



Standards and certifications

A study about the AM standardization landscape

BACKGROUND

Additive Manufacturing (AM) standards describe the framework, guidelines and requirements bound with AM processes. ASTM F42, from the U.S, works in collaboration with ISO/TC 261 through the Partner Standards Development Organization (PSDO) agreement. Similarly, European CEN/TC 438 AM standards committees work together with ISO/TC 261 under the Vienna agreement. From 2011 to 2020, through the collaboration between ASTM F42 and ISO/TC 261, around 25 standards have been published, and another 40+ standards are under development focusing on different aspects of standardization gaps for metal- and polymer-based AM processes as well as EH&S.

SCOPE

During summer 2020, AMEXCI investigated available standards and certifications to gather a holistic overview of the standardization landscape. The national and international organizations for AM standardization as well as their working structure for developing new AM standards in cooperation with each other and other entities have been explained in detail. Additionally, industrial certification bodies around the world have been summarized for this pre-study to provide a general look at the whole AM standardization map.



AMEXCI identified a total of 86 currently available standards, which are expected to reach 126 in the coming years. As depicted in the picture, the European and American organizations have published 90% of the AM standards equally.

Out of all the available standards, AMEXCI chose 12 diverse standards published in the last 4 years and screened their contents to estimate their maturity. For the analyses of the selected standards, the covered five subtopics were as follows: **design**, **qualification**, **machine management**, **component requirements in serial production** and **quality management system (QMS)**.

INSIGHTS

Through this pre-study, AMEXCI did not only review and analyse AM standards by categorizing the given information into different contents from the subtopics as represented in the table, but also compiled major gaps and needs. The defined gaps can be summarized as: **traceability**, e.g., raw material, the parts, and the data, **powder management**, **atmosphere in print chamber**, **applications**, **destructive and non-destructive testing**, and **EH&S**, where AMEXCI participates in the round robin testing of Nanosafety and HÄMAT public projects.

Design			
Considerations & Process limitations	File preparation	Data processing & File formatting	Post-processing requirements
Qualification			
Quality Procedures and other documents	Qualification requalification processes	Operators qualification	Feedstock requirements

AMEXCI have been involved in ISO projects through SIS/TK 563 committee and will keep close partnership to stay aware of the upcoming publications.

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The full version is available for participants of this project within AMEXCI's shareholder companies.