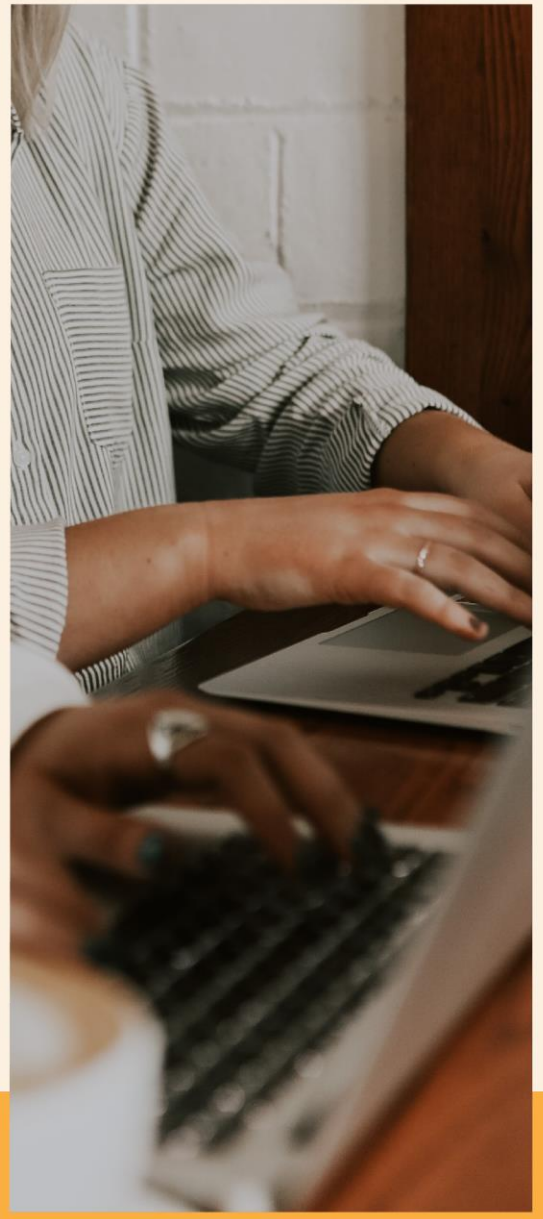

STAND4EU

Boosting the Exploitation of Standardisation Inputs from European Projects

Training on Standardisation

Note: Theis presentation reflects the views only of the presenters, and the Commission cannot be held responsible for any use which may be made from the information contained therein. This presentation is for educational purposes only. Opinions or points of view expressed in this presentation represent the views of the presenters, and does not necessarily represent the official position or policies of the Commission or standardisation bodies.

This project has received funding from the European Union's Horizon Europe research and innovation programme under grant agreement No 101070229 – STAND4EU

EWF Fraunhofer Small Business Standards Brunel University London CHALMERS SIEMENS

Purpose of this Training

To capacitate newcomers at International, European and National level about the standardisation process and the interactions needed, to ensure their integration, and that the activities are efficient and agile.

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The STAND4EU Project

STAND4EU

Boosting the Exploitation of Standardisation Inputs from European Projects

HORIZON-CL4-2021-HUMAN-01-18: Fostering standardisation to boost European industry's competitiveness

Started on 01/09/2022 for 24 months

EWF

Fraunhofer IGCV

Fraunhofer IPA

CHALMERS UNIVERSITY OF TECHNOLOGY

Small Business Standards

SIEMENS

Brunel University London

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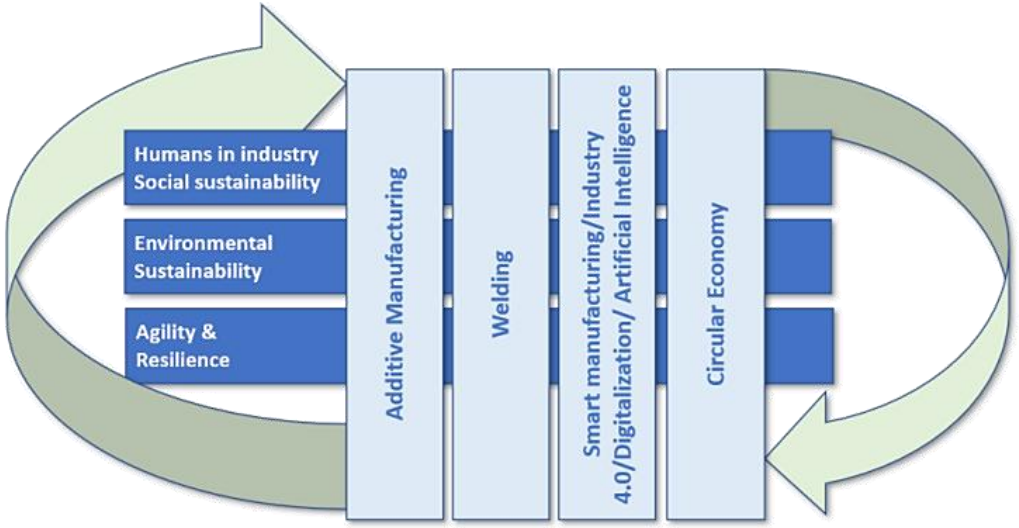
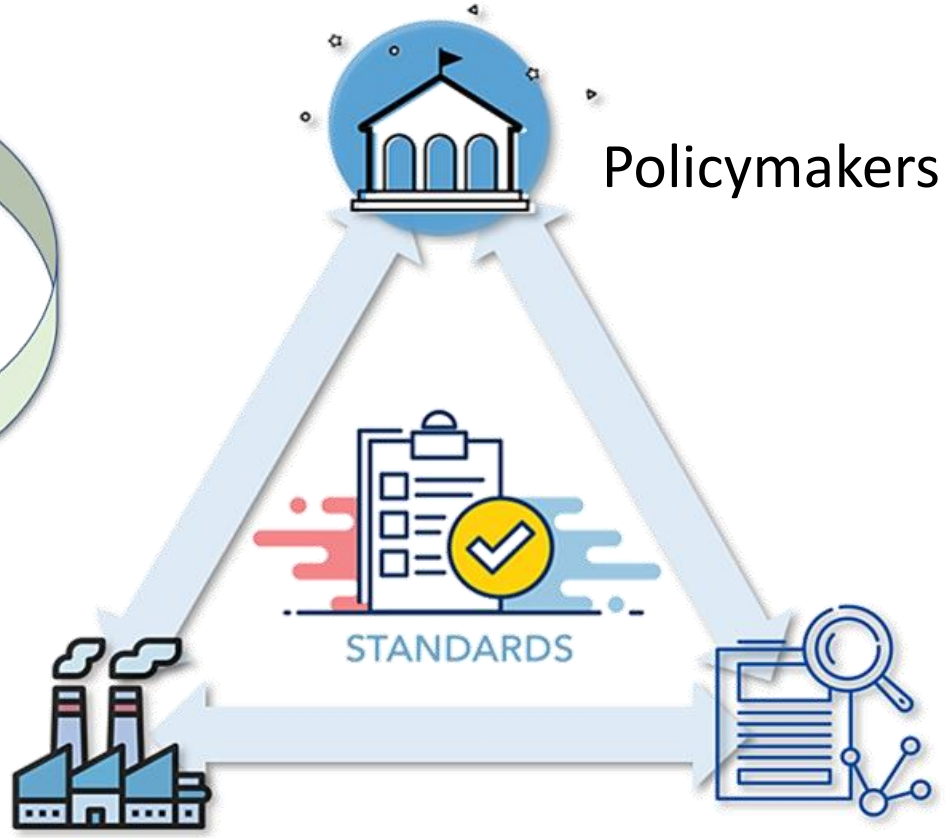
Our Focus & Objectives





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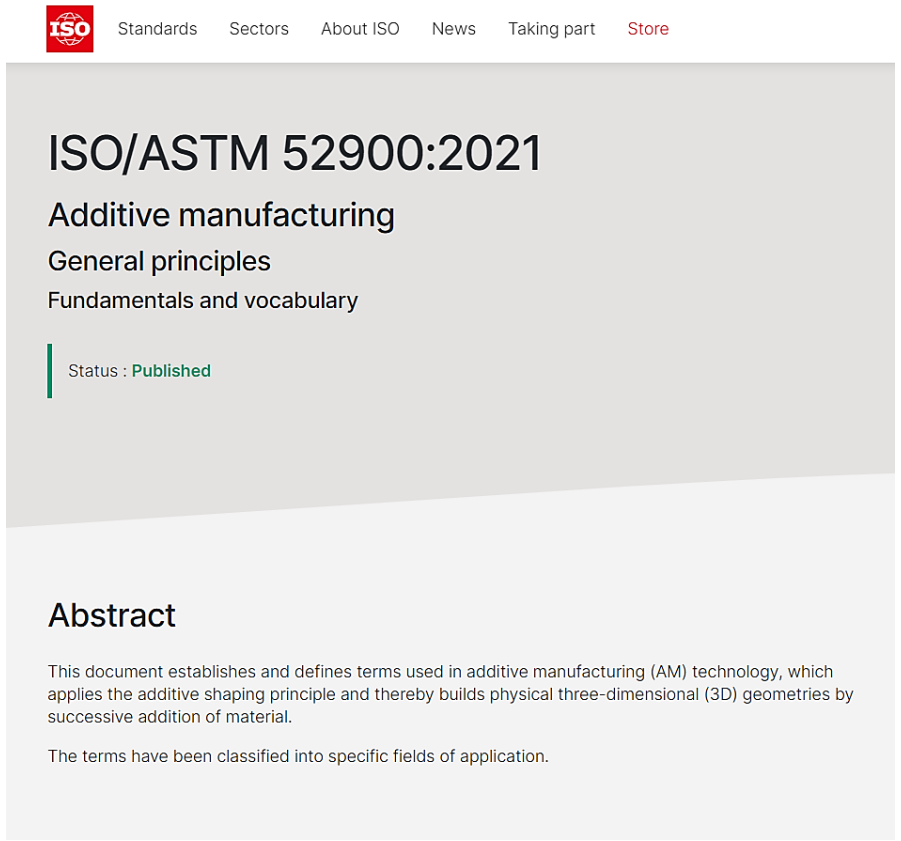
What is a Standard?

- A standard is a published document that describes a technical specification or a list of guidelines in the form of rules, definitions, methods, vocabularies, or codes of practices.

- Standards provide a unified source of reference for specifying or representing products.



Credit: ISO 52900:2021: https://www.iso.org/standard/74514.html

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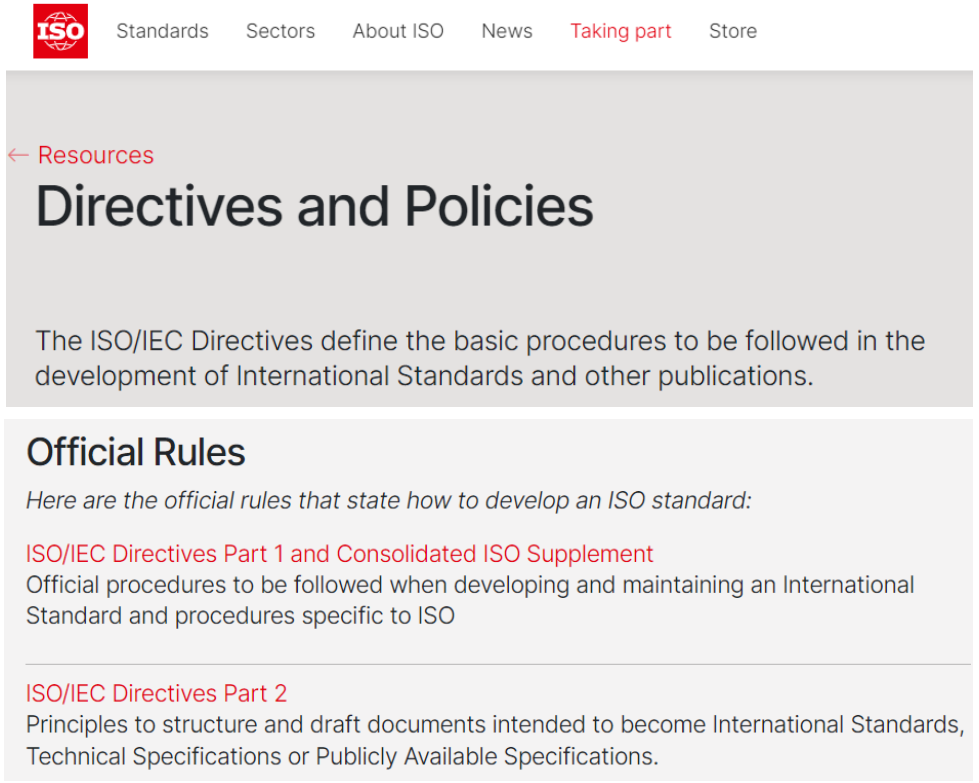
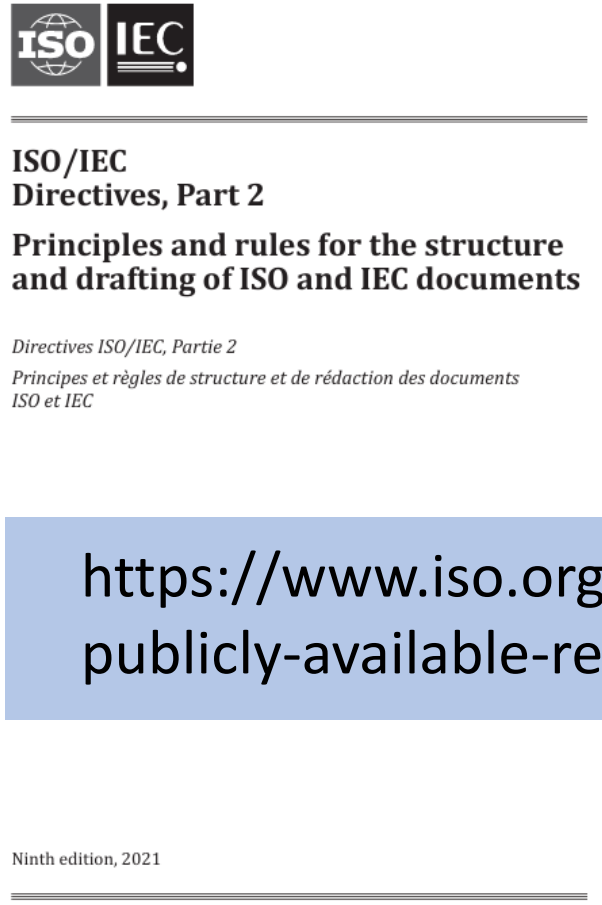
A Standard for Standards?





https://www.iso.org/resources/publicly-available-resources.html

Credit: ISO Publicly available resources, English – ISO/IEC Directives and Guides https://www.iso.org/resources/publicly-available-resources.html?t=PN-3O0hGNXgP8GC8aXRjMZ8hriOQaKfsd_cGtBpAtrJbsB4MyMpnipFPVvPTXuEL&view=documents#section-isodocuments-top

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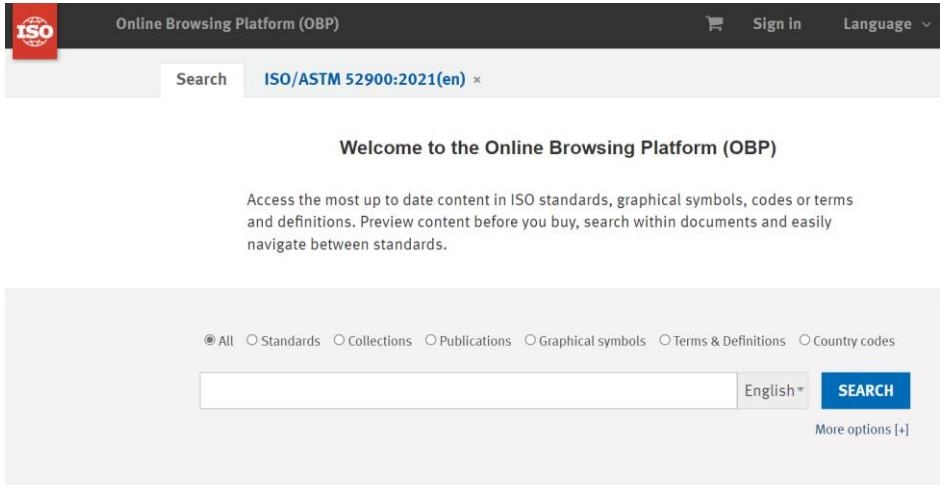
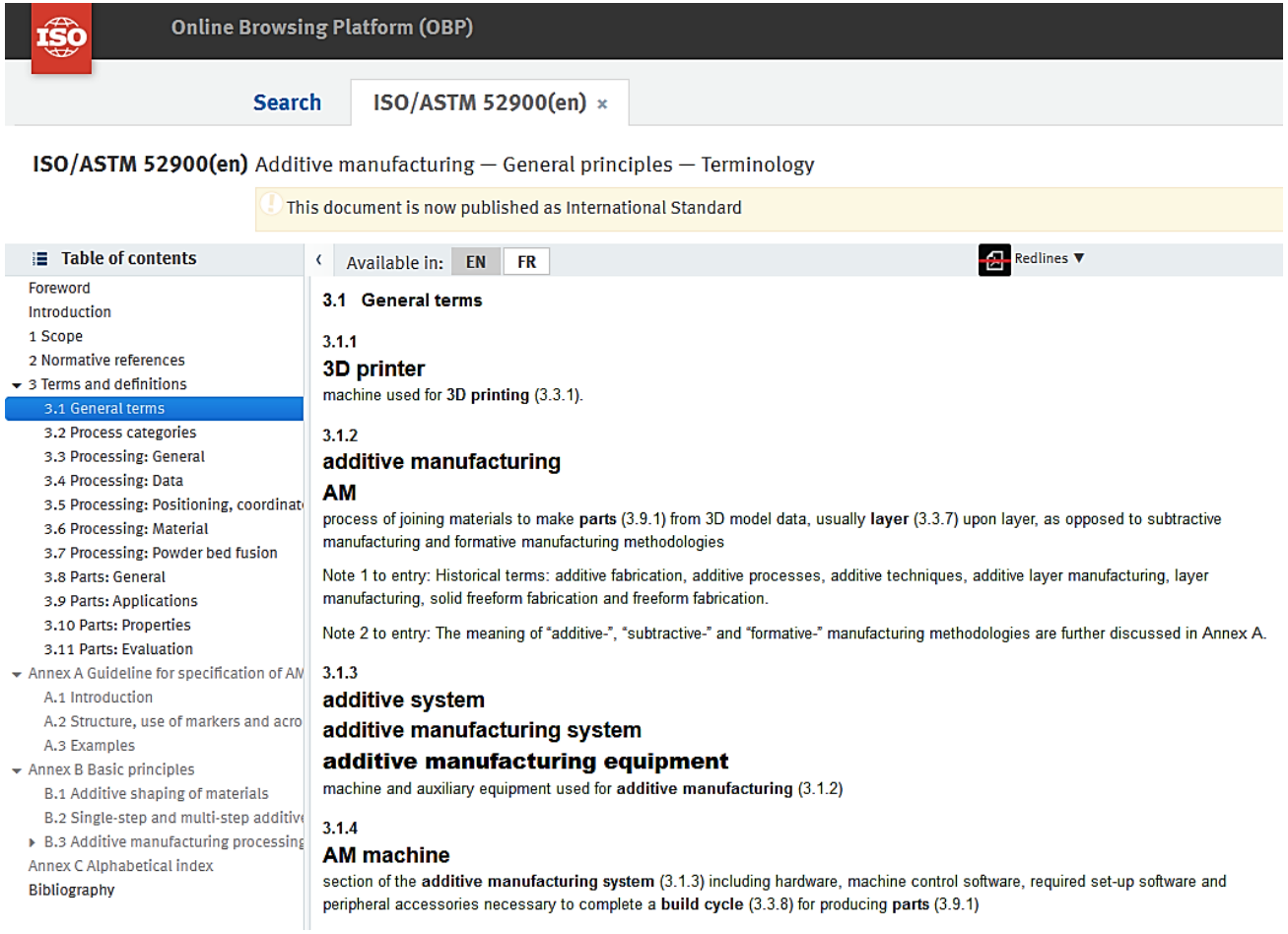
Accessing Standards?

https://www.iso.org/obp





Credit: ISO Online Browsing Platform: https://www.iso.org/obp

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CEN/TC438

https://standards.cencenelec.eu/CEN438

- CEN/TC 438 was established in 2015 that focuses on various aspects of AM, covering terminology, processes, materials, testing methods, and quality assurance. These standards are pivotal in ensuring the safety, quality, and interoperability of products and processes within the realm of AM across Europe.

- Currently comprising of 34 national members, CEN/TC 438 collaborates with ISO/TC 261 and ASTM F42 to develop and implement AM standards in Europe. The committee not only works on existing standards but also recommends new projects related to aerospace, medical products, digital manufacturing, and data, as well as sustainability and environmental aspects of AM. The standards developed by CEN/TC 438 have been adopted as European Standards (EN).

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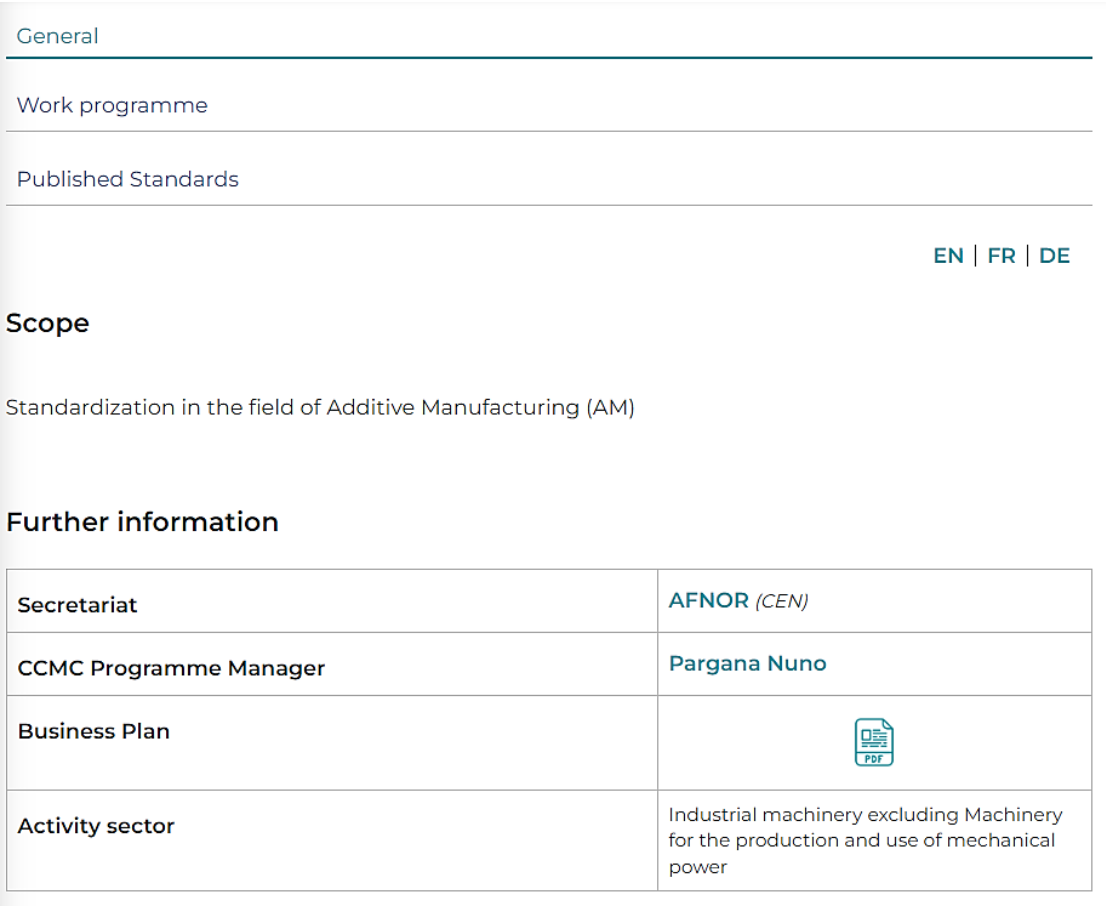
CEN/TC438 Website

https://standards.cencenelec.eu/CEN438



Credit: CEN/TC 438 https://standards.cencenelec.eu/CEN438

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CEN/TC438 Business Plan

BUSINESS PLAN

CEN/TC 438
ADDITIVE MANUFACTURING

EXECUTIVE SUMMARY

Business environment

Additive Manufacturing (AM) consists of a set of processes of joining materials to make parts or objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing and formative manufacturing methodologies. These objects can be manufacture prototypes, tools and production parts of almost any shape or geometry, and are produced from a 3D model or other electronic data source.

According to statistics on 2013, the size of the market was estimated at a value of 2,204 billion US $ (revenues generated in the primary additive manufacturing market).

Benefits realized and/or to be expected

- Systematic development, modification and use of mold-free production processes (AM) resulting in innovative products;
- Assistance to users within the assessment of different additive processes resulting in using the appropriate technology for the specified product demands;
- Specification of quality parameters of different processes needed for standardized test procedures;
- Specification of appropriate test procedures, thereby ensuring uniform interpretation and evaluation of quality parameters;
- Standardization of process chains of AM techlogies securing functionality and compatibility;
- Standardization of data formats, data structures and metrics for AM models
- Standardization of vocabulary required to define the product and to find a common speech

Main objectives and priorities

In order to ensure consistency and harmonization with international standards, the priority is to apply the Vienna agreement with ISO/TC 261: publish the ISO standards as EN ISO.

Credit: CEN/TC 438 https://standards.cencenelec.eu/CEN438

https://standards.cencenelec.eu/CEN438

A main part of the strategy is to ensure a close cooperation between CEN/TC 438, ISO/TC 261 and ASTM F 42 resulting in of set of standards in order to develop the common roadmap and organization structure for AM standards into the following three levels according to the figure above:

- General standards: standards that specify general concepts, common requirements, or are generally applicable to most types of AM materials, processes, and applications,
- Category standards: standards that specify requirements that are specific to a material category or process category,
- Specialized standards: standards that specify requirements that are specific to a material, process, or application.

Therefore, any new idea for a European standard shall first be proposed at ISO/ASTM level to follow the common ISO/ASTM structure of AM standards above.

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ASTM F42 Sub-Committee

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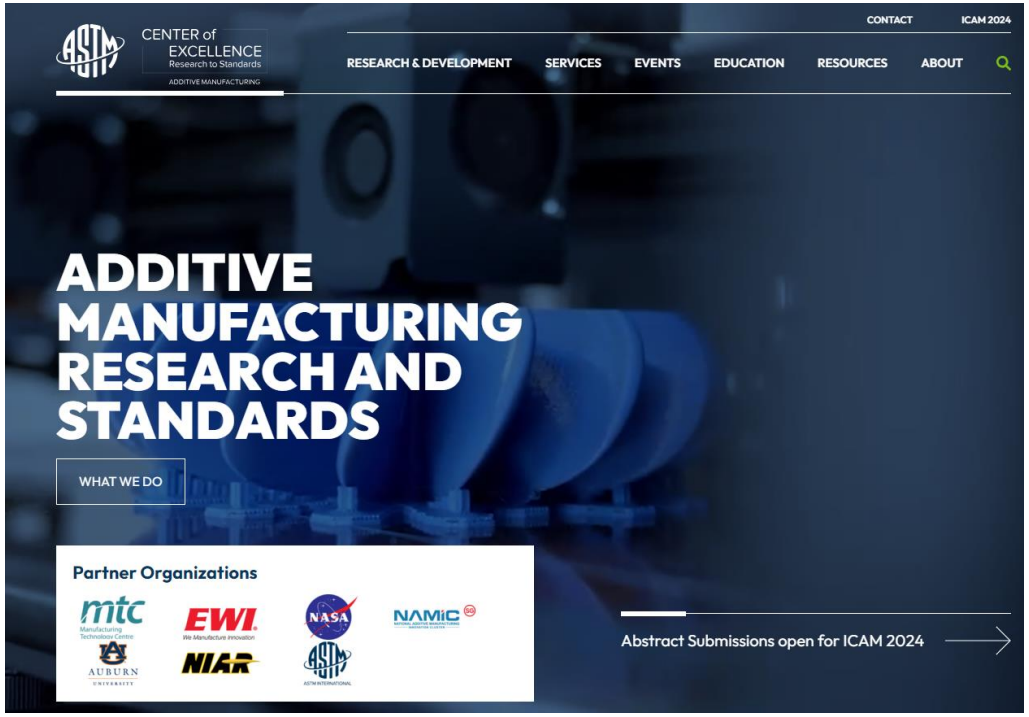
Committee F42 on Additive Manufacturing Technologies

Staff Manager: Pat Picariello

ASTM Committee F42 on Additive Manufacturing Technologies was formed in 2009. F42 meets twice a year, usually in the Spring and Fall (US & non-US, respectively), with about 150+ members attending two days of technical meetings. The Committee, with a current membership in excess of 1063, has 8 technical subcommittees; all standards developed by F42 are published in the Annual Book of ASTM Standards, Volume 10.04. Information on the F42 subcommittee structure, portfolio of approved standards, and Work Items under development, is available from the List of Subcommittees, Standards and Work Items below. These standards will play a preeminent role in all aspects of additive manufacturing technologies.



Credit: ASTM F42 https://www.astm.org/get-involved/technical-committees/committee-f42

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ASTM F42 Sub-Committee

F42.01 Test Methods	**F42.04** Design	**F42.05** Materials and Processes	**F42.05.01** Metals	**F42.05.02** Polymers	**F42.05.05** Ceramics
F42.06 Environment, Health and Safety	**F42.07** Applications	**F42.07.01** Aviation	**F42.07.02** Spaceflight	**F42.07.03** Medical/ Biological	**F42.07.04** Transportation/ Heavy Machinery
F42.07.05 Maritime	**F42.07.06** Electronics	**F42.07.07** Construction	**F42.07.08** Oil/Gas	**F42.07.09** Consumer	**F42.08** Data
F42.90 Executive	**F42.90.01** Strategic Planning	**F42.90.02** Awards	**F42.90.05** Research and Innovation	**F42.91** Terminology	**F42.95** US TAG to ISO TC 261

Credit: Adapted from ASTM F42 https://www.astm.org/get-involved/technical-committees/committee-f42

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ISO and ISO/TC 261

- Scope of ISO/TC261: Standardization in the field of Additive Manufacturing (AM) concerning their processes, terms and definitions, process chains (Hard- and Software), test procedures, quality parameters, supply agreements and all kind of fundamentals.

- There are 2 type of NSB organisation membership -> O and P members

- O-members can observe standards being developed and suggest comments and advice. P-members can actively participate by voting during the stages of the standards development.

Credit: ISO/TC 261 https://www.iso.org/committee/629086.html and https://www.iso.org/committee/629086.html?view=participation

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More about ISO/TC 261

Participating Members [27]

Country/Territory ↑	Acronym
Australia	SA
Austria	ASI
Belgium	NBN
Brazil	ABNT
Canada	SCC
China	SAC
Denmark	DS
Finland	SFS
France	AFNOR
Germany	DIN
Ireland	NSAI
Israel	SII
Italy	UNI
Japan	JISC
Korea, Republic of	KATS
Netherlands	NEN
Netherlands	NEN
Norway	SN
Philippines	BPS
Poland	PKN
Portugal	IPQ
Russian Federation	GOST R
Singapore	SSC
Spain	UNE
Sweden	SIS
Switzerland	SNV
United Kingdom	BSI
United States	ANSI

Observing Members [9]

Country/Territory ↑	Acronym
Czech Republic	UNMZ
Iran, Islamic Republic of	INSO
Jordan	JSMO
Luxembourg	ILNAS
New Zealand	NZSO
Romania	ASRO
Rwanda	RSB
South Africa	SABS
Türkiye	TSE

Credit: ISO/TC 261 https://www.iso.org/committee/629086.html and https://www.iso.org/committee/629086.html?view=participation

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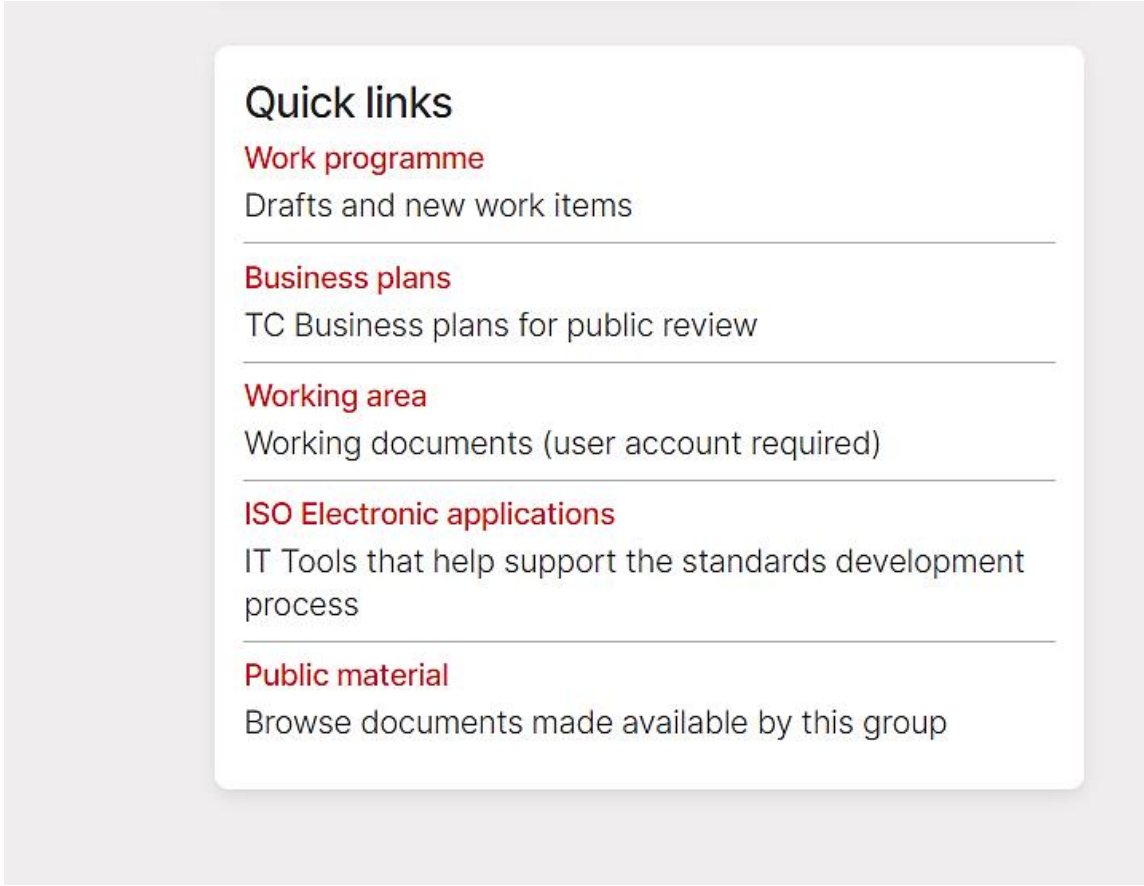
ISO/TC 261 Website

https://www.iso.org/committee/629086.html



Credit: ISO/TC 261 https://www.iso.org/committee/629086.html

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ISO/TC 261 Website

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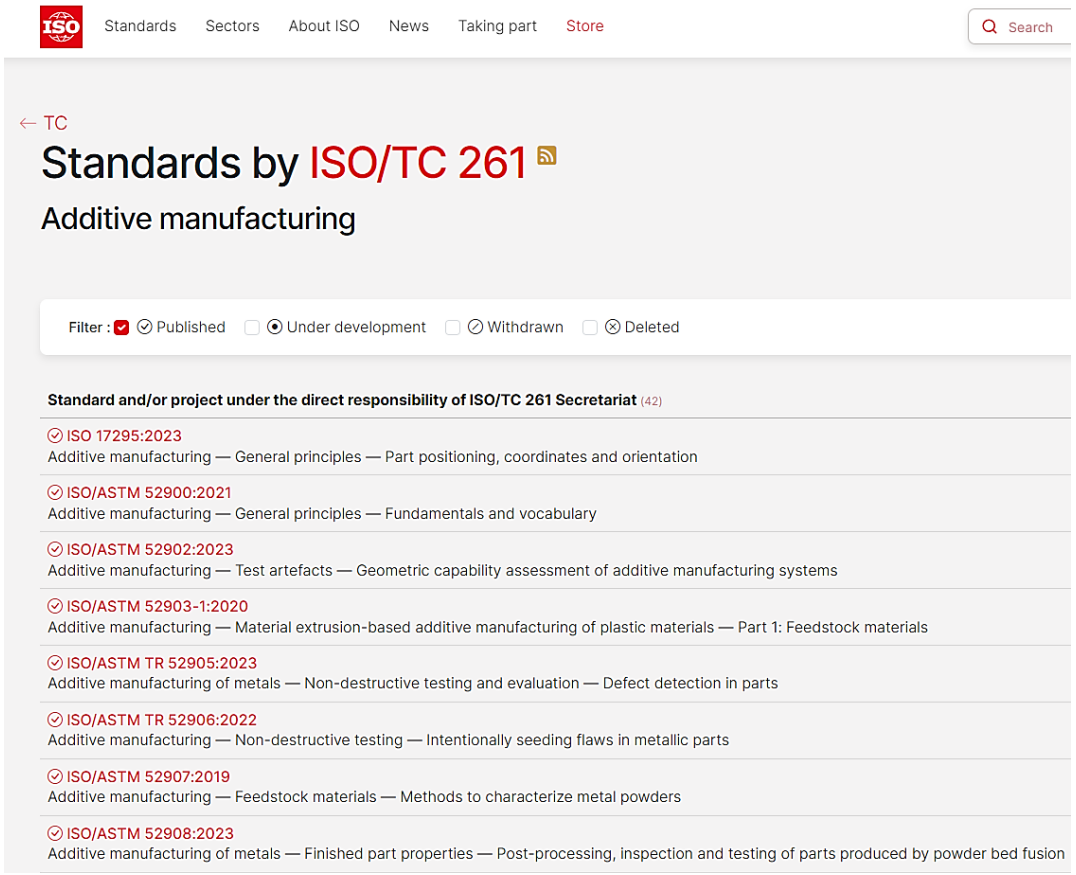

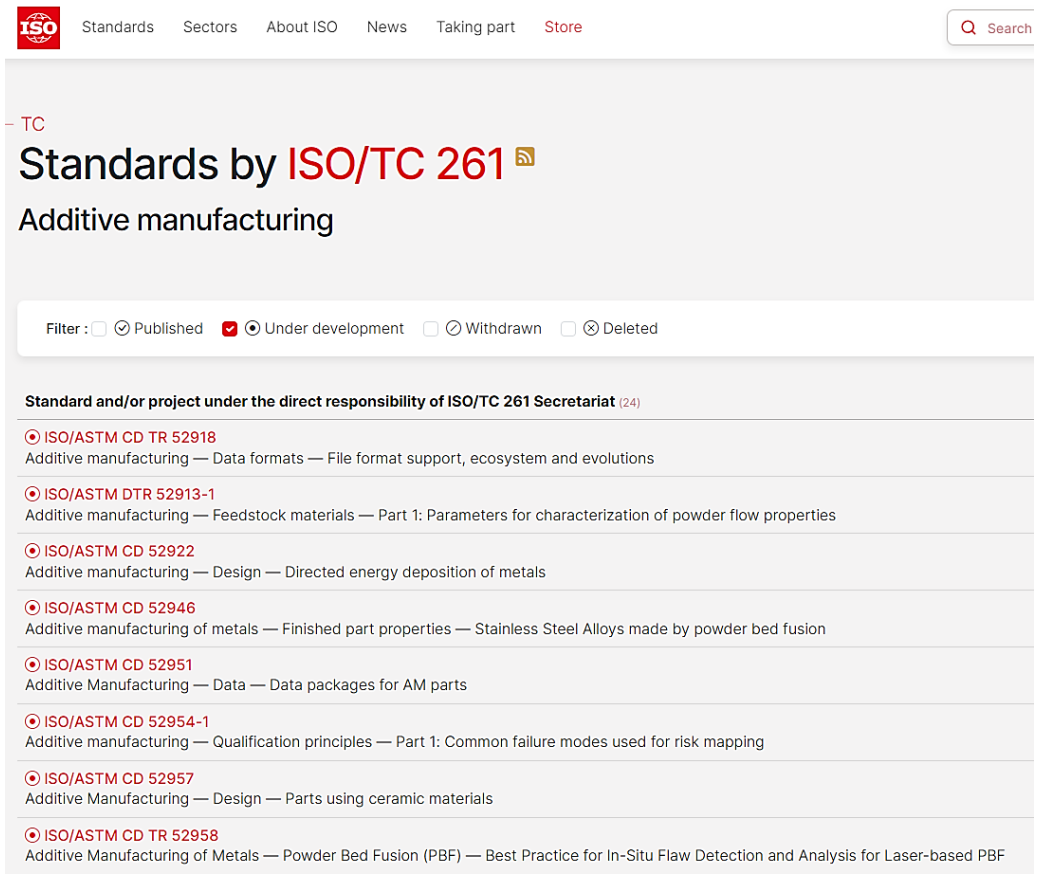

Credit: ISO/TC 261 https://www.iso.org/committee/629086.html

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ISO/TC 261 Business Plan

https://committee.iso.org/home/tc261

BUSINESS PLAN

ISO/TC 261
Additive manufacturing

EXECUTIVE SUMMARY

The main field and the overall size of the markets addressed by the committee

Additive Manufacturing (AM) technologies are an inherent part of the product development process. They are used to manufacture prototypes, tools and production parts. In comparison to conventional methods, where parts are molded into specified forms or cut from a massive block, AM bases on the principle that liquids, powders, stands and films are layered to build 3D-structures without the use of a mold.

The size of the market in 2021 was estimated at a value of 15.24 billion US $ (revenues generated in the primary AM market) according to Wohler's Report 2022.

The benefits already realized and/or expected through the availability of the standards

Benefits through standardization:

- systematic development, modification and use of processes of joining materials from 3D model data (AM) resulting in innovative products;
- assistance to users within the assessment of different additive processes resulting in using the appropriate technology for the specified product demands;

Credit: ISO/TC 261 Business Plan
https://www.iso.org/bp

	and efficient and timely development; • provides strategic guidance on specific areas of technical activity that require coordination both for new initiatives and ongoing work.
ISO/TC 261/ WG 1 to JWG 12	ISO/TC 261 has also installed working groups with the following tasks: a) Sufficient flow of information between ISO/TC 261 experts participating in the JG activities with ASTM F 42 on the work of the Joint Groups (JGs), b) Coordination of the work of the ISO/TC 261 experts in the JGs, c) Monitoring of progress, efficiency and effectiveness of the work of the JGs from ISO point of view, d) Developing proposals for further joint ISO/ASTM activities and possible JGs, e) ISO feedback to current questions/discussions in JGs, f) Continuous reporting of the JG activities, so that: • the main documents of the JGs (JG minutes, drafts etc.) will be distributed both in the respective JG and its corresponding working group, • necessary technical discussion while developing a draft in the JG will take place in the respective ISO WG, • appointed ISO experts for JGs are requested to to report on the JG activies, • the output of the JGs will be more familiar and acceptable to ISO/TC 261 when voting procedure starts according to PSDO agreement with ASTM. WG/JWG comprise a Convenor appointed by ISO/TC 261, technical experts appointed by the members of ISO/TC 261. The WG/JWG meet as deemed to be necessary.
ISO/TC 261/JAG	As explained in 5.2, in the cooperation with ASTM F 42 Joint Groups is used for the development of combined ISO/ASTM standards. The work of these Joint Groups is being monitored by a Joint Steering Group. The Joint Steering Group was established to review progress reports on the joint group activities provided by Working Group convenors or Subcommittee chairs, manage joint groups, resolve any problems, present

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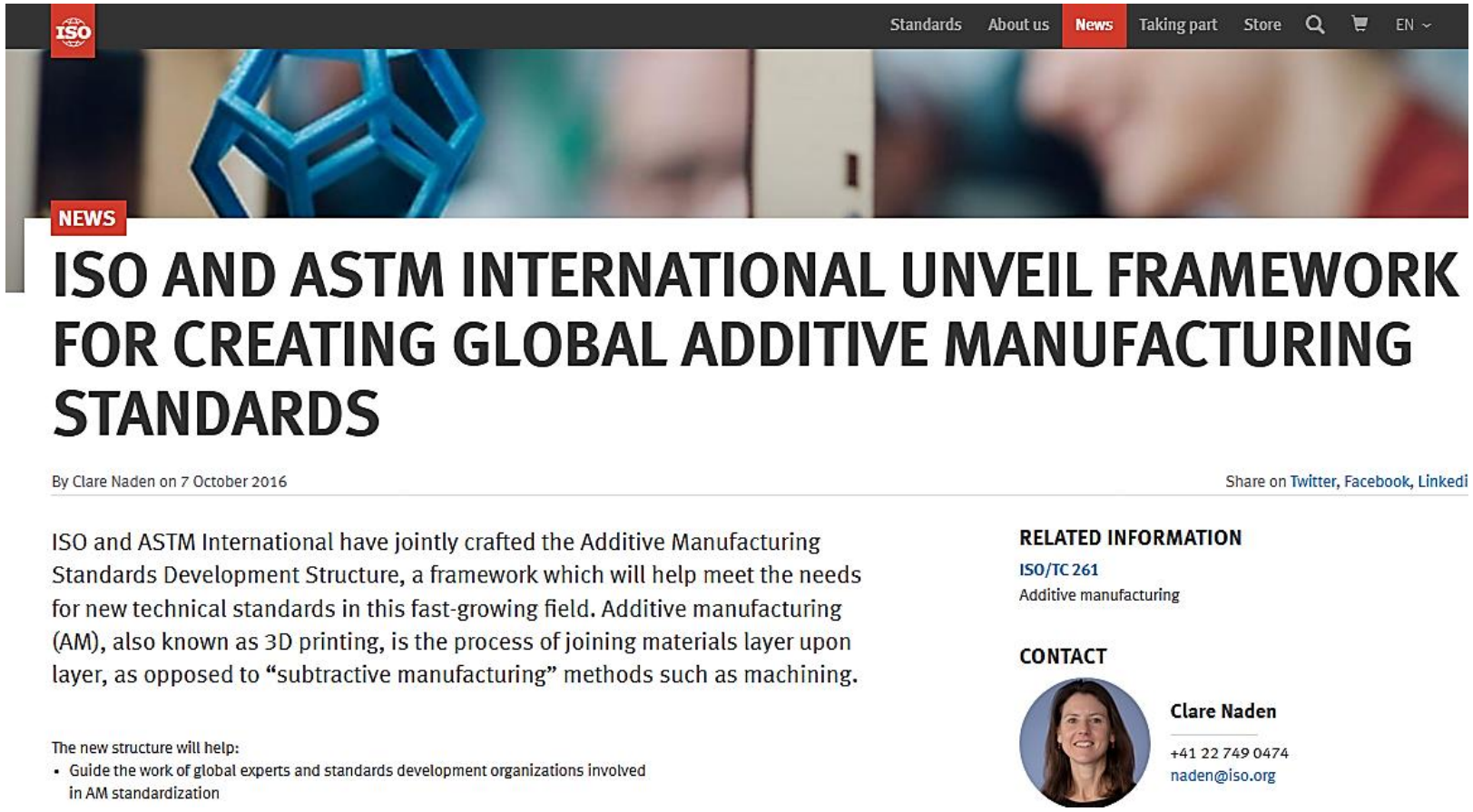
Additive Manufacturing Standards Development Structure

ISO-ASTM PSDO Agreement signed in 2011, seeks to eliminate duplication of effort while maximizing resource allocation within the AM industry.

Credit: https://sn.astm.org/outreach/astm-and-iso-sign-additive-manufacturing-psdo-agreement-nd11.html



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How are Joint AM Standards Developed?

- "ISO and ASTM collaboration allows TC 261 to apply a ***"fast track"*** process to existing ASTM F42 standards, making them ISO standards quickly. Likewise, ASTM can easily adopt ISO TC 261 standards. The collaboration especially encourages the development of joint ISO/ASTM standards.

- In each of these cases, the two organizations can ***co-brand*** the additive manufacturing standards. In the process, a co-branded standard (ISO/ASTM) replaces a standard that would otherwise be published exclusively by ISO or ASTM."

Credit: https://wohlersassociates.com/news/astm-iso-collaboration/

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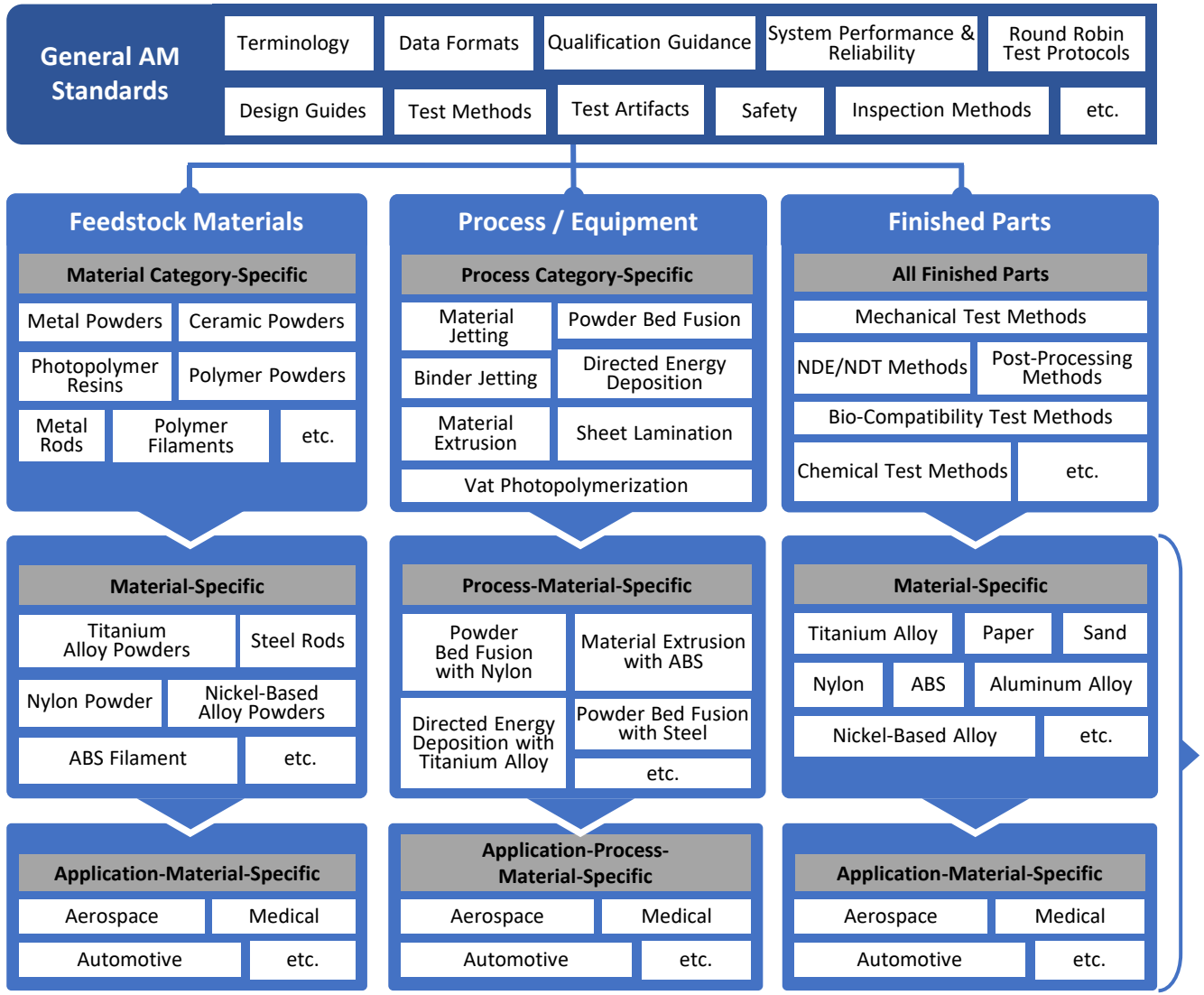
Additive Manufacturing Standards Development Structure



General Top-Level AM Standards

- General concepts
- Common requirements
- Generally applicable

Category AM Standards

Specific to material category or process category

Specialized AM Standards

Specific to material, process, or application

Credit: ISO/TC 261 Business Plan
https://www.iso.org/bp

ASTM INTERNATIONAL

ISO

How are Standards Developed?

- Standards are developed by experts in Technical Committees (TCs). ISO/TC 261 is an example of a TC that develops AM standards.
- In the standards development process, there are three ballots at ISO in terms of NWIP, DIS and FDIS. Disapprovals are resolved by consensus.
- National Standards Bodies who are members of a TC organize national-level meetings to reach a national position for the ballot.

Credit: Adapted from https://www.iso.org/sites/directives/current/consolidated/index.html#_Toc165304985

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How are Standards Developed?

- Project leaders submit the Scope, Title and deliverable type (Standard, Technical Specification or Technical Report) for the planned work. Refer to the ISO/IEC Directives, Part 2, Principles and rules for the structure and drafting of ISO and IEC documents

- Deliverable type: **Standard (IS) or Technical Specification (TS)** = Sets requirements and/or gives recommendations (TS has a limited lifetime and lower consensus level compared to IS), **Technical Report** = Purely descriptive

- Terms presented in ISO/ASTM 52900:2021 Additive manufacturing — General principles — Fundamentals and vocabulary must be taken into consideration and be properly referenced

Credit: Adapted from https://www.iso.org/sites/directives/current/consolidated/index.html#_Toc165304985 and https://www.iso.org/sites/directives/current/part2/index.xhtml

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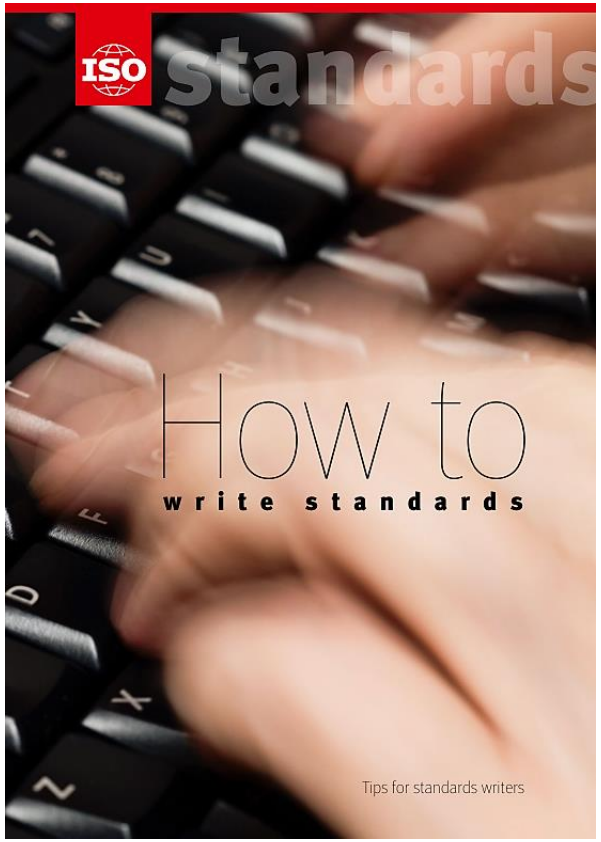
How to Write Standards?



Writing plain language 3
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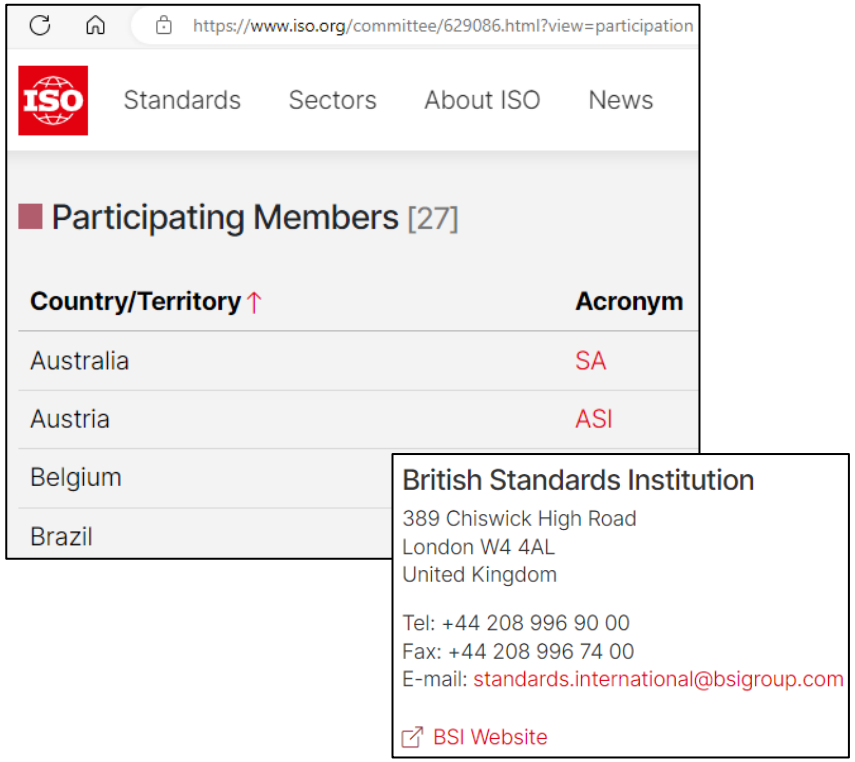
Contact your National Standards Body for further guidance



Credit: https://www.iso.org/files/live/sites/isoorg/files/developing_standards/docs/en/how-to-write-standards.pdf
https://www.iso.org/committee/629086.html?view=participation

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ISO/TC 261 – Groups, WGs and JWGs

- ISO/TC 261/JAG “ISO/TC 261 - ASTM F42 Steering group on JG activities”
- ISO/TC 261/CAG "Chairman's advisory group”
- ISO/TC 261/AHG 5 "Content for ISO/TC 261 homepage”
- ISO/TC 261/AHG 6 "Coordination of work between ISO/TC 261 and ISO/TC 184/SC 1 and ISO/TC 184/SC 4”

- ISO/TC 261/WG 1 "Terminology”
- ISO/TC 261/WG 2 "Processes, systems and materials”
- ISO/TC 261/WG 3 "Test methods and quality specifications”
- ISO/TC 261/WG 4 "Data and Design”
- ISO/TC 261/WG 6 "Environment, health and safety”
- ISO/TC 261/JWG 10 "Joint ISO/TC 261 - ISO/TC 44/SC 14 WG, Additive manufacturing in aerospace applications”
- ISO/TC 261/JWG 11 "Joint ISO/TC 261 - ISO/TC 61/SC 9 WG, Additive manufacturing for plastics”
- ISO/TC 150/JWG 1 “Joint ISO/TC 261 - ISO/TC 150/ WG: Additive manufacturing in surgical implants” (under lead of ISO/TC 150)

Credit: ISO/TC 261 https://www.iso.org/committee/629086.html

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ISO/TC261 Working Groups

WG1	WG2	WG3	WG4
Terminology	Processes, systems and materials	Test methods and quality specifications	Data and Design

WG6	JWG10	JWG11	(external)
Environment, health and safety	Joint ISO/TC44/SC14 WG: Additive manufacturing in aerospace applications	Joint ISO/TC61/SC9 WG: Additive manufacturing for plastics	ISO/TC150/JWG1: Additive manufacturing in surgical implant applications

Credit: ISO/TC 261 https://www.iso.org/committee/629086.html

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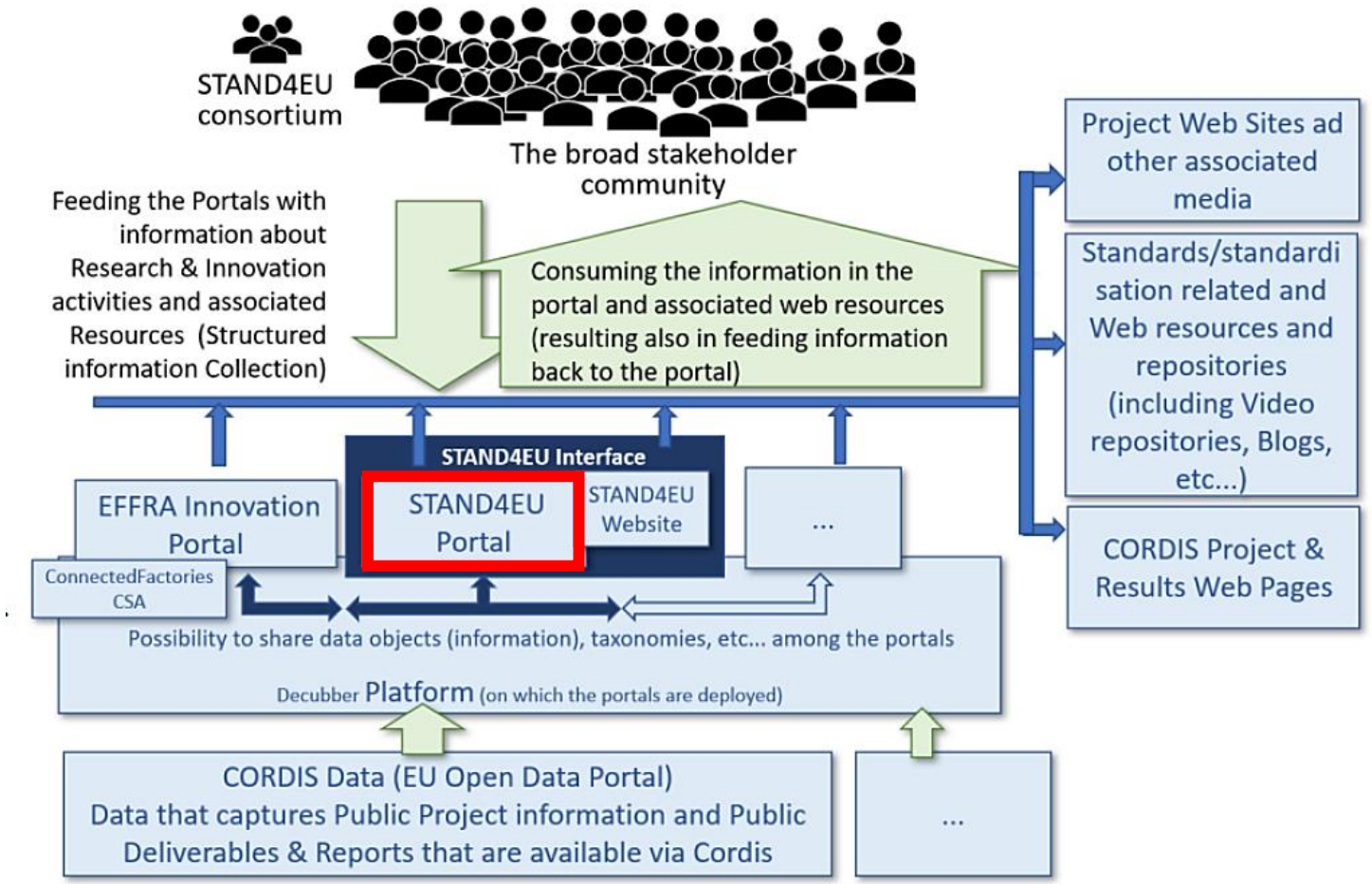
STAND4EU - Portal https://portal.stand4eu.eu



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STAND4EU - Portal

- A one-stop shop portal on EU projects and links with standardisation activities, results and other useful outputs

- Portal contains content generated by third parties responsible for the information

https://portal.stand4eu.eu

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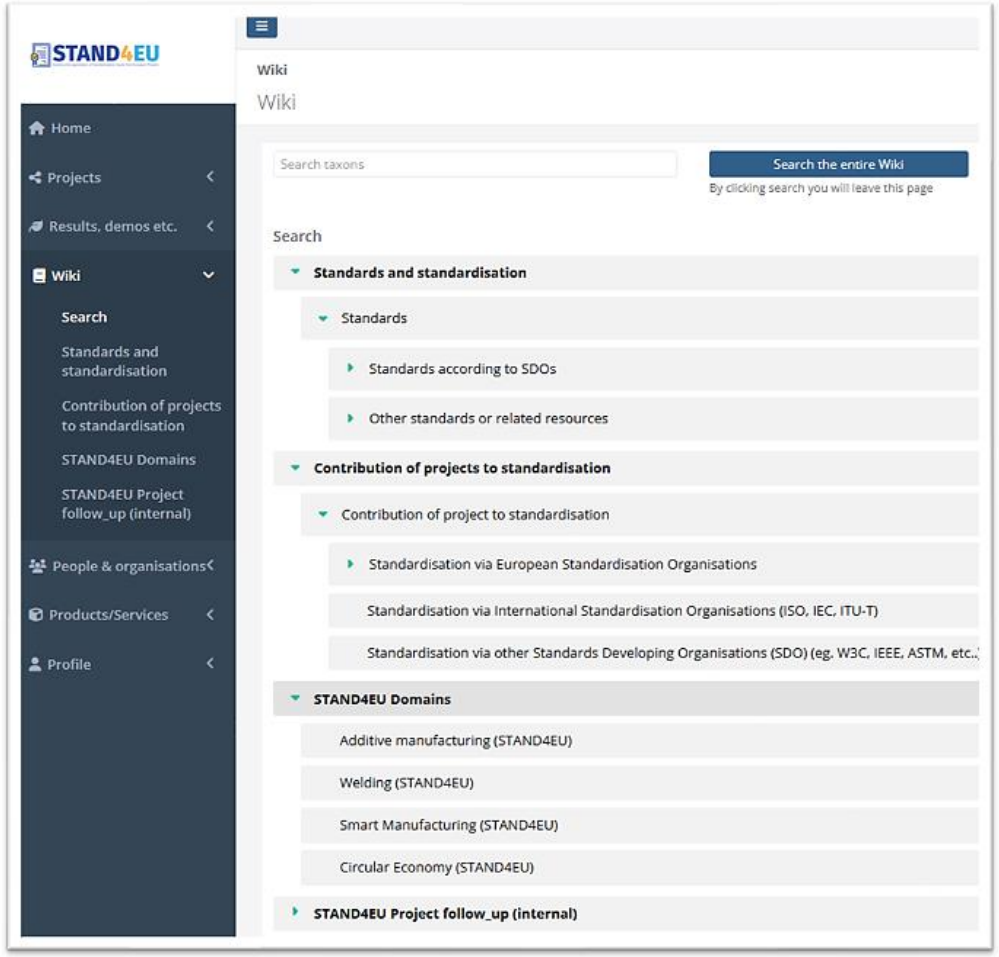
STAND4EU - Portal https://portal.stand4eu.eu



https://portal.stand4eu.eu/wiki

Structured information collection and sharing

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Boosting the Exploitation of Standardisation Inputs from European Projects

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