complaint (post-sale) services.

Referencing Accessibility standards in public procurement

Basically, accessibility standards can be referenced in any procurement procedure and anywhere in the procurement process when developing the technical specification and the procurement documents.

In order to define accessibility outcomes during procurement, reference to standards can be used to better address key requirements when integrating accessibility in general:

- **Is the design and development approach using appropriate techniques in support of stated accessibility outcomes?** A number of standards exist that help designers, developers, manufacturers, etc to organise their design, development and manufacturing processes to realise specific accessibility features and functions.
- **Will the supply (product) or service meet certain requirements and offer certain functionality?** Many standards specific to certain areas of application provide functional descriptions of features, methods and properties that sup- plies, or services must have in order to achieve specified accessibility outcomes. EN 301 549 (Accessibility requirements for public procurement of ICT supplies and services in Europe) is an example of such a standard.

Example of how context of use impacts users' needs, characteristics and capabilities: All users of a product or service will struggle to hear well in a noisy environment; and it will be worse for persons with impaired hearing.

Good solutions will acknowledge variations and changing circumstances and seek to meet diverse requirements to the greatest extent possible.

Developing supplies, services and works that are accessible for the widest range of users, including persons with disabilities generally involves **3 key aspects:**

- **Knowing the user:** identify intended users, their needs, characteristics, capabilities, and preferences and environment and context of use.
- **Reflecting user requirements** in the specification.
- **Evaluating solutions** against the user requirements and the specification to ensure they produce the right accessibility outcomes.

Note on assistive technologies: accessibility does not imply uniformity in design or functionality of products and services and does not preclude the use of assistive technologies. When defining user requirements and specifications, this should be taken into account. In developing products and services, compatibility and interoperability with assistive technologies can be relevant.

Generic standards

When referencing standards, the order of priority as mentioned in this guide shall be observed. The letters shown in bold indicates the order of priority. (ICS group 35.020)

- **ISO/IEC** DIS 29138-1:2009 'Information technology Accessibility considerations for people with disabilities – Part 1: User needs summary.
- **ISO/TS** 20282-2: 'Usability of consumer products and products for public use – Part 2: Summative test method.'
- CEN-CENELEC **Guide** 6: 'Guide for addressing accessibility in standards.'

Specific standards

ICT-products

- **EN** 301549:2015 Accessibility requirements suitable for public procurement of ICT products and services in Europe.
- **ISO** 9241-171:2008 'Ergonomics of human-system interaction – Part 171: Guidance on soft- ware accessibility'.

- ISO/IEC **TR** 29138-1:2009 'Information technology – Accessibility considerations for people with disabilities – Part 1: User needs summary'.
- ISO/IEC TR 29138-3:2009 'Information technology – Accessibility considerations for people with disabilities – Part 3: Guidance on user needs mapping'.
- ETSI EG 202 116 V1.2.2: 'Human Factors (HF); **Guide**lines for ICT products and services; "Design for All"'.
- ITU-T F.790: 'Telecommunications accessibility **guide**lines for older persons and persons with disabilities'.

Building construction

- **ISO** 21542:2012 Building construction – Accessibility and usability of the built environment.

Design and Ergonomics

- **ISO** 26800: 'Ergonomics – General approach, principles and concepts'.
- **ISO** 9241-210, 'Ergonomics of human-system interaction – Part 210: Human-centred design for interactive systems'.
- **ISO** 24500, 'Ergonomics – Accessible design – Auditory signals for consumer products'.
- **ISO** 7250: 'Basic human body measurements for technological design – Part 1: Body measurement definitions and landmarks'.
- **ISO** 20282-1: 'Ease of operation of everyday products – Part 1: Design requirements for con- text of use and user characteristics'.
- ISO/**TR** 22411: 'Ergonomics data and guidelines for the application of ISO/IEC Guide 71 to products and services to address the needs of older persons and persons with disabilities'.

Note: terms such as "Design for All", "Universal Design", "accessible design", "barrier-free design", "inclusive design" and "transgenerational design" are often used interchangeably with the same, or similar, meaning**.**

Lifts

- CEN TS 81-70:2003 Safety rules for the construction and installation of lifts – Basics and interpretations.

Within the mentioned areas for ICT, building construction, design and ergonomics and lifts several other standards exist that describe these sectors. These can be found by searching on ICS codes[24]. This can for example be done within;

- Buildings, where related standards can be found by searching on ICS code 91.040 (buildings).
- Lifts, where related standards can be found by searching on ICS code 11.180.10 (Aids and adaptation for moving).

[24] https://www.standardsportal.org/usa_en/resources/ics_code.aspx

Annex 5
List of National Standardisation Bodies (NSBs)

CEN and CENELEC's National Members are the National Standardisation Bodies (NSBs) of the 28 European Union countries, the Former Yugoslav Republic of Macedonia, Serbia and Turkey plus three countries of the European Free Trade Association (Iceland, Norway and Switzerland). There is one CEN member per country and one CENELEC member per country:

Acronym	Member Organisation	Country	Organisation	Website
ASI	CEN	Austria	Austrian Standards International – Standardization and Innovation	www.austrian-standards.at
OVE	CENELEC	Austria	Austrian Electrotechnical Association	www.ove.at
NBN	CEN	Belgium	Bureau de Normalisation/ Bureau voor Normalisatie	www.nbn.be
CEB-BEC	CENELEC	Belgium	Comité Electrotechnique Belge/Belgisch Elektrotechnisch Comité	www.ceb-bec.be
BDS	CEN/CENELEC	Bulgaria	Bulgarian Institute for Standardization	www.bds-bg.org
HZN	CEN/CENELEC	Croatia	Croatian Standards Institute	www.hzn.hr
CYS	CEN/CENELEC	Cyprus	Cyprus Organization for Standardisation	www.cys.org.cy
UNMZ	CEN/CENELEC	Czech Republic	Czech Office for Standards, Metrology and Testing	www.unmz.cz
DS	CEN/CENELEC	Denmark	Dansk Standard	www.ds.dk
EVS	CEN/CENELEC	Estonia	Estonian Centre for Standardisation	www.evs.ee
SFS	CEN	Finland	Suomen Standardisoimisliitto r.y.	www.sfs.fi
SESKO	CENELEC	Finland	Finnish Electrotechnical Standards Association	www.sesko.fi
ISRM	CEN/CENELEC	Former Yugoslav Republic of Macedonia	Standardization Institute of the Republic of Macedonia	www.isrm.gov.mk
AFNOR	CEN/CENELEC	France	Association Française de Normalisation	www.afnor.org
DIN	CEN	Germany	Deutsches Institut für Normung	www.din.de

Acronym	Member Organisation	Country	Organisation	Website
DKE	CENELEC	Germany	German Commission for Electrical, Electronic and Information Technologies of DIN and VDE	www.dke.de
NQIS/ELOT	CEN/CENELEC	Greece	National Quality Infrastructure System	www.elot.gr
MSZT	CEN/CENELEC	Hungary	Hungarian Standards Institution	www.mszt.hu
IST	CEN/CENELEC	Iceland	Icelandic Standards	www.stadlar.is
NSAI	CEN/CENELEC	Ireland	National Standards Authority of Ireland	www.nsai.ie
UNI	CEN	Italy	Ente Nazionale Italiano di Unificazione	www.uni.com
CEI	CENELEC	Italy	Comitato Elettrotecnico Italiano	www.ceiweb.it
LVS	CEN/CENELEC	Latvia	Latvian Standard Ltd.	www.lvs.lv
LST	CEN/CENELEC	Lithuania	Lithuanian Standards Board	www.lsd.lt
ILNAS	CEN/CENELEC	Luxembourg	Organisme Luxembour-geois de Normalisation	www.portail-qualite.lu
MCCAA	CEN/CENELEC	Malta	The Malta Competition and Consumer Affairs Author-ity	www.mccaa.org.mt
NEN	CEN	Netherlands	Nederlands Normalisatie-instituut	www.nen.nl
NEC	CENELEC	Nederlands Electro- technisch Comité	Nederlands Electrotech-nisch Comité	www.nen.nl
SN	CEN	Norway	Standards Norway	www.standard.no
NEK	CENELEC	Norway	Norsk Elektroteknisk Komite	www.nek.no
PKN	CEN/CENELEC	Poland	Polish Committee for Standardization	www.pkn.pl
IPQ	CEN/CENELEC	Portugal	Instituto Português da Qualidade	www.ipq.pt
ASRO	CEN/CENELEC	Romania	Romanian Standards Association	www.asro.ro
ISS	CEN/CENELEC	Serbia	Institute for Standardiza-tion of Serbia	www.iss.rs
UNMS SR	CEN/CENELEC	Slovakia	Slovak Office of Standards Metrology and Testing	www.unms.sk
SIST	CEN/CENELEC	Slovenia	Slovenian Institute for Standardization	www.sist.si
UNE	CEN/CENELEC	Spain	Asociación Española de Normalización	www.une.org
SIS	CEN	Sweden	Swedish Standards Institute	www.sis.se
SEK	CENELEC	Sweden	Svensk Elstandard	www.elstandard.se

Acronym	Member Organisation	Country	Organisation	Website
SNV	CEN	Switzerland	Schweizerische Normen-Vereinigung	www.snv.ch
Electrosuisse	CENELEC	Switzerland	Association for Electrical Engineering, Power and Information Technologies	www.electrosuisse.ch
TSE	CEN/CENELEC	Turkey	Turkish Standards Institution	www.tse.org.tr
BSI	CEN/CENELEC	United Kingdom	British Standards Institution	www.bsigroup.com

Annex 6
Checklist for referencing standards when planning public tenders

No matter which procurement procedure is chosen, standards can always be referenced in the procurement process. When referencing standards, it should always be considered where in the process, standards can be referenced in the best way.

The following provides a checklist of some key points to consider in the pre-award process of public tenders.

Preliminary market consultations
(Page 17 in the guide)

- Check if standards exist that can describe the whole or parts of the supply, service or work defined. (Ask your national standardisation organisation if in doubt, see Annex 5).
- If standards exist, then check at the preliminary market consultation stage if the standard is well known and used in the area of the tender requirements.

Award criteria
(Page 18 in the guide)

- When choosing the award criteria remember that standards can be referenced when choosing “Cost” or “Most economically advantageous”.
- If choosing “Cost”, then “Life-cycle costs” can be included and standards referenced to help define life-cycle costs.
- If choosing “Most economically advantageous”, then standards can be referenced either as a whole or as parts of standards.
- When referencing management systems or parts of them, consider if other standards, like products, performance or design standards could be referenced.

Technical specification
(Page 19 in the guide)

- Check if a standard exists that describes minimum requirements for the whole, or parts of the supply, service or work. (Ask your national standardisation organisation if in doubt, see Annex 5
- Decide if you need certificates or test-reports or other documentation to verify deliverable or control of system etc.
- If you decide that you will need certificates, test-reports or a conformity assessment, then make sure that requirements are incorporated in the technical specification.

Draft contract
(Page 19 in the guide)

- Do you have requirements that are not open for competition, but still relevant?
- If the above applies, see if any standards exist for the supply or service and add these requirements to the contract.

Contract notice
(Page 19 in the guide)

- If needed, the suitability assessment standards can be referenced under contract notice.

Contracting

- When contracting no new standards can be added. Therefore check, if you have included the right requirements in the pre-award phase.
  It is important to ensure that you can follow up on the contract to establish the correct deliverables have been provided.

Annex 7
Content of accreditation decision and certificates

The national accreditation body issues an accreditation decision to the Conformity Assessment Body. This decision must include (ENAC):

- The brand of the national accreditation body. (name)
- The number of accreditation.
- The rule meaning, the specific scope for the accreditation regulating the activity of conformity assessment.
- Reference to a technical Annex describing the scope of accreditation in terms of the specific activities for which it has demonstrated its competence, including period of validity.

The conformity assessment bodies brand/logo on conformity should include (SWEDAC):

- The brand of the conformity authority.
- The number of accreditation.
- (Membership if member of a European organisation)

Besides that, the certificate itself should include[25] (DNV-GL):

- Name and address of certification body
- The date certification is granted
- The name and address of the client
- The scope of certification (product, process, service)
- Expiry date of certification
- Any other information required by the certification scheme. (Additional information)
- A signature (name and title)
- Formal certification documentation


DNV·GL

MANAGEMENT SYSTEM CERTIFICATE

This is to certify that the management system of

Box Town Inc.
Vejbred 5, 1234, Byen, Denmark

has been found to conform to the Quality Management System standard:
ISO 9001:2015

This certificate is valid for the following scope:
Development, sales and service of packing systems.
(this certificate is for demo only)

DANAK

[25] EN ISO/IEC 17065 Conformity assessment – Requirements for bodies certifying products, processes and services

Annex 8
International Classification for Standards (ICS)

ISO published in 2015 the seventh edition of International Classification for standards[26].

The aim of the publication is to ensure a common international, European and national catalogue structure for standards and other normative documents.

The basic hierarchy of the guide is based on three levels. The first level consists of 40 fields of activity within standardisation. In level 2 the 40 fields are subdivided into 392 groups. In the third level 144 of the 392 groups are divided even further into 909 sub-groups.

All these fields, sub-groups and "sub-sub-groups" are linked to alike standards and the codes can be found with help from the National Standardisation Bodies or in their web-systems on standards.

For further information, or to learn about the codes please download the guide. Link is shown below.

The examples shown indicates how relevant standards can be linked.

1. Tender on Information Management system.

Task: Finding related standards to EN ISO/IEC 27001:2017 *Information Technology – security techniques – Information security management systems – requirements*

Field: Information Technology. **Code:** 35

Sub-code: 35.020 Information technology (ISO 27001)

Finding related standards:

- **Sub-Code:** 35.040 Information Coding: ISO/IEC 27006:2015 *Information Technology – Security techniques – Requirements for bodies providing audit and certification of information security management systems.*
- **Sub-Code:** 35.030 IT-Security: ISO/IEC 27000:2018 *Information Technology – Security techniques – Information security management systems – Overview and vocabulary.*

2. Tender on protective clothing.

Task: Providing protective clothing to employees and relevant standards to ensure protective clothing.

Field: Clothing Industry. **Code:** 61

Finding related standards:

- **Sub-code:** 61.020 Clothes: EN 1103:2005 Textiles – Fabrics for apparel – Detailed procedure to determine the burning behaviour.
- **Sub-Code:** 61.020 Clothes: EN 13758-2+A1:2007 Textiles – solar UV protective properties – Part 2: Classification and marking of apparel

[26] https://www.standardsportal.org/usa_en/resources/ics_code.aspx

List of fields and groups in ICS codes

Note, that under each the group sub-groups might exist. The below codes are quoted directly from the guide on ICS codes[27]*.*

01 Generalities. Terminology. Standardization. Documentation.

01.020 Terminology (principles and coordination)

01.040 Vocabularies

01.060 Quantities and units

01.070 Colour coding

01.075 Character symbols

01.080 Graphical symbols

01.100 Technical drawing

01.110 Technical product documentation

01.120 Standardization. General rules

01.140 Information sciences. Publishing

03 Services. Company organization. Management and quality. Administration. Transport. Sociology.

03.020 Sociology. Demography

03.040 Labour. Employment

03.060 Finances. Banking. Monetary systems.
Insurance

03.080 Services

03.100 Company organization and management. Management systems

03.120 Quality

03.140 Patents. Intellectual property

03.160 Law. Administration

03.180 Education

03.200 Leisure. Tourism

03.220 Transport

03.240 Postal services

07 Natural and applied sciences.

07.020 Mathematics

07.030 Physics. Chemistry

07.040 Astronomy. Geodesy. Geography

07.060 Geology. Meteorology. Hydrology

07.080 Biology. Botany. Zoology

07.100 Microbiology

07.120 Nanotechnologies

07.140 Forensic science

11 Health care technology.

11.020 Medical sciences and health care facilities in general

11.040 Medical equipment

11.060 Dentistry

11.080 Sterilization and disinfection

11.100 Laboratory medicine

11.120 Pharmaceutics

11.140 Hospital equipment

11.160 First aid

11.180 Aids for disabled or handicapped persons

11.200 Birth control. Mechanical contraceptives

11.220 Veterinary medicine

13 Environment. Health protection. Safety.

13.020 Environmental protection

13.030 Wastes

13.040 Air quality

13.060 Water quality

13.080 Soil quality. Pedology

13.100 Occupational safety. Industrial hygiene

13.110 Safety of machinery

13.120 Domestic safety

13.140 Noise with respect to human beings

13.160 Vibration and shock with respect to human beings

13.180 Ergonomics

13.200 Accident and disaster control

13.220 Protection against fire

[27] https://www.iso.org/files/live/sites/isoorg/files/archive/pdf/en/international_classification_for_standards.pdf

13.230 Explosion protection

13.240 Protection against excessive pressure

13.260 Protection against electric shock. Live working

13.280 Radiation protection

13.300 Protection against dangerous good

13.310 Protection against crime

13.320 Alarm and warning systems

13.340 Protective equipment

17 Metrology and measurement. Physical phenomena.

17.020 Metrology and measurement in general

17.040 Linear and angular measurements

17.060 Measurement of volume, mass, density, viscosity

17.080 Measurement of time, velocity, acceleration, angular velocity

17.100 Measurement of force, weight and pressure

17.120 Measurement of fluid flow

17.140 Acoustics and acoustic measurements

17.160 Vibrations, shock and vibration measurement

17.180 Optics and optical measurements

17.200 Thermodynamics and temperature measurements

17.220 Electricity. Magnetism. Electrical and magnetic measurements

17.240 Radiation measurements

19 Testing.

19.020 Test conditions and procedures in general

19.040 Environmental testing

19.060 Mechanical testing

19.080 Electrical and electronic testing

19.100 Non-destructive testing

19.120 Particle size analysis. Sieving

21 Mechanical systems and components for general use.

21.020 Characteristics and design of machines, apparatus, equipment

21.040 Screw threads

21.060 Fasteners

21.080 Hinges, eyelets and other articulated joints

21.100 Bearings

21.120 Shafts and couplings

21.140 Seals, glands

21.160 Springs

21.180 Housings, enclosures, other machine parts

21.200 Gears

21.220 Flexible drives and transmissions

21.240 Rotary-reciprocating mechanisms and their parts

21.260 Lubrication systems

23 Fluid systems and components for general use.

23.020 Fluid storage devices

23.040 Pipeline components and pipelines

23.060 Valves

23.080 Pumps

23.100 Fluid power system

23.120 Ventilators. Fans. Air-conditioners

23.140 Compressors and pneumatic machines

23.160 Vacuum technology

25 Manufacturing engineering.

25.020 Manufacturing forming processes

25.030 Additive manufacturing

25.040 Industrial automation systems

25.060 Machine tool systems

25.080 Machine tools

25.100 Cutting tools

25.120 Chipless working equipment

25.140 Hand-held tools

25.160 Welding, brazing and soldering

25.180 Industrial furnaces

25.200 Heat treatment

25.220 Surface treatment and coating

27 Energy and heat transfer engineering.

27.010 Energy and heat transfer engineering in general

27.015 Energy efficiency. Energy conservation in general

27.020 Internal combustion engines

27.040 Gas and steam turbines. Steam engine

27.060 Burners. Boilers

27.070 Fuel cells

27.075 Hydrogen technologies

27.080 Heat pumps

27.100 Power stations in general

27.120 Nuclear energy engineering

27.140 Hydraulic energy engineering

27.160 Solar energy engineering

27.180 Wind turbine energy systems

27.190 Biological sources and alternative sources of energy

27.200 Refrigerating technology

27.220 Heat recovery. Thermal insulation

29 Electrical engineering.

29.020 Electrical engineering in general

29.030 Magnetic materials

29.035 Insulating materials

29.040 Insulating fluids

29.045 Semiconducting materials

29.050 Superconductivity and conducting materials

29.060 Electrical wires and cables

29.080 Insulation

29.100 Components for electrical equipment

29.120 Electrical accessories

29.130 Switchgear and controlgear

29.140 Lamps and related equipment

29.160 Rotating machinery

29.180 Transformers. Reactors

29.200 Rectifiers. Converters. Stabilized power supply

29.220 Galvanic cells and batteries

29.240 Power transmission and distribution networks

29.260 Electrical equipment for working in special conditions

29.280 Electric traction equipment

31 Electronics.

31.020 Electronic components in general

31.040 Resistors

31.060 Capacitors

31.080 Semiconductor devices

31.100 Electronic tubes

31.120 Electronic display devices

31.140 Piezoelectric devices

31.160 Electric filters

31.180 Printed circuits and boards

31.190 Electronic component assemblies

31.200 Integrated circuits. Microelectronics

31.220 Electromechanical components for electronic and telecommunications equipment

31.240 Mechanical structures for electronic equipment

31.260 Optoelectronics. Laser equipment

33 Telecommunications. Audio and video engineering.

33.020 Telecommunications in general

33.030 Telecommunication services. Applica- tions

33.040 Telecommunication systems

33.050 Telecommunication terminal equipment

33.060 Radiocommunications

33.070 Mobile services

33.080 Integrated Services Digital Network (ISDN)

33.100 Electromagnetic compatibility (EMC)

33.120 Components and accessories for tele- communications equipment

33.140 Special measuring equipment for use in telecommunications

33.160 Audio, video and audiovisual engineering

33.170 Television and radio broadcasting

33.180 Fibre optic communications

33.200 Telecontrol. Telemetering

35 Information technology.

35.020 Information technology (IT) in general

35.030 IT Security

35.040 Information coding

35.060 Languages used in information technology

35.080 Software

35.100 Open systems interconnection (OSI)

35.110 Networking

35.140 Computer graphics

35.160 Microprocessor systems

35.180 IT terminal and other peripheral equipment

35.200 Interface and interconnection equipment

35.210 Cloud computing

35.220 Data storage devices

35.240 Applications of information technology

35.260 Office machines

37 Image technology.

37.020 Optical equipment

37.040 Photography

37.060 Cinematography

37.080 Document imaging applications

37.100 Graphic technology

39 Precision mechanics. Jewelry.

39.020 Precision mechanics

39.040 Horology

39.060 Jewellery

43 Road vehicles engineering.

43.020 Road vehicles in general

43.040 Road vehicle systems

43.060 Internal combustion engines for road vehicles

43.080 Commercial vehicles

43.100 Passenger cars. Caravans and light trailers

43.120 Electric road vehicles

43.140 Motorcycles and mopeds

43.150 Cycles

43.160 Special purpose vehicles

43.180 Diagnostic, maintenance and test equipment

45 Railway engineering.

45.020 Railway engineering in general

45.040 Materials and components for railway engineering

45.060 Railway rolling stock

45.080 Rails and railway components

45.100 Cableway equipment

45.120 Equipment for railway/cableway construction and maintenance

45.140 Metro, tram and light rail equipment

47 Shipbuilding and marine structure.

47.020 Shipbuilding and marine structures in general

47.040 Seagoing vessels

47.060 Inland navigation vessels

47.080 Small craft

49 Aircraft and space vehicle engineering.

49.020 Aircraft and space vehicles in general

49.025 Materials for aerospace construction

49.030 Fasteners for aerospace construction

49.035 Components for aerospace construction

49.040 Coatings and related processes used in aerospace industry

49.045 Structure and structure elements

49.050 Aerospace engines and propulsion systems

49.060 Aerospace electric equipment and systems

49.080 Aerospace fluid systems and components

49.090 On-board equipment and instruments

49.095 Passenger and cabin equipment

49.100 Ground service and maintenance equipment

49.120 Cargo equipment

49.140 Space systems and operations

53 Materials handling equipment.

53.020 Lifting equipment

53.040 Continuous handling equipment

53.060 Industrial trucks

53.080 Storage equipment

53.100 Earth-moving machinery

53.120 Equipment for manual handling

55 Packaging and distribution of goods.

55.020 Packaging and distribution of goods in general

55.040 Packaging materials and accessories

55.060 Spools. Bobbins

55.080 Sacks. Bags

55.100 Bottles. Pots. Jars

55.120 Cans. Tins. Tubes

55.130 Aerosol containers

55.140 Barrels. Drums. Canisters

55.160 Cases. Boxes. Crates

55.180 Freight distribution of goods

55.200 Packaging machinery

55.220 Storing. Warehousing

55.230 Distribution and vending machines

59 Textile and leather technology.

59.020 Processes of the textile industry

59.040 Textile auxiliary materials

59.060 Textile fibres

59.080 Products of the textile industry

59.100 Materials for the reinforcement of composites

59.120 Textile machinery

59.140 Leather technology

61 Clothing industry.

61.020 Clothes

61.040 Headgear. Clothing accessories. Fastening of clothing

61.060 Footwear

61.080 Sewing machines and other equipment for the clothing industry

65 Agriculture.

65.020 Farming and forestry

65.040 Farm buildings, structures and installations

65.060 Agricultural machines, implements and equipment

65.080 Fertilizers

65.100 Pesticides and other agrochemicals

65.120 Animal feeding stuffs

65.140 Beekeeping

65.145 Hunting

65.150 Fishing and fish breeding

65.160 Tobacco, tobacco products and related equipment

67 Food technology.

67.020 Processes in the food industry

67.040 Food products in general

67.050 General methods of tests and analysis for food products

67.060 Cereals, pulses and derived products

67.080 Fruits. Vegetables

67.100 Milk and milk products

67.120 Meat, meat products and other animal produce

67.140 Tea. Coffee. Cocoa

67.160 Beverages

67.180 Sugar. Sugar products. Starch

67.190 Chocolate

67.200 Edible oils and fats. Oilseeds

67.220 Spices and condiments. Food additives

67.230 Prepackaged and prepared foods

67.240 Sensory analysis

67.250 Materials and articles in contact with foodstuffs

67.260 Plants and equipment for the food industry

71 Chemical technology.

71.020 Production in the chemical industry
71.040 Analytical chemistry
71.060 Inorganic chemicals
71.080 Organic chemicals
71.100 Products of the chemical industry
71.120 Equipment for the chemical industry

73 Mining and minerals.

73.020 Mining and quarrying
73.040 Coals
73.060 Metalliferous minerals and their concentrates
73.080 Non-metalliferous minerals
73.100 Mining equipment
73.120 Equipment for processing of minerals

75 Petroleum and related technologies.

75.020 Extraction and processing of petroleum and natural gas
75.040 Crude petroleum
75.060 Natural gas
75.080 Petroleum products in general
75.100 Lubricants, industrial oils and related products
75.120 Hydraulic fluids
75.140 Waxes, bituminous materials and other
petroleum products
75.160 Fuels
75.180 Equipment for petroleum and natural gas industries
75.200 Petroleum products and natural gas handling equipment

77 Metallurgy.

77.020 Production of metals
77.040 Testing of metals
77.060 Corrosion of metals
77.080 Ferrous metals
77.100 Ferroalloys
77.120 Non-ferrous metals
77.140 Iron and steel products
77.150 Products of non-ferrous metals
77.160 Powder metallurgy
77.180 Equipment for the metallurgical industry

79 Wood technology.

79.020 Wood technology processes
79.040 Wood, sawlogs and sawn timber
79.060 Wood-based panels
79.080 Semi-manufactures of timber
79.100 Cork and cork products
79.120 Woodworking equipment

81 Glass and ceramics industries.

81.020 Processes in the glass and ceramics industries
81.040 Glass
81.060 Ceramics
81.080 Refractories
81.100 Equipment for the glass and ceramics industries

83 Rubber and plastic industries.

83.020 Manufacturing processes in the rubber and plastics industries
83.040 Raw materials for rubber and plastics
83.060 Rubber
83.080 Plastics
83.100 Cellular materials
83.120 Reinforced plastics
83.140 Rubber and plastics products
83.160 Tyres
83.180 Adhesives
83.200 Equipment for the rubber and plastics industries

85 Paper technology.

85.020 Paper production processes
85.040 Pulps
85.060 Paper and board
85.080 Paper products
85.100 Equipment for the paper industry

87 Paint and color industry.

87.020 Paint coating processes

87.040 Paints and varnishes

87.060 Paint ingredients

87.080 Inks. Printing inks

87.100 Paint coating equipment

91 Construction materials and building.

91.010 Construction industry

91.020 Physical planning. Town planning

91.040 Buildings

91.060 Elements of buildings

91.080 Structures of buildings

91.090 External structures

91.100 Construction materials

91.120 Protection of and in buildings

91.140 Installations in buildings

91.160 Lighting

91.180 Interior finishing

91.190 Building accessories

91.200 Construction technology

91.220 Construction equipment

93 Civil engineering.

93.010 Civil engineering in general

93.020 Earthworks. Excavations. Foundation construction. Underground works

93.025 External water conveyance systems

93.030 External sewage systems

93.040 Bridge construction

93.060 Tunnel construction

93.080 Road engineering

93.100 Construction of railways

93.110 Construction of ropeway

93.120 Construction of airports

93.140 Construction of waterways, ports and dykes

93.160 Hydraulic construction

95 Military affairs. Military engineering. Weapons.

95.020 Military in general

95.040 Military engineering

95.060 Weapons

97 Domestic and commercial equipment. Entertainment. Sports.

97.020 Home economics in general

97.030 Domestic electrical appliances in general

97.040 Kitchen equipment

97.060 Laundry appliances

97.080 Cleaning appliances

97.100 Domestic, commercial and industrial heating appliances

97.120 Automatic controls for household use

97.130 Shop fittings

97.140 Furniture

97.145 Ladders

97.150 Floor coverings

97.160 Home textiles. Linen

97.170 Body care equipment

97.180 Miscellaneous domestic and commercial equipment

97.190 Equipment for children

97.195 Items of art and handicrafts. Cultural property and heritage

97.200 Equipment for entertainment

97.220 Sports equipment and facilities

99 No title.