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Specifikacija geometrijskih veličin izdelka (GPS) - Tekstura površine: profil - 1. del: Označevanje površinskih tekstur (ISO 21920-1:2021)

Geometrical product specifications (GPS) - Surface texture: Profile - Part 1: Indication of surface texture (ISO 21920-1:2021)

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Spécification géométrique des produits (GPS) - État de surface: Méthode du profil - Partie 1: Indication des états de surface (ISO 21920-1:2021)

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European foreword

This document (EN ISO 21920-1:2022) has been prepared by Technical Committee ISO/TC 213 "Dimensional and geometrical product specifications and verification" in collaboration with Technical Committee CEN/TC 290 “Dimensional and geometrical product specification and verification” the secretariat of which is held by AFNOR.

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Part 1: Indication of surface texture

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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).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

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This document was prepared by Technical Committee ISO/TC 213, *Dimensional and geometrical product specifications and verification*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 290, *Dimensional and geometrical product specification and verification*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

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This document cancels and replaces ISO 1302:2002, which has been technically revised. In addition to the change of number, the main changes to ISO 1302:2002 are as follows:

— New specification elements for indication are defined.

— The maximum tolerance acceptance rule is the default tolerance acceptance rule.

A list of all parts in the ISO 21920 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.

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Introduction

This document is a geometrical product specification (GPS) standard and is to be regarded as a general GPS standard (see ISO 14638). It influences chain link A of the chains of standards on profile surface texture.

The ISO GPS matrix model given in ISO 14638 gives an overview of the ISO GPS system of which this document is a part. The fundamental rules of ISO GPS given in ISO 8015 apply to this document and the default decision rules given in ISO 14253-1 apply to the specifications made in accordance with this document, unless otherwise indicated.

For more detailed information of the relation of this document to other standards and the GPS matrix model, see Annex H, Table H.1, and Annex I.

This document covers the indication of profile surface texture.

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Geometrical product specifications (GPS) — Surface texture: Profile —

Part 1: Indication of surface texture

1 Scope

This document specifies the rules for indication of surface texture by profile methods in technical product documentation by means of graphical symbols.

This document does not cover population requirements.

NOTE See ISO 18391 for population (batch) specifications.

2 Normative references

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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 21920-2, *Geometrical product specifications (GPS) — Surface texture: Profile — Part 2: Terms, definitions and surface texture parameters*

ISO 21920-3, *Geometrical product specifications (GPS) — Surface texture: Profile — Part 3: Specification operators*

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ISO 81714-1, *Design of graphical symbols for use in the technical documentation of products — Part 1: Basic rules*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 21920-2 and ISO 21920-3 apply.

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

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

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

4 Tolerance acceptance rules

4.1 General

Tolerance acceptance rules define how the tolerance limits are applied to the measured parameter values. For profile surface texture, three tolerance acceptance rules can be indicated. See ISO 21920-3:2021, Table 1 for the position of the measurements.

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4.2 Maximum tolerance acceptance rule

The maximum tolerance acceptance rule does not allow any measured value to exceed the tolerance limit. The symbol of the maximum tolerance acceptance rule is shown in Figure 1.

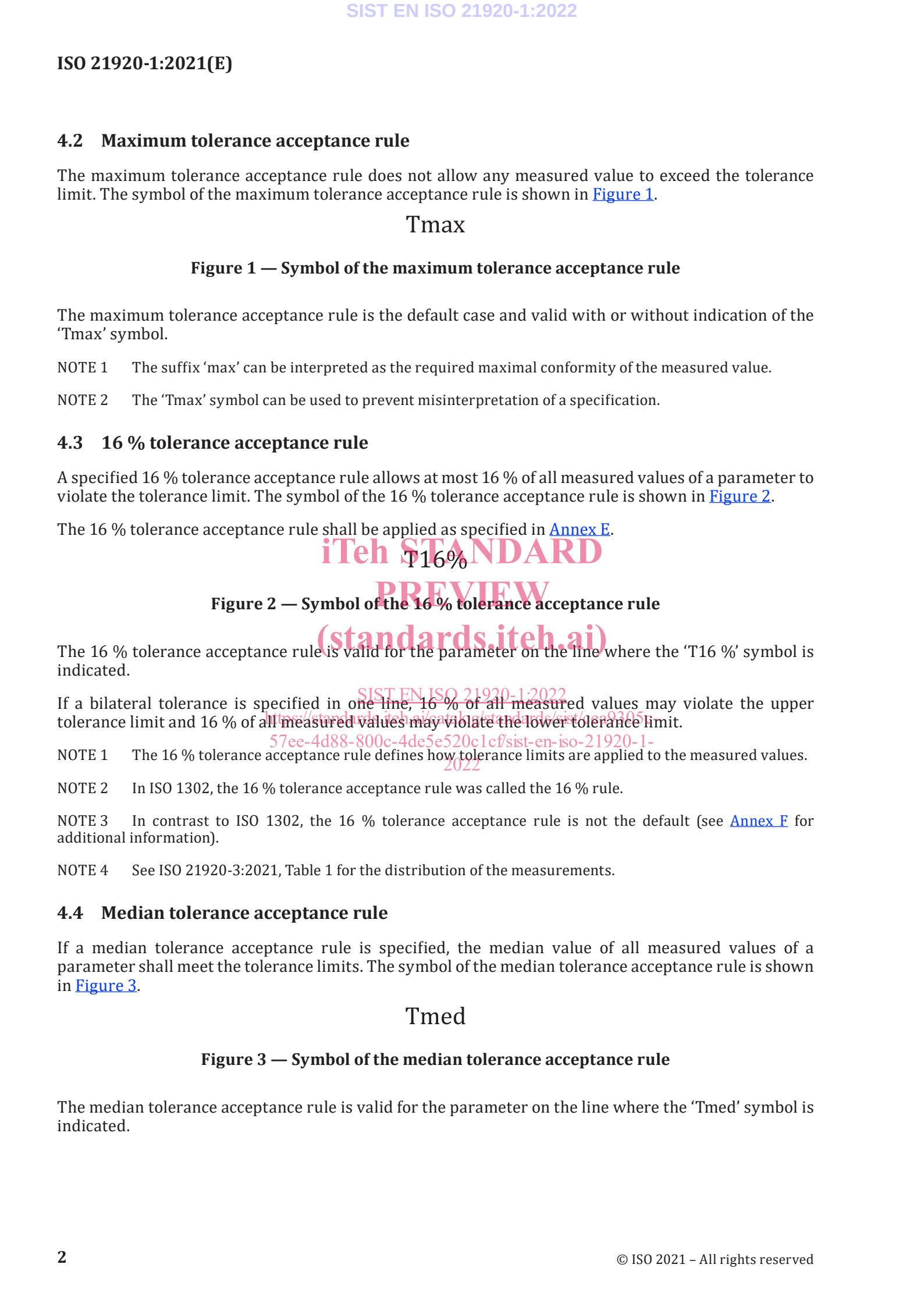

Figure 1 — Symbol of the maximum tolerance acceptance rule

The maximum tolerance acceptance rule is the default case and valid with or without indication of the 'Tmax' symbol.

NOTE 1 The suffix 'max' can be interpreted as the required maximal conformity of the measured value.

NOTE 2 The 'Tmax' symbol can be used to prevent misinterpretation of a specification.

4.3 16 % tolerance acceptance rule

A specified 16 % tolerance acceptance rule allows at most 16 % of all measured values of a parameter to violate the tolerance limit. The symbol of the 16 % tolerance acceptance rule is shown in Figure 2.

The 16 % tolerance acceptance rule shall be applied as specified in Annex E.

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Figure 2 — Symbol of the 16 % tolerance acceptance rule

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The 16 % tolerance acceptance rule is valid for the parameter on the line where the 'T16 %' symbol is indicated.

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If a bilateral tolerance is specified in one line, 16 % of all measured values may violate the upper tolerance limit and 16 % of all measured values may violate the lower tolerance limit.

NOTE 1 The 16 % tolerance acceptance rule defines how tolerance limits are applied to the measured values.

NOTE 2 In ISO 1302, the 16 % tolerance acceptance rule was called the 16 % rule.

NOTE 3 In contrast to ISO 1302, the 16 % tolerance acceptance rule is not the default (see Annex F for additional information).

NOTE 4 See ISO 21920-3:2021, Table 1 for the distribution of the measurements.

4.4 Median tolerance acceptance rule

If a median tolerance acceptance rule is specified, the median value of all measured values of a parameter shall meet the tolerance limits. The symbol of the median tolerance acceptance rule is shown in Figure 3.

Figure 3 — Symbol of the median tolerance acceptance rule

The median tolerance acceptance rule is valid for the parameter on the line where the 'Tmed' symbol is indicated.

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At least three measured values shall be used to apply the median acceptance rule. A higher number of measurements can be specified in “other requirements” (symbol OR(*n*), see 7.17).

NOTE 1 The median tolerance acceptance rule defines how tolerance limits are applied to the measured values.

NOTE 2 If the median value of all measured values of a parameter meets the tolerance limit, no more than half the measured values exceed the tolerance limit.

5 Specification elements for indication of profile surface texture specifications

5.1 General

Indications of profile surface texture specify requirements on the surface of a workpiece as well as the specification operator.

NOTE All specification elements permitted for indication of profile surface texture specifications are listed in 5.2 and 5.3 and described in Clause 7.

5.2 Mandatory indication to be explicitly specified

— Graphical symbol for profile surface tolerance.

— Symbol of the profile surface texture parameter.

— Tolerance limit of the profile surface texture parameter.

— For parameters without defined defaults: indication of the profile L-filter nesting index N_{ic} for R-parameters or profile S-filter nesting index N_{ic} for W-parameters or the setting class Sc*n*.

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NOTE 1 Parameters without defined default are not listed in ISO 21920-3: 2021, Tables 3 to 6.

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NOTE 2 The indication of the nesting index or the setting class is optional for all parameters listed in ISO 21920-3:2021, Tables 3 to 6.

NOTE 3 It is the responsibility of the designer to choose and indicate the appropriate L-filter or S-filter. ISO 21920-3:2021, Tables 3 to 6 define defaults that can be used for surfaces without particular performance requirements.

NOTE 4 A cut-off wavelength for a profile filter is an example of a nesting index, see ISO 21920-2.

5.3 Optional indications to specify non-default or further requirements

— Tolerance type (upper, lower or bilateral tolerance limit).

— Symbol ‘T16 %’, ‘Tmax’ or ‘Tmed’ to specify a tolerance acceptance rule.

— Profile S-filter type.

— Profile S-filter nesting index.

— Profile L-filter type for R-parameters or profile S-filter type for W-parameters.

— Profile L-filter nesting index N_{ic} for R-parameters or profile S-filter nesting index N_{ic} for W-parameters.

— Evaluation length l_e for the evaluation length parameters. Section length l_{sc} and number of sections n_{sc} for the section length parameters.

— Profile F-operator association method and element.

— Profile F-operator nesting index.

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