

International Standard



8062

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Castings — System of dimensional tolerances

Pièces moulées — Système de tolérances dimensionnelles

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Foreword

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Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 8062 was prepared by Technical Committee ISO/TC 3, *Limits and fits*.

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Castings — System of dimensional tolerances

0 Introduction

This International Standard relates to a system of tolerances for cast metals and their alloys.

The tolerance specified for a casting may determine the method of casting. It is therefore recommended, before the design or the order is finalized, for the customer to liaise with the foundry to discuss

- a) the proposed casting design and accuracy required;
- b) machining requirements;
- c) method of casting;
- d) the number of castings to be manufactured;
- e) the casting equipment involved;
- f) any special requirements, for instance, datum target systems.

Because the dimensional accuracy of a casting is related to production factors, tolerances which can be achieved for various methods and metals are described in the annex for

- a) long series and mass production, where development, adjustment and maintenance of casting equipment make it possible to achieve close tolerances;
- b) short series and single production.

1 Scope and field of application

This International Standard specifies a system of tolerances for the dimensions of castings. It is applicable to the dimensions of cast metals and their alloys produced by sand moulding, gravity die casting, low pressure die casting, high pressure die casting and investment casting.

This International Standard applies both to general tolerances given on a drawing and to individual and particular tolerances which are shown immediately following a specific dimension (see clause 9).

It applies where the casting producer provides the pattern equipment or accepts responsibility for proving it.

2 References

ISO 1101, *Technical drawings — Geometrical tolerancing — Tolerancing of form, orientation, location and run-out — Generalities, definitions, symbols, indications on drawings.*

ISO 5459, *Technical drawings — Geometrical tolerancing — Datums and datum-systems for geometrical tolerances.*

3 Basic dimensions

The basic dimensions given in this International Standard refer to the dimensions of a raw casting before machining (see figure 1). The necessary machining allowances are therefore included (see figure 2).

4 Tolerances

There are 16 tolerance grades, designated CT1 to CT16 (see table 1 and figure 3).

NOTE — Values are not given for grades CT 1 and CT 2; these are reserved for finer values which may be required in the future.

5 Mismatch

Mismatch shall lie within the tolerance shown in table 1. When it is important to restrict further the value of mismatch, it shall be stated on the drawing (see clause 9), and shall lie within the tolerances shown in table 1 or table 2 whichever is smaller (see figure 4). This value shall not be added to that given in table 1.

6 Wall thickness

Unless otherwise specified the tolerance for wall thickness in grades CT3 to CT15 will be one grade coarser than the general tolerance for other dimensions; for example, if there is a general tolerance on a drawing of CT10, the tolerance on wall thicknesses will be CT11.

7 Tolerances on tapered features

Where a design requires a tapered feature, the tolerance shall be applied symmetrically along the surface (see figure 5).

8 Position of tolerance zone

The tolerance zone, unless otherwise stated, is to be symmetrically disposed with respect to a basic dimension, i.e. with one half on the positive side and one half on the negative side (see figure 3). However, when agreed by both manufacturer and purchaser for specific reasons, the tolerance zone may be asymmetric, i.e. on either the positive or negative side.

9 Indication of casting tolerances on drawings

Tolerances according to this International Standard shall be stated on the drawing in the following ways :

a) with general information relating to tolerances, for example,

"General tolerances ISO 8062-CT16", or

b) if further restriction of the mismatch is required (see clause 5), for example

"General tolerances ISO 8062-CT16 maximum mismatch 2,5", and/or

c) following the basic dimension, in millimetres, for example,

"95 ± 1,1"

Dimensions for which general tolerances are not suitable shall be allocated individual tolerances. These may be finer or coarser than the general tolerances which would normally be applied to the basic dimensions, but the particular values should be chosen from table 1.

Table 1 — Casting tolerances

Raw casting basic dimension mm		Total casting tolerance ¹⁾ mm															
		Casting tolerance grade CT															
		12)	22)	3	4	5	6	7	8	9	10	11	12	13	14	15	16
—	10			0,18	0,26	0,36	0,52	0,74	1,0	1,5	2,0	2,8	4,2	—	—	—	—
10	16			0,20	0,28	0,38	0,54	0,78	1,1	1,6	2,2	3,0	4,4	—	—	—	—
16	25			0,22	0,30	0,42	0,58	0,82	1,2	1,7	2,4	3,2	4,6	6	8	10	12
25	40			0,24	0,32	0,46	0,64	0,90	1,3	1,8	2,6	3,6	5,0	7	9	11	14
40	63			0,26	0,36	0,50	0,70	1,0	1,4	2,0	2,8	4,0	5,6	8	10	12	16
63	100			0,28	0,40	0,56	0,78	1,1	1,6	2,2	3,2	4,4	6	9	11	14	18
100	160			0,30	0,44	0,62	0,88	1,2	1,8	2,5	3,6	5,0	7	10	12	16	20
160	250			0,34	0,50	0,70	1,0	1,4	2,0	2,8	4,0	5,6	8	11	14	18	22
250	400			0,40	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	0,90	1,2	1,8	2,6	3,6	5	7	10	14	18	22	28
630	1 000					1,0	1,4	2,0	2,8	4,0	6	8	11	16	20	25	32
1 000	1 600						1,6	2,2	3,2	4,6	7	9	13	18	23	29	37
1 600	2 500							2,6	3,8	5,4	8	10	15	21	26	33	42
2 500	4 000								4,4	6,2	9	12	17	24	30	38	49
4 000	6 300									7,0	10	14	20	28	35	44	56
6 300	10 000										11	16	23	32	40	50	64

1) See clause 8.

2) See note to clause 4.

NOTES

- 1 For wall thicknesses in grades CT3 to CT15, one grade coarser applies (see clause 6).
- 2 For sizes up to 16 mm, general tolerances from CT13 to CT16 are not available. For these sizes individual tolerances shall be indicated.

Table 2 — Mismatch

Tolerance grade CT	Mismatch ¹⁾ mm
3 and 4	Within tolerance in table 1
5	0,3
6	0,5
7 and 8	0,7
9 and 10	1,0
11 to 13	1,5
14 to 16	2,5

1) These values shall not be added to those given in table 1.

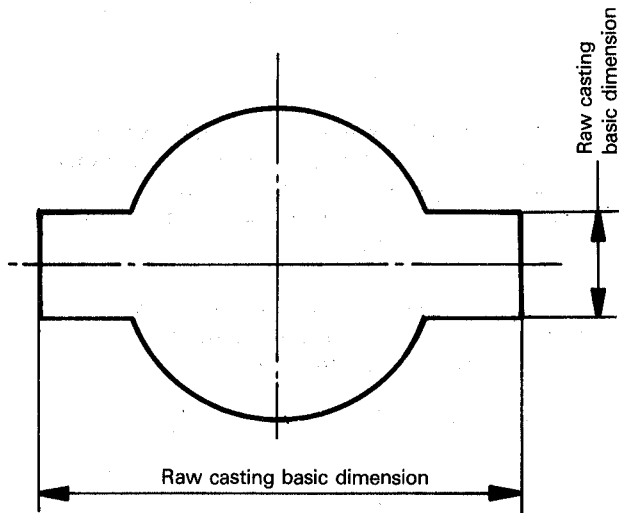


Figure 1 — Drawing indications
(see clause 3)

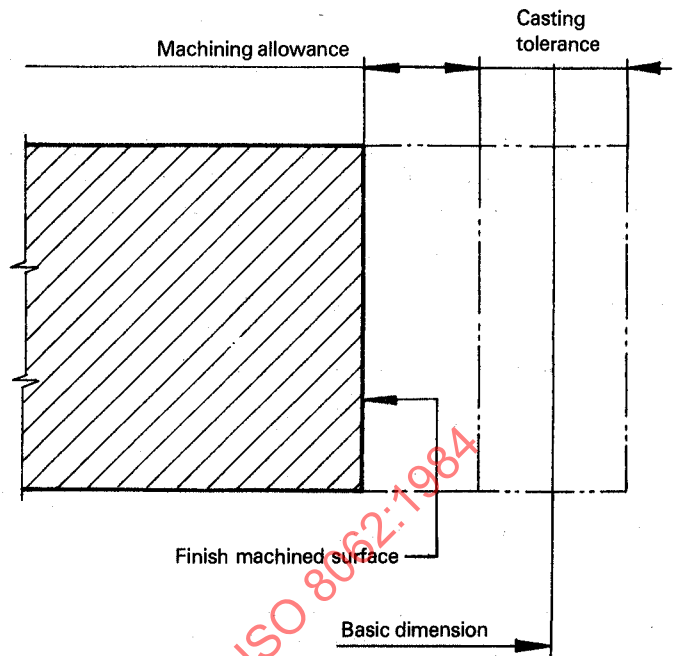


Figure 2 — Relationship of component with machining allowance showing the tolerance symmetrically disposed about the basic dimension

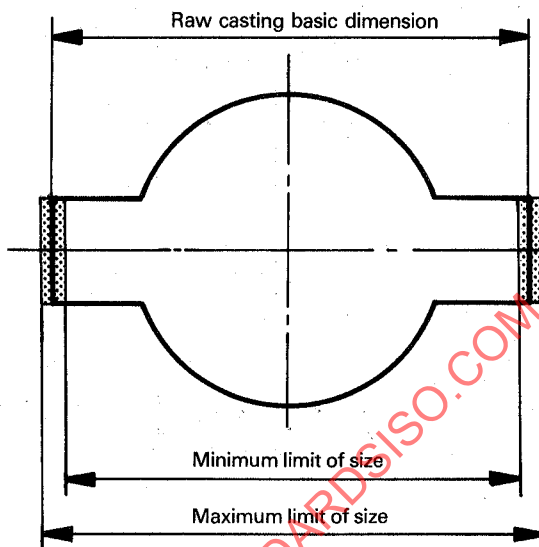


Figure 3 — Tolerance limits

NOTE — Any mismatch shall lie within the limits of size shown (see clauses 3, 4 and 5).

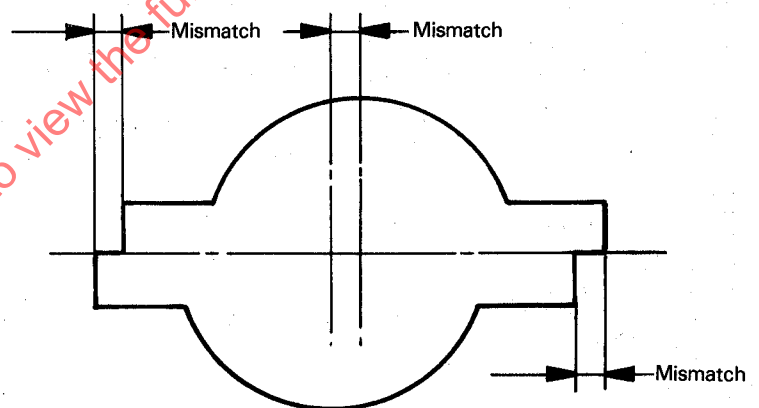


Figure 4 — Examples of mismatch
(see clause 5)

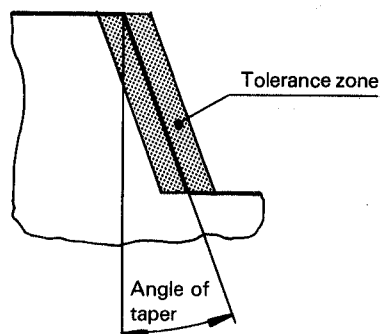


Figure 5 — Tapered feature
(see clause 7)