

ICS 77.120.99

CCS H 65



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

GB/T 45651-2025

**Recycling raw materials for neodymium iron boron by roasting
process**

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Issued on: April 25, 2025

Implemented on: November 1, 2025

**Issued by: State Administration for Market Regulation;
Standardization Administration of the PRC**

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1 Scope

This Document specifies the grading, code and symbol, technical requirements, test methods, inspection rules, marking, packaging, transportation, storage, and accompanying documentation for recycling raw materials for neodymium iron boron by roasting process.

This Document applies to recycling raw materials for neodymium iron boron by roasting process produced using the oxidation roasting process and used as raw materials for the production of rare earth products.

2 Normative References

GB/T 12690.5

GB/T 12690.19

GB/T 21524

3 Terms and Definitions

For the purposes of this Document, the following terms and definitions apply.

3.1 Recycling raw materials for neodymium iron boron by roasting process

The raw materials that after the recycled materials from NdFeB production and processing and the recycled old NdFeB magnets are processed through oxidizing roasting process and used for the production of rare earth products.

3.2 Oxidizing roasting

The process of heating the material below its melting point and in an oxidizing atmosphere to convert it into oxides.

3.3 Ratio of oxide

Oxidation degree of the recycling raw materials for neodymium iron boron by roasting process.

NOTE. Expressed as the mass percentage of trivalent iron to total iron.

4.1 Grading

According to the total amount of rare earth oxide (REO) in the recycling raw materials for neodymium iron boron by roasting process, the recycling raw materials for neodymium iron boron by roasting process are divided into Grade-I, Grade-II and Grade-III products.

4.2 Code and symbol

4.2.1 The code for the recycling raw materials for neodymium iron boron by roasting process consists of three levels. the first level represents recycling raw materials, represented by the initials "RM" of Recycling materials in English; the second level represents neodymium iron boron, represented by the element symbol NdFeB; the third level represents grading, represented by the numbers 1, 2, and 3, representing Grade-I, Grade-II, and Grade-III products respectively.

4.2.2 The symbol for the recycling raw materials for neodymium iron boron by roasting process shall be expressed in the order of the document number and code. EXAMPLE.

The symbol GB/T 45651-RM-NdFeB-2 indicates Grade-II recycling raw materials for neodymium iron boron by roasting process that comply with the requirements of this Document.

5.1 Appearance quality

The recycling raw materials for neodymium iron boron by roasting process shall be red or brown (see Appendix A), powdery, free of agglomerates, clean, uniform, and free of visible foreign matter, including sawdust, plastic shavings, sand, fiber dust, etc., excluding packaging.

5.2 Radioactive contamination

The gamma radiation dose equivalent rate of the recycling raw materials for neodymium iron boron by roasting process shall not exceed the local natural radiation background value + 0.25 $\mu\text{Sv/h}$.

5.3 Chemical composition

The chemical composition of the recycling raw materials for neodymium iron boron by roasting process shall comply with the provisions of Table 1.

5.4 Ratio of oxide

The ratio of oxide of the recycling raw materials for neodymium iron boron by roasting process shall be no less than 60.00%.

5.5 Particle size

The weight proportion of the recycling raw materials for neodymium iron boron by roasting process with a particle size less than 0.85 mm (20 mesh) shall be no less than 95%.

6.1 Appearance quality

Visual inspection under natural scattered light.

6.2 Radioactive contamination

The test method of the radioactive contamination shall be conducted in accordance with the provisions of SN/T 0570.

6.3 Chemical composition

6.3.1 The analysis method for REO shall be conducted in accordance with Method 1 in XB/T 612.1-2019.

6.3.2 The total content of Pr_6O_{11} , Nd_2O_3 , Tb_4O_7 , Dy_2O_3 , Gd_2O_3 , and Ho_2O_3 is calculated from the content of the individual rare earth oxides of Pr_6O_{11} , Nd_2O_3 , Tb_4O_7 , Dy_2O_3 , Gd_2O_3 , and Ho_2O_3 , i.e., total rare earth oxide content x the proportion of each individual rare earth oxide x 100%. The analysis method of the proportion of rare earth oxides shall be conducted in accordance with the provisions of XB/T 612.2; and the calculated value shall be rounded-off to two digits after the decimal point.

6.3.3 The analysis method of Fe content shall be conducted in accordance with the provisions of XB/T 617.4.

6.3.4 The analysis method of B content shall be conducted in accordance with the

provisions of XB/T 612.3.

6.3.5 The analysis method of Pb and Cd content shall be conducted in accordance with the provisions of GB/T 12690.5.

6.3.6 The analysis method of As content shall be conducted in accordance with the provisions of GB/T 12690.19.

6.3.7 The analysis method for F content shall be conducted in accordance with the provisions of XB/T 612.4.

6.4 Ratio of oxide

The analysis method for ratio of oxide is shown in Appendix B.

6.5 Particle size

The analysis method for particle size shall be conducted in accordance with the provisions of GB/T 21524.

7.1 Inspection and acceptance

Products shall be inspected by the supplier or a third-party inspection department commissioned by the supplier to ensure that product quality complies with the provisions of this Document, and accompanying documents shall be completed.

The purchaser shall inspect received products in accordance with the provisions of this Document. If the inspection results do not comply with the provisions of this Document, the purchaser shall submit any discrepancies to the supplier within 60 days of receipt of the products; and the dispute shall be resolved through mutual negotiation between the purchaser and the supplier. If arbitration is necessary, a third-party inspection department recognized by both parties may be commissioned to conduct, and joint sampling shall be conducted by the purchaser.

7.2 Batching

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