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

**GB 15735-2012**

Replacing GB 15735-2004

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**Safety and health requirements for the production process of  
metal heat treatment**

金属热处理生产过程安全、卫生要求

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## Foreword

All contents of this Standard are mandatory. This Standard is drafted according to rules given in GB/T 1.1-2009. This Standard replaces GB 15735-2004 Requirements for the Safety and Health in Production Process of Metal Heat Treatment. Compared with GB 15735-2004, the changes of main technical contents are as follows: - Some reference standards are added (see Chapter 2); - Contents in original Table 1 are modified; - Table 3, Table 4, Table 5 and Table 8 in the original standard are deleted; - Technical contents "

## 1 Scope

GB 15735 covers safety and health in metal heat treatment shops, where the hazards are unusually varied: furnaces at high temperature, quenching oils that catch fire, molten salt baths that react violently with water, cyanide salts used in case hardening, controlled atmospheres containing carbon monoxide, hydrogen and ammonia, and the electrical energy of induction equipment. The standard identifies those hazardous and harmful factors, then sets the requirements for the plant and working environment, the materials and residues, the installations, the process operations, and the technical and management measures for protection. Issued on 5 November 2012, in force since 1 June 2013, replacing GB 15735-2004. 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 edition it replaces are taken from there. The clause text, the tables and the numeric limits are not reproduced on this page - they are in the document itself, which is delivered in full in English translation.

This Standard specifies the general technical requirements for the safety and health in production process of heat treatment. This Standard is applicable to heat treatment production and production installation that are provided for heat treatment production and safety-health related to heat treatment production.

## 2 Normative references

The articles contained in the following documents have become part of this document when they are quoted herein. For the dated documents so quoted, all the modifications (including all corrections) or revisions made thereafter shall be applicable to this document. GB 2893 Safety colours

GB 2894 Safety signs and guideline for the use

GB 5083 General rules for designing the production facilities in accordance with safety and health requirements

GB 5959.1 Safety in electroheat installations - Part

## 3 Terms and Definitions

The terms defined in GB/T 15236 AND the following terms and definitions are applicable to this document.

3.1 Hazardous factors Factors which can cause casualties or sudden damage to materials.

3.2 Harmful factors Factors which can affect people's physical and psychological health, and cause diseases (including occupational disease) or cause chronic damage to materials.

3.3 Production materials Raw materials, materials, fuel, auxiliary materials and semi-finished products that are required in production.

3.4 Waste materials Excess materials in production process, and the waste caused in production process, including gaseous, liquid and solid materials.

3.5 Production installation Various labour information, such as equipment, facilities, tools and machines, instruments that are required in production.

## 4 Hazardous Factors and Harmful Factors in Heat

Treatment Production

4.1 Common hazardous factors in heat treatment production Common hazardous factors in heat treatment production include flammable substances, explosive substances, toxic substances, high voltage, hot objects and corrosive substances, refrigerants, dropped objects or gushers, and restricted areas, etc. Their sources and hazard ratings are shown in Table 1.

5.1.2 Production installation foundation shall meet requirements of corresponding load-bearing and vibration. Underground water cannot be exuded from the ground. Sump is also set and automatic drainage device shall be increased in areas where flood easily happens.

5.1.3 The ground intensity shall meet load-bearing requirements of production organization, materials storage and transportation; the ground materials shall meet requirements of heat resistance, corrosion resistance and impact resistance.

5.1.4 The plant shall have enough height and skylight, and vent shall be set properly to meet requirements of ventilation and brightness.

5.1.5 Exhaust devices in the plant and areas which generate hazardous substances such as bath furnace, quenching tank, rinse tank and discharge outlet for waste gas burning shall have enough capacity of ventilation.

5.1.6 Induction equipment, laser beam, electron beam, plasma beam, shot blasting and sand blasting equipment shall be separated into independent areas and meet special requirements in hazardous work area.

5.1.7 Storage and placement area of hazardous chemical production materials such as liquid oxygen, liquefied petroleum gas, propane and butane must meet the "Regulations on the Control over Safety of Dangerous Chemicals" by the State Council.

5.1.8 The heating device and pit for oil-quenching tank shall be separated; wall surface and bottom of pit shall effectively adopt waterproofing and leakage measures; and drain pit shall be set in the pit bottom; automatic drainage device shall be set if necessary. At the same time, the wall surface of pit shall be laid with safety cover plate.

5.1.9 Transmission pipeline for hazardous raw materials gas including natural gas, liquefied petroleum gas, ammonia, propane, butane in the plant must be overhead along wall, maintain a certain safe distance, and laid steadily.

5.1.10 Lightning arrestor shall be set in the plant.

5.1.11 The plant shall be set with enough quantity of fire hydrants and fire extinction equipment; the safety evacuation exit shall meet requirements of personnel emergency evacuation and entrance of fire engine.

5.1.12 Centralized and effective grounding device shall be set inside the plant to ensure safe use of electrical equipment.

## **5.2 Operating environment", "**

6.2 Waste materials" are increased and modified; - "General requirements" are added in Chapter 7(see 7.1); - Some technical requirements in Chapter 7 are added and modified (see 7.2.1~7.2.10); - The original "

7.2 Gas furnace and heavy oil furnace" is changed to be "

## **7.3 Fuel furnace"; - Technical contents in "**

7.4 Salt bath furnace" are added and modified; - The original "Ion nitriding equipment" is changed to "Plasma heat treatment equipment" (see 7.6); - Open flash point temperature for working temperature of quenching oil and tempering oil are modified (see 7.9.3); - The original 7.10~

7.14 are combined into "

7.11 Auxiliary equipment for heat treatment"; and corresponding contents are added; - "

## **8.3 Surface heat treatment"; - 8.4.4~**

8.4.7 are added in "

8.4 salt bath heat treatment"; - "Alignment" contents in original

8.7 are deleted; - "Confined space" and "equipment overhaul" are added (see 9.6, 9.7). This Standard was proposed and shall be under the jurisdiction of National Technical Committee on Heat Treatment of Standardization Administration of China (SAC/TC 75). Drafting organizations of this Standard. Jiangsu Fengdong Thermal Technology Co., Ltd., Beijing Research Institute of Mechanical and Electrical Technology, Nanjing Kerun Industrial Media Co., Ltd, and Tianjin Heat Treatment Institute Co., Ltd. Requirements for the Safety and Health in Production Process of Metal Heat Treatment