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Circular Economy – Recycling of Steel Waste and Scrap

الاقتصاد الدائري – إعادة تدوير نفايات وخردة الحديد

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Foreword

The national Circular Economy technical Committee of Saudi Standards, Metrology and Quality Organization (SASO) has prepared the Saudi Standard "*Circular Economy – Recycling of Steel Waste and Scrap*" based on relevant ADMO, International and National foreign Standards and references.

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Introduction:

The transition toward a circular economy represents a fundamental enabler for achieving environmental sustainability and optimizing resource efficiency within the Kingdom of Saudi Arabia. In alignment with national directives for integrated waste management and the strategic objectives of the National Waste Strategy, this standard strengthens the principles of circularity by promoting the recovery, recycling, and valorization waste and scrap.

Accordingly, the National Technical Committee for the Circular Economy plays a pivotal role in advancing Saudi Arabia's shift toward a more sustainable and resource-efficient future. Through its initiatives, the committee seeks to develop and adopt internationally aligned standards that foster responsible production, minimize waste generation, and drive innovation across industrial sectors.

In conclusion, the committee's objective is to establish a comprehensive framework for the sustainable management of steel waste and scrap through systematic recycling practices that enhance material recovery, reduce reliance on primary raw resources, and mitigate environmental impacts. It underscores the importance of adopting efficient collection, sorting, and processing methods that ensure product quality, traceability, and adherence to environmental and safety requirements.

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1. Scope

This document specifies the recycling standards to be applied in the Kingdom of Saudi Arabia in relation to steel waste and scrap, including materials such as structural steel, steel beams, steel pipes, and steel waste and scrap from construction and demolition projects. It also covers steel waste from manufacturing processes and discarded household items like appliances, vehicles, and machinery. Table 1 defines the main World Customs Organization (WCO) Harmonized System (HS) codes for iron and steel waste and scrap to which this standard applies, once they have become waste.

The scope of this standard includes segregation, processing, and recycling of materials to ensure environmentally sound practices and compliance with National Waste Strategy Targets. These standards apply to recycling facilities, waste management companies, and industries involved in the generation and processing of steel waste and scrap waste and scrap, ensuring that they meet the required criteria for safe handling, recovery, and recycling.

Note: This standard applies to Recyclers producing recovered steel (being graded).

Recovered steel waste and scrap must comply with the quality standards, be refined domestically or internationally, and adhere to Annex I. Criteria For Acceptable Steel Waste And Scrap and Annex V. Output General Quality Requirements guidelines. Recovered steel waste and scrap is transported in clean, labeled containers with batch and grade details to avoid contamination. Output materials must meet contamination limits, and external quality monitoring is required regularly, with records kept for five years. A sampling protocol is also mandatory, and customer feedback is solicited to ensure product quality. A quality management system covering input acceptance, process monitoring, product sampling, and customer feedback must be in place to ensure consistent quality.

1.1 Acceptable Waste Types

For the purpose of clarifying the full scope of the wastes addressed in this standard, the following main World Customs Organization (WCO) Harmonized System (HS) code of iron and steel scrap apply.

World Customs Organization (WCO) Harmonized System (HS) code of Iron and steel scrap

Heading	H.S. Code ¹	Description
73.01		Sheet piling of iron or steel, whether or not drilled, punched or made from assembled elements, welded angles, shapes and sections, of iron or steel
	7301.10 7301.20	• Sheet piling • Angles, shapes and sections
73.02		Railway or tramway track construction material of iron or steel, the following: rails, check-rails and rack rails, switch blades, crossing frogs, point rods and other crossing pieces, sleepers (cross-ties), fish-plates, chairs, chair wedges, sole plates (base plates), rail clips, bedplates, ties and other material specialized for jointing or fixing rails
	7302.10 7302.30 7302.40 7302.90	• Rails • Switch blades, crossing frogs, point rods and other crossing pieces • Fish-plates and sole plates • Other
73.03	7303.00	Tubes, pipes and hollow profiles, of cast iron
73.04		Tubes, pipes and hollow profiles, seamless, of iron (other than cast iron) or steel
	7304.19 7304.23 7304.29 7304.31 7304.39 7304.41 7304.49 7304.51 7304.59 7304.90	• Line pipe of a kind used for oil or gas pipelines: ◦ Other • Casing, tubing and drill pipe, of a kind used in drilling for oil or gas: ◦ Other drill pipe ◦ Other • Other, of circular cross-section, of iron or non-alloy steel: ◦ Cold-drawn or cold-rolled (cold-reduced) ◦ Other • Other, of circular cross-section, of stainless steel: ◦ Cold-drawn or cold-rolled (cold-reduced) ◦ Other • Other, of circular cross-section, of other alloy steel: ◦ Cold-drawn or cold-rolled (cold-reduced) ◦ Other • Other
73.05		Other tubes and pipes (for example, welded, riveted or similarly closed), having circular cross-sections, the external diameter of which exceeds 406.4 mm, of iron or steel
	7305.11	• Line pipe of a kind used for oil or gas pipelines: ◦ Longitudinally submerged arc welded

¹ Articles of iron or steel, World Customs Organization, 1573_2017e.

Heading	H.S. Code ¹	Description
	7305.12 7305.19 7305.20 7305.31 7305.39 7305.90	○ Other, longitudinally welded ○ Other ● Casing of a kind used in drilling for oil or gas ● Other, welded: ○ Longitudinally welded ○ Other ● Other
73.06	Other tubes, pipes and hollow profiles (for example, open seam or welded, riveted or similarly closed), of iron or steel	
	7306.19 7306.29 7306.30 7306.61 7306.69 7306.90	○ Line pipe of a kind used for oil or gas pipelines: ○ Other ○ Casting and tubing of a kind used drilling for oil or gas: ○ Other ○ Other, welded, of circular cross-section, of iron or non-alloy steel ○ Other, welded, of non-circular cross-section: ○ Of square or rectangular cross-section ○ Of other non-circular cross-section ○ Other
73.07	Tube or pipe fittings (for example, couplings, elbows, sleeves), of iron or steel	
	7307.11 7307.19 7307.91 7307.92 7307.93 7307.99	● Cast fittings: ○ Of non-malleable cast iron ○ Other ● Other: ○ Flanges ○ Threaded elbows, bends and sleeves ○ Butt welding fittings ○ Other
73.08	Structures (excluding prefabricated buildings of heading 94.06) and parts of structures (for example, bridges and bridge-sections, lock-gates, towers, lattice masts, roofs, roofing frame-works, doors and windows and their frames and thresholds for doors, shutters, balustrades, pillars and columns), of iron or steel; plates, rods, angles, shapes, sections, tubes and the like, prepared for use in structures, of iron or steel	
	7308.10 7308.20 7308.30 7308.40 7308.90	● Bridges and bridge-sections ● Towers and lattice masts ● Doors, windows and their frames and thresholds for doors ● Equipment for scaffolding, shuttering, propping or pit propping ● Other
73.09	7309.00	Reservoirs, tanks, vats and similar containers for any material (other than compressed or liquefied gas), of iron or steel, of a

Heading	H.S. Code ¹	Description
		capacity exceeding 300 l, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment
73.10		Tanks, casks, drums, cans, boxes and similar containers, for any material (other than compressed or liquefied gas), of iron or steel, of a capacity not exceeding 300 l, whether or not lined or heat insulated, but not fitted with mechanical or thermal equipment
	7310.10 7310.21 7310.29	• Of a capacity of 50 l or more • Of a capacity of less than 50 l: ○ Cans which are to be closed by soldering or crimping ○ Other
73.11	7311.00	Containers for compressed or liquefied gas, of iron or steel
73.12		Stranded wire, ropes, cables, plaited bands, slings and the like, of iron or steel, not electrically insulated
	7312.10 7312.90	• Stranded wire, ropes and cables • Other
73.13	7313.00	Barbed wire of iron or steel; twisted hoop or single flat wire, barbed or not, and loosely twisted double wire, of a kind used for fencing, of iron or steel
73.14		Cloth (including endless bands), grill, netting and fencing, of iron or steel wire; expanded metal of iron or steel
	7314.12 7314.14 7314.19 7314.20 7314.31 7314.39 7314.41 7314.42 7314.49 7314.50	• Woven cloth: ○ Endless bands for machinery, of stainless steel ○ Other woven cloth, of stainless steel ○ Other • Grill, netting and fencing, welded at the intersection, of wire with a maximum cross-sectional dimension of 3 mm or more and having a mesh size of 100 cm² or more ○ Other grill, netting and fencing, welded at the intersection: • Plated or coated with zinc ○ Other • Other cloth, grill, netting and fencing: ○ Plated or coated with zinc ○ Coated with plastics ○ Other • Expanded metal
73.15		Chain and parts thereof, of iron or steel
	7315.11 7315.12 7315.19 7315.20	• Articulated link chain and parts thereof ○ Roller chain ○ Other chain ○ Parts • Skid chain

Heading	H.S. Code ¹	Description
	7315.81 7315.82 7315.89 7315.90	• Other chain ○ Stud-link: ○ Other, welded link ○ Other • Other parts
73.16	7316.00	Anchors, grapnels and parts thereof, of iron or steel
73.17	7317.00	Nails, tacks, drawing pins, corrugated nails, staples (other than those of heading 83.05) and similar articles, of iron or steel, whether or not with heads of other material, but excluding such articles with heads of copper
73.18	Screws, bolts, nuts, coach screws, screw hooks, rivets, cotters, cotter-pins, washers (including spring washers) and similar articles, of iron or steel	
	7318.11 7318.12 7318.13 7318.14 7318.15 7318.16 7318.19 7318.21 7318.22 7318.23 7318.24 7318.29	• Threaded articles: ○ Coach screws ○ Other wood screws ○ Screw hooks and screw rings ○ Self-tapping screws ○ Other screws and bolts, whether or not with their nuts or washers ○ Nuts ○ Other • Non-threaded articles: ○ Spring washers and other lock washers ○ Other washers ○ Rivets ○ Cotters and cotter-pins ○ Other
73.19		Sewing needles, knitting needles, bodkins, crochet hooks, embroidery stilettos and similar articles, for use in the hand, of iron or steel; safety pins and other pins of iron or steel, not elsewhere specified or included
	7319.40 7319.90	• Safety pins and other pins • Other
73.20	Springs and leaves for springs, of iron or steel	
	7320.10 7320.20 7320.90	• Leaf-springs and leaves therefor • Helical springs • Other
73.21	Stoves, ranges, grates, cookers (including those with subsidiary boilers for central heating), barbecues, braziers, gas-rings, plate warmers and similar non-electric domestic appliances, and parts thereof, of iron or steel	
	7321.11 7321.12 7321.19	• Cooking appliances and plate warmers: ○ For gas fuel or for both gas and other fuels ○ For liquid fuel ○ Other, including appliances for solid fuel

Heading	H.S. Code ¹	Description
	7321.81 7321.82 7321.89 7321.90	• Other appliances: ○ For gas fuel or for both gas and other fuels ○ For liquid fuel ○ Other, including appliances for solid fuel • Parts
73.22		Radiators for central heating, not electrically heated, and parts thereof, of iron or steel; air heaters and hot air distributors (including distributors which can also distribute fresh or conditioned air), not electrically heated, incorporating a motor-driven fan or blower, and parts thereof, of iron or steel
	7322.11 7322.19 7322.90	• Radiators and parts thereof: ○ Of cast iron ○ Other • Other
73.23	Table, kitchen or other household articles and parts thereof, of iron or steel; iron or steel wool; pot scourers and scouring or polishing pads, gloves and the like, of iron or steel	
	7323.10 7323.91 7323.92 7323.94 7323.99	• Iron or steel wool; pot scourers and scouring or polishing pads, gloves and the like • Other: ○ Of cast iron, not enamelled ○ Of cast iron, enamelled ○ Of iron (other than cast iron) or steel, enamelled ○ Other
73.24	Sanitary ware and parts thereof, of iron or steel	
	7324.21 7324.29 7324.90	• Baths: ○ Of cast iron, whether or not enamelled ○ Other • Other, including parts
73.25	Other cast articles of iron or steel	
	7325.10 7325.91 7325.99	• Of non-malleable cast iron • Other: ○ Grinding balls and similar articles for mills ○ Other
73.26	Other articles of iron or steel	
	7326.11 7326.19 7326.20 7326.90	• Forged or stamped, but not further worked ○ Grinding balls and similar articles for mills ○ Other • Articles of iron or steel wire • Other

2. Normative references

The following documents are essential to the application of this document. For the dated documents, only the versions with the dates indicated are applicable to this document. For the undated documents, only the latest versions (including all the amendments) are applicable to this standard.

- National Waste Management Law and Implementing Regulations.
- Council of Ministers order No. 457, date 11/8/1440 AH for The National Center for Waste Management establishment.
- Royal Decree No. M/10 Dated 1392-03-03 for The Saudi Standards, Metrology and Quality Organization (SASO) establishment.
- Commission Decision of 3 May 2000 establishing a list of wastes; (2000/532/EC).
- Commission Regulation No 333/2011 establishing criteria determining when certain types of scrap metal cease to be waste; (2008/98/EC).
- European Steel Scrap Specification; (EUROPEAN STEEL SCRAP SPECIFICATION).
- Articles of iron or steel, World Customs Organization; (1573_2017e).

3. Terms and definitions

For the purpose of this standard, the definitions set out in National Waste Management Law and Implementing Regulations apply. In addition, the following definitions apply in this standard:

Item	Definition
Collection	Collecting waste from designated storage containers of various sizes and types using trucks and machinery designated for such purpose
Collectors	Entities that are responsible for collecting waste from designated storage containers of various sizes and types using trucks and machinery designated for such purpose
Consignment	Refers to a batch of the waste concerned which is intended for delivery from a producer to another holder and may be contained in either one or several transport units, such as containers
Converters	Converters take recycled materials and transform them into new products. This step often involves significant manufacturing processes.
European Waste Catalogue (EWC)	A comprehensive list of codes and descriptions for wastes based on their source and type.

Item	Definition
Hazardous waste	Waste that is classified as hazardous under this Law and the Regulations and generated from industrial or non-industrial activities which contain toxic, flammable, reactive, or corrosive materials, or solvents, degreasers, oils, dyes and pigments, pasty residue, or acids and alkalis.
Holder	Refers to the natural or legal person who is in possession of the waste material
Importer	Refers to any natural or legal person established within the Kingdom of Saudi Arabia who introduces waste into the customs territory of the Kingdom
Inspector and/or inspectors	Persons designated by a decision of the Minister to take charge of detecting, proving and investigating violations of the provisions of the Law and the Regulations, jointly or individually
ISRI	Refers to The US trade association 'Institute of Scrap Recycling Industries' (ISRI) publishes yearly a so-called scrap specifications circular.
License	A written permission issued by the Center to carry out any activity related to waste management, as specified in this Law and the Regulations.
License or Permit	Issued in accordance with the requirements of the National Waste Management Law and Implementing Regulations to allow the holder to recycle waste.
Non-hazardous waste	Waste that does not formulate a threat to public health or the environment, and which cannot be classified under any circumstances as hazardous waste
Permit	A document issued to waste recycling facilities by the Center to verify their compliance with the Center's controls and requirements prior to obtaining the licenses issued by the competent agencies in accordance with their regulations.
Producer	Refers to the holder who transfers waste to another holder for the first time as waste
Qualified staff	Refers to staff which is qualified by experience or training to monitor and assess the properties of the waste concerned
Recycled steel scrap or output material	Steel scrap produced in compliance with the requirements of this standard.
Recyclers	Entities that are responsible for the process of transforming specific waste components into usable materials for the purpose of recovering such components or using them as raw materials in manufacturing processes
Recycling	The process of transforming specific waste components into usable materials for the purpose of recovering such components or using them as raw materials in manufacturing processes.

Item	Definition
Retailers	Retailers are businesses that sell products directly to consumers. They play a crucial role in the recycling chain by influencing consumer behavior, offering sustainable products, and facilitating recycling initiatives
Service Provider	A person who holds a license or permit to engage in any waste management activity.
Sorters	Entities that are responsible for manually or automatically separating waste components, such as paper, glass, metals, and the like, in transfer stations or sorting and treatment facilities for the purpose of recycling or treatment
Sorting	Manually or automatically separating waste components, such as paper, glass, metals, and the like, in transfer stations or sorting and treatment facilities for the purpose of recycling or treatment.
Steel Scrap	Scrap metal which consists mainly of iron and steel
Storage	Temporarily storing all or part of the components of waste for transportation or future use.
The Center	The National Center for Waste Management
The Law	Waste Management law
The Minister	Minister of Environment, Water, and Agriculture, and Chairman of the Center's Board of Directors
The Regulations	Implementing Regulations of this Law
Transportation	Transporting waste using approved means of transportation to transfer stations, treatment or sorting facilities, or designated landfills.
User	Construction company, manufacturer, contractor, or other organisation or individual responsible for the end use of steel scraps.
Visual inspection	Refers to inspection of the waste concerned covering all parts of a consignment and using human senses or any non-specialised equipment
Waste	All materials that are thrown or disposed of, and that directly or indirectly affect public health or the environment
Waste management	Managing any activity or practice related to waste, such as waste collection, transportation, sorting, storage, treatment, recycling, import, export, and safe disposal, including the aftercare of waste disposal sites.
Waste Producer	A person who produces the waste classified under this Law.

4. General Requirements

4.1 General Application Of The Waste Hierarchy

Article 11, chapter 3 of the waste management law provides the following hierarchy shall apply as a priority order in waste prevention and management for the waste concerned:



Figure 1 Waste Hierarchy

- a) The use of materials and natural resources will be rationalized;
- b) Wherever possible the waste will be re-used;
- c) Wherever rational use of materials and reuse is not possible, the waste will be minimized;
- d) Waste will be stored at the designated locations, in accordance with the requirements specified by the Regulation;
- e) The waste that can be reused or recycled will be sorted and placed in designated locations.

4.2 Requirement To Hold A Permit To Manage Wastes

All parties that undertake activities involving the treatment, recovery, or recycling of waste must hold the necessary permit(s) and/or license(s) from

the MWAN and other relevant competent authority to undertake the relevant activity for the wastes concerned.

5. Input Requirements

5.1 Specified Input Materials

There are multiple ways to categorize scrap metal based on its origin. Within this standard, steel waste and scrap are distinguished based on the below:

- Scrap from steel plants and rolling mills
- Scrap produced during steel processing (termed new scrap)
- Scrap sourced from used products (known as old scrap)

New scrap arises early in the manufacturing process. It is well-defined in composition and usually does not require pre-treatment prior to re-melting, though resizing may be necessary. New scrap that is painted or coated typically does not need waste-related pre-treatment before entering furnaces, with the exception of cable, which does require prior treatment.

Conversely, old scrap is collected post-use, either as individual pieces or in a mixed state. It often includes various contaminants, influenced by its origin and the methods of collection.

Scrap can also be classified according to the products that contained the metal before it was discarded. In this respect, the main sources of iron and steel waste and scrap include:

- Vehicles (such as cars, ships, and airplanes)
- Metal products used in construction
- Machinery
- Packaging materials

Note: The acceptable waste types specified in Section 0 are the only materials to be considered under this standard.

Producers should only accept waste types that can practically yield ferrous scrap that meets product quality standards as shown in Annex I. Criteria For Acceptable Steel Waste And Scrap and Annex Ii. Quality Of Waste Used As Input Materials

Only waste containing iron or steel, recoverable for new iron, steel, or cast products, and safe for the environment and human health after treatment, should be allowed.

In principle, all waste types containing recoverable iron or steel and with existing treatment methods (refer to Annex Iii. Treatment Processes And Techniques) to produce quality scrap metal can be accepted if they meet the criteria included in Annex I. Criteria For Acceptable Steel Waste And Scrap and Annex Ii. Quality Of Waste Used As Input Materials.

Table 1 Shows the World Customs Organization (WCO) Harmonized System (HS) code of Iron and steel scrap used to categorize the steel waste and scrap, those standards provide more details and specifications for each category of steel waste and scrap.

5.2 Incoming Inspections

Parties that carry out waste treatment to recover material that is suitable for recycling must check as part of an incoming inspection whether the materials they receive and their own materials are suitable for the production of the recycled material. In particular, incoming inspections must be made in compliance with the requirements with in Annex I. Criteria For Acceptable Steel Waste And Scrap. Unauthorized input materials must be excluded from steel waste and scrap recovery. Details including their origin, type, and quantity as well as their whereabouts must be recorded separately.

5.3 Input Record Keeping

A record of all consignments shall be maintained by the recycler for a period of five years and made available for inspection upon request by the MWAN and other relevant competent authority. The records shall specify the origin, type, and quantity of each consignment.

5.4 Storage Of Input Materials

The incoming waste shall be stored in a covered area and under dry conditions and stored separately from any other waste streams that may be managed on the same site. Storage should prevent access by pests, should prevent ingress by climatic conditions that may degrade the materials stored and storage time should be minimised as much as possible.

6. Processing Requirements

6.1 Separation Of Contaminants

Where Consignments are contaminated with separable amounts of ‘non-target materials’ or pollutants, separation must be carried out in order to fulfill the requirements in Annex I. Criteria For Acceptable Steel Waste And Scrap and to achieve the highest possible recovered product quality. If the requirements cannot be achieved using the equipment and techniques available on site, these consignments must be separated and may be subjected to alternative waste treatment (at the same site or an alternative site) to achieve the requirements, or alternatively be disposed (the least preferable outcome).

The origin, type, quantity, and whereabouts of the impermissible separated or discarded materials must be recorded separately.

6.2 Recycling Processes And Techniques

Specified production processes and techniques

Material must be treated:

- In accordance with the conditions of the license or permit.
- To ensure the output material meets the requirements of the designated market and intended application, in order to meet Annex V. Output General Quality Requirements **and any additional customer requirements.**
- To the point that it requires no further processing before it can be used as intended (i.e., it has been recovered).

This standard does not specify the treatment process to be applied. Common treatment stages are:

- **Mechanical or Manual Sorting / Hand Picking:** Mechanical sorting or manual sorting (also known as hand picking), are methods used to separate substances from a mixture by manually selecting and removing unwanted components. This technique is often used when the substances are visibly different in size, shape, color.

- **Shredding and Crushing:** Large pieces of steel waste and scrap are shredded or crushed to reduce their size, making them easier to handle and process and helping to separate any non-target material.
- **Magnetic Separation:** Magnetic separators are used to separate steel waste and scrap (ferrous metals) that may be mixed with non-ferrous metals.
- **Density Separation:** Techniques like air classification may be used to separate materials based on their weight and density (e.g. to remove plastic, rubber, or paper contamination).
- **Eddy Current Separation:** Eddy current separation is a technique used to separate non-ferrous metals that may be mixed with steel waste and scrap (ferrous metals).
- **Advanced Sorting:** Advanced techniques including e.g. artificial intelligence (AI) driven robotic separation and X-Ray Fluorescence (XRF) based sensor sorters may be effective for more variable and/or smaller particle waste streams where ferrous and non-ferrous metals are mixed.
- **Chemical or mechanical removal of coatings:** Coatings/paints and other layers such as plating, labelling or insulation may be present on scrap steel and removal (depollution) might be necessary to achieve the output requirements. Appropriate techniques will depend on the material(s) that require removal.

The treatment processes and techniques used by the recycler must meet the criteria specified in Annex Iii. Treatment Processes And Techniques. Qualified staff will operate the recycling process and techniques on site.

6.3 Monitoring Of The Treatment Processes And Techniques Applied

Qualified staff shall carry out inspections of the treatment processes and techniques applied on site. Such inspections must continuously be monitored.

Where an inspection identifies a problem in the treatment processes and techniques applied a corrective action will be specified and enacted at the earliest opportunity.

Where an inspection identifies a problem that may result in a failure to meet the output specifications included in this standard the treatment processes

and/or techniques applied must cease to operate until the corrective action has been taken.

Records of all inspections and corrective action employed shall be kept for a period of at least five years and made available for inspection upon request by the MWAN and other relevant competent authority.

7. End Requirements

7.1 End-Product Specifications And Statement Of Conformity

The product specification(s) to which the recovered steel waste and scrap complies will be specified. The recovered steel waste and scrap resulting from the recovery operation must comply with the criteria set out in Annex V. Output General Quality Requirements which shows the different references for steel categories.

Each batch of product from the recovery process shall be accompanied by a statement of conformity in accordance with the model set out in Annex Iv. Statement Of Conformity

7.2 End Product Record Keeping

A record of all product batches shall be maintained for a period of five years and made available for inspection upon request by the MWAN and other relevant competent authority. The records shall specify the destinations, type, and quantity of each consignment as well as copies of the statements of conformity accompanying each batch in accordance with the model set out in Annex Iv. Statement Of Conformity.

7.3 End Use Restrictions

All recovered steel waste and scrap must at least comply with the quality requirements laid down in this standard. In general, consequently, the output against this standard needs to be melted and refined in steel refineries either domestically or internationally to meet Industry and quality standards prior to use in final products.

Recovered steel waste and scrap that is suitable for the designated applications must be produced from the input materials specified in Annex I. Criteria For Acceptable Steel Waste And Scrap and Annex Ii. Quality Of Waste Used As Input Materials and comply with the final quality requirements contained in Annex V. Output General Quality Requirements.

7.3.1 TRANSPORT OF OUTPUT MATERIALS

Final output materials (recovered steel waste and scrap) will be transported in separate containers to those used for input materials to avoid their contamination by other objects or substances including waste unless those containers have been subject to cleaning operations to prevent such contamination prior to transport of the final output materials. The transport will take place accompanied by the statements of conformity of all product batches on that vehicle.

7.3.2 LABELLING

If processing restrictions apply for the recovered steel waste and scrap, they must be communicated and explained on the labelling of the product in a way that is clear and understandable to the end-user. Labelling must include batch number, size of container, grade, restrictions etc.

7.3.3 DEFINED LIST OF LEVELS OF CONTAMINATION OF OUTPUT MATERIALS

Final outputs must meet the general requirements for quality specified in Annex V. Output General Quality Requirements in terms of the levels of contamination that must not be exceeded. Any batch that exceeds those levels must be recovered using alternative processes or disposed in keeping with the waste hierarchy.

7.3.4 EXTERNAL QUALITY MONITORING

The recycler must have external quality monitoring of the end products produced that is carried out at regular intervals in accordance with Annex Iii. Treatment Processes And Techniques by an authorized specialist or specialist institute. The results of the external quality monitoring must be kept in the form of a product assessment by the authorized specialist or specialist institute and held on the site of the recycler for a period of at least five years and made available to the MWAN and other relevant competent authority upon request.

7.3.5 SAMPLING PROTOCOL

In addition to the external quality monitoring referred to above, the recycler must perform their own sampling according to the provisions listed in Annex Iii. Treatment Processes And Techniques. Where such sampling is undertaken by a third party that third party must not be the same as the external quality monitoring organization referred to above.

7.3.6 CUSTOMER FEEDBACK

The recycler will provide a facility for customer feedback on the quality of the output scrap made available. Feedback provided will be assessed and, if necessary, changes to the treatment processes applied will be made to address any substantiated negative feedback received in respect to output scrap quality.

7.3.7 QUALITY MANAGEMENT SYSTEM

A suitable quality management system for recovered steel waste and scrap is expected to include:

- Procedures to decide about the acceptance of input materials
- Monitoring of processes to ensure they are effective at all times
- Procedures for monitoring product quality (including sampling and analysis) that are adjusted to the process and product specifics according to good practice
- Actively soliciting feedback from customers in order to confirm compliance with product documentation
- Record keeping of main quality control parameters
- Measures for the review and improvement of the quality management system
- Training of staff

ANNEX I (Normative)

Annex I. Criteria For Acceptable Steel Waste And Scrap

Criteria for Acceptable Steel Waste and Scrap ²		
Criteria		Self-monitoring requirements
1.1	The scrap shall be graded according to ANNEX V (Normative) Annex V. Output General Quality Requirements and any customer or industry specification for direct use in the production of metal substances or objects by steel works or foundries.	Qualified staff shall grade each consignment.
1.2	The total amount of foreign materials Steriles shall be $\leq 2\%$ by weight. Foreign materials are: (1) non-ferrous metals (excluding alloying elements in any ferrous metal substrate) and nonmetallic materials such as earth, dust, insulation and glass; (2) combustible non-metallic materials such as rubber, plastic, fabric, wood and other chemical or organic substances; (3) larger pieces (brick-size) which are non-conductors of electricity such as tyres, pipes filled with cement, wood or concrete; (4) residues arising from steel melting, heating, surface conditioning (including scarfing), grinding, sawing, welding and torch cutting operations, such as slag, mill scale, baghouse dust, grinder dust, sludge.	Qualified staff shall carry out a visual inspection of each consignment. At appropriate intervals (at least every 6 months), representative samples of foreign materials shall be analysed by weighing after magnetic or manual (as appropriate) separation of iron and steel particles and objects under careful visual inspection. The appropriate frequencies of monitoring by sampling shall be established taking into account the following factors: (1) the expected pattern of variability (for example as shown by historical results); (2) the inherent risk of variability in the quality of waste used as input for the recovery operation and any subsequent processing; (3) the inherent precision of the monitoring method; and (4) the proximity of results to the limitation of the foreign materials' content to a maximum of 2 % per weight. The process of determining monitoring frequencies should be documented as part of the quality management system and should be available for auditing.

² (COMMISSION REGULATION (EU) No 333/2011)

Criteria for Acceptable Steel Waste and Scrap ²		
Criteria		Self-monitoring requirements
1.3	The scrap shall not contain excessive ferrous oxide in any form, except for typical amounts arising from outside storage of prepared scrap under normal atmospheric conditions.	Qualified staff shall carry out a visual inspection for the presence of oxides.
1.4	Scrap shall be free of visible oil, oily emulsions, lubricants or grease except negligible amounts that will not lead to any dripping.	Qualified staff shall carry out a visual inspection of each consignment, paying particular attention to those parts where oil is most likely to drip.
1.5	Radioactivity: there is no need for response action according to national or international rules on monitoring and response procedures for radioactive scrap metal.	Qualified staff shall monitor the radioactivity of each consignment. Each consignment of waste shall be accompanied by a certificate established in accordance with national or international rules on monitoring and response procedures for radioactive scrap metal. The certificate may be included in other documentation accompanying the consignment.
1.6	The waste shall not display any of the hazardous properties listed in the relevant KSA hazardous waste Regulations.	Qualified staff shall carry out a visual inspection of each consignment. Where visual inspection raises any suspicion of possible hazardous properties, further appropriate monitoring measures shall be taken, such as sampling and testing where appropriate. The staff shall be trained on potential hazardous properties that may be associated with the waste concerned and on material components or features that allow hazardous properties to be recognised. The procedure for recognising hazardous materials shall be documented under the quality management system.
1.7	The waste shall not contain any pressurised, closed or insufficiently open containers that could cause an explosion the recycling process.	Qualified staff shall carry out a visual inspection of each consignment.

ANNEX II (Normative)

Annex Ii. Quality Of Waste Used As Input Materials

Quality of waste used as input for the recovery operation ³		
Criteria		Self-monitoring requirements
1.8	Only waste containing recoverable iron or steel may be used as input	Acceptance control of all waste received (by visual inspection) and of the accompanying documentation shall be carried out by qualified staff which is trained on how to recognise waste that does not meet the criteria set out in this Section
1.9	Hazardous waste shall not be used as an input except where proof is provided that the processes and techniques specified in Annex Iii. Treatment Processes And Techniques of this Annex to remove all hazardous properties have been applied	
1.10	The following waste shall not be used as an input: (a) filings and turnings that contain fluids such as oil or oily emulsions; and (b) barrels and containers, except equipment from end-of-life vehicles, which contain or have contained oil or paints	

³ (COMMISSION REGULATION (EU) No 333/2011)

ANNEX Iii (Normative)**Annex Iii. Treatment Processes And Techniques**

Criteria for treatment processes and techniques⁴

	Criteria
1.1	The iron or steel waste and scrap shall have been segregated at source or while collecting and shall have been kept separate or the input waste shall have been treated to separate the iron and steel waste and scrap from the non-metal and non-ferrous components
1.2	All mechanical treatments (like cutting, shearing, shredding or granulating; sorting, separating, cleaning, de-polluting, emptying) needed to prepare the scrap metal for direct input into final use in steel works and foundries shall have been completed.
1.3	For waste containing hazardous components, the following specific requirements shall apply: (a) input materials that originate from hazardous waste that are listed in the (KSA waste law and its implementing regulations Appendix 1, 2, and 3) shall have undergone all treatments required by relevant KSA law; (b) chlorofluorocarbons in discarded equipment shall have been captured in a process approved by the competent authorities; (c) cables shall have been stripped or chopped. If a cable contains organic coatings (plastics), the organic coatings shall have been removed in accordance with the best available techniques; (d) barrels and containers shall have been emptied and cleaned, and (e) hazardous substances in waste that is not mentioned in point (a) shall have been efficiently removed in a process which is approved by the competent authority.

⁴ (COMMISSION REGULATION (EU) No 333/2011)

Annex Iv (Normative)**Annex Iv. Statement Of Conformity**

1.	Producer/importer of original waste: Name: Address: Contact person: Tel. Fax E-mail:
2.	(a) name or code of the product category, in accordance with an industry specification or standard the recycled waste now complies: (b) where relevant, main technical provisions of a customer specification, such as composition, size, type and properties:
3.	The recycled product consignment complies with the specification or standard referred to in point 2.
4.	Quantity of the consignment in tonnes:
5.	The producer of the product applies a quality management system which has been verified by an accredited verifier.
6.	Declaration of the producer/importer of the final product. I certify that the above information is complete and correct to my best knowledge. Name: Date: Signature:

ANNEX V (Normative)**Annex V. Output General Quality Requirements**

General quality requirements (Summarised European Steel Scrap Specification)

The following table contains E specifications which to define the various general requirements for different types of steel scrap.

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
Old scrap	E3	Old thick steel scrap, predominantly more than 6 mm thick in sizes not exceeding 1,5x0,5x0,5 m prepared in a manner to ensure direct charging. May include tubes and hollow sections. Excludes vehicle body scrap and wheels from light vehicles. Must be free of rebars and merchant bars, free of metallic copper, tin, lead (and alloys), mechanical pieces and steriles to meet the aimed analytical contents. Refer to points B) and C) of the general conditions	Thickness ≥6mm <1.5 x 0.5 x 0.5 m	≥0.6	≤1 %	≤0.250	≤0.010	Σ≤0.250		
	E1	Old thin steel scrap predominantly less than 6 mm thick in sizes not	Thickness <6mm <1.5 x 0.5 x 0.5 m	≥0.5	<1.5 %	≤0.400	≤0.020	Σ≤0.300		

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
		exceeding 1,5x0,5x0,5 m prepared in a manner to ensure direct charging. If greater density is required it is recommended that maximum 1 metre is specified. May include light vehicle wheels, but must exclude vehicle body scrap and domestic appliances. Must be free of rebars and merchant bars, free of metallic copper, tin, lead (and alloys), mechanical pieces and steriles to meet the aimed analytical contents. Refer to points B) and C) of the general conditions								
New scrap (low residual, uncoated)	E2	Thick new production steel scrap predominantly more than 3 mm thick prepared in a manner to ensure direct charging. The steel scrap must be uncoated unless permitted by joint agreement and be free of rebars and merchant bars even from new production. Must be free of metallic copper, tin, lead (and alloys), mechanical pieces and steriles to meet the aimed analytical contents.	Thickness ≥3mm <1.5 x 0.5 x 0.5 m	≥0.6	<0.3 %		Σ≤0.300			

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
		Refer to points B) and C) of the general conditions								
	E8	Thin new production steel scrap predominantly less than 3 mm thick prepared in a manner to ensure direct charging. The steel scrap must be uncoated unless permitted by joint agreement and be free of unbound ribbons to avoid trouble when charging. Must be free of metallic copper, tin, lead (and alloys) mechanical pieces and steriles to meet the aimed analytical contents. Refer to points (B) and (C) of the general conditions	Thickness <3mm <1.5 x 0.5 x 0.5 m (except bound ribbons)	≥0.4	<0.3 %		Σ≤0.300			
	E6	New production thin steel scrap (less than 3 mm thick) compressed or firmly baled in a manner to ensure direct charging. The steel scrap must be uncoated unless permitted by joint agreement. Must be free of metallic copper, tin, lead (and alloys), mechanical pieces and steriles to meet the aimed analytical contents. Refer to points (B) and (C) of the general conditions.		≥1	<0.3 %		Σ≤0.300			

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
Shredded scrap	E40	Shredded steel scrap. Old steel scrap fragmentized into pieces not exceeding 200 mm in any direction for 95 % of the load. No piece, in the remaining 5 %, shall exceed 1000 mm. Should be prepared in a manner to ensure direct charging. The scrap shall be free of excessive moisture, loose cast iron and incinerator material (especially tin cans). Must be free of metallic copper, tin, lead (and alloys) and steriles to meet the aimed analytical contents. Refer to points (B) and (C) of the general conditions		>0.9	<0.4 %	≤0.250	≤0.020			
Steel turnings	E5H	Homogeneous lots of carbon steel turnings of known origin, free from excessive bushy. Should be prepared in a manner to ensure direct charging. Turnings from Free Turning Steel must be clearly identified. The turnings must be free from all contaminants such as non ferrous metals, scale, grinding dust and heavily oxidized turnings or other materials from chemical			*					

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
		industries. Prior chemical analysis could be required								
	E5M	Mixed lots of carbon steel turnings, free from excessive bushy and free from turnings from Free Cutting Steel. Should be prepared in a manner to ensure direct charging. The turnings must be free from all contaminants such as non ferrous metals, scale, grinding dust and heavily oxidized turnings or other materials from chemical industries			*	≤0.400	≤0.030	Σ≤1	≤0.100	
High residual scrap	EHRB	Old an new steel scrap consisting mainly of rebars and merchant bars prepared in a manner to ensure direct charging. May be cut, sheared or baled and must be free of excessive concrete or other construction material. Must be free of metallic copper, tin, lead (and alloys), mechanical pieces and steriles to meet the aimed analytical contents. Refer to points (B) and (C) of the general conditions	Max. 1.5 × 0.5 × 0.5 m	≥0.5	<1.5 %	≤0.450	≤0.030	Σ≤0.350		
	EHRM	Old and new mechanical pieces and components not accepted in the other	Max. 1.5 × 0.5 × 0.5 m	≥0.6	<0.7 %	≤0.400	≤0.030	Σ≤1.0		

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
		grades prepared in a manner to ensure direct charging. May include cast iron pieces (mainly the housing of the mechanical components). Must be free of metallic copper, tin, lead (and alloys) and pieces such as bearing shell, bronze rings and other as well as steriles to meet the aimed analytical contents. Refer to points (B) and (C) of the general conditions								
Fragmentized scrap from incineration	E46	Fragmentised incinerator scrap. Loose steel scrap processed through an incinerating plant for household waste followed by magnetic separation, fragmentised into pieces not exceeding 200 mm in any direction and consisting partly of tin coated steel cans. Should be prepared in a manner to ensure direct charging. The scrap shall be free of excessive moisture and rust. Must be free of excessive metallic copper, tin, lead (and alloys) and steriles to meet the aimed analytical contents. Refer		≥0.8	Fe content ≥92 %	≤0.500	≤0.070			

Category	Specification	Description	Dimensions	Density (t/m ³)	Steriles	Aimed analytical contents (residuals) in %				
						Cu	Sn	Cr, Ni, Mo	S	P
		to points (B) and (C) of the general conditions								
* No clear method to determine these values.										

ANNEX VI (Normative)**ANNEX VI. EXTERNAL QUALITY MONITORING**

External quality monitoring must meet the following minimum requirements.

MONITORING FREQUENCY

The appropriate frequencies of analysing representative samples shall be established taking into account the following factors:

- (1) the expected pattern of variability (as shown by historical results)
- (2) the inherent risk of variability in the quality of waste used as input for the recovery operation and in the performance of the treatment processes
- (3) the inherent precision of the monitoring method
- (4) the proximity of results to the limit values for the total amount of foreign materials.

Monitoring frequency	Description
Routine Monitoring	Routine monitoring should include, at a minimum, a structured approach to ensure adherence to quality standards. This involves conducting comprehensive quality audits at least quarterly during the first year of operation to verify ongoing compliance with the standards outlined in Annex I. Criteria For Acceptable Steel Waste And Scrap. If compliance is consistently achieved throughout the first year, the minimum frequency of audits may be reduced to biannual audits from the second year onward. However, if non-compliance is detected, the frequency of audits will revert to quarterly and continue at this level until compliance is maintained for four consecutive audits
Periodic Audits	Comprehensive quality audits should be conducted quarterly to ensure long-term compliance with quality standards as set out in Annex I. Criteria For Acceptable Steel Waste And Scrap(including sampling and analysis);
Random Inspections	Unannounced random inspections should be conducted at least once every six months to verify ongoing adherence to Annex I. Criteria For Acceptable Steel Waste And Scrapand Annex V. Output General Quality Requirements.

SAMPLING

Sampling Method:

- **Representative Sampling:** Sampling should be done to ensure that it accurately represents the entire batch. The number of samples taken should be proportional to the size of the batch.
- **Sample Size:** Typically, 5-10% of the total batch weight should be sampled. However, the minimum sample size should not be less than 50 kg for small batches.

Sampling Locations:

- Samples should be collected from different points of the batch (e.g., top, middle, and bottom) to ensure the representativeness of the sample.
- For larger batches, samples should be taken from various containers or lots within the batch.

SAMPLING PROTOCOL

The sampler must prepare a record (sampling protocol), which must contain in particular the following information:

1.	Date and time of sampling: Place of sampling (address, if not identical to that of the recycling facility):
2.	Name and address of the external sampling organization: Name of the sampler (natural person):
3.	Name (company name) of the recycler: Recycling facility address:
4.	Sample name for clear identification of the fresh original sample:
5.	Quality assurance data:
6.	Description of the location, cubature and dimensions of the assessment quantity: Description of the nature of the assessment quantity: Description of sampling; This must contain at least: ○ sampling method: ○ number of sampling points or cuts:
7.	Signatures of the sampler and the recycler or his authorized representative:
8.	Other relevant comments if necessary: