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Metal heat treatment - Terminology

金属热处理 术语

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Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part

1. Structure and Drafting Rules of Standardization Documents" Drafting. This document replaces GB/T 7232-2012 "Terminology for Metal Heat Treatment Processes". Compared with GB/T 7232-2012, except for structural adjustments In addition to editorial changes, the main technical changes are as follows:

a) Changed the applicable limits of "scope" (see Chapter 1, Chapter 1 of the.2012 edition);

b) Change "general category" to "basic terminology" (see Chapter 3, Chapter 2 of the.2012 edition), and add "induction heat treatment" and "multi-field heat treatment" 34 terms such as "treatment" and "temperature uniformity measurement" (see 3.1~3.3, Appendix A), deleted "bright heat treatment" and "clean heat treatment" 12 terms such as "physics" and "grain boundary engineering" (see Appendix A, Chapter 2 of the.2012 edition);

c) Added 45 terms such as "recovery", "softening annealing" and "quenching temperature" (see Chapter 4, Appendix A), and deleted "dehydrogenation treatment" 29 terms including "continuous annealing" and "box annealing" (see Appendix A, Chapter 3 to Chapter 12 of the.2012 edition);

d) Added 60 terms such as "delta ferrite", "eutectoid ferrite" and "pro-eutectoid ferrite" (see Chapter 5, Appendix A), deleted 19 terms including "grain number", "dendrite structure" and "nanocrystal" (see Appendix A, Chapter 13 and 14 of the.2012 edition);

e) Added the term "heat treatment equipment" (see Chapter 6, Appendix A). Please note that some content in this document may be subject to patents. The publisher of this document assumes no responsibility for identifying patents. This document is proposed and coordinated by the National Heat Treatment Standardization Technical Committee

(SAC/TC75). This document was drafted by: Beijing Mechanical and Electrical Research Institute Co., Ltd. of China Machinery Industry Group, Jiangsu Fengdong Thermal Technology Co., Ltd., Tianjin Heat Treatment Research Institute Co., Ltd., Shanghai Jiao Tong University, Jiangsu University, Zhejiang National Inspection and Testing Technology Co., Ltd., Hubei Sanhuan Forging Co., Ltd. Company, Changzhou New District Hehai Heat Treatment Engineering Co., Ltd., Guangdong Shichuang Metal Technology Co., Ltd., Xi'an Fulette Heat Treatment Co., Ltd. Division, Hefei University of Technology, Dalian Jiaotong University. The main drafters of this document. Xu Yueming, Li Qiao, Luo Xinmin, Xiang Jianhua, Song Baojing, Gu Jianfeng, Cheng Xiaonong, Zhang Qingchun, Li Hang, Shi Yousen, Li Zhimei, Han Yongzhen, Chen Yi, Chen Nailu, Dong Xiaohong, Yin Heping, Yang Zhen, Wu Yucheng, Ren Ruiming, Gao Xinyu. This document was first published in 1987, revised for the first time in 1999, revised for the second time in 2012, and this is the third revision. Metal heat treatment terminology

1 Scope

China's national terminology for metal heat treatment. Heat treatment is where a steel's properties are actually decided - the same composition can be soft and ductile or hard and brittle depending only on how it was heated and cooled - and its vocabulary is correspondingly exact and completely unforgiving of approximation. Annealing, normalising, quenching, tempering, austempering and martempering are different processes producing different structures; ferrite, pearlite, bainite and martensite are different phases; and case hardening, carburising, nitriding and carbonitriding are different ways of making a hard surface on a tough core. A specification that uses one of these words where it means another specifies a different part. Since heat treatment is bought as a service from subcontractors, the words in the order are the whole contract. This document defines the main terms of heat treatment fundamentals, processes, structures and properties, and equipment, and applies to technical standards and technical documents concerned with metal heat treatment.

This document defines the main terms and definitions of metal heat treatment basics, heat treatment processes, structures and properties, and heat treatment equipment. This document applies to technical standards and technical documents related to metal heat treatment.

2 Normative reference documents

This document has no normative references.

3.1 General term

3.1.1 Heat treatment The process of heating, maintaining and cooling metal materials or workpieces in appropriate ways to obtain the expected structure and

properties.

3.1.2 Overall heat treatmentbulkheattreatment The entire workpiece is heat treated by penetrating heating.

3.1.3 local heat treatmentlocalheattreatment Heat treatment is performed on only a certain part or several parts of the workpiece.

3.1.4 Surface heat treatmentsurfaceheattreatment Heat treatment performed only on the surface of the workpiece.

3.1.5 thermo-chemical treatment Place the workpiece in an appropriate active medium for heating and insulation, allowing one or several elements to penetrate into the surface of the workpiece to change its chemical composition, Heat treatment of tissue structure and properties.

3.1.6 Heat treatment is carried out in advance in order to adjust the original structure and ensure the final heat treatment or (and) cutting performance of the workpiece.

3.1.7 Vacuum heat treatmentvacuumheattreatment Heat treatment is performed by placing the workpiece in an environment with a pressure lower than $1 \times 10^5 \text{ Pa}$ (usually $1 \times 10^{-1} \text{ Pa} \sim 1 \times 10^{-3} \text{ Pa}$).

3.1.8 Heat treatment uses electromagnetic induction to generate eddy currents in the workpiece to heat the workpiece.