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**Remanufacturing engineering design
of mechanical products - Guideline**

机械产品再制造工程设计 导则

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Foreword

This Standard was drafted in accordance with the rules given in GB/T 1.1-2009.

This Standard was proposed by and shall be under the jurisdiction of National Technical Committee 337 on Green Manufacturing Technology of Standardization Administration of China (SAC/TC 337).

The drafting organizations of this Standard: Key Laboratory of Defense Technology for Equipment Remanufacturing Technology, Beijing Ruiman Technology Co., Ltd., Hefei University of Technology, China Productivity Center for Machinery, Hebei Jing-Jin-Ji Institute of Remanufacturing Industry Technology, Testing Technical Center for Industrial Products and Raw Materials of Shanghai Entry-Exit Inspection and Quarantine Bureau, Sinotruk Jinan Fuqiang Power Co., Ltd., China National Institute of Standardization, National Remanufacturing Engineering Research Center of Mechanical Products, Shanghai Lingang Remanufacturing Industrial Development Co., Ltd., Beijing Shield Engineering Association, Beijing Zhongzhi Resources Recycling Technology Co., Ltd., Shandong Energy Heavy Equipment Manufacturing Group Co., Ltd., Guangzhou Huadu Quanqiu Automatic Transmission Co., Ltd.

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Remanufacturing engineering design of mechanical products - Guideline

1 Scope

This Standard specifies the terms, scope, basic principles, working procedures and contents of remanufacturing engineering design of mechanical products.

This Standard applies to the comprehensive design of the remanufacturing engineering system (including product recycling, production process, management plan, marketing services, etc.) of mechanical products and/or parts; this Standard can be referred to for the remanufacturing engineering design of electromechanical products.

NOTE: The object of the remanufacturing engineering design of mechanical products is the whole process of the remanufacturing of mechanical products, including qualitative design and quantitative design.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition dated applies to this document. For undated references, the latest edition of the referenced documents (including all amendments) applies to this document.

GB/T 28619, *Remanufacturing – Terminology*

3 Terms and definitions

For the purposes of this document, the following terms and definitions and those given in GB/T 28619 apply.

3.1

remanufacturing engineering design of mechanical products

The process in which an overall planning is provided for all remanufacturing links, technical units and resource utilization including the recycling of waste mechanical

the remanufacturing of waste mechanical products to achieve the best benefits, taking into consideration the comprehensive costs of the remanufacturing of mechanical products, including design, production, transportation and storage, and the comprehensive costs generated by the remanufacturing production of mechanical products, the environmental pollution caused by economic activities, etc.

4.2.4 The environmental protection design of the remanufacturing of mechanical products requires that the environmental influences caused by the remanufacturing processing of waste products and the use of remanufactured products are less than the environmental influences caused by the production and use of prototype new products.

4.2.5 The resources design of the remanufacturing of mechanical products requires the utilization of the resources of waste products and recyclable resources as much as possible.

4.3 Abidance-by-laws-and-regulations principle

The remanufacturing engineering design of mechanical products shall be carried out within the framework of laws, regulations and standards, such as:

- a) the restrictive requirements and obligations as specified in international laws and regulations;
- b) the requirements of national policies, laws, regulations and compulsory standards;
- c) technical standards and voluntary agreements;
- d) other relevant requirements.

4.4 Stakeholder-requirements principle

Stakeholder requirements shall be taken into consideration for the remanufacturing engineering design of mechanical products, such as:

- a) the right requirements of stakeholders for original products and remanufactured products;
- b) the demands, development tendencies and expectations of the market and consumers;
- c) the expectations of the society and investors, etc.;
- d) other relevant requirements.

The remanufacturing production process is mainly to optimize, design and establish the remanufacturing production modes and technological standards and provide the remanufacturing production plans which are executable, in accordance with the remanufacturing quality requirements. It mainly includes:

- dismantling process: the contents include the design and determination of dismantling process, dismantling procedures, dismantling tools and sites;
- cleaning process: the contents include the design and determination of cleaning positions, cleaning technological process, cleaning quality standards, cleaning equipment and sites;
- detection process: the contents include the design and determination of detection positions, detection technological process, detection quality standards, detection equipment and sites;
- machining process: the contents include the design and determination of machining faces, machining technical standards, processing equipment and sites;
- surface technological process: the contents include the design and determination of part positions, technological process, technical standards, equipment, materials and sites for the surface technical restoration or performance upgrading;
- assembling process: the contents include the design and determination of assembling process, assembling standards, assembling equipment and sites of remanufactured products;
- coating process: the contents include the design and determination of coating positions, coating process, coating standards, coating equipment, materials and sites of remanufactured products;
- plant layout: the contents and plans includes the design and determination of remanufacturing plant layouts, equipment layouts, working station layouts and production line layouts.

5.2.3 Remanufacturing management plan design

Planning shall be made as a whole and remanufacturing management plans shall be designed and established in accordance with the quality requirements of remanufactured products and the characteristics of remanufacturing production process, mainly including:

- quality management: the design and determination of the quality management standards, etc. of different remanufacturing processes and products;
- production management: the design and determination of management contents,

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