Non-destructive testing - Measurement and evaluation of the X-ray tube voltage - Part 3: Spectrometric method (ISO 16526-3:2011)

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NATIONAL FOREWORD

See Eesti standard EVS-EN ISO 16526-3:2020 sisaldab Euroopa standardi EN ISO 16526-3:2020 ingliskeelset teksti.	This Estonian standard EVS-EN ISO 16526-3:2020 consists of the English text of the European standard EN ISO 16526-3:2020.
Standard on jõustunud sellekohase teate avaldamisega EVS Teatajas.	This standard has been endorsed with a notification published in the official bulletin of the Estonian Centre for Standardisation.
Euroopa standardimisorganisatsioonid on teinud Euroopa standardi rahvuslikele liikmetele kättesaadavaks 04.03.2020.	Date of Availability of the European standard is 04.03.2020.
Standard on kättesaadav Eesti Standardikeskusest.	The standard is available from the Estonian Centre for Standardisation.

Tagasisidet standardi sisu kohta on võimalik edastada, kasutades EVS-i veebilehel asuvat tagasiside vormi või saates e-kirja meiliaadressile standardiosakond@evs.ee.

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Essais non destructifs - Mesurage et évaluation de la tension des tubes radiogènes - Partie 3: Méthode spectrométrique (ISO 16526-3:2011)

Zerstörungsfreie Prüfung - Messung und Auswertung der Röntgenröhrenspannung - Teil 3: Spektrometer-Verfahren (ISO 16526-3:2011)

This European Standard was approved by CEN on 6 January 2020.

EUROPEAN COMMITTEE FOR STANDARDIZATION
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European foreword

The text of ISO 16526-3:2011 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 16526-3:2020 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of an identical text or by endorsement, at the latest by September 2020, and conflicting national standards shall be withdrawn at the latest by September 2020.

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.

This document supersedes EN 12544-3:1999.

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Endorsement notice

The text of ISO 16526-3:2011 has been approved by CEN as EN ISO 16526-3:2020 without any modification.

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Introduction

In order to cover the different requirements for the measurement of the X-ray tube voltage, three different methods are described in ISO 16526-1 to ISO 16526-3.

The voltage divider method (ISO 16526-1) enables a direct and absolute measurement of the average high voltage of constant potential X-ray systems on the secondary side of the high voltage generator.

The thick filter method (ISO 16526-2) describes a constancy check. This method is recommended for the regular stability check of an X-ray system.

The spectrometric method (ISO 16526-3) is a procedure for non-invasive measurement of the X-ray tube voltage using the energy spectrum of the X-rays. This method can be applied for all X-ray systems and is the recommended method whenever the voltage divider method is not applicable, e. g. in case of tank units where it is not possible to connect the voltage divider device.

Non-destructive testing — Measurement and evaluation of the X-ray tube voltage —

Part 3: Spectrometric method

1 Scope

This part of ISO 16526 specifies the test method for a non-invasive measurement of X-ray tube voltages using the energy spectrum of X-rays (spectrometric method). It covers the voltage range from 10 kV to 500 kV.

The intention is to check the correspondence of the actual voltage with the indicated value on the control panel of the X-ray unit. It is intended to measure the maximum energy only and not the complete X-ray spectrum.

The procedure is applicable for tank type and constant potential X-ray units.

2 Definitions

For the purposes of this part of ISO 16526, the following definitions apply:

2.1 Energy dispersive photon detector

A photon detector, e. g. Ge based detector, which responds to incident photons with electric pulses, whose amplitude are a measure for the energy of the photons.

2.2 Multi channel analyser

An electronic device which is capable of sorting incoming electric pulses according to their amplitude.

NOTE The pulses are sorted into storage registers or channels in such a way that the contents of a register or channel is increased by one if a pulse occurs with the corresponding amplitude.

2.3 Energy spectrum

The graphical representation of the contents of the channels versus the energy.

2.4 Pile-up

Effect of two or more pulses which are too close to each other and which causes their amplitude to be added in the spectrum.

3 Test method

3.1 Principle

An energy dispersive photon detector is located in the collimated direct beam of the X-ray tube under test (figure 1). The output pulses of the detector are counted and analysed by a multichannel analyzer.