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

GB/T 31205-2014

Abrasion-corrosion resistant steel castings

耐磨耐蚀钢铸件

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Foreword

GB/T 31205-2014 was issued on 30 September 2014 by the General Administration of Quality Supervision, Inspection and Quarantine and the Standardization Administration of the People's Republic of China, and has been in force since 1 June 2015.

The document is a recommended national standard: the /T in the designation marks it as recommended rather than compulsory.

1 Scope

China's national standard for abrasion-corrosion resistant steel castings. The combination in the name is the point: many materials resist wear and many resist corrosion, and the parts covered here face both at once, which is a harder problem than either alone. The duty is that of slurry handling - pump casings and impellers, cyclones, valves and pipe fittings moving abrasive solids suspended in water that is often acidic or saline - in metallurgy, building materials, power, construction, chemicals and general machinery. The two mechanisms reinforce each other: abrasion continuously removes the passive oxide film that would otherwise protect the steel, so corrosion proceeds at the rate of bare metal, and corrosion weakens the surface so that abrasion removes it faster. The standard specifies the terms and definitions, the grade designations, the technical requirements, the test methods, the inspection rules, and the marking, storage, packaging and transport for such castings.

This standard specifies the terms and definitions, the grade designations, the technical requirements, the test methods, the inspection rules, and the marking, storage, packaging and transport of abrasion-corrosion resistant steel castings, referred to below as castings.

This standard applies to parts in the metallurgical, building material, power, construction,

chemical and machinery industries that are subject to abrasion under wet corrosive-abrasive conditions in which abrasive wear predominates. Other types of abrasion-corrosion resistant steel castings may be dealt with by reference to this standard.

2 Normative references

The following 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.

GB/T 222 Permissible tolerances for chemical composition of steel products

GB/T 223.4, GB/T 223.11, GB/T 223.18, GB/T 223.23, GB/T 223.25, GB/T 223.26, GB/T 223.43, GB/T 223.59, GB/T 223.60, GB/T 223.64, GB/T 223.71 and GB/T 223.72 Methods for chemical analysis of iron, steel and alloy

GB/T 228.1 Metallic materials - Tensile testing - Part 1: Method of test at room temperature

GB/T 229 Metallic materials - Charpy pendulum impact test method

GB/T 230.1 Metallic materials - Rockwell hardness test - Part 1: Test method

GB/T 231.1 Metallic materials - Brinell hardness test - Part 1: Test method

GB/T 232 Metallic materials - Bend test

GB/T 5611 Foundry terminology

GB/T 5613 Designation of cast steels

GB/T 5677 Radiographic testing of steel castings

GB/T 6060.1-1997 Roughness comparison specimens - Cast surfaces

GB/T 6394 Determination of estimating average grain size of metal

GB/T 6414-1999 Castings - System of dimensional tolerances and machining allowances

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

GB/T 9443 Penetrant testing of steel castings

GB/T 11351-1989 Mass tolerances for castings

GB/T 13925-2010 Metallographic examination of cast high manganese steel

GB/T 15056 Method for evaluating surface roughness of castings

GB/T 20066 Steel and iron - Sampling and preparation of samples for the determination of chemical composition

3 Terms and definitions

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

3.1 abrasion-corrosion - abrasive wear accompanied by corrosion.

4 Grade designations

4.1 The grade designations used in this standard are expressed in accordance with GB/T 5613 and with industry practice; after the code only the principal alloying elements and their contents are specified.

4.2 The method of expressing the grade of an abrasion-corrosion resistant steel casting is: ZG for cast steel, MS for the abrasion-corrosion code in which M stands for abrasion and S for corrosion, then the nominal carbon content of the cast steel expressed in hundredths of a per cent, then the symbols of the principal alloying elements and the nominal percentage content of the principal alloying element.

Example: ZGMS25Cr10MnSiMoNi denotes an abrasion-corrosion resistant steel casting with a nominal carbon content of 0.25 %, a chromium content of 10 %, and containing manganese, silicon, molybdenum and nickel.

4.3 The grades are specified according to the chemical composition of the abrasion-corrosion resistant steel castings, as given in Table 1.

Table 1 gives the grades and their chemical composition by mass fraction in per cent.

ZGMS30Mn2SiCr: C 0.22-0.35, Si 0.5-1.2, Mn 1.2-2.2, Cr 0.5-1.2, S and P each not more than 0.04. ZGMS30CrMnSiMo: C 0.22-0.35, Si 0.5-1.8, Mn 0.6-1.6, Cr 0.5-1.8, Mo 0.2-0.8. ZGMS30CrNiMo: C 0.22-0.35, Si 0.4-0.8, Mn 0.4-1.0, Cr 0.5-2.5, Mo 0.2-0.8, Ni 0.3-2.5. ZGMS40CrNiMo: C 0.35-0.45, Si 0.4-0.8, Mn 0.4-1.0, Cr 0.5-2.5, Mo 0.2-0.8, Ni 0.3-2.5. ZGMS30Cr5Mo: C 0.25-0.35, Si 0.4-1.0, Mn 0.5-1.2, Cr 4.0-6.0, Mo 0.2-0.8, Ni not more than 0.5. ZGMS50Cr5Mo: C 0.45-0.55, Si 0.4-1.0, Mn 0.5-1.2, Cr 4.0-6.0, Mo 0.2-0.8, Ni not more than 0.5. ZGMS60Cr2MnMo: C 0.45-0.70, Si 0.4-1.0, Mn 0.5-1.5, Cr 1.5-2.5, Mo 0.2-0.8, Ni not more than 1.0. ZGMS85Cr2MnMo: C 0.70-0.95, Si 0.4-1.0, Mn 0.5-1.5, Cr 1.5-2.5, Mo 0.2-0.8, Ni not more than 1.0. ZGMS25Cr10MnSiMoNi: C 0.15-0.35, Si 0.5-2.0, Mn 0.5-2.0, Cr 7.0-13.0, Mo 0.2-0.8, Ni 0.3-2.0, Cu not more than 1.0. ZGMS110Mn13Mo1: C 0.75-1.35, Si 0.3-0.9, Mn 11-14, Mo 0.9-1.2, S not more than 0.04, P not more than 0.06.