ISO/ASTM 52904:2024-07 (E)

Additive manufacturing of metals - Process characteristics and performance - Metal powder bed fusion process to meet critical applications

Contents

Page

Foreword ..... **v**

Introduction ..... **vi**

1 Scope **1**

2 Normative references **1**

3 Terms and definitions **1**

4 Personnel requirements **2**

5 Digital data **2**
5.1 Digital data records 2
5.2 Digital data processing 2

6 PBF equipment requirements **3**
6.1 General 3
6.2 Build consumables 3
6.2.1 Build platform 3
6.2.2 Shielding gases 3
6.2.3 Powder spreading device 3
6.2.4 Compressed air 3
6.3 Auxiliary tools and equipment 4
6.4 Machine operating software 4
6.5 Environmental controls 4

7 Feedstock requirements **4**
7.1 Purchasing feedstock 4
7.2 Control of feedstock 4

8 Qualification **5**
8.1 Design checks 5
8.1.1 Part files 5
8.1.2 Machining allowance 5
8.1.3 Orientation and location 5
8.1.4 Parts nesting 5
8.2 Pre-build checks 5
8.2.1 General 5
8.2.2 Maintenance and calibration status 5
8.2.3 PBF machine elements and systems 6
8.2.4 Build chamber environment 6
8.2.5 Build platform 6
8.2.6 Powder spreading device 6
8.2.7 Gas supply 6
8.2.8 Feedstock condition and quantity 6
8.2.9 Baseline machine and process parameters 7
8.3 Periodic preventive maintenance 7
8.3.1 General 7
8.3.2 Energy delivery verification 7
8.3.3 Z-axis movement 7
8.3.4 Compressed air 7
8.3.5 Oxygen and vacuum 7
8.3.6 Laser field alignment (LFA) 7
8.3.7 Other recommended preventive maintenance 8

8.4 Machine, process, and part qualification 8
8.4.1 Process qualification 8
8.4.2 Build platform 8
8.4.3 Test specimens 8
8.4.4 Requalification 9
8.5 Consolidated material and part 9
8.5.1 Material properties 9
8.5.2 Part properties 10
8.5.3 Non-conformities 10
9 Manufacturing plan and documentation 10
9.1 Manufacturing plan 10
9.2 Documentation 11
Annex A (informative) **Example of a manufacturing plan 12**
Bibliography 15