ICS 19.100 SLOVENSKÁ TECHNICKÁ NORMA Február 2026

STN	**Nedeštruktívne skúšanie Charakteristiky ohniska priemyselných röntgenových zariadení na nedeštruktívne skúšanie Časť 1: Rádiografická štrbinová metóda (ISO 32543-1: 2024)**	**STN EN ISO 32543-1** 01 5030

Non-destructive testing - Characteristics of focal spots in industrial X-ray systems - Part 1: Pinhole camera radiographic method (ISO 32543-1:2024)

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

Táto norma bola oznámená vo Vestníku ÚNMS SR č. 01/26

Obsahuje: EN ISO 32543-1:2025, ISO 32543-1:2024

Oznámením tejto normy sa ruší
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EN ISO 32543-1

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Supersedes EN 12543-2:2021

English Version

Non-destructive testing - Characteristics of focal spots in industrial X-ray systems - Part 1: Pinhole camera radiographic method (ISO 32543-1:2024)

Essais non destructifs - Caractéristiques des foyers émissifs des tubes radiogènes industriels - Partie 1: Méthode radiographique par sténopé (ISO 32543-1:2024)

Zerstörungsfreie Prüfung - Charakterisierung von Brennflecken in Industrie-Röntgenanlagen - Teil 1: Radiographisches Lochkamera-Verfahren (ISO 32543-1:2024)

This European Standard was approved by CEN on 29 September 2025.

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CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels

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European foreword

The text of ISO 32543-1:2024 has been prepared by Technical Committee ISO/TC 135 "Non-destructive testing" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 32543-1:2025 by Technical Committee CEN/TC 138 "Non-destructive testing" 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of an identical text or by endorsement, at the latest by April 2026, and conflicting national standards shall be withdrawn at the latest by April 2026.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

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Endorsement notice

The text of ISO 32543-1:2024 has been approved by CEN as EN ISO 32543-1:2025 without any modification.

International Standard

ISO 32543-1

First edition
2024-05

Non-destructive testing — Characteristics of focal spots in industrial X-ray systems —

Part 1: Pinhole camera radiographic method

Essais non destructifs — Caractéristiques des foyers émissifs des tubes radiogènes industriels —

Partie 1: Méthode radiographique par sténopé

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

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This document was prepared by the European Committee for Standardization (CEN) (EN 12543-2:2021) and was adopted (without modification other than those given below) by Technical Committee(s) ISO/TC 135, *Non-destructive testing*, Subcommittee SC 5, *Radiographic testing.*

The main changes are as follows:

— verbal forms in the Scope and 5.1 NOTE have been modified to meet ISO content requirements;

— definitions in Clause 3 have been modified to remove reference to content outside Clause 3;

— Figures 5, 6 and 7 have been updated;

— keys have been added to Figures 1, 2, 3, 4, 5 and 6;

— change "profile integration" to "profile averaging" when referring to the averaging of the profile lines;

— minor editorial corrections.

A list of all parts in the ISO 32543 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user’s national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Introduction

In order to cover the large range of effective focal spot sizes, different methods are described in the ISO 32543 series.

The pinhole method of ISO 32543-1 is intended for effective focal spot sizes above 0,1 mm and mainly used for sealed standard and mini focus tubes. ASTM E1165 describes the same pinhole procedure.

The edge method of EN 12543-4 is intended for field applications when the users have to observe the effective focal spot on a regular basis and the pinhole method is non-practical.

The edge measurement method of EN 12543-5 is intended for measurement of effective focal spot sizes between 5 µm and 300 µm and mainly for the use with µ-Focus tubes (up to 100 µm) and mini focus tubes with spot sizes of 100 µm to 300 µm.

In the overlapping ranges, the different parts of the EN 12543 series and ISO 32543 series provide comparable values within ±20 % tolerance.

International Standard **ISO 32543-1:2024(en)**

Non-destructive testing — Characteristics of focal spots in industrial X-ray systems —

Part 1:
Pinhole camera radiographic method

1 Scope

This document specifies a method for the measurement of effective focal spot dimensions above 0,1 mm of X-ray systems up to and including 1 000 kV X-ray voltage by means of the pinhole camera method with digital evaluation. The tube voltage applied for this measurement is restricted to 200 kV for visual film evaluation and can be selected higher than 200 kV if digital detectors are used.

The imaging quality and the resolution of X-ray images depend highly on the characteristics of the effective focal spot, in particular the size and the two-dimensional intensity distribution as seen from the detector plane. Compared to the other methods specified in the EN 12543 series and the ISO 32543 series, this method allows to obtain an image of the focal spot and to see the state of it (e.g. cratering of the anode).

This test method provides instructions for determining the effective size (dimensions) of standard (macro focal spots) and mini focal spots of industrial X-ray tubes. This determination is based on the measurement of an image of a focal spot that has been radiographically recorded with a “pinhole” technique and evaluated with a digital method.

For the characterization of commercial X-ray tube types (i.e. for advertising or trade), the specific FS (focal spot) values of Annex A can be used.

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 19232-5, *Non-destructive testing — Image quality of radiographs — Part 5: Determination of the image unsharpness and basic spatial resolution value using duplex wire-type image quality indicators*