



SLOVENSKI STANDARD
oSIST prEN ISO/ASTM 52935:2022
01-september-2022

Aditivna proizvodnja kovin - Princip - Kvalifikacija osebja za koordinacijo aditivne proizvodnje (ISO/ASTM DIS 52935:2022)

Additive manufacturing of metals – Qualification principles – Qualification of AM coordination personnel (ISO/ASTM DIS 52935:2022)

Additive Fertigung von Metallen - Grundsätze der Qualifizierung - Qualifizierung des AM -Koordinationspersonals (ISO/ASTM DIS 52935:2022)

Fabrication additive de métaux - Principes de qualification - Qualification du personnel de coordination de la FA (ISO/ASTM DIS 52935:2022)

Ta slovenski standard je istoveten z: prEN ISO/ASTM 52935

ICS:

25.030 3D-tiskanje Additive manufacturing

oSIST prEN ISO/ASTM 52935:2022 en,fr,de

DRAFT INTERNATIONAL STANDARD

ISO/ASTM DIS 52935

ISO/TC 261

Secretariat: DIN

Voting begins on:
2022-07-08

Voting terminates on:
2022-09-30

Additive manufacturing of metals – Qualification principles – Qualification of AM coordination personnel

ICS: 25.030

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN ISO/ASTM 52935:2022](https://standards.iteh.ai/catalog/standards/sist/58b2e6bd-ceda-4931-becc-3688ce4d870a/osist-pren-iso-astm-52935-2022)

<https://standards.iteh.ai/catalog/standards/sist/58b2e6bd-ceda-4931-becc-3688ce4d870a/osist-pren-iso-astm-52935-2022>

This document is circulated as received from the committee secretariat.

THIS DOCUMENT IS A DRAFT CIRCULATED FOR COMMENT AND APPROVAL. IT IS THEREFORE SUBJECT TO CHANGE AND MAY NOT BE REFERRED TO AS AN INTERNATIONAL STANDARD UNTIL PUBLISHED AS SUCH.

IN ADDITION TO THEIR EVALUATION AS BEING ACCEPTABLE FOR INDUSTRIAL, TECHNOLOGICAL, COMMERCIAL AND USER PURPOSES, DRAFT INTERNATIONAL STANDARDS MAY ON OCCASION HAVE TO BE CONSIDERED IN THE LIGHT OF THEIR POTENTIAL TO BECOME STANDARDS TO WHICH REFERENCE MAY BE MADE IN NATIONAL REGULATIONS.

RECIPIENTS OF THIS DRAFT ARE INVITED TO SUBMIT, WITH THEIR COMMENTS, NOTIFICATION OF ANY RELEVANT PATENT RIGHTS OF WHICH THEY ARE AWARE AND TO PROVIDE SUPPORTING DOCUMENTATION.

ISO/CEN PARALLEL PROCESSING



Reference number
ISO/ASTM DIS 52935:2022(E)

© ISO/ASTM International 2022

iTeh STANDARD PREVIEW (standards.iteh.ai)

<https://standards.iteh.ai/catalog/standards/sist/58b2e6bd-ceda-4931-becc-3688ce4d870a/osist-pren-iso-astm-52935-2022>



COPYRIGHT PROTECTED DOCUMENT

© ISO/ASTM International 2022

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester. In the United States, such requests should be sent to ASTM International.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11

Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

ASTM International
100 Barr Harbor Drive, PO Box C700
West Conshohocken, PA 19428-2959, USA
Phone: +610 832 9634
Fax: +610 832 9635
Email: khooper@astm.org
Website: www.astm.org

Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Tasks and responsibilities	2
4.1 General.....	2
4.2 Specification of tasks and responsibilities.....	2
4.3 Tasks and responsibilities.....	2
4.4 Responsibilities and extent of authorization.....	2
5 Technical knowledge and competence	3
5.1 General.....	3
5.2 Competence levels for AM coordination personnel.....	3
5.2.1 Level 1 - Basic.....	3
5.2.2 Level 2 - Standard.....	3
5.2.3 Level 3 - Advanced.....	3
6 Qualification	3
6.1 Assessment of AM coordination personnel.....	3
6.2 Validity of qualification.....	4
6.3 Re-qualification.....	4
7 Qualification test certificate	4
Annex A (normative) Qualification test certificate of AM coordination personnel	6
Annex B (normative) AM Coordination Personnel Tasks / Responsibilities and Levels	7
Bibliography	14

ISO/ASTM DIS 52935:2022(E)

Foreword

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

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

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

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

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

This document was prepared by Technical Committee ISO/TC 261, *Additive manufacturing*, Joint Group JG 74, *Personnel Qualifications* in cooperation with ASTM Committee F42, Additive Manufacturing Technologies, on the basis of a partnership agreement between ISO and ASTM International with the aim to create a common set of ISO/ASTM standards on Additive Manufacturing.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

For many companies, additive manufacturing represents an interesting alternative to established manufacturing processes. The trend towards complex, customised or consolidated components, in addition to opportunities for reduced lead times and decentralised production allows an economically feasible use for a growing number of areas. This increasingly applies to many series applications, which add further demands on the efficiency and consistency of the processes. In particular, components used in regulated industries (e.g. automotive, rail, aerospace, process and industrial plants, medical) are subject to high demands in terms of quality and safety.

Where industrial components are produced using additive manufacturing processes, these must satisfy the equivalent quality and safety requirements demanded of conventional processes. To this end, the production chain and environment are designed such that the process quality and resulting product quality are always consistent and reproducible. To achieve consistency and reproducibility, it is of utmost importance to ensure that the involved workforce is adequately qualified for all stages of production.

This document describes the activities and responsibilities of the actors with coordination roles in the field of additive manufacturing for metallic parts.

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[oSIST prEN ISO/ASTM 52935:2022](https://standards.iteh.ai/catalog/standards/sist/58b2e6bd-ceda-4931-becc-3688ce4d870a/osist-pren-iso-astm-52935-2022)

<https://standards.iteh.ai/catalog/standards/sist/58b2e6bd-ceda-4931-becc-3688ce4d870a/osist-pren-iso-astm-52935-2022>

Additive manufacturing of metals – Qualification principles – Qualification of AM coordination personnel

1 Scope

This document specifies qualification requirements for coordination personnel in industrial manufacturing sites responsible for additive manufacturing of metal parts.

This document is applied to all metallic processes that are covered by ISO 17296-2. In this context, the skills, tasks and responsibilities for different levels of AM coordination personnel need to be adapted according to the applicable regulations, depending on the process.

This document is intended to provide guidance for qualification of coordination personnel in general-industrial applications. Additional requirements could be needed for specific industries or applications (e.g. aerospace, medical) or to meet regulatory requirements.

2 Normative references

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

ISO/ASTM 52900, *Additive manufacturing — General principles — Fundamentals and vocabulary*

ISO/ASTM 52920, *Additive manufacturing — Qualification principles — Quality requirements for industrial additive manufacturing sites*

ISO/ASTM/TS 52930, *Additive manufacturing — Qualification principles — Installation, operation and performance (IQ/OQ/PQ) of PBF-LB equipment*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in in ISO/ASTM 52900 and the following apply.

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

— ISO Online browsing platform: available at <https://www.iso.org/obp>

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1

AM coordination personnel

AM coordinator

person or group of people performing defined AM coordination tasks, designated by the company to be responsible for a specific process

Note 1 to entry: The designation may be valid for one or more of the processes in ISO 17296-2.

Note 2 to entry: Different personnel may be appointed by the manufacturer (3.2) for different AM related tasks.

3.2

part provider

manufacturer or distributor of parts produced by an additive manufacturing process

ISO/ASTM DIS 52935:2022(E)

3.3

examiner

person with knowledge and experience relevant to the qualification, and acceptable to the customer or examining body or engineering authority.

Note 1 to entry: In certain cases, an external independent examining body can be required [ISO / IEC 17024].

4 Tasks and responsibilities

4.1 General

Coordination personnel have multiple tasks and responsibilities for additive manufacturing of metals. These tasks and responsibilities will have varying levels depending on the companies' needs and the coordination personnel's education and experience.

These different levels of tasks and responsibilities should be considered as complementary and integrated into each other. Meaning that a higher coordination personnel can have similar tasks and activities as a lower level personnel. The company defines if these tasks, regardless of the level, are assigned to one single staff or to several staff members.

4.2 Specification of tasks and responsibilities

Each manufacturer is responsible for the appointment of their AM coordination personnel and corresponding level of coordination. This appointment is not transferable to other manufacturers.

The tasks and responsibilities of AM coordination personnel shall be selected from [Annex B](#) and/or as specified in applicable standards, contracts, and regulations. The level of competence of AM coordination personnel shall be determined in accordance with the complexity of the AM and related activities, product type(s), criticality of the application and the quality requirements.

Where more than one person carries out AM coordination, the tasks and responsibilities shall be clearly allocated, such that responsibility is clearly defined, and the persons are competent for each specific AM coordination task.

The manufacturer shall appoint at least one person to be responsible for AM coordination tasks.

If AM coordination is subcontracted, the tasks and responsibilities shall be defined and documented. However, compliance with this document remains the responsibility of the manufacturer.

4.3 Tasks and responsibilities

The tasks and responsibilities assigned to AM coordination personnel shall be identified in accordance with [4.1](#), [4.2](#) and [Annex B](#) and documented per [Annex A](#).

Persons other than the AM coordinator may be designated to perform specific tasks on their behalf. Delegations of this type shall be documented.

4.4 Responsibilities and extent of authorization

The responsibilities and extent of authorization assigned to the AM coordination personnel are identified as follows:

- their position in the manufacturer's organization and their responsibilities;
- the extent of authorization assigned to them to carry out the assigned tasks (see [Annex B](#));
- the extent of authorization assigned to them to accept or validate, by signature, technical administrative documents or contracts, on behalf of the manufacturer, as needed to fulfil the assigned tasks, for example, for procedure specification and supervision reports.

5 Technical knowledge and competence

5.1 General

All AM coordination personnel shall be able to demonstrate:

- competence in the AM-related tasks allocated to them;
- technical knowledge in AM technologies relevant to the assigned tasks, defined in [Annex B](#), obtained by a combination of education, training and/or experience.

Competence includes application of AM and related standards when relevant to the assigned tasks.

Competence shall be documented on the Qualification Test Certificate in [Annex A](#) for each task and responsibility based on:

- The level of qualification may be different for different categories;
- Qualification in every category is not required, if not applicable.

5.2 Competence levels for AM coordination personnel

AM coordination personnel shall be allocated to one of the following levels, depending on the nature and/or complexity of the production.

5.2.1 Level 1 - Basic

At Level 1, AM coordination personnel shall be competent to make decisions in basic work and supervise basic aspects of AM production related topics and activities, apply established procedures, apply variation within strict boundaries and supervise operators.

5.2.2 Level 2 - Standard

At Level 2, AM coordination personnel shall be competent to select and apply established procedures and implement variations in response to technical or economic requirements, select and supervise AM personnel.

Qualification for Level 2 shall include knowledge and skills of Level 1.

5.2.3 Level 3 - Advanced

At Level 3, AM coordination personnel shall be competent to evaluate application, develop, define and apply procedures, select, instruct and supervise AM personnel and coordination personnel and implementing AM production, for a specific process and including coordination/supervision of the full manufacturing chain, and related topics and activities

Qualification of Level 3 shall include the knowledge and skills of Level 2.

6 Qualification

6.1 Assessment of AM coordination personnel

The examination or assessment shall be conducted by personnel with a level of competence or responsibility equal or higher than the person under assessment.

The method applied for assessment shall be recorded in a specific document and contain the acceptance criteria to be applied in examination to assess the capabilities of the candidate against the expected responsibilities and performances described in [Annex B](#).