



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 6414-2017

**Castings -- Dimensional tolerances and geometrical tolerances
and machining allowances**

Issued on: December 29, 2017

Implemented on: December 29, 2017

Issued by: AQSIQ; SAC

Table of Contents

Foreword...	3
1 Scope...	5
2 Normative references...	5
3 Terms and definitions...	6
4 Dimension indication...	7
5 Tilt elements...	7
6 Abbreviated terms...	9
7 Tolerance grades...	9
8 Surface mismatch (SMI)...	14
9 Wall thickness tolerance...	15
10 Required machining allowance (RMA)...	15
11 Indication on drawings...	18
Annex A (Normative) Casting tolerances...	20

Foreword

This Standard is drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard replaces GB/T 6414-1999 "Castings - System of dimensional tolerances and machining allowances". Compared with GB/T 6414-1999, the main technical changes of this Standard are as follows.

- Modify some tolerance values of dimensional casting tolerances;
- Modify the tolerance grades that can be achieved during mass production of various alloy castings in Table A.1;
- ADD Table 1 Abbreviated terms;
- ADD Table 3~Table 7;
- Modify the tolerance grades of Table A.1 and Table A.3;
- Delete the previous Annex C; ADD new Annex C, D and E.

This Standard uses the redraft law to modify and adopt ISO 8062-3:2007

"Geometrical product specifications (GPS) - Dimensional and geometrical

tolerances for moulded parts - Part 3.General dimensional and geometrical tolerances and machining allowances for castings".

Compared with ISO 8062-3.2007, this Standard has many adjustments in structure. Annex E lists the comparison of clause-subclause number between this Standard and ISO 8062-3.2007.

The technical differences between this Standard and ISO 8062-3.2007 and their reasons are as follows.

- ADD the nominal dimension of casting and illustration in Clause 3 Terms and definitions;
- ADD Clause 4 Dimension indication;
- ADD Clause 5 Tilt elements;
- ADD the graphical description of required machining allowance in Clause 10.

This Standard has made the following editorial change.

- CHANGE the standard name to "Castings - Dimensional tolerances and geometrical tolerances and machining allowances".

This Standard was proposed by and shall be under the jurisdiction of National Technical Committee 54 on Foundry of Standardization Administration of China (SAC/TC 54).

Responsible drafting organization of this Standard. Shenyang Research Institute of Foundry.

Participating drafting organizations of this Standard. Anhui Research Institute of Mechanical Science, Anhui Yingliu Group Huoshan Casting Co., Ltd., Hefei Jianghuai Casting Co., Ltd., Anhui Shenjian Technology Co., Ltd., CRRC Qishuyan Institute Co., Ltd., Tianrun Crankshaft Co., Ltd., CITIC Dicastal Co., Ltd., Tederic Heavy Machinery Co., Ltd., Cixi Huili Machinery & Electric Co., Ltd., Henan Huaihai Jingcheng Industrial Technology Co., Ltd., Hebei Jianzhi Casting Group Ltd., Nanchang University, Dongfeng (Shiyan) Nonferrous

Casting Co., Ltd.

Main drafters of this Standard. Zhang Yin, Liu Dongmei, Wang Fang, Du Yingliu, Qian Kuncai, Jiang Tianfang, Li Yong, Zhao Yongzheng, Pei Bing, Wei Chuanying, Cong Jianchen, Cong Hongri, Bai Bangwei, Xie Mingli, Li Lifeng, Luo Yu, Liu Quanrong, Song Liang, Cheng Kai, Chang Wei, Ren JiuHong, Li Guolin, Yang Zhaoling, Ye Han.

The previous editions of the standard replaced by this Standard were released as follows.

- GB/T 6414-1986; GB/T 6414-1999.

Castings - Dimensional tolerances and geometrical tolerances and machining allowances

1 Scope

This Standard specifies the terms and definitions of dimensional tolerances, geometrical tolerances and machining allowances of castings, dimension indication method, dimensional casting tolerance grades, geometrical tolerance grades, required machining allowance grades and their indications on drawings.

2 Normative references

The following documents are indispensable for the application of this document.

For the dated references, only the editions with the dates indicated are applicable to this document. For the undated references, the latest edition (including all the amendments) are applicable to this document.

GB/T 131 Geometrical Product Specifications (GPS) - Indication of Surface texture in technical Product documentation

3 Terms and definitions

The terms and definitions defined in GB/T 5611 and the following ones apply to this document.

The taper on the pattern or core box wall parallel to the drawing direction, in

order to make the pattern easy to be taken out of the casting mould or the core escape from the core box.

4 Dimension indication

Except for wall thickness dimensioning (a dimension chain consisting of two dimensions is allowed), chain dimensioning shall be avoided.

5.3 The taper of a special surface, which is different from the general taper

arrangement on the drawing, shall be separately indicated on the surface. The indication shall comply with the provisions of GB/T 131, such as.

5.4 For the dimension to be machined, in order to obtain the finished dimension,

"taper +" shall be used; regardless of the general technical requirements for the taper on the drawing.

6 Abbreviated terms

Abbreviated terms are given in Table 1.

7 Tolerance grades

The nominal dimension used in Table 3~Table 6 is the largest nominal dimension of the casting structure. The nominal dimension of the fillet may be ignored and does not need to be indicated separately.

For general orientation tolerances, a datum system shall be specified on the drawing and identified by the indication "GB/T 6414-2017 DS" on the drawing.

Indication example.

8.3 If it is necessary to restrict the value of the surface mismatch, in accordance

with GB/T 24744, the maximum permissible surface mismatch shall be stated individually on the drawing.

9 Wall thickness tolerance

Unless otherwise specified, the wall thickness tolerances from DCTG1 to DCTG15 shall be one grade coarser than the general tolerances of other