
**Additive manufacturing —
Material extrusion-based additive
manufacturing of plastic materials —**

**Part 2:
Process equipment**

*Fabrication additive — Fabrication additive de matériaux plastiques
à base d'extrusion de matière —*

Partie 2: Équipement de processus



This document is a preview generated by FES



COPYRIGHT PROTECTED DOCUMENT

© ISO/ASTM International 2020

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 Process specification	1
4.1 General.....	1
4.2 Class I.....	2
4.3 Class II.....	2
4.4 Class III.....	2
5 Materials	2
6 Fabrication of test specimens	2
6.1 General.....	2
6.2 Direction-independent properties.....	2
6.3 Non-mechanical direction-dependent properties.....	2
6.4 Mechanical direction-dependent properties.....	2
6.4.1 All mechanical property testing except tension testing.....	2
6.4.2 Tension testing.....	3
7 Responsibility for quality assurance (inspection and test)	3
8 Tolerances and surface roughness	3
9 Material processing	3
9.1 Maintenance.....	3
9.2 Raw material.....	4
9.3 Process parameters.....	4
9.4 Production runs.....	4
9.5 Post processing.....	4
10 Qualification	5
10.1 Additive manufacturing equipment qualification.....	5
10.2 Build qualification.....	5
10.3 Additive manufacturing equipment requalification.....	5
11 Report	5
Bibliography	6

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 ISO/TC 261, *Additive manufacturing*, in cooperation with ASTM F 42, 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.

This first edition of ISO/ASTM 52903-2 cancels and replaces ASTM 20196-2.

A list of all parts in the ISO/ASTM 52903 series can be found on the ISO website.

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

The values stated in either SI units or inch-pound units are to be regarded separately as standard. The values stated in each system are not necessarily exact equivalents; therefore, each system needs to be used independently of the other. Combining values from the two systems can result in non-conformance with this document.

Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials —

Part 2: Process equipment

1 Scope

This document describes a method for defining requirements and assuring component integrity for plastic parts created using material extrusion based additive manufacturing processes. It relates to the process, equipment and operational parameters. Processes include all material extrusion based additive manufacturing processes.

This document is intended for use by AM users and customers procuring such parts.

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:—¹⁾, *Additive manufacturing — General principles — Fundamentals and vocabulary*

ISO/ASTM 52903-1, *Additive manufacturing — Material extrusion-based additive manufacturing of plastic materials — Part 1: Feedstock materials*

ISO/ASTM 52921, *Standard terminology for additive manufacturing — Coordinate systems and test methodologies*

ASTM F3091/F3091M, *Standard Specification for Powder Bed Fusion of Plastic Materials*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO/ASTM 52900 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 <http://www.electropedia.org/>

4 Process specification

4.1 General

According to the final quality of the part, the process may be classified under the following classes:

1) Under preparation. Current stage: ISO/ASTM FDIS 52900:2020.