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Additive manufacturing - Qualification principles - Test methods for metal casting sand moulds (ISO/ASTM 52919:2025)

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

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Additive manufacturing - Qualification principles - Test methods for metal casting sand moulds (ISO/ASTM 52919:2025)

Fabrication additive - Principes de qualification - Méthode d'essai pour les moules en sable pour fonderie métallique (ISO/ASTM 52919:2025)

Additive Fertigung - Grundsätze der Qualifizierung - Prüfverfahren für Sandformen für den Metallguss (ISO/ASTM 52919:2025)

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European foreword

This document (EN ISO/ASTM 52919:2025) 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of an identical text or by endorsement, at the latest by March 2026, and conflicting national standards shall be withdrawn at the latest by March 2026.

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Foreword

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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).

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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).

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Introduction

Additive manufacturing (AM) technology, which enables a part with a complex shape to be made without a master mould, has been applied to fabricate advanced sand moulds for metal casting. AM-made sand moulds have advantages in that it is possible to make cast parts not only with more precise dimensions, but also with thinner and complex shapes; therefore, application fields in the foundry industry are expanding.

The difference between sand moulds and general mechanical/structural parts is that sand moulds are never used as final products. In other words, a sand mould is crushed after each casting process when its role ends. Therefore, sand moulds do not require long-term-stable properties, but specific properties for the casting process, such as having stiffness with a good balance between sufficient mechanical strength and crushability, as well as gas permeability and physical thermal properties for a hot environment. The test methods and dimensions of specimens are standardized in existing documents for conventionally made sand moulds, and they are applicable to AM-made sand moulds. However, these standards do not cover all aspects of sand moulds made by AM, where uneven properties due to location in a build space and variations in process conditions between build cycles, as well as anisotropy due to a layer-by-layer process also can have a significant effect of the properties of the sand mould.

This document provides practices for sampling specimens of AM-made sand moulds, for application in parallel with existing test methods for the mechanical and physical properties of a metal casting sand mould made in a conventional way. In this document existing standards for testing tensile strength, transverse strength, gas permeability and thermal expansion are cited in terms of applicability to test pieces extracted from sand moulds made with AM. In addition, examples of test reports for two typical applications, where this document can be applied, are presented. One is for purchasing AM-made sand moulds and the other is for verifying the performance of an AM machine for sand moulds.

International Standard **ISO/ASTM 52919:2025(en)**

Additive manufacturing — Qualification principles — Test methods for metal casting sand moulds

1 Scope

This document specifies test methods for metal casting sand moulds produced using additive manufacturing technologies, with mechanical and physical properties including, but not limited to, tensile strength, transverse strength, gas permeability and thermal expansion.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their contents constitute 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 17295, *Additive manufacturing — General principles — Part positioning, coordinates and orientation*

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

ISO/ASTM 52901, *Additive manufacturing — General principles — Requirements for purchased AM parts*