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

GB/T 14986.3-2018

Soft magnetic alloys - Part 3: Iron-cobalt alloys

软磁合金 第3部分：铁钴合金

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Foreword

GB/T 14986 Soft Magnetic Alloys is divided into five parts as follows: -- Part 1. general requirements; -- Part 2. iron-nickel alloys; -- Part 3. iron-cobalt alloys; -- Part 4. iron-chrome alloys; -- Part 5. iron-aluminum alloy. This is the third part of GB/T 14986. This Part is drafted in accordance with stipulations in GB/T 1.1-2009. This Part is drafted as a replacement of iron-cobalt alloys part in GB/T 14986-2008 High Saturation Magnetic Induction Magnetic Compensate Alloys Depending on Temperature Variation Corrosion-resisting Iron-aluminum Permanent Permeability Soft Magnetic Alloys. In comparison with GB/T 14986-2008, there are several main technical changes as follows: -- Two trademarks 1J21 and 1J27, and relevant technical requirements are newly added (refer to

6.4 in Version 2008); -- The stipulations of chemical compositions P and S in 1J22 become more rigorous; the stipulation that residual element Cr shall be $\leq 0.20\%$ is added (refer to Table 3; Table 10 in Version 2008); -- The magnetic performance (B800, B1600, B2400) of 1J22 cold-rolled strip is enhanced, the magnetic performance (B1600, Hc) of cold-drawn wire, hot-rolled flat material and hot-rolled (wrought) bar is enhanced (refer to Table 5; Table 11 in Version 2008); -- The stipulations of surface quality of cold-rolled strip become more rigorous (refer to 7.6;

7.1 in Version 2008); -- The fundamental physical parameters of alloys and the typical performance value of alloy materials are added as a supplement (refer to Appendix B; Appendix B in Version 2008). This Part is proposed by China Iron and Steel Industry

Association (CISA). This Part is summarized by National Technical Committee 183 on Steel Soft Magnetic Alloys - Part 3. Iron-cobalt Alloys

1 Scope

GB/T 14986.3-2018 is the Chinese national standard on soft magnetic alloys - part 3: iron-cobalt alloys, in the field of metallurgy. The /T suffix marks it as a recommended standard: it is not compulsory by itself, but it becomes binding as soon as a contract, a tender or a customer specification calls it up - which in practice is how most foreign buyers meet it. It was issued on 7 June 2018 by the State Administration for Market Regulation; Standardization Administration of China, and has been in force since 1 March 2019. Classification: ICS 77.140.40, CCS H58. This page is published from the official record of the standard held by the Chinese standards administration: the identification, the dates, the classification and the issuing body are taken from there. The clause text, the tables and the numeric limits are in the document itself, which is delivered complete in English translation.

This Part in GB/T 14986 specifies the terms, definitions, classification, content of order, dimension, appearance, technical requirements, test methods, inspection rules, packaging, mark and quality certificate of high saturation magnetic induction, high magnetostriction coefficient 1J21, 1J22 and 1J27 iron-cobalt soft magnetic alloy. This Part is applicable to cold-rolled strip, cold-drawn wire, hot-rolled flat material and hot-rolled (wrought) bar (hereinafter referred to as alloys) of 1J21, 1J22 and 1J27 iron-cobalt alloy.

2 Normative References

The following documents are indispensable to the application of this Standard. In terms of references with a specified date, only versions with a specified date are applicable to this Standard. The latest version (including all the modifications) of references without a specified date is also applicable to this Standard.

GB/T 223.5 Steel and Iron - Determination of Acid-soluble Silicon and Total Silicon Content - Reduced Molybdenosilicate Spectrophotometric Method

GB/T 223.11 Iron, Steel and Alloy - Determination of Chromium Content - Visual Titration or Potentiometric Titration Method

GB/T 223.13 Methods for Chemical Analysis of Iron, Steel and Alloy - The Ammonium Ferrous Sulfate Titration Method for the Determination of Vanadium Content

GB/T 223.18 Methods for Chemical Analysis of Iron, Steel and Alloy - The Sodium Thiosulfate Separation Iodimetric Method for the Determination of Copper Content

GB/T 223.20 Methods for Chemical Analysis of Iron, Steel and Alloy - The Potentiometric Titration Method for the Determination of Cobalt Content

GB/T 223.23 Iron, Steel and Alloy - Determination of Nickel Content - The Dimethylglyoxime

Spectrophotometric Method

GB/T 223.59 Iron, Steel and Alloy - Determination of Phosphorus Content - Bismuth Phosphomolybdate Blue Spectrophotometric Method and Antimony Phosphomolybdate Blue Spectrophotometric Method

GB/T 223.64 Iron, Steel and Alloy - Determination of Manganese Content - Flame Atomic Absorption Spectrometric Method

GB/T 223.79 Iron and Steel - Determination of Multi-element Contents - X-ray Fluorescence Spectrometry (Routine Method)

GB/T 223.85 Steel and Iron - Determination of Sulfur Content - Infrared Absorption Method after Combustion in an Induction Furnace

GB/T 223.86 Steel and Iron - Determination of Total Carbon Content - Infrared Absorption Method after Combustion in an Induction Furnace

GB/T 4162 Forged and Rolled Steel Bars - Method for Ultrasonic Testing

GB/T 14986.1-2018 Soft Magnetic Alloys - Part 1. General Requirements

3 Terms and Definitions

Terms and definitions provided in GB/T 14986.1-2018 are applicable to this Standard.

4 Classification

In accordance with cobalt content, iron-cobalt alloys shall be classified into the following three types.

- a) F1. cobalt content. 49.0% ~ 51.0%; vanadium content. 0.8% ~ 2.0%;
- b) F2. cobalt content. 34.5% ~ 36%;
- c) F3. cobalt content. 26.5% ~ 28.5%. NOTE. iron-cobalt alloys is also known as "iron-cobalt vanadium alloys" in some publications.

5 Content of Order

Order-placing contract shall include the following content.