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National Standard of the People's Republic of China

GB/T 5153-202X

Designation and chemical composition of wrought magnesium and magnesium alloy

变形镁及镁合金牌号和化学成分

(English Translation)

（送审稿）

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Foreword

SAC/TC 243 is in charge of this English translation. In case of any doubt about the contents of English translation, the Chinese original shall be considered authoritative.

本文件按照GB/T 1.1-2020《标准化工作导则 第1部分：标准化文件的结构和起草规则》的规定起草。

This document is drafted in accordance with the rules given in the GB / T 1.1 2020 *Directives for standardization—Part 1: Rules for the structure and drafting of standardizing standards*

本文件代替GB/T 5153-2016《变形镁及镁合金牌号和化学成分》，与GB/T 5153-2016相比，除结构调整和编辑性改动外，主要技术变化如下：

This document replaces the GB/T 5153-2016 *Designation and composition of wrought magnesium and magnesium alloys* in whole. In addition to a number of structural adjustments and editorial changes, the following technical deviations have been made with respect to the GB/T 5153-2016:

a） 更改了标准适用范围（见第1章，2016年版第1章）；

a) Revised the scope of application of the document (see Clause 1, Clause 1 of the 2016 edition);

b） 更改了纯镁牌号的表示方法（见4.1，2016年版3.1）；

b) Revised the designation system for pure magnesium (see 4.1, 3.1 of the 2016 edition);

c） 更改了“Ca”元素的代号（见4.2，2016年版3.2）；

c) Revised the code for the "Ca" element (see 4.2, 3.2 of the 2016 edition);

d） 增加了Mg9999、Mg9995A、Mg9995B、Mg9990、AZ81A、AZ92A、AW70M、EK20M、EK30M、EZ30Z、VW84N、VW91M、VW93M、VW94M、LZ91M、LZ91N、LA93M、LA93Z、LA141M共计19个牌号和化学成分（见5.1）；

d) Added a total of 19 designations and their chemical compositions: Mg9999, Mg9995A, Mg9995B, Mg9990, AZ81A, AZ92A, AW70M, EK20M, EK30M, EZ30Z, VW84N, VW91M, VW93M, VW94M, LZ91M, LZ91N, LA93M, LA93Z, LA141M (see 5.1);

e） 增加了纯镁牌号（不小于99.00%）的“Mg”元素含量的计算方法（见5.3.4）；

e) Added the calculation method for the "Mg" element content in pure magnesium designations (not less than 99.00%) (see 5.3.4);

f） 增加了不活跃合金的牌号和化学成分（见附录A）。

f) Added designations and chemical compositions for inactive alloys (see Annex A).

请注意本文件的某些内容可能涉及专利。本文件的发布机构不承担识别专利的责任。

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本文件由中国有色金属工业协会提出。

This document was proposed by China Nonferrous Metals Industry Association.

本文件由全国有色金属标准化技术委员会（SAC/TC 243）归口。

This document was prepared by SAC/TC 243 National Technical Committee for Standardization of Nonferrous Metals.

本文件于1985年首次发布，2003年第一次修订，2016年第二次修订，本次为第三次修订。

This document was issued in 1985 as the first edition, was first revised in 2003, was second revised in 2016, and this is the third revision.

变形镁及镁合金牌号和化学成分

Designation and chemical composition of wrought magnesium and magnesium alloy

1 范围 Scope

本文件规定了变形镁及镁合金牌号和化学成分。

This document specifies the designations and chemical compositions of wrought magnesium and magnesium alloys.

本文件适用于变形镁及镁合金铸锭、板材、带材、箔材、管材、棒材、型材、线材、锻件等加工产品的牌号命名及化学成分确定。

This document is applicable to the designation system and determination of chemical compositions for wrought magnesium and magnesium alloy processed products such as ingots, sheets / plates, strips, foils, tubes, rods / bars, profiles, wires, forgings, etc.

2 规范性引用文件 Normative references

下列文件中的内容通过文中的规范性引用而构成本文件必不可少的条款。其中，注日期的引用文件，仅该日期对应的版本适用于本文件；不注日期的引用文件，其最新版本（包括所有的修改单）适用于本文件。

The following normative documents contain provisions which, through reference in this text,constitute provisions 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.

GB/T 8170　数值修约规则与极限数值的表示和判定

GB/T 8170 *Rules of rounding off for numerical values & expression and judgment of limiting values*

GB/T 13748（所有部分）　镁及镁合金化学分析方法

GB/T 13748 *(all parts) Methods for chemical analysis of magnesium and magnesium alloys*

3 术语和定义 Terminologies and definitions

本文件没有需要界定的术语和定义。

For the purposes of this document, no terms or definitions shall apply.

4 牌号的表示方法 Designation system

4.1 镁含量不小于99.00%时为纯镁，其牌号以符号“Mg”加数字的形式表示，符号“Mg”后的数字表示镁元素的质量分数。数字后面可增加1位英文字母作为标识代号，没有特殊意义，用于区分镁元素含量相同但其他元素含量略有差异的牌号。

When the magnesium content is not less than 99.00%, it is considered pure magnesium. Its designation is represented by the symbol “Mg” followed by a number. The number after the symbol “Mg” indicates the mass fraction of the magnesium element. One English letter may be added to the number as an identification code, which has no special meaning and is used

to distinguish designations with the same magnesium content but slightly different contents of other elements.

4.2 镁合金牌号以1位或2位英文字母加数字再加英文字母的形式表示。前面的英文字母代表除镁元素外名义含量（即含量范围的中位数）最高（和次高）的主要元素代号，元素代号见表1。数字代表主要元素的名义含量。数字后面的英文字母为标识代号，没有特殊意义，用于区分主要元素含量相同但其他元素含量略有差异的牌号。

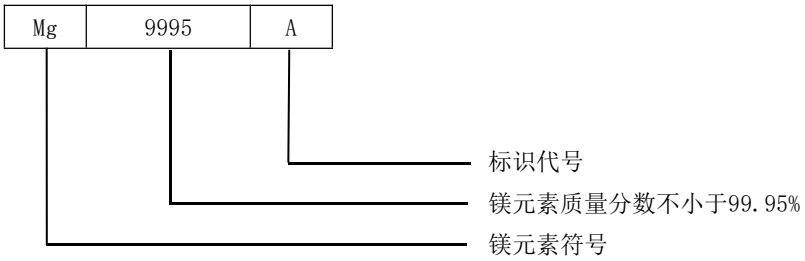
The designation of magnesium alloys is represented by one or two English letters, followed by a number and then an English letter. The preceding English letter(s) represents the main element code(s) for the element(s) with the highest (and second highest) nominal content (i.e., the median of the content range) besides magnesium. The element codes are listed in Table 1. The number represents the nominal content of the main element(s). The English letter after the number is an identification code, which has no special meaning and is used to distinguish designations with the same main element contents but slightly different contents of other elements.

表1 元素对应的元素代号

Table 1—Element codes corresponding to elements

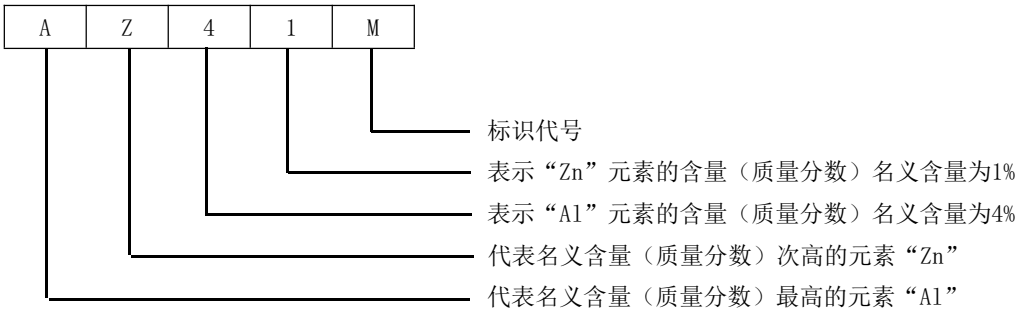
元素名称 Element name	元素代号 Element code	元素名称 Element name	元素代号 Element code
铝（Al） Aluminum	A	镍（Ni）	N
铋（Bi） Bismuth	B	铅（Pb）	P
铜（Cu） Copper	C	银（Ag）	Q
镉（Cd） Cadmium	D	铬（Cr）	R
稀土（RE） Rare Earth	E	硅（Si）	S
铁（Fe） Iron	F	锡（Sn）	T
钍（Th） Thorium	H	钆（Gd）	V
锶（Sr） Strontium	J	钇（Y）	W
锆（Zr） Zirconium	K	钙（Ca）	X
锂（Li） Lithium	L	锑（Sb）	Y
锰（Mn） Manganese	M	锌（Zn）	Z

示例 1：EXAMPLE 1



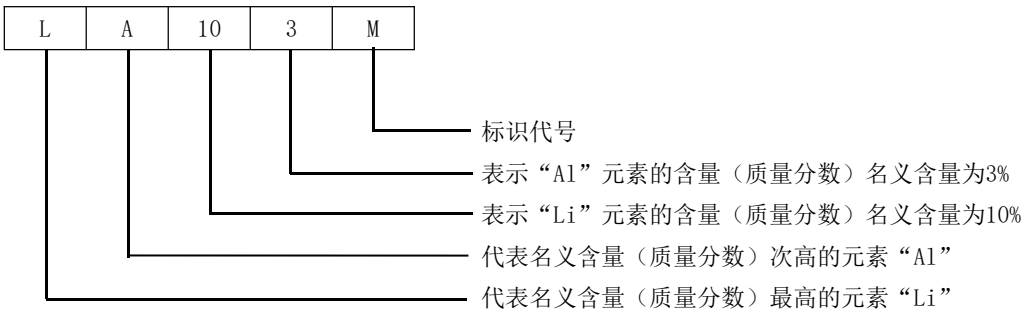
Identification code
Magnesium element mass fraction not less than 99.95%
Magnesium element symbol

示例 2：EXAMPLE 2



Identification code
Represents the nominal content (mass fraction) of the “Zn” element as 1%
Represents the nominal content (mass fraction) of the “Al” element as 4%
Represents the element “Zn” with the second highest nominal content (mass fraction)
Represents the element “Al” with the highest nominal content (mass fraction)

示例 3：EXAMPLE 3



Identification code
Represents the nominal content (mass fraction) of the “Al” element as 3%
Represents the nominal content (mass fraction) of the “Li” element as 10%
Represents the element “Al” with the second highest nominal content (mass fraction)
Represents the element “Li” with the highest nominal content (mass fraction)

5 技术要求 Technical requirements

5.1 化学成分 Chemical compositions

变形镁及镁合金化学成分中元素极限数值的表示应符合表 2 的规定。变形镁及镁合金牌号和化学成分应符合表 3、表 A.1 的规定。

The expression of limiting values for elements in the chemical composition of wrought magnesium and magnesium alloys shall conform to the provisions of Table 2. The designations and chemical compositions of wrought magnesium and magnesium alloys shall conform to the provisions of Table 3 and Table A.1.

表 2 元素极限数值的表示

Table 2—Expression of element limiting values

元素极限数值 Element limiting value	极限数值表示形式 Limiting value expression format
＜0.001% less than 0.001%	0.000X
0.001% to ＜0.01% 0.001% to 0.01%	0.00X
0.01% to ＜0.10% 0.001% to 0.01%	0.0X
0.10% to 0.55% 0.10% to 0.55%, incl.	0.XX
＞0.55% over 0.55%	0.X、X.X、XX.X 0.X, X.X, XX.X

表3 变形镁及镁合金牌号和化学成分

Table 3—Designations and chemical compositions of wrought magnesium and magnesium alloys

合金组别 Alloy group	牌号 Designation	化学成分（质量分数） Chemical composition(mass fraction) %											
		Al	Zn	Mn	Zr	Li	Si	Fe	Cu	Ni	其他 Others		Mg
											单个 Each	合计 Total	
Mg	Mg9999	0.002	0.003	0.002	—	—	0.002	0.002	0.0003	0.0003	Pb: 0.001 Sn: 0.001 Ti: 0.0005	0.003	0.01	99.99
	Mg9995A	0.008	0.005	0.006	—	—	0.006	0.003	0.002	0.001	Pb: 0.005 Sn: 0.005	0.005	0.05	99.95
	Mg9995B	0.015	0.01	0.015	—	—	0.015	0.005	0.002	0.001	Pb: 0.005 Sn: 0.005	0.01	0.05	99.95
	Mg9990	0.02	—	0.03	—	—	0.03	0.04	0.004	0.001	—	0.01	0.10	99.90
MgAlLi	AL32M	2.5 to 3.5, incl.	0.50 to 0.8, incl.	0.20 to 0.40, incl.	—	1.0 to 3.0, incl.	0.01	0.005	0.0015	0.001	—	0.02	0.15	余量 Remainder
MgAlAg	AQ80M	7.5 to 8.5, incl.	0.35 to 0.55, incl.	0.15 to 0.35, incl.	—	—	0.05	0.02	0.02	0.001	Ag: 0.02 to 0.8, incl. RE: 0.01 to 0.10, incl. Ca: 0.001 to 0.02, incl.	0.01	0.30	余量 Remainder
MgAlY	AW70M	6.5 to 8.5, incl.	—	0.10 to 0.20, incl.	—	—	0.02	0.005	0.001	0.001	Y: 0.10 to 0.25, incl.	0.01	0.30	余量 Remainder
MgAlZn	AZ31B	2.5 to 3.5, incl.	0.6 to 1.4, incl.	0.20 to 1.0, incl.	—	—	0.08	0.003	0.01	0.001	Ca: 0.04	0.05	0.30	余量 Remainder
	AZ31C	2.4 to 3.6, incl.	0.50 to 1.5, incl.	0.15 to 1.0, incl.[a]	—	—	0.10	—	0.10	0.03	—	—	0.30	余量 Remainder
	AZ33M	2.6 to 4.2, incl.	2.2 to 3.8, incl.	—	—	—	0.10	0.008	0.005	—	—	0.01	0.30	余量 Remainder
	AZ40M	3.0 to 4.0, incl.	0.20 to 0.8, incl.	0.15 to 0.50, incl.	—	—	0.10	0.05	0.05	0.005	Be: 0.01	0.01	0.30	余量 Remainder
	AZ41M	3.7 to 4.7,	0.8 to 1.4, incl.	0.30 to 0.6,	—	—	0.10	0.05	0.05	0.005	Be: 0.01	0.01	0.30	余量

		incl.		incl.										Remainder
	AZ61A	5.8 to 7.2, incl.	0.40 to 1.5, incl.	0.15 to 0.50, incl.	—	—	0.10	0.005	0.05	0.005	—	—	0.30	余量 Remainder
	AZ61M	5.5 to 7.0, incl.	0.50 to 1.5, incl.	0.15 to 0.50, incl.	—	—	0.10	0.05	0.05	0.005	Be:0.01	0.01	0.30	余量 Remainder
	AZ62M	5.0 to 7.0, incl.	2.0 to 3.0, incl.	0.20 to 0.50, incl.	—	—	0.10	0.05	0.05	0.005	Be:0.01	0.01	0.30	余量 Remainder

表 3 变形镁及镁合金牌号和化学成分（续）

Table 3—Designations and chemical compositions of wrought magnesium and magnesium alloys (*continued*)

合金组别 Alloy group	牌号 Designation	化学成分（质量分数）% Chemical composition (mass fraction) %												
		Al	Zn	Mn	Zr	Li	Si	Fe	Cu	Ni	其他 Others		Mg
												单个 Each	合计 Total	
MgAlZn	AZ63B	5.3 to 6.7, incl.	2.5 to 3.5, incl.	0.15 to 0.6, incl.	—	—	0.08	0.003	0.01	0.001	—	—	0.30	余量 Remainder
	AZ80A	7.8 to 9.2, incl.	0.20 to 0.8, incl.	0.12 to 0.50, incl.	—	—	0.10	0.005	0.05	0.005	—	—	0.30	余量 Remainder
	AZ80M	7.8 to 9.2, incl.	0.20 to 0.8, incl.	0.15 to 0.50, incl.	—	—	0.10	0.05	0.05	0.005	Be:0.01	0.01	0.30	余量 Remainder
	AZ81A	7.2 to 8.0, incl.	0.50 to 0.9, incl.	0.15 to 0.35, incl.	—	—	0.20	—	0.08	0.01	—	—	0.30	余量 Remainder
	AZ91D	8.5 to 9.5, incl.	0.45 to 0.9, incl.	0.17 to 0.40, incl.	—	—	0.08	0.004	0.02	0.001	Be:0.0005 to 0.003, incl.	0.01	0.30	余量 Remainder
	AZ92A	8.3 to 9.7, incl.	1.6 to 2.4, incl.	0.10 to 0.35, incl.	—	—	0.30	—	0.25	0.01	—	—	0.30	余量 Remainder
MgREZr	EK20M	—	0.15 to 0.30, incl.	—	0.25 to 0.50, incl.	—	0.005	0.002	0.002	0.002	Nd:2.0 to 2.5, incl.	0.005	0.05	余量 Remainder
	EK30M	—	0.15 to 0.30, incl.	—	0.25 to 0.50, incl.	—	0.005	0.002	0.002	0.002	Nd:2.6 to 3.2, incl.	0.01	0.10	余量 Remainder
MgREZn	EZ30Z	—	0.14 to 0.7,	0.05	0.30 to 1.0,	—	0.01	0.01	0.03	0.005	RE: 2.0 to 3.5,	0.01	0.30	余量

			incl.		incl.						incl.[b] Ca: 0.50			Remainder
MgLiAl	LA43M	2.5 to 3.5, incl.	2.5 to 3.5, incl.	—	—	3.5 to 4.5, incl.	0.50	0.05	0.05	—	—	0.05	0.30	余量 Remainder
	LA93M	2.5 to 3.8, incl.	0.50 to 1.5, incl.	0.05	—	8.0 to 10.0, incl.	0.05	0.01	0.05	0.005	—	0.02	0.30	余量 Remainder
	LA93Z	2.5 to 3.5, incl.	2.5 to 3.5, incl.	0.05	—	8.5 to 10.3, incl.	0.05	0.01	0.05	0.005	—	0.02	0.30	余量 Remainder
	LA103M	2.5 to 3.5, incl.	0.8 to 1.8, incl.	—	—	9.5 to 10.5, incl.	0.50	0.05	0.05	—	—	0.05	0.30	余量 Remainder
	LA103Z	2.5 to 3.5, incl.	2.5 to 3.5, incl.	—	—	9.5 to 10.5, incl.	0.50	0.05	0.05	—	—	0.05	0.30	余量 Remainder
	LA141M	0.50 to 1.5, incl.	—	0.05	—	13.0 to 15.0, incl.	0.05	0.01	0.05	0.005	—	0.02	0.30	余量 Remainder
MgLiZn	LZ91M	—	0.8 to 1.5, incl.	—	—	8.5 to 9.8, incl.	0.50	0.02	0.04	0.005	—	0.05	0.30	余量 Remainder
	LZ91N	—	0.50 to 1.5, incl.	0.05	—	8.5 to 9.5, incl.	0.05	0.01	0.05	0.005	—	0.05	0.30	余量 Remainder
MgMn	M1A	—	—	1.2 to 2.0, incl.	—	—	0.10	—	0.05	0.01	Ca:0.30	—	0.30	余量 Remainder
	M1C	0.01	—	0.50 to 1.3, incl.	—	—	0.05	0.01	0.01	0.001	—	0.05	0.30	余量 Remainder
	M2M	0.20	0.30	1.3 to 2.5, incl.	—	—	0.10	0.05	0.05	0.007	Be: 0.01	0.01	0.20	余量 Remainder

表 3 变形镁及镁合金牌号和化学成分（续）

Table 3—Designations and chemical compositions of wrought magnesium and magnesium alloys (*continued*)

合金组别 Alloy group	牌号 Designation	化学成分（质量分数） % Chemical composition (mass fraction) %												
		Al	Zn	Mn	Zr	Li	Si	Fe	Cu	Ni		其他 Others		Mg
												单个 Each	合计 Total	

MgMnRE	ME20M	0.20	0.30	1.3 to 2.2, incl.	—	—	0.10	0.05	0.05	0.007	Ce: 0.15 to 0.35, incl. Be: 0.01	0.01	0.30	余量 Remainder
MgGdY	VW64M	—	0.30 to 1.0, incl.	—	0.30 to 0.7, incl.	—	0.05	0.02	0.02	0.001	Gd: 5.5 to 6.5, incl. Y: 3.0 to 4.5, incl. Ag: 0.20 to 1.0, incl. Ca: 0.002 to 0.02, incl.	0.01	0.30	余量 Remainder
	VW75M	0.01	—	0.10	0.40 to 1.0, incl.	—	0.01	—	0.10	0.004	Gd: 6.5 to 7.5, incl. Y: 4.6 to 5.7, incl. Nd: 0.9 to 1.5, incl.	—	0.30	余量 Remainder
	VW83M	0.02	0.10	0.05	0.40 to 0.6, incl.	—	0.05	0.01	0.02	0.005	Gd: 8.0 to 9.0, incl. Y: 2.8 to 3.5, incl.	0.01	0.15	余量 Remainder
	VW84M	—	1.0 to 2.0, incl.	0.6 to 1.0, incl.	—	—	0.05	0.01	0.02	0.005	Gd: 7.5 to 9.0, incl. Y: 3.5 to 5.0, incl.	0.01	0.15	余量 Remainder
	VW84N	—	—	0.6 to 1.0, incl.	—	—	0.05	0.01	0.02	1.0 to 3.0, incl.	Gd: 7.9 to 9.0, incl. Y: 3.5 to 5.0, incl.	0.02	0.20	余量 Remainder
	VW91M	—	0.30	0.10	0.30 to 0.6, incl.	—	0.02	0.02	0.02	0.005	Gd: 8.7 to 10.2, incl. Y: 0.02 to 2.0, incl.	0.01	0.15	余量 Remainder
	VW93M	—	—	—	0.30 to 0.7, incl.	—	0.02	0.02	0.005	0.003	Gd: 8.0 to 9.6, incl. Y: 1.8 to 3.2, incl. Ag: 0.02 to 0.50, incl. Er: 0.02 to 0.30, incl.	0.01	0.10	余量 Remainder
	VW94M	—	0.8 to 1.5, incl.	—	0.40 to 0.7, incl.	—	—	0.005	0.005	0.005	Gd: 8.5 to 9.5, incl. Y: 3.5 to 4.5, incl.	0.02	0.30	余量 Remainder
MgYRE	WE43B	—	—	0.03	0.40 to 1.0, incl.	0.20	—	0.01	0.02	0.005	Y: 3.7 to 4.3, incl. Nd: 2.0 to 2.5, incl. 其他稀土元素: 1.9[c] Other rare earth elements: 1.9[c] Zn+Ag: 0.20	0.01	0.30	余量 Remainder
	WE43C	—	0.06	0.03	0.20 to 1.0, incl.	0.05	—	0.005	0.02	0.002	Y: 3.7 to 4.3, incl. Nd: 2.0 to 2.5, incl. 其他稀土元素: 0.30 to 1.0, incl.[d] Other rare earth elements: 0.30 to 1.0, incl.[d]	0.01	0.30	余量 Remainder
	WE54A	—	0.20	0.03	0.40 to 1.0, incl.	0.20	0.01	—	0.03	0.005	Y: 4.8 to 5.5, incl. Nd: 1.5 to 2.0, incl. 其他稀土元素: 2.0[c] Other rare earth elements: 2.0[c]	0.20	0.30	余量 Remainder

表3 变形镁及镁合金牌号和化学成分（续）

Table 3—Designations and chemical compositions of wrought magnesium and magnesium alloys (*continued*)

合金组别 Alloy group	牌号 Designation	化学成分（质量分数）% Chemical composition (mass fraction) %										其他 Others		Mg
		Al	Zn	Mn	Zr	Li	Si	Fe	Cu	Ni		单个 Each	合计 Total	
MgYRE	WE83M	0.01	—	0.10	0.40 to 1.0, incl.	—	0.01	—	0.10	0.004	Y: 7.4 to 8.5, incl. Nd: 2.4 to 3.4, incl.	—	0.30	余量 Remainder
	WE93M	0.10	—	—	0.40 to 1.0, incl.	—	0.01	—	—	0.004	Y: 8.2 to 9.5, incl. RE: 2.5 to 3.7, incl.[e]	—	0.30	余量 Remainder
MgZnMn	ZM21M	—	1.0 to 2.5, incl.	0.50 to 1.5, incl.	—	—	0.01	0.005	0.10	0.004	—	—	0.30	余量 Remainder
	ZM51M	—	4.5 to 6.0, incl.	0.50 to 2.0, incl.	—	—	0.01	0.005	0.10	0.004	—	—	0.30	余量 Remainder
MgZnZr	ZK40A	—	3.5 to 4.5, incl.	—	0.45 to 0.9, incl.	—	—	—	—	—	—	—	0.30	余量 Remainder
	ZK60A	—	4.8 to 6.2, incl.	—	0.45 to 0.9, incl.	—	—	—	—	—	—	—	0.30	余量 Remainder
	ZK61M	0.05	5.0 to 6.0, incl.	0.10	0.30 to 0.9, incl.	—	0.05	0.05	0.05	0.005	Be: 0.01	0.01	0.30	余量 Remainder

注 1：表中元素含量为单个数值时，“Mg”元素含量为最低限，其他元素含量为最高限。

NOTE 1: When the element content in the table is a single value, the “Mg” element content is the minimum limit, and the content of other elements is the maximum limit.

注 2：元素栏中“—”表示该位置不规定极限数值，对应元素为非常规分析元素，“其他”栏中“—”表示无极限数值要求。

NOTE 2: In the element columns, “—” indicates that no limiting value is specified for that position, and the corresponding element is non-routine analysis element. In the “Others” columns, “—” indicates no limiting value requirement.

注 3：“其他”表示表中未规定极限数值的元素和未列出的金属元素。

NOTE 3: “Others” refers to elements for which no limiting values are specified in the table and metallic elements not listed.

注 4：“合计”表示质量分数不小于 0.010%的“其他”金属元素之和。

NOTE 4: “Total” refers to the sum of the mass fraction of “Others” metallic elements with a mass fraction not less than 0.010%.

[a] 铁元素含量不大于 0.005%时，锰元素的最小极限值不做要求。

[a] When iron content is not greater than 0.005%, the minimum limiting value for Mg is not required.

[b] 稀土为富钕混合稀土或纯钕稀土。当稀土为富钕混合稀土时，钕含量占比不小于 85%。

[b] Rare earth refers to neodymium-rich mixed rare earth or pure neodymium rare earth. When rare earth is neodymium-rich mixed rare earth, the neodymium content is not less than 85%.

[c] 其他稀土元素为中重稀土，例如：钆、镝、铒、镱。其他稀土源生自钇，典型为钇含量占比为 80%、重稀土含量占比为 20%。

[c] Other rare earth elements are medium and heavy rare earths, such as gadolinium, dysprosium, erbium, ytterbium. Other rare earths originate from yttrium, typically with yttrium content accounting for 80% and heavy rare earth content accounting for 20%.

[d] 其他稀土元素为中重稀土，例如：钆、镝、铒、钐和镱。钆+镝+铒含量（质量分数）为 0.30% to 1.0%。钐含量（质量分数）不大于 0.04%，镱含量（质量分数）不大于 0.02%。

[d] Other rare earth elements are medium and heavy rare earths, such as gadolinium, dysprosium, erbium, samarium, and ytterbium. The content (mass fraction) of gadolinium + dysprosium + erbium is 0.30% – 1.0%. The content (mass fraction) of samarium is not greater than 0.04%, and the content (mass fraction) of ytterbium is not greater than 0.02%.

[e] 稀土为富铈混合稀土，其中铈含量占比为 50%、镧含量占比为 30%、钕含量占比为 15%、镨含量占比为 5%。

[e] Rare earth refers to cerium-rich mixed rare earth, with cerium content accounting for 50%, lanthanum content accounting for 30%, neodymium content accounting for 15%, and praseodymium content accounting for 5%.

5.2 其他 Miscellaneous

5.2.1 不活跃合金的牌号和化学成分应符合附录 A 的规定。
The designations and chemical compositions of inactive alloys shall conform to the provisions of Annex A.
5.2.2 本文件牌号与曾用牌号对照关系见附录 B。
The correspondence between the designations in this document and previously used designations is shown in Annex B.

6 成分分析 Composition analysis

6.1.1 仅对表 3、表 A.1 中“Mg”及“其他”栏之外有数值规定的元素进行常规分析。当怀疑非常规分析元素的质量分数超出了本文件的极限数值时，生产者应对这些元素进行分析。
Routine analysis shall be performed only for elements with specified numerical values in Table 3 and Table A.1, excluding the “Mg” and “Others” columns. When it is suspected that the mass fraction of non-routine analysis elements exceeds the limiting values specified in this document, the producer shall analyze these elements.
6.1.2 表 3、表 A.1 的化学成分分析方法采用 GB/T 13748（所有部分）规定的方法进行，也可采用其他准确可靠的方法，仲裁分析按照 GB/T 13748（所有部分）或供需双方协商确定的方法进行。
The chemical composition analysis methods for Table 3 and Table A.1 shall be conducted in accordance with the methods specified in GB/T 13748 (all parts). Alternatively, other accurate and reliable methods may be used. For arbitration analysis, the methods shall conform to GB/T 13748 (all parts) or be determined through negotiation between the supplier and the purchaser.
6.1.3 计算表 3、表 A.1 中“其他”的“合计”时，求和前各元素分析数值应表示到 0.XX%。
When calculating the “Total” of “Others” in Table 3 and Table A.1, the analytical values of each element shall be expressed as 0.XX% before summation.
6.1.4 表 3、表 A.1 中纯镁牌号的“Mg”元素含量采用计算法确定：
The “Mg” element content for pure magnesium designations in Table 3 and Table A.1 shall be determined by calculation:

——当“Mg”元素含量为99.00%到99.90%时，用100%减去所有质量分数不小于0.010%的常规分析元素与怀疑超量的非常规分析的金属元素的和，求和前各元素数值应表示到0.0X%；
When the “Mg” element content is 99.00% to 99.90%, subtract the sum of all routine analysis elements with a mass fraction not less than 0.010% and any non-routine analysis metallic elements suspected to exceed limits from 100%. The values of each element before summation shall be expressed as 0.0X%.

——当“Mg”元素含量为＞99.90%到99.99%时，用100%减去所有质量分数不小于0.0010%的常规分析元素与怀疑超量的非常规分析的金属元素的和，求和前各元素数值应表示到0.0XX%，求和后将总和修约到0.0X%。
When the “Mg” element content is over 99.90% to 99.99%, subtract the sum of all routine analysis elements with a mass fraction not less than 0.0010% and any non-routine analysis metallic elements suspected to exceed limits from 100%. The values of each element before summation shall be expressed as 0.0XX%, and the total sum shall be rounded to 0.0X% after summation.

6.1.5 分析数值的判定采用修约比较法，数值修约规则按 GB/T 8170 的有关规定进行，修约数位应与本文件中表 3、表 A.1 规定的极限数位一致。
The judgement of analytical values shall adopt the rounding comparison method. The rules for rounding numerical values shall follow the relevant provisions of GB/T 8170, and the rounding digit shall conform to the limiting value digit specified in Table 3 and Table A.1 of this document.

7 取样 Sampling

化学成分分析取样参照 GB/T 17432 进行。

Sampling for chemical composition analysis refers to GB/T 17432.

附录 A
Annex A
（规范性）
(Normative)
不活跃合金的牌号和化学成分
Designations and chemical compositions of inactive alloys

不活跃合金的牌号和化学成分见表 A.1。
The designations and chemical compositions of inactive alloys are shown in Table A.1.

表 A.1 不活跃合金的牌号和化学成分
Table A.1—Designations and chemical compositions of inactive alloys

合金组别 Alloy group	牌号 Designation	化学成分（质量分数）% Chemical composition (mass fraction) %												
		Al	Zn	Mn	Zr	Li	Si	Fe	Cu	Ni		其他 Others		Mg
												单个 Each	合计 Total	
MgAlRE	AE90M	8.0 to 9.5, incl.	0.30 to 0.9, incl.	—	—	—	0.01	0.005	0.10	0.004	RE: 0.20 to 1.2, incl.[a]	—	0.20	余量 Remainder
MgAlSr	AJ31M	2.5 to 3.5, incl.	0.20	0.6 to 0.8, incl.	—	—	0.10	0.02	0.05	0.005	Sr: 0.9 to 1.5, incl.	0.05	0.15	余量 Remainder
MgAlMn	AM41M	3.0 to 5.0, incl.	—	0.50 to 1.5, incl.	—	—	0.01	0.005	0.10	0.004	—	—	0.30	余量 Remainder
	AM81M	7.5 to 9.0, incl.	0.20 to 0.50, incl.	0.50 to 2.0, incl.	—	—	0.01	0.005	0.10	0.004	—	—	0.30	余量 Remainder
	AM91M	8.0 to 10.0, incl.	—	0.50 to 1.2, incl.	—	—	0.008	0.009	—	—	—	0.02	0.20	余量 Remainder
MgAlSn	AT11M	0.50 to 1.2, incl.	—	0.10 to 0.30, incl.	—	—	0.01	0.004	—	—	Sn: 0.6 to 1.2, incl.	0.01	0.15	余量 Remainder
	AT51M	4.5 to 5.5, incl.	—	0.20 to 0.50, incl.	—	—	0.02	0.005	—	—	Sn: 0.8 to 1.3, incl.	0.05	0.15	余量 Remainder
	AT61M	6.0 to 6.8, incl.	—	0.20 to 0.40, incl.	—	—	0.02	0.005	—	—	Sn: 0.7 to 1.3, incl.	0.05	0.15	余量 Remainder

MgAlY	AW90M	8.0 to 9.5, incl.	0.30 to 0.9, incl.	—	—	—	0.01	—	0.10	0.004	Y: 0.20 to 1.2, incl.	—	0.20	余量 Remainder
MgAlZn	AZ31D	2.5 to 3.5, incl.	0.6 to 1.4, incl.	0.20 to 1.0, incl.	—	—	0.05	0.002	0.04	0.001	Ca: 0.04, incl.	0.01	0.30	余量 Remainder
	AZ30M	2.2 to 3.2, incl.	0.20 to 0.50, incl.	0.20 to 0.40, incl.	—	—	0.01	0.005	0.0015	0.0005	Ce: 0.05 to 0.08, incl.	0.01	0.15	余量 Remainder
	AZ31N	2.5 to 3.5, incl.	0.50 to 1.5, incl.	0.20 to 0.40, incl.	—	—	0.05	0.0008	—	—	—	0.02	0.15	余量 Remainder
	AZ31S	2.4 to 3.6, incl.	0.50 to 1.5, incl.	0.15 to 0.40, incl.	—	—	0.10	0.005	0.05	0.005	—	0.05	0.30	余量 Remainder
	AZ31T	2.4 to 3.6, incl.	0.50 to 1.5, incl.	0.05 to 0.40, incl.	—	—	0.10	0.05	0.05	0.005	—	0.05	0.30	余量 Remainder
	AZ61S	5.5 to 6.5, incl.	0.50 to 1.5, incl.	0.15 to 0.40, incl.	—	—	0.10	0.005	0.05	0.005	—	0.05	0.30	余量 Remainder
	AZ80S	7.8 to 9.2, incl.	0.20 to 0.8, incl.	0.12 to 0.40, incl.	—	—	0.10	0.005	0.05	0.005	—	0.05	0.30	余量 Remainder
	AZ91B	8.5 to 9.5, incl.	0.45 to 0.9, incl.	0.15 to 0.40, incl.	—	—	0.20	—	0.25	0.01	—	—	0.30	余量 Remainder
MgREZn	EZ22M	0.001	1.2 to 2.0, incl.	0.01	0.10 to 0.50, incl.	—	0.0005	0.001	0.001	0.0001	Er: 2.0 to 3.0	0.01	0.15	余量 Remainder
MgLiAl	LA86M	5.5 to 6.5, incl.	0.50 to 1.5, incl.	—	—	7.0 to 9.0, incl.	0.10 to 0.40, incl.	0.01	0.04	0.005	Cd: 2.0 to 4.0, incl. Ag: 0.50 to 1.5, incl. Y: 0.50 to 1.2, incl. K: 0.005 Na: 0.005	—	0.30	余量

表 A.1 不活跃合金的牌号和化学成分(续)

Table A.1—Designations and chemical compositions of inactive alloys (*contitued*)

合金组别 Alloy group	牌号 Designation	化学成分（质量分数） % Chemical composition (mass fraction) %											
		Al	Zn	Mn	Zr	Li	Si	Fe	Cu	Ni	其他 Others		Mg
											单个 Each	合计 Total	
MgMn	M2S	—	—	1.2 to 2.0, incl.	—	—	0.10	—	0.05	0.01	—	0.05	0.30	余量 Remainder
MgGdRE	VE82M	—	—	—	0.40 to 1.0, incl.	—	0.01	0.05	—	0.004	Gd: 7.5 to 9.5, incl. RE: 0.50 to 2.5, incl.[a]	—	0.30	余量 Remainder
MgGdZr	VK41M	—	—	—	0.8 to 1.2, incl.	—	0.02	0.01	—	—	Gd: 3.8 to 4.2, incl.	0.03	0.30	余量 Remainder
MgGdY	VW92M	—	1.6 to 2.4, incl.	—	0.40 to 1.0, incl.	—	—	0.01	0.02	0.005	Gd: 8.8 to 9.8, incl. Y: 1.6 to 2.4, incl. Nd: 0.7 to 1.4, incl.	0.02	0.20	余量 Remainder
MgYRE	WE71M	—	—	—	0.40 to 1.0, incl.	—	0.01	0.05	—	0.004	Y: 6.7 to 8.5, incl. RE: 0.7 to 2.5, incl.[a]	—	0.30	余量 Remainder
	WE91M	0.10	—	—	0.40 to 1.0, incl.	—	0.01	—	—	0.004	Y: 8.2 to 9.5, incl. RE: 0.7 to 1.9, incl.[a]	—	0.30	余量 Remainder
MgYNi	WN54M	—	—	—	—	—	0.05	0.01	0.02	3.5 to 5.0	Y: 4.5 to 6.0, incl.	0.02	0.20	余量 Remainder
MgYZn	WZ52M	—	1.5 to 2.5, incl.	0.35 to 0.55, incl.	0.50 to 1.5, incl.	—	0.05	0.01	0.04	0.005	Y: 4.0 to 6.0, incl. Cd: 0.15 to 0.50, incl.	—	0.30	余量 Remainder
MgZnAl	ZA73M	2.5 to 3.5, incl.	6.5 to 7.5, incl.	0.01	—	—	0.0005	0.01	0.001	0.0001	Er: 0.30 to 0.9, incl.	—	0.30	余量 Remainder
MgZnCu	ZC20M	—	1.5 to 2.5, incl.	—	—	—	0.02	0.02	0.30 to 0.6	—	Ce: 0.20 to 0.6, incl.	0.01	0.05	余量 Remainder

MgZnRE	ZE10A	—	1.0 to 1.5, incl.	—	—	—	—	—	—	—	RE: 0.12 to 0.22, incl.	—	0.30	余量 Remainder
	ZE20M	0.02	1.8 to 2.4, incl.	0.50 to 0.9, incl.	—	—	0.01	0.008	0.006	0.004	Ce: 0.10 to 0.6, incl.	0.01	0.20	余量 Remainder
	ZE90M	0.0001	8.5 to 9.0, incl.	0.01	0.30 to 0.50, incl.	—	0.0005	0.0001	0.001	0.0001	Er: 0.45 to 0.50, incl.	0.01	0.15	余量 Remainder
MgZnZr	ZK61S	—	4.8 to 6.2, incl.	—	0.45 to 0.8, incl.	—	—	—	—	—	—	0.05	0.30	余量 Remainder
MgZnMn	ZM21N	0.02	1.3 to 2.4, incl.	0.30 to 0.9	—	—	0.01	0.008	0.006	0.004	Ce: 0.10 to 0.6, incl.	0.01	0.20	余量 Remainder
MgZnY	ZW62M	0.01	5.0 to 6.5, incl.	0.20 to 0.8	0.50 to 0.9, incl.	—	0.05	0.005	0.05	0.005	Y: 1.0 to 2.5, incl. Ag: 0.20 to 1.6, incl. Cd: 0.10 to 0.6, incl. Ce: 0.12 to 0.25, incl.	0.05	0.30	余量 Remainder
	ZW62N	0.20	5.5 to 6.5, incl.	0.6 to 0.8	—	—	0.10	0.02	0.05	0.005	Y: 1.6 to 2.4, incl.	0.05	0.15	余量 Remainder

注 1：表中元素含量为单个数值时为最高限。

NOTE 1: When the element content in the table is a single value, it represents the maximum limit.

注 2：元素栏中“—”表示该位置不规定极限数值，对应元素为非常规分析元素，“其他”栏中“—”表示无极限数值要求。

NOTE 2: In the element columns, “—” indicates that no limiting value is specified for that position, and the corresponding element is non-routine analysis element. In the “Others” columns, “—” indicates no limiting value requirement.

注 3：“其他”表示表中未规定极限数值的元素和未列出的金属元素。

NOTE 3: “Other” refers to elements for which no limiting values are specified in the table and metallic elements not listed.

注 4：“合计”表示质量分数不小于 0.010%的“其他”金属元素之和。

NOTE 4: “Total” refers to the sum of the mass fraction of “Others” metallic elements with a mass fraction not less than 0.010%.

[a] 稀土为富铈混合稀土，其中铈含量占比为 50%、镧含量占比为 30%、钕含量占比为 15%、镨含量占比为 5%。

[a] Rare earth refers to cerium-rich mixed rare earth, with cerium content accounting for 50%, lanthanum content accounting for 30%, neodymium content accounting for 15%, and praseodymium content accounting for 5%.

附录B
Annex B
（资料性）
(Informative)
本文件牌号与曾用牌号对照关系
Correspondence between designations in this document and previously used designations

本文件牌号与曾用牌号对照表见表B.1。

The correspondence table between the designations in this document and previously used designations is shown in Table B.1.

表 B.1 本文件牌号与曾用牌号对照关系

Table B.1—Correspondence between designations in this document and previously used designations

本文件牌号 Designation in this document	曾用牌号 Previously used designation
M2M	MB1
AZ40M	MB2
AZ41M	MB3
AZ61M	MB5
AZ62M	MB6
AZ80M	MB7
ME20M	MB8
ZK61M	MB15

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