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Additive manufacturing of metals - Qualification principles - Part 5: Qualification of operators for DED-Arc (ISO/ASTM 52926-5:2023)

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This document (EN ISO/ASTM 52926-5:2023) 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of an identical text or by endorsement, at the latest by May 2024, and conflicting national standards shall be withdrawn at the latest by May 2024.

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The text of ISO/ASTM 52926-5:2023 has been approved by CEN as EN ISO/ASTM 52926-5:2023 without any modification.

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Part 5: Qualification of operators for DED-Arc

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Foreword

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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, 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).

A list of all parts of the ISO/ASTM 52926 series can be found on the ISO website.

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Introduction

For many companies, additive manufacturing represents an alternative to more conventional manufacturing processes such as casting, forging or milling. The trend towards complex components, decentralised production and customer specific products allows an economically feasible use for more and more areas. This also applies to many series applications, which comprise completely different demands on the efficiency of the processes. In particular, components used in different fields (e.g., automotive industry, mechanical engineering, railway sector, aerospace, process and industrial plants, medical technology, etc.) are subject to high demands in terms of quality and safety. This creates a need for norms and standards that provide a transparent baseline for the production of components for a great variety of application areas.

The manufacturing of products intended for applications subjected to specific requirements relies on that the products' compliance to these requirements can be assured. Additive manufacturing is no exception to this. To this end, the production chain and environment should be designed in such a way that the process quality and the resulting product quality are always consistent and reproducible. To assure this consistency and reproducibility, it is of utmost importance to assure that the involved workforce is adequately qualified for all stages in the production.

ISO/ASTM 52926 series describes the activities and responsibilities of the operators in the field of the additive manufacturing technology. Its aim is to specify the qualification tests to be employed in the assessment of AM operators’ skills when operating AM machines, especially in regulated industries, such as automotive industry, mechanical engineering, the railway sector, the aerospace industry, process and industrial plants or medical technology, consideration of the criteria specified within the framework of this document create a basis for fulfilling the requirements for specific products.

NOTE This document gives the constraints and requirements for an operator to be qualified for direct energy deposition – arc (DED-arc).

INTERNATIONAL STANDARD **ISO/ASTM 52926-5:2023(E)**

Additive manufacturing of metals — Qualification principles —

Part 5: Qualification of operators for DED-Arc

1 Scope

This document identifies the capabilities and responsibilities required for the qualification of the AM operators on the field of the additive manufacturing technologies dealing with metallic parts production, specifically for the employment of directed energy deposition – arc with metals (DED-Arc/M).

This document identifies criteria for the theoretical and practical assessment of personnel operating DED-Arc/M machines. The activities and procedures foreseen to be performed by the DED-Arc/M operator are also part of this document.

This document is intended to provide an outline for qualification of AM machine operators in general industrial applications.

2 Normative references

The following documents are referred to in the text in such a way that some or all 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 52926-1, *Additive Manufacturing of metals — Qualification principles — Part 1: General qualification of operators*