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**Neporušitveno preskušanje zvarnih spojev - Ultrazvočno preskušanje - Uporaba avtomatske popolne fokusirne metode (TFM) in sorodnih postopkov (ISO 23864:2021)**

Non-destructive testing of welds - Ultrasonic testing - Use of automated total focusing technique (TFM) and related technologies (ISO 23864:2021)

Zerstörungsfreie Prüfung von Schweißverbindungen - Ultraschallprüfung - Verwendung der automatisierten Totalfokussierungsmethode (TFM) und verwandte Technologien (ISO 23864:2021)

Essais non destructifs des assemblages soudés - Contrôle par ultrasons - Utilisation de la technique d'acquisition automatisée de focalisation en tout point (FTP) et de techniques associées (ISO 23864:2021)

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**Ta slovenski standard je istoveten z: EN ISO 23864:2021**

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25.160.40      Varjeni spoji in vari      Welded joints and welds

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## Non-destructive testing of welds - Ultrasonic testing - Use of automated total focusing technique (TFM) and related technologies (ISO 23864:2021)

Essais non destructifs des assemblages soudés -  
Contrôle par ultrasons - Utilisation de la technique  
d'acquisition automatisée de focalisation en tout point  
(FTP) et de techniques associées (ISO 23864:2021)

Zerstörungsfreie Prüfung von Schweißverbindungen -  
Ultraschallprüfung - Verwendung der automatisierten  
Totalfokussierungsmethode (TFM) und verwandte  
Technologien (ISO 23864:2021)

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## European foreword

The text of ISO 23864:2021 has been prepared by Technical Committee IIW "International Institute of Welding" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 23864:2021 by Technical Committee CEN/TC 121 "Welding and allied processes" the secretariat of which is held by DIN.

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of an identical text or by endorsement, at the latest by June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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**Non-destructive testing of welds —  
Ultrasonic testing — Use of automated  
total focusing technique (TFM) and  
related technologies**

*Essais non destructifs des assemblages soudés — Contrôle par  
ultrasons — Utilisation de la technique d'acquisition automatisée de  
focalisation en tout point (FTP) et de techniques associées*

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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 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](http://www.iso.org/directives)).

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This document was prepared by the IIW, *International Institute of Welding*, Commission V, *NDT and Quality Assurance of Welded Products*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 121, *Welding and allied processes*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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# Non-destructive testing of welds — Ultrasonic testing — Use of automated total focusing technique (TFM) and related technologies

**IMPORTANT** — The electronic file of this document contains colours which are considered to be useful for the correct understanding of the document. Users should therefore consider printing this document using a colour printer.

## 1 Scope

This document specifies the application of the TFM technique and related technologies for semi- or fully automated ultrasonic testing of fusion-welded joints in metallic materials of minimum thickness 3,2 mm.

**NOTE** Unless stated otherwise, in this document “TFM” and “TFM technique” refer to the TFM technique as defined in ISO 23243, and to all related technologies, see for example ISO 23865 and ISO 23243.

This document is applicable to components with welds fabricated using metals which have isotropic (constant properties in all directions) and homogeneous conditions. This includes welds in low carbon alloy steels and common aerospace grade aluminium and titanium alloys, provided they are homogeneous and isotropic.

This document applies to full penetration welded joints of simple geometry in plates, pipes and vessels.

This document specifies four testing levels (A, B, C, D), each corresponding to a different probability of detection of imperfections. Guidance on the selection of testing levels is provided. Coarse-grained metals and austenitic welds can be tested when the provisions of this document have been taken into account.

This document gives provisions on the specific capabilities and limitations of the TFM technique for the detection, locating, sizing and characterization of discontinuities in fusion-welded joints. The TFM technique can be used as a stand-alone approach or in combination with other non-destructive testing (NDT) methods for manufacturing, in-service and post-repair tests.

This document includes assessment of indications for acceptance purposes based on either amplitude (equivalent reflector size) and length or height and length.

This document does not include acceptance levels for discontinuities.

The following two typical testing techniques for welded joints are referred to in this document:

- a) side scanning, where the probe(s) is (are) positioned adjacent to the weld cap, typically using wedges. Side scanning can be performed from one side or both sides of the weld;
- b) top scanning where the probe is positioned on top of weld cap with a flexible, conformable delay line or using immersion technique, or using contact technique after removing the weld cap.

Semi-automated testing encompasses a controlled movement of one or more probes along a fixture (guidance strip, ruler, etc.), whereby the probe position is measured with a position sensor. The scan is performed manually.

In addition, fully automated testing includes mechanized propulsion.