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Reclaimed steel raw material R ecyclingiron-steelmaterials

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preface

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Author: Zhang Longqiang, Wang Zhenwu, Li izhang, YanGe, Yang Haifeng, Li Shubin, Cai Xiangdong, Sun Jiansheng, Lu Chunsheng, Zhou Senming, LuoShengMing, Luo Xiaogang, Zhou Bingyan, Wang Shumei, Feng Helin, Wang Fangjie, Du Xingya, Wang Biao, Dou Liying, Pan Yuting, Zeng Jin, Wu Jianzhong, Meng Xianzhong, Mo Jingzhong, Wang Jingbo, Li Jinglin, Wang Ke, Li Mingbo, Hu Shiyong, Chen Xiaozhou, Hu Xiaofeng, Li Yuanzheng, Chen Rong, Gu Weidong, Peng Kediao, Huang Zhengguo, Chen Yi, Wu Yuhong, Zhang Shaokai, Zhu Guoping, Ge Yongjun, Wang Jianwu, Jiang Weiguo, Zhi Huibo, Ma Jin, Zhao Tong, Su Dong, Liu Zhiguo, Ye Xiaoshuang, Huang Lei, Su Shibao, Yan Wenkai, Yan Chen, Wang Zhongdong, Tan Xinxing, Fu Jie, Wan Xiujuan, Su Chunming, Yang Shuai, Zha Xianwen, Wang Juan.

Regenerative steel raw materials

1scope

This document specifies the classification, technical requirements, inspection methods, acceptance rules, transportation and quality certificates of recycled steel raw materials. This document is applicable to recycled steel raw materials used as raw materials in iron, steel, casting and ferroalloy smelting.

2Normative reference documents

The contents of the following documents constitute essential provisions in this document. For the dated references, only the version corresponding to that date applies to this document; for the unspecified referenced document, the latest version (including all modification orders) applies to this document.

GB 5085 .1	Hazardous waste identification criteria	Corrosion identification
GB 5085 .2	Hazardous waste identification criteria	Initial screening for acute toxicity
GB 5085 .3	Hazardous waste identification criteria	Leaching toxicity identification
GB 5085 .4	Hazardous waste identification criteria	Flammability identification
GB 5085 .5	Hazardous waste identification criteria	Reactive discrimination
GB 5085 .6	Hazardous waste identification criteria	Identification of the toxic substance content
GB /T 5202	Radiation protection instrumentα、βAndα/β(βEnergy is greater than60The keV) pollution meter and monitor	

GB /T8170Representation and determination of numerical reduction rules and limit valuesGB 18871Basic standards for the

protection of ionizing radiation and the safety of radiation sources

GB /T12162 .3Used to calibrate the dosimeter and the dose rate meter and to determine its energy responseXAnd ya reference radiation No3Part: field Calibration of the dosimeter and personal dosimeter and determination of energy response and angular response

3Terms and definitions

The following terms and definitions shall apply to this document.3.1

reclaimed materialsrecyclingraw materials

Iron and steel products or steel scraps that have lost their original use value or have been abandoned or abandoned although having not lost their use value.3.2

Regenerative steel raw materialsrecyclingiron-steelmaterials

Recycling materials are classified and processed, and can be used as iron resources directly into the furnace.3.3

radioactive contaminantradioacti v ematerials

Radioactive substances or radioactive sources contained in recycled steel raw materials.3.4

Explosive itemsexplosivematerials

The weapons and ammunition, inflammable and explosive products, explosives and other articles.

3.5

foreign impuritycarried -wa s te

Non-metallic materials, including wood materials, waste materials, waste paper, waste plastics, waste rubber, waste glass, stones and particle size, are not greater than2 mmPowdered substances (dust, sludge, sawdust, fiber terminal, etc.), but not including packaging and other substances used during transportation.

3.6

bulk densitybulkdensity

Quality of recycled steel raw materials per cubic meter.3.7

Physical specificationssize

Physical dimensions of recycled steel raw materials: length, width, height, thickness or diameter. Note: The millimeter is generally taken as the unit of measurement.

3.8

disassemblydismantling

The recycled machinery and equipment, building materials, steel structure and other steel products are decomposed into a certain size, so that the recycled steel raw materials are suitable for transportation, production and use of the processing process.

3.9

sortingsorting

The process of sorting the recycled steel products according to the chemical composition, physical specifications and use requirements and separating them from other substances to become a specific class of recycled steel raw materials.

3 .10

shearcutting

The recycled steel products are cut or cut to become the physical specifications to meet the requirements of the recycled steel raw material process.3 .1 1

tatteredshredding

The recycled steel products using professional equipment processing into a broken recycled steel raw materials process.3 .12

balebundling

The recycled steel products use professional equipment to suppress molding into the process of bulk type recycled steel raw materials.

4classify

4 .1Category name and code name

Recycled iron and steel raw materials through different processing methods, according to the shape and chemical composition is divided into7broad heading. They are: heavy

recycled steel raw materials, medium recycled steel raw materials, small recycled steel raw materials, broken recycled steel raw materials, block recycled steel raw materials, alloy steel recycled steel raw materials, cast iron recycled steel raw materials.

The categories, codes and grades of recycled steel raw materials are shown in Table 1, and the typical photos are shown in the appendixA。

outside1Category and code of recycled steel raw materials

class	English name	English abbreviation	Chinese abbreviation	code name	the name of a shop
Heavy-duty recycled iron steel raw materials	heavy recycling iron-steel materials	HRS	Heavy material	101	HRS101
				102	HRS 102
Medium-sized recycled steel raw materials	medium recycling iron-steel materials	MRS	Medium material	201	MRS 201
				202	MRS 202
Small recycled steel raw materials	light recycling iron-steel materials	LRS	Small material	301	LRS 301
				302	LRS 302
				303	LRS 303
Broken type recycled steel raw materials	shredded recycling iron-steel materials	SRS	Broken material	401	SRS 401
				402	SRS402
				403	SRS403
Block ped recycled steel raw materials	bundled recycling iron-steel materials	BRS	Pack material	501	BRS 501
				502	BRS 502
				503	BRS 503
Alloy steel recycled steel raw materials	alloy recycling iron-ste el materials	ARS	Alloy steel	601	ARS 601
				602	ARS 602
				603	ARS 603
Cast iron recycled steel raw materials	cast recycling iron -steel mate - rials	CRS	Casting iron material	701	CRS 701
				702	CRS 702

4 .2Classification requirements

The classification requirements of recycled steel raw materials are shown in Table 2, and the characteristics are shown in the appendixB。

outside2Classification requirements for recycled steel raw materials

class	the name of a shop	Physical specifications	Raw material source and typical examples		Main addition, working mode
			General source	Typical example	

Heavy again Raw steel raw materi al	HRS101	1 . Physical specification: Thickness≥6.0 mmOr the diameter of the same one≥ 10Solid body of the mm; longlinear measure≤1 500 mm; wideDegree of 600 mm; 2. Single weight: 1,500 kg	Thickness in6 .0 mmAbove, or in diameter10 mmSolid body above, Iron and steel products retired after a certain service life: 1) all kinds of scrapped large equipment; 2) scrapped railway equipment and materials; 3) all kinds of scrapped large steel structures; 4) all kinds of scrapped large ships, etc	1 . Large machine tools, industrial and mining machinery, etc.; 2 . Various large parts, steel casting parts, etc.; 3 . Rail, wheel, axle, carriage, guide rail and other railway components;4 . All kinds of steel structure, steel pipe, section steel, plate and all kinds of old steel; 5 . Ship disassembly or maintenance of a variety of old steel plate, section steel, pipe and machine parts	Sor ting and dis ma ntli ng the she ar
	HRS 102		thickness6. 0 mmAbove, or in diameter10Solid body above mm, Waste or tail materials formed in the process of production or processing: 1) cut head and tail, defective and degraded products produced in the process of steel production; 2) waste material or tail materials formed in the process of various steel processing	1 . Cut head and cut tail of steel ingot or billet;2 . Steel billet residual defective products; 3 . Steel plate rolling cutting edge, cutting head, cutting tail; 4 . All kinds of steel (section steel, round steel, Angle steel, steel plate, etc.) in the process of residual material or tail material; 5 . Resimaterial or tail material produced after steel plate stamping	Sor ting cutt ing

outside2Classification requirements for recycled steel raw materials (continued)

class	the name of a shop	Physical specifications	Raw material source and typical examples		Main addition, working mode
			General source	Typical example	
Medium again Raw steel raw material	MRS 201	1 . Physical specifications: Thickness of 4.0 mmOr 8 mm in diameter Solid body; length ≤1 500 mm; Width of 600 mm;2. Single weight: 1,500 kg	Thickness in. 04 mmAbove, or in diameter8Solid body above mm, Retired steel products after a certain number of years: 1) all kinds of scrapped small and medium-sized equipment; 2) all kinds of scrapped medium-type steel structural parts; 3) all kinds of scrapped small and medium-sized ships, etc	1. Small and medium-sized machine tools, industrial and mining machinery; 2 . All kinds of small and medium-sized parts, cast steel parts; 3 . All kinds of small and medium-sized steel structure, steel pipe, section steel, plate and all kinds of old steel; 4. Small and medium-sized ship disassembly or maintenance, a variety of old steel plate, steel, pipe and machine parts	Sorting and dismantling the shear
	MRS 202		thickness4 .0 mmAbove, or in diameter8Solid body above mm, All kinds of steel processing formed in the process of residual material or tail material	1 . All kinds of steel (section steel, round steel, Angle steel, steel plate, etc.) in the process of residual material or tail material; 2 . Resimaterial or tail material produced after steel plate stamping	Sorting cutting
Small again Raw steel raw material	LRS 301	1 . Physical specifications: Thickness is 2.0 mm; Length of 1,500 mm;Width of 600 mm; 2. Single weight: 1,500	Thickness in2 .0 mmAbove, the steel products retired after a certain number of years: 1) all kinds of scrapped small equipment; 2) all kinds of scrapped small motor vehicles or electric vehicle racks	1 . All kinds of scrapped small equipment such as machine tools, machines, etc.; 2 . All kinds of scrapped parts and components; 3 . All kinds of motorcycle rack, battery car rack, bicycle rack, electric vehicle frame, etc.; 4 . All kinds of light bone dragon steel, life hardware, generator disassembly iron core; 5 . Ship disassembly or maintenance of a variety of old steel plate, section steel, pipe and machine parts	Sorting and dismantling the shear

	LRS 302	kg	thickness2 .0 mmAbove, all kinds of steel processing process in the formation of the surplus material or tail material	1 . All kinds of steel (section steel, round steel, Angle steel, steel plate, etc.) in the process of residual material or tail material; 2 . Silica steel sheet residual material or tail material; 3 . Resimaterial or tail material produced after steel plate stamping	Sorting cutting
	LRS 303	1 . Physical specifications: Thickness is 2.0 mm; Length of 1,500 mm;Width of 600 mm; 2. Single weight: 1,500 kg	thickness2 .0 mmBelow, the new materials formed in the process of various steel processing	Automobile board, home appliance board produced in the processing process of the surplus material or tail material	Sorting cutting
Broken type, recycled steel, iron raw material	SRS 401	bulk density: ≥0.8 t/m3, Specific according to the supply and demand parties agreed upon	Recycled car disassembly material	Car disassembling material	Sorting and dismantling
	SRS402		To a small or thickness less than2 .0 mmOther types of recycled materials as raw materials	1. Recycling home appliances;2 .machine parts; 3 . All kinds of small equipment; 4 . Coated steel plate, color steel tile, etc	Sorting broken
	SRS403		Industrial processing waste material	1 . Automobile plate processing surplus material or tail material; 2 . Home appliance board and other single plate processing surplus material or tail material	Sorting broken

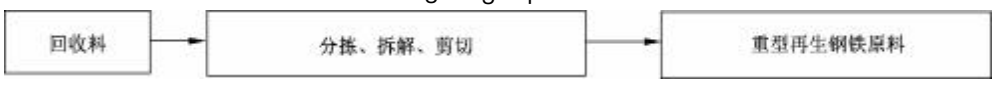
outside2Classification requirements for recycled steel raw materials (continued)

class	the name of a shop	Physical specifications	Raw material source and typical examples		Main addition, working mode
			General source	Typical example	
Block type, recycled steel, iron raw material	BRS 501	1 . Physical specifications: And 1,500 mm long;Is about 1,000 mm wide;And 1,000 mm high;2. Single weight of 2,000 kg	With automobile plate or other single variety of processing surplus material or tail material as raw material	1 . Waste material produced after the stamping of the automobile plate;2 . Home appliance board surplus material; 3 . Silica steel sheet residual material or tail material; 4 . Other processing products surplus material or tail material	Sorting packaging
	BRS 502		Recycled old steel bars (thread, wire material)	By the recycled old steel bar (rebar and wire rod) packaging molding	Sorting packaging
	BRS 503		Steel shavings and steel chips produced during steel machining	Steel in the process of mechanical processing of steel shavings, steel chips, etc	Pack the bag
Alloy steel, recycled steel, iron raw material	ARS 601	1 . Physical specifications: And 1,500 mm long;Is about 1,000 mm wide;2. Single weight: 1,500 kg	Nickel-chromium series stainless steel recycling parts or processing surplus materials, containing nickel (Ni) Should not be less than 7.0%	1 . Nickel-chromium stainless steel recycled parts, such as machinery, equipment, equipment, structural parts; 2 . Nickel-chromium system of stainless steel material processing formed by the residual material or tail material; 3 . Ship disassembly or maintenance of a variety of nickel-chromium series stainless steel plate, pipe and machine parts	Sorting, cutting and packing
	ARS 602		Chromium system stainless steel recycled parts or processing parts	1 . Chromium system stainless steel recycled parts such as machine, set, spare, equipment, structural parts and other stainless steel	Sorting, cutt

			material：The amount of chromium (Cr) is not less than11 .5%	parts; 2 . Chromium is a stainless steel material formed when processing the waste material or tail material	ing and packing
	ARS 603		Recycled alloy steel as raw material: 1) Use invalid tool steel, mold steel, bearing steel, gear steel, superalloy and other recycled parts; 2), the leftover materials produced in the processing process; 3) shavings and alloy steel scraps produced by mechanical processing	1. With tool steel, mold steel, bearing steel, gear steel, high temperature alloy and other alloy steel as raw materials; 2 . Alloy steel processing surplus material or tail material	Sorting and cutting and packing bags
Cast iron again Raw steel raw material	CRS 701	1 . Physical specifications: Thickness is 2.0 mm; Length of 1,500 mm;Width of 600 mm; 2. Single weight: 1,500 kg	Thickness in2 .0 mmAbove, the cast iron products retired after a certain number of years: 1) all kinds of recycled cast iron equipment; 2) all kinds of recycled small cast iron products	1 . Various recycling of small cast iron equipment;2 . Various recycled cast iron parts; 3 . All kinds of recycled small cast iron products, etc	Sorting and dismantling the shear
	CRS 702		thickness2 .0 mmAbove, all kinds of iron casting processing formed in the process of waste material or tail material	Resimaterial or tail material produced after casting or casting	Sorting cutting

4 .3processing method

The schematic diagram of the processing process of different types of recycled steel raw materials is shown in Fig1~ graph 7。



graph1Processing classification diagram of heavy recycled steel raw materials

graph2Schematic diagram of processing classification of medium-sized recycled steel raw materials

graph3Schematic diagram of processing classification of small recycled steel raw materials

graph4Processing classification diagram of broken type recycled steel raw materials

graph5Schematic diagram of processing classification of block-type recycled steel raw materials

graph6Classification diagram of recycled steel raw materials for alloy steel

graph7Processing classification diagram of cast iron recycled steel raw materials

5technical requirement

5 1. Storage requirements

Reclaimed steel raw materials should be stored in classification.5

.2radioactive contaminant

The control of radioactive pollutants shall comply with the

following requirements:a)

Should not be mixed with

radioactive substances;

b)raw material（Include packaging）The external radiation dose rate shall not exceed the local normal natural radiation background value + 0. 25μ Gy /h;

c)Raw material surfaceα、βThe level of radioactive contamination was：Of any part of the surface300 cm^2The average of the maximum detection level of theαNot super go beyond the limit0.04 Bq /cm^2,βnot exceeding0.4 Bq /cm^2。

5 .3Explosive items

Renewable steel raw materials should not be mixed with explosive items.

5 .4hazardous wastes

The mixing of the following hazardous wastes shall be strictly restricted in the recycled steel raw materials:a) 《 Waste in the National Hazardous Waste List;

b)according toGB 5085 .1~GB 5085 .6Identification criteria for identification, where with corrosive, toxic, flammability, reactivity and so on one Or other hazardous wastes with more than one hazardous characteristic.

The quality of the hazardous waste in the recycled iron and steel raw materials shall not exceed the total quality0 .01%。5 .5foreign impurity

The appearance of recycled iron and steel raw materials shall be kept clean, with no obvious waste paper, waste plastic, waste fiber and other inclusions, and the requirements of inclusions shall conform to the table3The provisions of.

outside3Inclclusion requirements for recycled steel raw materials

class	English name	English abbreviation	Chinese abbreviation	the name of a shop	Inclclusion /% not greater than
Heavy-duty recycled iron steel raw materials	heavy recycling iron-steel materials	HRS	Heavy material	HRS101	0.8
				HRS 102	0.3
Medium-sized recycled steel raw materials	medium recycling iron-steel materials	MRS	Medium material	MRS 201	0.8
				MRS 202	0.3
Small recycled steel raw materials	light recycling iron-steel materials	LRS	Small material	LRS 301	0.8
				LRS 302	0.3
				LRS 303	0.3
Broken type recycled steel raw materials	shredded recycling iron-steel materials	SRS	Broken material	SRS 401	1.0
				SRS402	1.0
				SRS403	1.0
Block ped recycled steel raw materials	bundled recycling iron-steel materials	BRS	Pack material	BRS 501	0.3
				BRS 502	0.8
				BRS 503	0.3
				ARS 601	0.3

Alloy steel recycled steel raw materials	alloy recycling iron–ste el materials	ARS	Alloy steel	ARS 602	0.3
				ARS 603	0.3
Cast iron recycled steel raw materials	cast recycling iron –steel mate – rials	CRS	Casting iron material	CRS 701	0.8
				CRS 702	0.3

6method of calibration

6 1. classify

The recycled iron and steel raw materials are classified through sensory inspection, and if necessary, the weighing instrument, tape measure and other inspection means or measuring instruments or other testing means are used to determine its physical specifications.

6. 2radioactive contaminant

The radioactive pollutants of recycled steel raw materials shall be tested according to the appendix C The provisions of the inspection.6. 3Explosive items

Explosive items are

examined by the senses.6.

4hazardous wastes

Inspection of hazardous waste is conducted according to GB 5085. 1~GB 5085. 6 The provisions of the implementation。6. 5foreign impurity

6. 5. 1The inclusions of recycled steel raw materials are first tested by visual sense to estimate the quality proportion。When it is not determined whether the requirements, press 6. 5. 2 checkout。

6. 5. 2The inclusion detection procedure for recycled steel raw materials is as follows:

a) Take the raw material samples, weigh and record the sample quality *Endyceps sinensis*;

b) Sorted the inclusions, and recorded the quality of non-metallic wood waste, waste paper, waste plastic, waste rubber, waste glass, stones, etc *Endyceps sinensis* 1 ;

c) make use of 2 The sieve of the mm sieve hole screens the raw material sample, The recording particle size is not greater than 2 mm The quality of the powder (dust, sludge, wood chips, fiber dust, etc.) material *Admito 2*;

d) Through the magnetic separation device, the screened powder material for magnetic separation, record the mass of the magnetic selected metal (iron powder, steel chips, iron oxide, etc.) material *Admito 3*。

Calculate the inclusion content according to formula (1) (J), Values are expressed as a value of%.

$$Endyceps\ sinensis\ J = Endyceps\ sinensis\ 1 + = Adventitia\ 3 \frac{m_2}{m} \times 100\% \quad (1)$$

In formula:

Endyceps sinensis J —The content of inclusions;

Endyceps sinensis 1 —Bulk nonmetallic inclusion mass, In kg (kg);

Admito 2—The particle size is not greater than 2 mm The mass of the powdery material of, In kg (kg);

Admito 3—The particle size is not greater than 2 mm The mass of the metal material of the, In kg (kg);

Endyceps sinensis—Sample quality, In kg (kg)。

7regulation of inspection

7. 1combined lots

Each inspection batch shall be composed of recycled steel raw materials of the same class and grade; each inspection batch shall not be less than 3 0 0 t 。

7. 2inspecting item

Radioactive pollutants, explosive articles, hazardous wastes and inclusions of recycled steel raw materials shall be tested.

7. 3sample

The sampling of recycled steel raw materials shall conform to the table 4 The provisions of.

outside4Sampling of recycled steel raw material inspection project

inspecting item	Sampling regulations	Requires the chapter number	Chapter number of the test method
radioactive contaminant	Batch by batch inspection	5.2	6.2
Explosive items		5.3	6.3
hazardous wastes		5.4	6.4
foreign impurity	Take no less than for each inspection batch1Sample samples; the quality of each sample is not less than50 kg	5.5	6.5

7 .4Determination of the test results

7 .4 1. The value of the test results is calculated as GB / T8170Repair the contract, and use the agreement value comparison method to determine。

7 .4 .2The inspection of this document adopts the method of random sampling inspection, and the result of random sampling inspection is taken as the inspection result of the whole batch of goods。

7 .4 .3If any of the radioactive pollutants, explosive articles and hazardous wastes do not meet the requirements, the batch of recycled steel raw materials is determined to do not conform to the provisions of this document.

7 .4 .4Double test should be determined for inclusion testing. When the first test does not meet the requirements, the second sample can be tested and weighted average with the results of the first test. The weighted average calculation result conforms to the table3If specified, the batch of recycled steel raw materials shall be deemed qualified; otherwise, the batch of recycled steel raw materials shall not conform to the provisions of this document.

8Certificate of transportation and quality

8 1. transport

8 1 1. . When shipping and loading (ship), each carriage (cabin, container) is generally only allowed to load the same category, the same grade of recycled steel raw materials.

8 1 .2. In order to make up for the loss of the cabin, more than two categories, but should be separated as far as possible to make obvious marks.8 .2certificate of quality

8 .2 1. For the delivery of recycled steel raw materials, each delivery batch shall be accompanied by a quality certificate or delivery note。

8 .2 .2The quality certificate or delivery note shall be accompanied by the data or certificate of qualified radioactive inspection and indicate it：

a) Name of the supplier;

b) quality;

c) Category and grade number;

d) If the alloy steel recycled steel raw materials need to indicate the steel type and the main alloy content;e) Stainless steel recycled steel raw materials need to indicate the content of the main components (chromium, nickel).

appendixA

(File)

Typical photos of

recycled steel raw materials See the typical photos of recycled steel raw materialsA.1~ graph A.12。

graphA 1. Heavy-duty recycled iron steel raw materialsHRS 10 1graphA .2Heavy-duty recycled iron steel raw materialsHRS 102

graphA .3Medium-sized recycled steel raw materialsMRS 20 1graphA .4Medium-sized recycled steel raw materialsMRS 202

graphA .5Small recycled steel raw materialsLRS 30 1graphA .6Small recycled steel raw materialsLRS 303

graphA .7Broken type recycled steel raw material S RS 401/402graphA .8Broken type recycled steel raw materialsS RS 403

graphA .9Block ped recycled steel raw materialsBRS 50 1graph. A 10Block ped recycled steel raw materialsBRS 502

graphA 1 1. Alloy steel recycled steel raw materialsARS 601/ARS 602graph. A 12Cast iron recycled steel raw materialsCRS 70 1

appendixB

(File)

The characteristic properties of recycled steel raw materials

B 1. apparent characteristics

B 1 1. . The appearance of recycled iron and steel raw materials should be kept clean, without obvious waste paper, waste plastics, waste fiber and other substances.

B 1 .2. The appearance of recycled steel raw materials should be without serious corrosion。

B 1 .3. Reyclsteel raw materials should have no closed containers。

B 1 .4. Cylinders, steel barrels and other container products should be cut and broken to the point that they do not have the function of the original container and remove the original container clean.

B .2chemical composition

B .2 1. The content of phosphorus and sulfur in recycled steel raw materials are not greater than respectively0 .050%, the copper content is not greater than0 .300%, and the arsenic content is not greater than0 .050%。

B .2 .2Alloy steel regeneration in the steel raw materials, Stainless steel recycled steel raw material containing nickel (Ni) is not less than7 .0% or containing chromium (Cr) is not less than11 .5%。

B .2 .3The chemical composition of cast iron and other alloy steel steel raw materials shall be negotiated by both supply and demand parties。

B .3metal properties

Recycling steel raw materials should ensure high quality metal properties, TFe content is shown in the tableB.1。

outsideB 1. The TFe content of recycled steel raw materials

class	English name	English abbreviation	Chinese abbreviation	TFe content /% Not less than
Heavy-duty recycled iron steel raw materials	heavy recycling iron-steel materials	HRS	Heavy material	93 .0
Medium-sized recycled steel raw materials	medium recycling iron-steel materials	MRS	Medium material	93 .0
Small recycled steel raw materials	light recycling iron-steel materials	LRS	Small material	92 .0

Broken type recycled steel raw materials	shredded recycling iron–steel materials	SRS	Broken material	92 .0
Block ped recycled steel raw materials	bundled recycling iron –steel ma – terials	BRS	Pack material	93 .0
Alloy steel recycled steel raw materials	alloy recycling iron–steel materials	ARS	Alloy steel	—
Cast iron recycled steel raw materials	cast recycling iron–s teel materials	CRS	Casting iron material	92 .0

B .4test method

The method for the detection of recycled steel ingredients is provided in the appendixD。

appendixC
(normaliza
tion)
Test method for radioactive contamination

C 1. inspection instrument

The inspection instrument shall comply with itGB18871、GB /T12162 .3And GB / T5202The provisions of。

C .2External exposure through the radiation dose rate measurement

C .2 1. Natural environmental radiation background value measurement

C .21 .1.Before measuring external radiation through radiation dose rate, the local natural environmental radiation background value should be measured and determined。

C .21 .2.Select a flat open ground that can represent the local normal natural radiation background state and without radioactive pollution3~5A point (can be made ls a fixed survey point) as the survey point.

C .21 .3.Place the measuring probe of the meter on the ground above the measuring point1 mHigh place, determine its external exposure through the radiation dose rate, each10 s Read the measurements1Times, take10The mean of the secondary readings was taken as the measurement of the point, and the arithmetic mean of each measurement point was taken as the mean of normal natural radiation measurements.

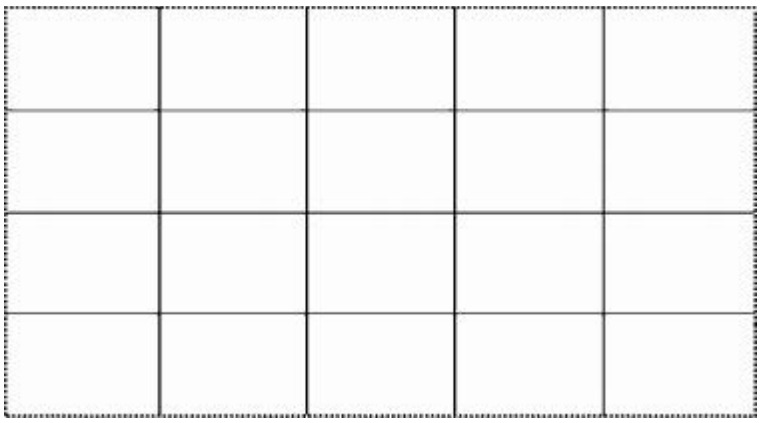
C .2 .2data–logging

C .2.2. 1Raw materials should be tested for radioactive contamination before passing through the port channel。During the circuit inspection, you can fully connect the measuring instrument
Near the surface of the measured object or the surface of the container, car body, warehouse, etc., the peripheral surface of the measured object.

C .2.2.2When the radioactivity was found that the circuit test obviously exceeded the management limit of the three test indicators, it was judged to be unqualified。When the radioactive pollution has been found to exceed the management limit of the three detection indicators, no separate inspection or selection will be carried out.

C .2 .3Distribution of test points

C .2.3. 1Cars, trains, containers, ships, or piles of bulk raw materials can be distributed according to the grid method (see graphC.1)。Detection of external irradiation through the radiation dose rate and surface contamination by direct measurement method.



graphC 1. Schematic diagram of the radioactive contamination measurement distribution sites

C .2.3.2The car is longitudinal by the carriage2Line and lateral3Line of the grid augments, points, in the grid6Distribution point and measurement at each intersection point。

C .2.3.3Train, container by vertical and horizontal2A method of grid point measurement, but not less than10A point。

C .2.3.4Ship cabin according to the size of the cabin, according to the front, middle and back of the cabin3Lines and the left, middle, and right3The grid, the point measurement at the intersection of the grid, but not less than12A point.

C .2 .4measure

C .2.4. 1Standard operation according to the requirements of the instrument operating instructions。

C .2.4.2Keep the instrument probe as close as possible to the surface of the measured object。

C .2.4.3After the display value of the instrument is stable, start the measurement and reading, each10s indication1Times, take10The average value of the secondary readings was used as the test point External exposure through the radiation dose rate measurements.

Note: In the test, the inspection of tubes, containers and other inclusion bodies, pay special attention to the internal that can not be detected from the outside due to shieldingα、βsurface contamination.

C .2 .5The efficiency factor of the measuring instrument

C .2.5. 1In-service measuring instruments shall be tracked with verification sources (such as early, middle and late1Times)。

C .2.5.2Place the instrument probe over the pollution-free dry ground and stabilize each10 sindication1Times, take10Mean values of the secondary readings*Ben*·1 Is the natural environmental radiation background value.

C .2.5.3Adjust the gear of the instrument according to the net source value () of the verification source, put the check source on the probe and stand in the original place, and then read the same10Second, measured the average value of the check source*Ben*·2。

C .2.5.4Press type (C.1) Calculate the efficiency factor of the measuring instrument*Endyceps sinensis*η。

$$Endyceps\ sinensis\eta = \frac{Ben\cdot 2}{Ben\cdot 1} \quad \text{(C.1)}$$

In formula:

*Endyceps sinensis*0—The efficiency factor of the measuring instrument;

Endyceps sinensis—Check the net source value of the source, In microGorey per hour(μ Gy /h);

Ben·2—Check the source10Mean values of the secondary readings, In micro-Gorey per hour (μ Gy / h);*Ben*·1—Natural environmental radiation background value, In microGorey per hour(μ Gy /h)。

C .2 .6Correction of measurement values

Press type (C.2) Calculate the radiation dose rate through the corrected external irradiation*Ben*·。

$$\dot{Ben} = Endyceps\ sinensis1 \cdot Endyceps\ sinensis\eta \cdot \dot{Ben}c \quad \text{(C.2)}$$

In formula:

Ben·—The modified measurement value of the measuring instrument, In microGorey per hour(μ Gy /h);*Endyceps sinensis*1— —The scale factor of the measuring instrument (given by the verification certificate of the instrument);

*Endyceps sinensis*η—The efficiency factor of the measuring instrument;

Ben·c—Measurement value readings of the measuring instrument, In microGorey per hour(μ Gy /h)。

C .3α 、βSurface pollution inspection

C .3 1. Test requirements

same asα、βSurvey and location measurement of surface contamination level should be conducted simultaneously with the measurement of radiation dose rate through external exposure, If necessary, the project survey and distribution survey can also be conducted separately.

C .3 .2Test point layout

Toα、βSurface contamination level shall be tested as perC.2 .3The measurement area should be greater than300 cm^2。

C . 3. 3α The efficiency determination of the surface pollution tester

C . 3. 3. 1The natural surface residual radiation background was measured by using the α surface pollution tester 1 0 m i n The count of $N0,\alpha$。

C . 3. 3. 2Determine the instrument calibration source 5 The min, the count $N1,\alpha$。

C . 3. 3. 3The instrument probe was reversed for 180° before the measurement 5 The min, the corrected source $N2,\alpha$ (Consider the inhomogeneity of the plane source) 。

C . 3. 3. 4Press type (C. 3) Calculate the efficiency factor of the instrument $\eta 4\pi(\alpha)$ 。

$$\eta 4\pi = \frac{(N1,\alpha \text{ X. } N2,\alpha) - N0,\alpha}{100A} \times 100\%$$

In formula:

$\eta 4\pi(\alpha)$ —α Surface radiation pollution detection instrument efficiency factor; $N1,\alpha$—The corrected source was previously applied 5 Counts as measured by the min; $N2,\alpha$—Counts measured after 180°;

$N0,\alpha$—Radiation count of the instrument to the background;

$A\alpha$—α Correct the activity value of the source (plane source)。

C . 3. 4β Efficiency determination of a surface contamination tester

C . 3. 4. 1need β The surface pollution measurement instrument measured the natural environmental radiation background 4 m i n The count of $N0,\beta$。

C . 3. 4. 2Determine the corrected source 2 The min, the count $N1,\beta$。

C . 3. 4. 3Reverse the instrument probe for 180° and determine 2 Count count N of the corrected source 2, β (Consider the inhomogeneity of the plane source) 。

C . 3. 4. 4Press type (C. 4) Calculate the efficiency factor of the instrument $\eta 4\pi(\beta)$ 。

$$\eta 4\pi = \frac{(N1,\beta \text{ ten } N2,\beta) - N0,\beta}{4A\beta} \times 100\%$$

In formula:

$\eta 4\pi(\beta)$ —β Surface radiation pollution detection instrument efficiency factor; $N1,\beta$—The corrected source was previously applied 2 Counts as measured by the min;

$N2,\beta$— 180° 2 Counts as measured by the min; $N0,\beta$—Radiation count of the instrument to the background;

$A\beta$—β calibration source (plane source) The activity value。

C . 3. 5 α、β Surface contamination level measurement

C . 3. 5. 1α、βSurface contamination The instrument probe is as close as possible to the surface of the object (the distance from the surface is not greater than respectively 2 0 m mAnd 5 0 mm), the measured area should be greater than 3 0 0 c m^2。

C . 3. 5. 2To no more than 1 0 0 mm / s The speed of moving the instrument, was conducted onα、βDetection of the surface contamination levels。

C . 3. 5. 3Each test point shall be conducted 2 times and ~3 timesSecondary readings, with each interval 1 The min and read its cumulative count value N。C . 3. 5. 4Press type (C. 5) Calculateα、βSurface pollution level C(a perhapsβ), In units per square centimeter (Bq / cm^2) 。

$$C(\alpha \text{ perhaps}\beta) = \frac{N}{\eta 4\pi(a \text{ or } \beta) S \cdot t}$$

In formula:

C(α perhapsβ) —αperhapsβ (One of them) is the surface contamination level, In units per square centimeter (Bq / cm^2) ; N– –Counting of the testing instruments;

η 4 π (a orβ) —a perhapsβEfficiency factor of the surface pollution meter;

S– –The area of the detection window of the detection instrument, unit in square centimeter (cm^2) ; t–Measurement time in seconds (s).

appendixD

(File)

Standard for analytical methods of steel products

GB /T 223 .3	Method for chemical analysis of steel and alloloys; the amount of phosphorus by weight method	
GB /T 223 .4	Determination of steel and alloy manganese content by potential titration or visual titration	
GB /T 223 .5	Determination of silicon and all silicon content of prototype silicon molybdate spectrophotometric method	
GB /T 223 .6	Chemical analysis of steel and alloy	
GB /T 223 .7	Determination of iron content potassium dichromate titration	
GB /T 223 .8	Steel and Alloy Chemical Analysis–Sodium Fluoride separation–EDTA titration for determination of aluminum content	
GB /T 223 .9	Determination of steel and alloy aluminum content Chromium Tianqing S spectrophotometric method	
GB /T 223 .11	Determination of steel and alloy chromium content by visible titration or potential titration	
GB /T 223 .12	Chemical analysis methods for steel and alloys	Sodium carbonate separation–determination by photometric method
GB /T 223 .13	Chemical analysis methods for steel and alloys	Vanadium content was determined by ammonium titration of ferrous sulfate
GB /T 223 .14	Chemical analysis methods for steel and alloys	Determination of vanadium content by tantalum reagent
GB /T 223 .17	Chemical analysis methods for steel and alloys	The termination of titanium
GB /T 223 .18	Chemical analysis methods for steel and alloys	Sodium thiosulfate separation–iodine measurement method to determine copper quantity
GB /T 223 .19	Chemical analysis methods for steel and alloys	Determination of copper content by sub–chloromethane extraction
GB /T 223 .20	Chemical analysis methods for steel and alloys	Cobalt amount was measured by the potential titration method
GB /T 223 .21	Chemical analysis methods for steel and alloys	5–CI–Determination of cobalt content by PADAB spectrophotometry
GB /T 223 .22	Chemical analysis methods for steel and alloys	Determination of cobalt content by spectrophotometric method of nitroso–R salt
GB /T 223 .23	Determination of steel and alloy nickel content by butadione oxime spectrophotometry	
GB /T 223	Iron and steel and alloy chemical analysis method, determination of	

	.25	nickel amount by budiketone oxime weight method	
GB /T	223 .26	Determination of steel and alloy molybdenum content by thiocyanate spectrophotometric method	
GB /T	223 .28	Chemical analysis methods for steel and alloysa–Determination of molybdenum by weight imimweight	
GB /T	223 .29	Determination of lead content in steel and alloy carrier precipitation–crethanol orange spectrophotometric method	
GB /T	223 .31	Determination of arsenic content in steel and alloy: distillation and separation–molybdenum blue spectrophotometric method	
GB /T	223 .32	Chemical analysis methods for steel and alloys	Arsenic content was determined by sodium hypohosphate reduction–iodine measurement
GB /T	223 .33	Chemical analysis methods for steel and alloys	Extraction separation–azo chloride mA photometry
GB /T	223 .38	Chemical analysis methods for steel and alloys	Ion–exchange separation–weight method for the determination of niobium amount
GB /T	223 .40	Determination of steel and alloyed niobium content by chlorosulfophenol S spectrophotometry	
GB /T	223 .41	Chemical analysis methods for steel and alloys	Ion–exchange separation–photometric measurement of tantalum
GB /T	223 .42	Chemical analysis methods for steel and alloys	Ion exchange separation–Bromotrochol red luminosity measurement of tantalum
GB /T	223 .43	Steel and alloy, the determination of tungsten quantity	Weimetric and spectrophotometry
GB /T	223 .47	Chemical analysis methods for steel and alloys	The amount of antimony was determined by carrier precipitation — molybdenum blue photometry
GB /T	223 .49	Chemical analysis methods for steel and alloys	Extraction separation–azo chlorin mA spectrophotometric determination of total rare earth
GB /T	223 .50	Chemical analysis methods for steel and alloys	Phenyl fluorescent ketone–bromide was determined by direct photometry
Tin quantity			
GB /T	223 .51	Chemical analysis methods for steel and alloys	5–Br–PADAP photometry
GB /T	223 .52	Chemical analysis methods for steel and alloys	Selenium content was measured by hydroxylamine hydrochloride–iodine measurement method
GB /T	223 .53	Chemical analysis methods for steel and alloys	Determination of copper content by flame atomic absorption spectrophotometry
GB /T	223 .54	Chemical analysis methods for steel and alloys	Determination of nickel content by flame atomic absorption spectrophotometry

GB /T223 .58Methods for steel and alloy chemical analysis of sodium arsenite–sodium nitrite titration

GB /T223 .59Determination of steel and alloy phosphorus content bismuth phosphorus–molybdenum blue spectrophotometry and antimony phosphorus–molybdenum blue spectrophotometry

GB /T223 .60Methods for chemical analysis of steel and alloy Determination of silicon content by weight method of perchloric acid dehydration

GB /T223 .61Methods for chemical analysis of steel and alloys Determination of phosphorus content by ammonium phosphorolybdate capacity method

GB /T223 .62Methods for chemical analysis of steel and alloy; Determination of phosphorus content by butyl acetate extraction

GB /T223 .63Methods for chemical analysis of steel and alloy; photometric determination of manganese content by sodium periodate (potassium)

GB /T223 .64Determination of steel and alloy manganese content by flame atomic absorption spectrometry

GB /T223 .65Determination of steel and alloy cobalt content by flame atomic absorption spectrometry

GB /T223 .66Steel and alloy chemical analysis method thiocyanate–chlorpromazine hydrochloride–trichloromethane extraction method for the determination of tungsten quantity

GB /T223 .67Determination of sulfur content in steel and alloy by secondary methyl blue spectrophotometry

GB /T223 .68Chemical analysis method of iron and steel and alloy, sulfur content is determined by potassium iodate titration after combustion in tubular furnace

GB /T223 .69Determination of carbon content of steel and alloy after combustion gas capacity method in tubular furnace

GB /T223 .70Determination of iron and alloy iron content by o–dinitrogen spectrophotometric method

GB /T223 .71Methods for chemical analysis of steel and alloy; carbon content is determined by post–combustion weight method in tube furnace

GB /T223 .72Determination of sulfur content of steel and alloy by weight method

GB /T223 .73Determination of iron content in steel and alloy by titanium trichloride–potassium dichromate titration method

GB /T223 .75Determination of boron content in steel and alloy Methanol distillation–curcumin photometric method

GB /T223 .76Chemical analysis of steel and Alloys; Determination of vanadium content by flame atomic absorption spectrometry

GB /T223 .77Methods for chemical analysis of steel and alloy Determination of calcium content by flame atomic absorption spectrometry

GB /T223 .78Chemical analysis of steel and Alloys– –Curcumin measured boron content by direct photometry

GB /T4336Determination of multi–element content of carbon steel and low alloy steel spark discharge atomic emission spectroscopy (conventional method) GB /

T11170Determination of multielement content of stainless steel by spark discharge atomic emission spectroscopy (conventional method)
GB /T20123Determination of total carbon and sulfur content in iron and steel in high–frequency induction furnace (conventional method)
GB /T20125Determination of multielement content of low alloy steel by inductively coupled plasma atomic emission spectroscopy

reference documentation

[1] The National Hazardous Waste List (Order of the Ministry of Ecology and Environment No15No.)