

SLOVENSKI STANDARD
oSIST prEN ISO 8062-3:2019
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Specifikacija geometrijskih veličin izdelka (GPS) - Dimenzijske in geometrijske tolerance zaformanih delov - 3. del: Splošne dimenzijske in geometrijske tolerance ter dodatki za obdelavo ulitkov (ISO/DIS 8062-3:2019)

Geometrical product specifications (GPS) - Dimensional and geometrical tolerances for moulded parts - Part 3: General dimensional and geometrical tolerances and machining allowances for castings (ISO/DIS 8062-3:2019)

Geometrische Produktspezifikationen (GPS) - Maß-, Form- und Lagetoleranzen für Formteile - Teil 3: Allgemeine Maß-, Form- und Lagetoleranzen und Bearbeitungszugaben für Gussstücke (ISO/DIS 8062-3:2019)

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Spécification géométrique des produits (GPS) - Tolérances dimensionnelles et géométriques des pièces moulées - Partie 3: Tolérances dimensionnelles et géométriques générales et surépaisseurs d'usinage pour les pièces moulées (ISO/DIS 8062-3:2019)

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ICS:

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17.040.40	Specifikacija geometrijskih veličin izdelka (GPS)	Geometrical Product Specification (GPS)

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Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts —

Part 3: General dimensional and geometrical tolerances and machining allowances for castings

Spécification géométrique des produits (GPS) — Tolérances dimensionnelles et géométriques des pièces moulées —

Partie 3: Tolérances dimensionnelles et géométriques générales et surépaisseurs d'usinage pour les pièces moulées

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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Symbols	2
5 Tolerance grades	2
5.1 General.....	2
5.2 Dimensional casting tolerance grades (DCTG).....	2
5.3 Geometrical casting tolerance grades (GCTG).....	3
5.3.1 General.....	3
5.3.2 Nominal dimensions.....	4
5.3.3 Datums.....	4
6 Surface mismatch (SMI)	6
7 Wall thickness	7
8 Required machining allowances (RMA)	7
8.1 General.....	7
8.2 Required machining allowance grades (RMAG).....	7
9 Indication on drawings	8
9.1 Indication of general dimensional casting tolerances.....	8
9.2 Indication of machining allowances.....	9
9.3 Indication of geometrical casting tolerances.....	9
10 Rejection	10
Annex A (informative) Casting tolerances and geometrical tolerances	11
Annex B (informative) Required machining allowance grades (RMAG)	14
Annex C (informative) Concept of general tolerancing of characteristics	15
Annex D (informative) Datums for general geometrical tolerances	17
Annex E (informative) Application of general geometrical tolerances for castings	21
Annex F (informative) Relation to the GPS matrix model	29
Bibliography	30

ISO/DIS 8062-3:2019(E)

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 (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 213, *Dimensional and geometrical product specifications and verification*.

This second edition cancels and replaces the first edition (ISO 8062-3:2007), which has been technically revised.

The main changes compared to the previous edition are as follows:

- clarification of inconsistencies.

A list of all parts in the ISO 8062- 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

This document is a geometrical product specification (GPS) standard and is regarded as a complementary process-specific tolerance standard (see ISO 14638). It influences chain link A, B and C of the chain of standards on mouldings.

For more detailed information on the relation of this standard to other standards and the GPS matrix model, see [Annex F](#).

This part of ISO 8062 defines a system of tolerance grades and machining allowance grades for cast metals and their alloys. Guidance on its application is given in ISO/TS 8062-2.

It is noted that the dimensional specifications introduced by the application of ISO 8062-3 can be ambiguous, when it is applied to a dimension which is not a size (see ISO 14405-2).

The specified system applies if the manufacturer provides a pattern or die equipment or accepts responsibility for proving it.

The tolerances specified for a casting may determine the casting method. It is therefore recommended, before the design or the order is finalized, that the customer liaises with the foundry to discuss:

- a) the proposed casting design and accuracy required;
- b) machining requirements;
- c) method of casting;
- d) location of the parting surfaces and the necessary draft angles;
- e) the number of castings to be manufactured;
- f) the casting equipment involved;
- g) the consequences of the wear out of the equipment during its life cycle;
- h) datum system according to ISO 5459;
- i) casting alloy;
- j) any special requirements, for instance, individual dimensional and geometrical tolerances, fillet radii, tolerances and individual machining allowances;

Because the dimensional and geometrical accuracy of a casting is related to production factors, tolerance grades which can be achieved for various methods and metals are described in [Annex A](#).

- k) dimensional tolerances for long series and mass production, where development, adjustment and maintenance of casting equipment make it possible to achieve close tolerances;
- l) dimensional tolerances for short series and single production;
- m) geometrical tolerances.

Information on typical required machining allowance grades is given in [Annex B](#).

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Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts —

Part 3: General dimensional and geometrical tolerances and machining allowances for castings

1 Scope

This part of ISO 8062 specifies general dimensional and geometrical tolerances as well as machining allowance grades for castings as delivered to the purchaser in accordance with ISO 8062-2. It is applicable for tolerancing of dimensions and geometry of castings in all cast metals and their alloys produced by various casting manufacturing processes.

This part of ISO 8062 applies to both general dimensional and general geometrical tolerances (referred to in or near the title block of the drawing), unless otherwise specified and where specifically referred to on the drawing by one of the references in [clause 9](#).

The dimensional tolerances covered by this part of ISO 8062 are tolerances for linear dimensions.

The geometrical tolerances covered by this part of ISO 8062 are: Tolerances for straightness, flatness, roundness, parallelism, perpendicularity, symmetry and coaxiality.

This part of ISO 8062 can be used for the selection of tolerance values for individual indications.

NOTE This part of ISO 8062 does not apply to 3D-CAD models used without indicated dimensions.

2 Normative references

The following referenced documents are indispensable for the application 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 129-1, *Technical product documentation (TPD) — Presentation of dimensions and tolerances — Part 1: General principles*

ISO 1101, *Geometrical product specifications (GPS) — Geometrical tolerancing — Tolerances of form, orientation, location and run-out*

ISO 1302, *Geometrical Product Specifications (GPS) — Indication of surface texture in technical product documentation*

ISO 5459, *Geometrical product specifications (GPS) — Geometrical tolerancing — Datums and datum systems*

ISO 8015, *Geometrical product specifications (GPS) — Fundamentals — Concepts, principles and rules*

ISO 8062-1, *Geometrical product specifications (GPS) — Dimensional and geometrical tolerances for moulded parts — Part 1: Vocabulary*

ISO 10135, *Geometrical product specifications (GPS) — Drawing indications for moulded parts in technical product documentation (TPD)*

ISO 10579, *Geometrical product specifications (GPS) — Dimensioning and tolerancing — Non-rigid parts*

ISO/DIS 8062-3:2019(E)

3 Terms and definitions

For the purpose of this part of ISO 8062, the terms and definitions given in ISO 8062-1, ISO 1101, ISO 5459 and ISO 10135 apply.

4 Symbols

For the purposes of this International Standard, the symbols of Table 1 apply.

Table 1 — Symbols

Symbol	Interpretation	Reference
DCT	Dimensional casting tolerance	5.2
DCTG	Dimensional casting tolerance grade	5.2
GCT	Geometrical casting tolerance	5.3
GCTG	Geometrical casting tolerance grade	5.3
RMA	Required machining allowance	8
RMAG	Required machining allowance grade	8
TP	Taper +	ISO 10135
TM	Taper -	ISO 10135
SMI	Surface mismatch	ISO 10135

5 Tolerance grades

5.1 General

Individual general dimensional and geometrical tolerances shall be indicated according to the relevant GPS standards on dimensional and geometrical tolerancing.

If using general tolerances, it is necessary to investigate whether for functional reasons smaller tolerances or for economical reasons larger tolerances are needed (see [Annex C](#)). In both cases, individual tolerances are to be indicated.

For drawings where the tolerances according to this part of ISO 8062 apply in a specified restrained condition only, ISO 10579 shall be referred to on the drawing.

5.2 Dimensional casting tolerance grades (DCTG)

16 dimensional casting tolerance grades are defined and designated DCTG 1 to DCTG 16 (see Table 2).

NOTE 1 For wall thicknesses, see clause 7.

Table 2 — Linear dimensional casting tolerances (DCT)

All dimensions in millimetres

Nominal dimensions related to the moulded part		Linear dimensional tolerance for dimensional casting tolerance grade (DCTG) a)															
		DCTG 1	DCTG 2	DCTG 3	DCTG 4	DCTG 5	DCTG 6	DCTG 7	DCTG 8	DCTG 9	DCTG 10	DCTG 11	DCTG 12	DCTG 13	DCTG 14	DCTG 15	DCTG 16 b)
above	up to and including																
-	10	0,09	0,13	0,18	0,26	0,36	0,52	0,74	1	1,5	2	2,8	4,2	-	-	-	-
10	16	0,1	0,14	0,2	0,28	0,38	0,54	0,78	1,1	1,6	2,2	3	4,4	-	-	-	-
16	25	0,11	0,15	0,22	0,3	0,42	0,58	0,82	1,2	1,7	2,4	3,2	4,6	6	8	10	12
25	40	0,12	0,17	0,24	0,32	0,46	0,64	0,9	1,3	1,8	2,6	3,6	5	7	9	11	14
40	63	0,13	0,18	0,26	0,36	0,5	0,7	1	1,4	2	2,8	4	5,6	8	10	12	16
63	100	0,14	0,2	0,28	0,4	0,56	0,78	1,1	1,6	2,2	3,2	4,4	6	9	11	14	18
100	160	0,15	0,22	0,3	0,44	0,62	0,88	1,2	1,8	2,5	3,6	5	7	10	12	16	20
160	250	-	0,24	0,34	0,5	0,7	1	1,4	2	2,8	4	5,6	8	11	14	18	22
250	400	-	-	0,4	0,56	0,78	1,1	1,6	2,2	3,2	4,4	6,2	9	12	16	20	25
400	630	-	-	-	0,64	0,9	1,2	1,8	2,6	3,6	5	7	10	14	18	22	28
630	1000	-	-	-	-	1,4	2	2,8	4	6	8	11	16	20	25	32	37
1000	1600	-	-	-	-	-	1,6	2,2	3,2	4,6	7	9	13	18	23	29	37
1600	2500	-	-	-	-	-	-	2,6	3,8	5,4	8	10	15	21	26	33	42
2500	4000	-	-	-	-	-	-	-	4,4	6,2	9	12	17	24	30	38	49
4000	6300	-	-	-	-	-	-	-	-	7	10	14	20	28	35	44	56
6300	10000	-	-	-	-	-	-	-	-	-	11	16	23	32	40	50	64

a) For wall thicknesses in grade DCTG 1 to DCTG 15, one grade coarser applies (see clause 7).

b) Grade DCTG 16 exists only for wall thicknesses of castings generally specified to DCTG 15.

NOTE 2 [Annex A](#) gives recommendations for the application of the above tolerance grades.

As the default conditions for dimensions, the casting tolerance shall be symmetrically disposed with respect to the nominal dimension, i. e. with one half on the positive side and one half on the negative side.

If agreed between manufacturer and purchaser for specific reasons, the casting tolerance may be asymmetric. In such a case the casting tolerance shall be stated individually, in accordance with ISO 129-1, following the nominal dimensions of the final moulded part.

NOTE 3 In pressure die casting an asymmetric tolerance disposition is often applied because of special technical reasons.

NOTE 4 In case of a draft angle the nominal dimension is modified by the draft angle (TP or TM).

5.3 Geometrical casting tolerance grades (GCTG)

5.3.1 General

Seven geometrical casting tolerance grades (GCTG) are defined and designated GCTG 2 to GCTG 8 (see Tables 3 to 6).

NOTE GCT values are not given for grade GCTG 1. This grade is reserved for finer values which may be required in the future.

ISO/DIS 8062-3:2019(E)

General tolerances on form (straightness, flatness, roundness) and on orientation (parallelism, perpendicularity) do not apply to features with draft. These features need individual indicated tolerances according to the function and to the manufacturer's advice.

Other geometrical tolerances than those given in tables 3 to 6 (e. g. profile, position, common zone flatness) are to be indicated individually.

Therefore, it is recommended to acquire the information about the design of the mould regarding the location of the parting surfaces and the amount of draft applied to the features from the manufacturer in order to complete the drawing, see Introduction.

5.3.2 Nominal dimensions

The nominal dimension to be used in Tables 3 to 6 shall be the longest nominal dimension of the considered integral feature of the moulded part, disregarding the nominal dimension of not individually indicated fillets and chamfers.

NOTE 1 Integral feature (see ISO 17450-1) means the real surface which can be touched physically. The longest nominal dimension in case of a cylinder is diameter or length, in case of rectangular planar surface it is the longest side.

NOTE 2 This definition is not applicable for 3D shapes.

5.3.3 Datums

5.3.3.1 Datums for general orientation tolerances

For general orientation tolerances according to ISO 8062-3 a datum system is to be specified on the drawing and to be identified by the indication "ISO 8062-3 DS" in or near the title block of the drawing as shown in Figure 1.



Figure 1 — Drawing indication for the datum system for general orientation tolerances according to ISO 8062-3

NOTE This datum system does not apply to general geometrical tolerances on coaxiality and symmetry, see [5.3.3.2](#) and [5.3.3.3](#).

5.3.3.2 Datums for general coaxiality tolerances

For datums of general coaxiality tolerances the following applies:

- if one cylindrical feature (internal or external) extends over the whole length of all other cylindrical coaxial features this feature axis applies as the (single) datum, see [Annex D Figure D.1](#);
- otherwise a common datum applies, composed of the axes of the two most separated features on the considered drawing centre line, see [Annex D Figure D.2](#); if more than one possibility exist (e. g. inner or outer features), the feature with the largest diameter applies, see [Annex D Figure D.3](#).

The general tolerances for coaxiality apply also to the datum features themselves, if a common datum applies.