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**Earth-moving machinery - Guidelines for the design of waste
and used products for resource recovery**

土方机械 废旧产品资源化利用设计 导则

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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. Please note that some content in this document may involve patents. The issuing organization of this document assumes no responsibility for identifying patents. This document was proposed by the China Machinery Industry Federation. This document is under the jurisdiction of the National Technical Committee on Standardization of Earthmoving Machinery (SAC/TC334). This document was drafted by: Jiangsu XCMG Construction Machinery Research Institute Co., Ltd., Huangshan Sanjia Yihua Precision Machinery Co., Ltd., and Fujian Minjiang Machinery Industry Co., Ltd. Xuan Technology Co., Ltd., Hangzhou Zongxing Technology Co., Ltd., Shandong Mingyu Heavy Industry Machinery Co., Ltd., Sichuan Shudao Construction Engineering Co., Ltd. Company, Xinhongchang Technology (Shenzhen) Co., Ltd., Tianjin Engineering Machinery Research Institute Co., Ltd. The main drafters of this document are: Chen Xinchun, Wu Jianjun, Zhu Bin, Zhou Yuchuan, Yi Xuehang, Wang Bo, Wang Yayue, Chen Shuqiao, Yan Naiping, and Chen Tao. Hou Xuming, Li Guangqing, He Ting, Zhu Mengchen, Hou Jie.

This document aims to maximize the resource utilization rate and economic benefits of waste products while minimizing environmental pollution. It addresses this by analyzing waste products and components... This study systematically investigates the recycling, reuse, remanufacturing, and reuse of waste products, standardizing the design process for

the resource utilization of waste products. Guiding the design work for the resource utilization of waste earthmoving machinery, improving the utilization rate of waste products, and promoting the green and sustainable development of the earthmoving machinery industry. Kangfazhan. This document outlines the general principles, design content and requirements, and management requirements for the resource utilization of waste earthmoving machinery, but does not include detailed design specifications. The design requirements for the resource utilization of specific waste products should be taken into account. earthmoving machinery Design Guidelines for Resource Utilization of Waste Products

1.Scope This document establishes the general principles and requirements for the resource utilization design of waste earthmoving machinery, and specifies the resource utilization of waste earthmoving machinery. The process and management requirements for resource utilization design. This document applies to the design of resource utilization of waste products from earthmoving machinery.

4 General Principles and Requirements

4.1 Principles of Full Life Cycle Management The design for the resource utilization of waste products should consider the product's resource recovery and environmental impact, anticipate future disposal and resource utilization issues, and adopt easy-to-use technologies. A recyclable and environmentally friendly design solution.

4.2 Green Design Principles The design for the resource utilization of waste products should follow the following green design principles, including but not limited to.

- a) Environmental protection and resource conservation should be considered to reduce the use of harmful substances;
- b) Recyclable materials should be selected;
- c) The possibility of recycling waste products should be considered to minimize the environmental burden and increase the recycling rate of materials. Resource reuse rate.

4.3 Safety and Disassembly Principles The design for the resource utilization of waste products must consider the safety of dismantling to avoid the leakage of hazardous substances or the occurrence of dangers. The design should... Reserved dismantling points ensure the smooth dismantling of waste products.

4.4 Principle of Balancing Comprehensive Benefits The design for the resource utilization of waste products should comprehensively consider the balance between the resource utilization rate, economic benefits, and environmental pollution.

4.5 Selection and Design of Recyclable Materials The design for the resource utilization of waste products should select recyclable materials and materials that can be obtained from recycling.

4.6 Life assessment of components The design for the resource utilization of waste products should conduct an assessment of the remaining life of the waste product components in accordance with GB/T 34631.

5 Design process for resource utilization of waste products

5.1 Process The design process for the resource utilization of waste products is shown in Figure 1.

5.2 Requirements Analysis Requirements analysis is a crucial step in clarifying the functional requirements and constraints of customers or the market, and it serves as the basis for reviewing resource utilization design schemes. The following tasks should be completed.

- a) Consider and understand customer or market functional requirements;
- b) Analyze the constraints, identify the key points and challenges of customer functions or market needs, including but not limited to supply cycles, costs, and production capacity. Production conditions, as well as constraints on resources such as equipment, facilities, tools, personnel, and technology for waste product processing;
- c) Conduct information collection and research, including but not limited to collecting information on the characteristics and difficulties of resource utilization at home and abroad, and conducting on-site investigations and research on existing types of resources. Similar design flaws in the recycling of waste products;
- d) Analyze the functional and structural hierarchy of earthmoving machinery, components, or raw materials to meet customer or market demands.

5.3 Analysis of Waste Products The analysis of waste products should clarify the remaining value of waste products, which will serve as the basis for resource utilization assessment and review of resource utilization design schemes. The following tasks should be completed.

- a) Compile a list of existing obsolete products, including their types, quantities, design lifespan, service life, and operating conditions;
- b) Detect and analyze the degree of damage and failure modes of waste products.

5.4 Recyclability Assessment

5.4.1 The calculation method for recyclability assessment refers to Chapter 5 of GB/T 30964-2014. The following factors should be considered.

- a) Does the residual value of the discarded products meet customer or market demand?
- b) Consideration should be given to the recycling of hydraulic components, transmission

components, power components, structural components, electronic components, and other parts;

c) Consideration should be given to the recycling of materials such as metals, plastics, rubber, and glass;

d) Whether the cost savings in parts and raw materials and production costs are accounted for.

5.4.2 Output a list of recyclable parts and materials, and a list of parts and materials to be processed and disposed of.

5.4.3 Non-recyclable parts and materials shall be disposed of by incineration, landfill, or other methods in accordance with the provisions of GB 18599.

5.5 Reusability Assessment

5.5.1 The following factors should be considered in the reuse assessment.

a) Whether the reuse of parts from discarded products meets usage and safety requirements;

b) Whether the recycled products are easy to clean and protect.

5.5.2 Output a list of reusable parts and materials.

5.6 Remanufacturability Assessment

5.6.1 Remanufacturability assessment shall comply with the provisions of GB/T 34631 and GB/T 32811, evaluating the remaining life of scrap product parts and their remanufacturing potential. The economic and technical feasibility of remanufacturing waste product parts should be considered. The following factors should be taken into account.

a) The completeness of dismantled parts from discarded products;

b) Cleaning quality requirements for waste product parts;

c) The convenience and accuracy of quality condition testing for disassembled and cleaned waste product parts;

d) The recoverability and economic viability of the morphology and performance of discarded product parts;

e) The ease of assembly and packaging of parts from discarded products.

5.6.2 Output a list of remanufactured parts and materials.

5.7 Reusability Assessment

5.7.1 The following factors should be considered in the reuse assessment.