SLOVENSKI STANDARD
oSIST prEN ISO 10042:2017

01-junij-2017

Varjenje - Obločni zvarni spoji aluminija in njegovih zlitin - Stopnje sprejemljivosti nepopolnosti (ISO/DIS 10042:2017)

Welding - Arc-welded joints in aluminium and its alloys - Quality levels for imperfections (ISO/DIS 10042:2017)

Schweißen - Lichtbogenschweißverbindungen an Aluminium und seinen Legierungen - Bewertungsgruppen von Unregelmäßigkeiten (ISO/DIS 10042:2017)

Soudage - Assemblages en aluminium et alliages d'aluminium soudés à l'arc - Niveaux de qualité par rapport aux défauts (ISO/DIS 10042:2017)

Ta slovenski standard je istoveten z: prEN ISO 10042

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77.120.10	Aluminij in aluminijeve zlitine	Aluminium and aluminium alloys

oSIST prEN ISO 10042:2017 **en,fr,de**

DRAFT INTERNATIONAL STANDARD

ISO/DIS 10042

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Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections

Soudage — Assemblages en aluminium et alliages d'aluminium soudés à l'arc — Niveaux de qualité par rapport aux défauts

ICS: 25.160.40

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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 documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2. 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. www.iso.org/patents

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For an explanation on the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the WTO principles in the Technical Barriers to Trade (TBT) see the following URL: Foreword - Supplementary information

The committee responsible for this document is ISO/TC 44/SC 10.

ADD INFORMATION ABOUT REPLACED STANDARDS AND OTHER PARTS AS NECESSARY

Main changes to the previous edition:

a) reference numbers from ISO 4063 deleted in the Scope;

b) Table 1, 1.3: reference number ISO 6520-1 changed from "2012 - uniformly distributed porosity " to "2018 - surface porosity";

c) Table 1, 1.8: new figure and change to quality level B and C;

d) Table 1, 1.9: change to quality level C;

e) Table 1, 1.14: additional figure;

f) Table 1, 1.15: change to quality level D;

g) Table 1, 1.18: new figure and figure deleted, reference to 6520-1-5013 "shrinkage groove" deleted;

h) Table 1, 1.19 to 1.21, : imperfections added with values from ISO 5817: poor restart, stray arc, spatter;

i) Table 1, 2.2: changes to quality levels B and C;

j) Table 1, 2.10: changes to quality levels C and D;

k) Table 1, 2.11: one old figure deleted and new figures introduced, requirements for "Butt joint (full penetration)";

l) Table 1, 2.12: new figure introduced with new requirements, changes to quality levels C and D;

m) standard editorially revised.

Introduction

This International Standard should be used as a reference in drafting application codes and/or other application standards. It contains a simplified selection of arc welding imperfections based on the designations given in ISO 6520-1.

Some imperfections described in ISO 6520-1 have been used directly and some have been grouped together. The basic numerical referencing system from ISO 6520-1 has been used.

The purpose of this International Standard is to define the dimensions of typical imperfections which might be expected in normal fabrication. It may be used within a quality system for the production of welded joints. It provides three sets of dimensional values from which a selection can be made for a particular application. The quality level necessary in each case should be defined by the application standard or the responsible designer in conjunction with the manufacturer, user and/or other parties concerned. The quality level will have to be prescribed before the start of production, preferably at the enquiry or order stage. For special purposes, additional details may to be prescribed.

The quality levels given in this International Standard provide basic reference data and are not specifically related to any particular application. They refer to the types of welded joint in fabrication and not to the complete product or component itself. It is possible, therefore, that different quality levels are applied to individual welded joints in the same product or component.

It would normally be expected that for a particular welded joint the dimensional limits for imperfections could all be covered by specifying one quality level. In some cases, it may be necessary to specify different quality levels for different imperfections in the same welded joint.

The choice of quality level for any application should take account of design considerations, subsequent processing (e.g. surfacing), mode of stressing (e.g. static, dynamic), service conditions (e.g. temperature, environment) and consequences of failure. Economic factors are also important and should include not only the cost of welding but also of inspection, test and repair.

Although this International Standard includes types of imperfection relevant to the arc welding processes given in Clause 1, only those which are applicable to the process and application in question need to be considered.

Imperfections are quoted in terms of their actual dimensions, and their detection and evaluation may require the use of one or more methods of non-destructive testing. The detection and sizing of imperfections is dependent on the inspection methods and the extent of testing specified in the application standard or contract.

This International Standard does not address the methods used for the detection of imperfections. However, ISO 17635 contains a correlation between the quality level and acceptance level for different NDT methods.

This International Standard is directly applicable to visual examination of welds and does not include details of recommended methods of detection or sizing by other non-destructive means. It should be

considered that there are difficulties in using these limits to establish appropriate criteria applicable to non-destructive testing methods such as ultrasonic, radiographic and penetrant testing and they may need to be supplemented by requirements for inspection, examination and testing.

The values given for imperfections are for welds produced using normal welding practice. Requirements for smaller (more stringent) values as stated in quality level B may include additional manufacturing processes, e.g. grinding, TIG dressing.

Requests for official interpretation of any aspect of this International Standard should be directed to the secretariat of ISO/TC 44/SC 10 via your national standards body. A complete listing of these bodies can be found at www.iso.org.

Welding — Arc-welded joints in aluminium and its alloys — Quality levels for imperfections

1 Scope

This International Standard specifies quality levels for imperfections in arc-welded joints in aluminium and its alloys. It applies to material thicknesses above 0,5 mm. It covers full-penetration butt welds and all fillet welds. The principles of this International Standard may also be applied to partial-penetration butt welds.

Quality levels for beam-welded joints are presented in ISO 13919-2.

Three quality levels are given in order to permit application to a wide range of welded constructions. They are designated by symbols B, C and D. Quality level B corresponds to the highest requirement on the finished weld. The quality levels refer to production quality and not to the fitness for purpose (see 3.2) of the product manufactured.

This International Standard applies to:

— all types of weld, e.g. butt welds, fillet welds and branch connections;

— the following welding processes:

  — metal inert gas welding (MIG welding); gas metal arc welding /USA/,

  — tungsten inert gas welding (TIG welding); gas tungsten arc welding /USA/,

  — plasma arc welding;

— manual, mechanized and automatic welding;

— all welding positions.

Metallurgical aspects, e.g. grain size, hardness, are not covered by this International Standard.

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 2553, *Welding and allied processes — Symbolic representation on drawings — Welded joints*

ISO 4063, *Welding and allied processes — Nomenclature of processes and reference numbers*

ISO 6520-1, *Welding and allied processes — Classification of geometric imperfections in metallic materials — Part 1: Fusion welding*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
quality level
description of the quality of a weld on the basis of type, size and amount of selected imperfections

3.2
fitness for purpose
ability of a product, process or service to serve a defined purpose under specific conditions

3.3
short imperfections
in cases when the weld is 100 mm long or longer, imperfections are considered to be short imperfections if, in the 100 mm which contains the greatest number of imperfections, their total length is not greater than 25 mm;

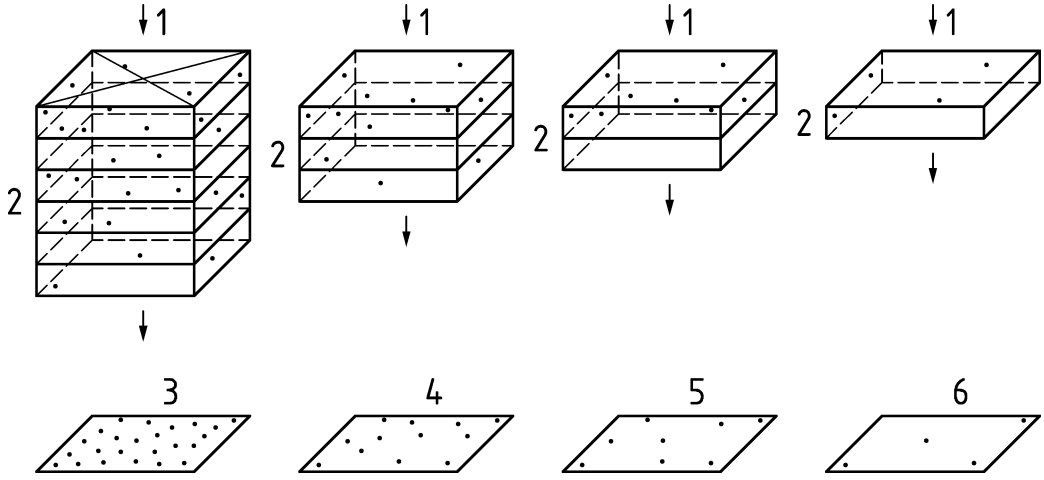
in cases when the weld is less than 100 mm long, imperfections are considered to be short imperfections if their total length is not greater than 25 % of the length of the weld

3.4
systematic imperfection
imperfection that is repeatedly distributed in the weld over the weld length to be examined, the size of each individual imperfection being within the specified limits

3.5
cross-sectional area
area to be considered after fracture or sectioning

3.6
projected area
area where imperfections distributed along the volume of the weld under consideration are imaged two-dimensionally

NOTE In contrast to the cross-sectional area, the occurrence of imperfections is dependent on the weld thickness when exposed radiographically (see Figure 1).



Key

1	direction of X-rays	3	6-fold thickness	5	2-fold thickness
2	4 pores per volume unit	4	3-fold thickness	6	1-fold thickness

Figure 1 — Radiographic films of specimens with identical occurrence of pores per volume unit