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

GB/T 5153-2016

**Designation and composition of wrought magnesium and
magnesium alloys**

变形镁及镁合金牌号和化学成分

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Table of Contents

- 1 Scope
- 2 Normative References
- 3 Designation rules
- 4 Requirements
- 4.3 Composition analysis
- 4.4 Others
- Annex A

Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009. This Standard was proposed by China Iron and Steel Association. This Standard replaces GB/T 5153-2003, Designation and composition of wrought magnesium and magnesium alloys. Compared with GB/T 5153-2003, the major technical changes of this Standard are as follows: -- it adds element codes "J" and "V" to represent respectively elements "strontium (Sr)" and "gadolinium (Gd)"; -- it adds the expression method of limit values; -- based on the research and development of magnesium alloy system, it improves the alloy groups of magnesium alloy, including Mg-Al, Mg-Zn, Mg-Mn, Mg-RE, Mg-Gd, Mg-Y, Mg-Zr and Mg-Li; -- it adds the requirements for composition analysis and sampling; -- it adds 46 designations and compositions. This Standard was proposed by China Nonferrous Metals Industry Association. This Standard shall be under the jurisdiction of Technical Committee 243 on Nonferrous Metals of Standardization Administration of China (SAC/TC 243). The responsible drafting organization of this Standard. Northeast Light Alloy Co., Ltd.. The contributory drafting organizations of this Standard. Chongqing University, Qinghai Qaidam Qingyuan-Fanmei Technology Co., Ltd., Shanghai Jiaotong University, Central South University, Shandong Yinguang-Yuyuan Light Metal Precision Shaping Co., Ltd., Henan Yuhang Metal Materials Co., Ltd., Zibo Hongtai Science and Technology Co., Ltd., Xi'an Jiaotong University Suzhou Academy, Xi'an Sifang Ultra-light Materials Co., Ltd., National Centre for Quality Supervision and Inspection of Magnesium and Magnesium Alloy Products, Chongqing Magnesium Industry Technology Co., Ltd., Zhejiang Qixin Alloy Materials Co., Ltd., Ningxia Sun Magnesium Industry Co., Ltd.. The main drafters of this Standard. Ma Yue, Wang Qiang, Zhou Bing, Zhang Jing, Chai Donglang, Chai Xiang, Wang Yingxin, Yin Yunxia, Jiang Dejun, Pan Fusheng, Peng Liming, Yang Jianyuan, Liu Chuming, Li Qi, Wu Xiaoxu, Cai Zhi, Qian Yafeng, Li Ping, Zhao Xiaojun, Liu Junjun, Zhou Yuanfu. The previous editions of the standard replaced by this Standard are as follows: -- GB/T 5153-1985, GB/T 5153-2003. Designation and composition of wrought magnesium and

magnesium alloys

1 Scope

China's national standard fixing the designations and chemical compositions of wrought magnesium and magnesium alloys. Magnesium is the lightest structural metal - about two thirds the density of aluminium and a quarter that of steel - and wrought magnesium is the part of the field that has grown, because extrusions, sheet and forgings reach properties that castings do not. Its awkwardness is well known: a hexagonal crystal structure with few slip systems, so it is hard to form at room temperature and is worked warm, and its alloys are more sensitive to composition than aluminium's. A tenth of a per cent of iron, nickel or copper destroys the corrosion resistance completely, which is why the high-purity variants exist as separate designations. China produces most of the world's magnesium, so the designation system used here is the one the trade quotes. The standard applies to wrought magnesium and magnesium alloy products.

This Standard specifies the designations and chemical compositions of wrought magnesium and magnesium alloys. This Standard applies to wrought magnesium and magnesium alloy products.

2 Normative References

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to This Standard.

GB/T 8170, Rules of rounding off for numerical values and expression and judgement of limiting values

GB/T 13748 (all parts), Chemical analysis methods of magnesium and magnesium alloys

GB/T 17432, Methods for sampling for analyzing the chemical composition of wrought aluminum and aluminum alloys

ISO 3116.2007, Magnesium and magnesium alloys - Wrought magnesium alloys

3 Designation rules

3.1 The designation of pure magnesium is expressed in the form of Mg and digits, the digits behind Mg representing the mass fraction of Mg.

3.2 The designation of magnesium alloys is expressed in the form of English letters and digits and English letters. The front English letters are the major alloy element code (the element code as specified in Table 1); and the digits behind indicate the approximate content of the major alloy element.

4 Requirements

4.1 Chemical composition The designations and chemical compositions of wrought magnesium and magnesium alloys shall be as specified in Table

2. The blank "others" in the table refers to metallic elements not listed in the table. When the mass fraction in the table is a single value,

4.2 Sampling Sampling shall be as specified in GB/T 17432.

4.3 Composition analysis

4.3.1 Only carry out routine chemical analysis for the elements having value specifications in Table 2, excluding "magnesium" and "others".

4.3.2 When it is doubted that the mass fraction of some elements of "-" and "others" not listed in Table 2 exceeds their "single" or "total" limit value in this Standard, these elements can be analyzed.

4.3.3 Chemical composition is analyzed in accordance with the method specified in

4.4 Others

4.4.1 The digits of the mass fraction of the elements given in the chemical composition analysis report shall be consistent with the digits of the corresponding designations specified in Table 2.

4.4.2 The rules of rounding off of numerical values are as specified in GB/T 8170.

4.4.3 For the table of cross-references between the new and old designations see Annex A.

Annex A

(Normative) Cross-references between the new and old designations For the table of cross-references between the new and old designations (including the registered designations applied for after the issuance of GB/T 5153-2003) see Table A.1.