

TNI	Aditívna výroba kovov Zváranie práškových vrstiev (PBF) Monitorovanie <i>in situ</i> pomocou koaxiálnej fotodiódy na detekciu chýb spôsobených pri tavení v PBF-LB (ISO/ASTM TR 52958)	TNI CEN ISO/ASTM TR 52958 18 8534
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Additive manufacturing of metals - Powder bed fusion (PBF) - *In-situ* coaxial photodiode monitoring for lack of fusion flaw detection in PBF-LB (ISO/ASTM TR 52958: 2026)

Táto technická normalizačná informácia obsahuje anglickú verziu CEN ISO/ASTM TR 52958:2026, ISO/ASTM TR 52958:2026.

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**Additive manufacturing of metals - Powder bed fusion
(PBF) - In-situ coaxial photodiode monitoring for lack of
fusion flaw detection in PBF-LB (ISO/ASTM TR
52958:2026)**

Fabrication additive de métaux - Fusion sur lit de
poudre - Surveillance par photodiode coaxiale in situ
pour la détection de défauts de fusion en PBF-LB
(ISO/ASTM TR 52958:2026)

Additive Fertigung von Metallen - Pulverbettfusion
(PBF) - Bewährte Verfahren zur In-Situ-
Fehlererkennung und -analyse für laserbasierte PBF
(ISO/ASTM TR 52958:2026)

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CEN ISO/ASTM TR 52958:2026 (E)

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European foreword

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Technical Report

ISO/ASTM TR 52958

Additive manufacturing of metals — Powder bed fusion (PBF) — In-situ coaxial photodiode monitoring for lack of fusion flaw detection in PBF- LB

*Fabrication additive de métaux — Fusion sur lit de poudre —
Surveillance par photodiode coaxiale in situ pour la détection de
défauts de fusion en PBF-LB*

**First edition
2026-05**

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ISO/ASTM TR 52958:2026(en)**Foreword**

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Additive manufacturing of metals — Powder bed fusion (PBF) — In-situ coaxial photodiode monitoring for lack of fusion flaw detection in PBF-LB

1 Scope

This document provides a workflow comprising experimental procedures and flaw detection algorithms aimed at locating flaws in parts produced during the powder bed fusion-laser-based (PBF-LB) process of metals. It emphasizes the use of coaxial photodiode-based in-situ monitoring and statistical and clustering machine learning algorithms, particularly for detecting lack of fusion-induced flaws. The workflow delineates setting thresholds for statistical detection and determining the number of clusters for machine learning algorithms, utilizing intentional seeded flaws in parts. Validation procedures are provided through computed tomography scanner data. Hardware limitations and considerations for multi-laser processes are addressed, with attention to potential issues.

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, *Additive manufacturing — General principles — Fundamentals and vocabulary*

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