International Standard

ISO 18490

Non-destructive testing — Evaluation of vision acuity of NDT personnel

Essais non destructifs — Évaluation de l'acuité visuelle du personnel END

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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.

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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For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*, SC 7, *Personnel Qualification*, in collaboration with European Committee for Standardization (CEN) CEN/TC 138, *Non-destructive testing*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This second edition cancels and replaces the first edition (ISO 18490:2015), which has been technically revised.

The main changes are as follows:

— far and colour vision acuity of NDT personnel added to the Scope;

— updated references;

— new terms and definitions added;

— charts for Illumination level and Luminance added;

— chart for Eye to Chart distance for Near, Far and Colour vision added;

— additional provisions for vision correction added;

— test instructions for near, far, and colour vision added;

— guidance on verification of trained professional provided and sample attestation form for NDT Vision Test Report added as Annexes (Annex I);

— information for grey scale perception and low contrast acuity added as Annexes (Annex G and Annex H);

— for near vision, removed use of Tumbling E and added use of Reading Charts and Snellen chart;

— acceptance level for near, far, colour visions added;

— examples of Radner, Snellen and Landolt charts added as Annexes;

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— corresponding Reading Acuity Notations for Test Distances of 40 cm (16 inches) and 32 cm (12,5 inches) added as Annex.

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.

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Introduction

Standards for NDT Personnel qualification and certification require that the visual acuity of inspection personnel is verified as being appropriate to their function. By meeting the vision acuity level defined in this document, such requirements of ISO 9712 will be met. The purpose of this document is to provide a detailed, standardised procedure for the evaluation of vision acuity for such personnel under defined lighting conditions.

The tests are not medical in nature and are intended to objectively ensure adequate vision perception. Because it is extremely difficult to demonstrate any equivalency in vision tests, this document has been prepared in order that an international system can be used without any need to demonstrate equivalence and is the recommended method of determining vision acuity for NDT Personnel.

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Non-destructive testing — Evaluation of vision acuity of NDT personnel

1 Scope

This document specifies quality requirements for the chart, test procedure and acceptance level for near, far, and colour vision acuity of NDT personnel. Information for grey scale perception and low contrast can be found in the annexes. This document also specifies the qualification requirements for personnel permitted to carry out the test.

This document is only applicable to vision acuity under defined conditions similar to those encountered during routine NDT inspection. This document does not address an individual's overall visual acuity and users are advised to consider the need for a general eye examination by specialist medical personnel to ensure general vision acuity.

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 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 7921, *Ophthalmic optics and instruments- Near reading charts*

ISO 8596, *Ophthalmic optics — Visual acuity testing — Standard and clinical optotypes and their presentation*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 9712, ISO 7921, ISO 8596 and the following apply.

ISO and IEC maintain terminology databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
optotype
letters or symbols shown on an eye chart

3.2
eyewear
form of lens or protective transparent material placed or used between the human eye and the work piece during routine NDT inspection operations

3.3
trade test
test performed by the employer after failure of the Ishihara Colour test to ensure a candidate can distinguish and differentiate between the colours used in the NDT methods/ techniques concerned as specified by the employer.

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