



Technical
Specification

ISO/ASTM TS 52949

**Additive manufacturing of
metals — Qualification principles
— Installation, operation and
performance (IQ/OQ/PQ) of PBF-EB
equipment**

*Fabrication additive de métaux — Principes de qualification —
Installation, fonctionnement et performances (IQ/OQ/PQ) des
équipements PBF-EB*

**First edition
2025-01**

[ISO/ASTM TS 52949:2025](https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025)

<https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025>

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/ASTM TS 52949:2025](https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025)

<https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025>



COPYRIGHT PROTECTED DOCUMENT

© ISO/ASTM International 2025

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 Abbreviated terms	1
5 General concepts	1
6 Elements of process validation	2
6.1 General.....	2
6.2 Installation qualification (IQ).....	2
6.2.1 General.....	2
6.2.2 Specific considerations for installation qualification.....	2
6.3 Operational qualification (OQ).....	3
6.3.1 General.....	3
6.3.2 Specific considerations for operational qualification.....	3
6.4 Performance qualification (PQ).....	4
6.4.1 General.....	4
6.4.2 Specific considerations for performance qualification.....	4
7 Revalidation	5

iTech Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/ASTM TS 52949:2025](https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025)

<https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025>

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 aim 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.

Introduction

Additive manufacturing is a machine-centric process. This document provides recommended practices for machine-related process qualification for serial production of metal parts produced with the powder bed fusion, by electron beam process (PBF-EB/M). Since this process is very similar to the PBF-LB/M this document references ISO/ASTM TS 52930 pointing only the differences on the validation processes. This document is addressed to organizations that already have a comprehensive quality system in place.

While this document is process specific, it is intended to apply to any industry with strict quality requirements. In such industries, it is not possible to complete machine qualification without ensuring repeatable production of the desired process result, given the current state of AM process knowledge. Operational quality and part performance quality sections are included for this reason.

iTeh Standards
(<https://standards.iteh.ai>)
Document Preview

[ISO/ASTM TS 52949:2025](https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025)

<https://standards.iteh.ai/catalog/standards/iso/bd2a115a-a360-4226-8140-915769ab11ed/iso-astm-ts-52949-2025>

