

STN	Aditívna výroba kovov Vlastnosti hotového dielu Dodatočné spracovanie, kontrola a skúšanie dielov vyrobených tavením kovového prášku (ISO/ASTM 52908: 2023)	STN EN ISO/ASTM 52908 18 8521
------------	--	---

Additive manufacturing of metals - Finished Part properties - Post-processing, inspection and testing of parts produced by powder bed fusion (ISO/ASTM 52908:2023)

Táto norma obsahuje anglickú verziu európskej normy.
This standard includes the English version of the European Standard.

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 02/24

Obsahuje: EN ISO/ASTM 52908:2023, ISO/ASTM 52908:2023

138057

Úrad pre normalizáciu, metrológiu a skúšobníctvo Slovenskej republiky, 2024
Slovenská technická norma a technická normalizačná informácia je chránená zákonom č. 60/2018 Z. z. o technickej normalizácii v znení neskorších predpisov.

EUROPEAN STANDARD

EN ISO/ASTM 52908

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2023

ICS 25.030

English Version

Additive manufacturing of metals - Finished Part
properties - Post-processing, inspection and testing of
parts produced by powder bed fusion (ISO/ASTM
52908:2023)

Fabrication additive de métaux - Propriétés des pièces
finies - Post-traitement, inspection et essais des pièces
produites par fusion sur lit de poudre (ISO/ASTM
52908:2023)

Additive Fertigung von Metallen - Eigenschaften von
Fertigteilen - Nachbearbeitung, Inspektion und
Prüfung von Bauteilen hergestellt mittels
pulverbettbasiertem Schmelzen (ISO/ASTM
52908:2023)

This European Standard was approved by CEN on 19 November 2023.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

EN ISO/ASTM 52908:2023 (E)

Contents	Page
European foreword.....	3

European foreword

This document (EN ISO/ASTM 52908:2023) has been prepared by Technical Committee ISO/TC 261 "Additive manufacturing" in collaboration with Technical Committee CEN/TC 438 "Additive Manufacturing" the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2024, and conflicting national standards shall be withdrawn at the latest by May 2024.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Türkiye and the United Kingdom.

Endorsement notice

The text of ISO/ASTM 52908:2023 has been approved by CEN as EN ISO/ASTM 52908:2023 without any modification.

INTERNATIONAL ISO/ASTM STANDARD 52908

First edition
2023-11

Additive manufacturing of metals — Finished part properties — Post- processing, inspection and testing of parts produced by powder bed fusion

*Fabrication additive de métaux — Propriétés des pièces finies — Post-
traitement, inspection et essais des pièces produites par fusion sur lit
de poudre*



Reference number
ISO/ASTM 52908:2023(E)

© ISO/ASTM International 2023

ISO/ASTM 52908:2023(E)**COPYRIGHT PROTECTED DOCUMENT**

© ISO/ASTM International 2023

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	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Abbreviations	2
5 Qualification	2
5.1 General.....	2
5.2 Part validation.....	3
5.3 Technical documentation relating to part(s) produced.....	3
5.4 Facility documentation.....	3
5.4.1 Additive manufacturer documentation requirements.....	3
5.4.2 Subcontractor documentation requirements.....	3
5.5 Quality assurance documentation.....	4
6 Post processing	4
6.1 General.....	4
6.2 Post-build activities.....	4
6.3 Thermal treatment.....	5
6.3.1 General.....	5
6.3.2 Reducing residual stresses.....	5
6.3.3 Reducing anisotropy.....	5
6.3.4 Prepare material for mechanical post-processing.....	5
6.3.5 Densification.....	5
6.3.6 Annealing and aging.....	5
6.4 Separation from the built platform and support structures.....	6
6.5 Surface finishing.....	6
6.5.1 Surface finishing operations.....	6
6.5.2 Machining allowances.....	6
7 Inspection and testing	6
7.1 General.....	6
7.2 Metallurgical testing.....	7
7.2.1 Objective.....	7
7.2.2 Test specimen selection, design, and preparation for part characterization.....	7
7.2.3 Test methods, parameters, and test specimens.....	8
7.2.4 Chemical analysis.....	9
7.2.5 Metallurgical properties.....	9
7.2.6 Determining the non-metallic inclusion content.....	9
7.2.7 Analysis and test report.....	9
7.3 Material testing.....	9
7.3.1 General.....	9
7.3.2 Orientation in the build space.....	10
7.3.3 Test specimen geometry and surface quality.....	10
7.3.4 Density (part).....	10
7.3.5 Archimedean method.....	12
7.3.6 Image analysis of metallographic specimens.....	13
7.4 Mechanical testing.....	15
7.4.1 Static testing.....	15
7.4.2 Dynamic testing.....	20
7.5 Surface quality inspection.....	21
7.6 Geometrical inspection (form, dimension, and tolerances).....	21
7.7 Non-destructive testing.....	21

ISO/ASTM 52908:2023(E)

Bibliography	23
---------------------------	-----------

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 document 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).

ISO draws attention to the possibility that the implementation of this document may involve the use of (a) patent(s). ISO takes no position concerning the evidence, validity or applicability of any claimed patent rights in respect thereof. As of the date of publication of this document, ISO had not received notice of (a) patent(s) which may be required to implement this document. However, implementers are cautioned that this may not represent the latest information, which may be obtained from the patent database available at www.iso.org/patents. ISO shall not be held responsible for identifying any or all such patent rights.

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*, in cooperation with ASTM Committee F42, *Additive Manufacturing Technologies*, on the basis of a partnership agreement between ISO and ASTM International with the Objective to create a common set of ISO/ASTM standards on Additive Manufacturing, and in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 438, *Additive manufacturing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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.

ISO/ASTM 52908:2023(E)

Introduction

As with conventional manufacturing processes (e.g. casting and milling), metallic parts produced by additive manufacturing technologies have critical-to-quality characteristics. These characteristics include density, strength, hardness, surface quality, dimensional accuracy, residual stresses, absence of cracks, voids, and structural homogeneity, which are typically tested in additively manufactured components. The quality of additively manufactured components is essential for functional components produced on an industrial scale. Thus, it is necessary to qualify additive manufacturing processes according to uniform criteria and to apply standardised in-process and post-process testing.

Additive manufacturing of metals — Finished part properties — Post-processing, inspection and testing of parts produced by powder bed fusion

1 Scope

This document specifies requirements for the qualification, quality assurance and post processing for metal parts made by powder bed fusion.

This document specifies methods and procedures for testing and qualification of various characteristics of metallic parts made by additive manufacturing powder bed fusion processes, in accordance with ISO/ASTM 52927, categories H and M.

This document is intended to be used by part providers and/or customers of parts.

This document specifies qualification procedures where appropriate to meet defined quality levels.

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 3369:2006, *Impermeable sintered metal materials and hardmetals — Determination of density*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 18265, *Metallic materials — Conversion of hardness values*

ISO 21920-1, *Geometrical product specifications (GPS) — Surface texture: Profile — Part 1: Indication of surface texture*

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

ISO/ASTM 52907, *Additive manufacturing — Feedstock materials — Methods to characterize metal powders*

ISO/ASTM 52920, *Additive manufacturing — Qualification principles — Requirements for industrial additive manufacturing processes and production sites*

ISO/ASTM 52927, *Additive manufacturing — General principles — Main characteristics and corresponding test methods¹⁾*

ISO/ASTM 52928, *Additive manufacturing — Feedstock materials — Powder life cycle management²⁾*

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

ANSI/ASME Y14.5, *Dimensioning and Tolerancing*

ASTM B311, *Standard Test Method for Density of Powder Metallurgy (PM) Materials Containing Less Than Two Percent Porosity*

1) Under preparation. Stage at the time of publication: ISO/DIS 52927:2023.

2) Under preparation. Stage at the time of publication: ISO/DIS 52928:2023.

ISO/ASTM 52908:2023(E)

ASTM B962, *Standard Test Methods for Density of Compacted or Sintered Powder Metallurgy (PM) Products Using Archimedes' Principle*

ASTM E8/E8M, *Standard Test Methods for Tension Testing of Metallic Materials*

DIN 50125, *Testing of metallic materials — Tensile test pieces*

koniec náhľadu – text ďalej pokračuje v platenej verzii STN