الهيئة السعودية للمواصفات والمقاييس والجودة

Saudi Standards, Metrology and Quality Org (SASO)

SASO 33881/ DS

Circular Economy – Recycling of Aluminium Waste and Scrap

الاقتصاد الدائري – إعادة تدوير نفايات وخردة الألمنيوم

ICS: 13.030.50; 77.120.10

Foreword

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

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 aluminum 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 aluminums waste and scrap from various sources such as industrial machinery and tools, transportation facilities and vehicles, packaging material scrap (cans, foil and containers), aluminum parts from various electrical appliances, casing for various devices (computer, smartphone, etc.), construction material (aluminium doors and windows) etc.

The scope of this standard includes the 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 segregation of aluminium waste and scrap, ensuring that they meet the required criteria for safe handling, recovery, and recycling.

Note: This standard applies to Recyclers producing Aluminum.

The recovered aluminium must comply with the quality standards, be refined domestically or internationally, and adhere to ANNEX I. CRITERIA FOR ACCEPTABLE ALUMINIUM WASTE AND SCRAPANNEX VII. ALUMINIUM WASTE AND SCRAP CATEGORIES ACCORDING TO ISRI SPECIFICATION guidelines. Recovered aluminium 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 feedback must be solicited from the recycling facilities to ensure product quality. A quality management system covering input acceptance, process monitoring, product sampling, and feedback from the recycling facilities must be in place to ensure consistent quality.

1.2 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 aluminium waste and scrap apply.

World Customs Organization (WCO) Harmonized System (HS) code of aluminium waste and scrap

Heading	H.S. Code[1]	Description
76.02	7602.0	Aluminium waste and scrap

Aluminium waste and scrap can be generated from the following HS Code materials

[1] *HS (Harmonized system) codes (export/import codes), Aluminium and articles thereof, World Customs Organization,1576_2022e.pdf*

Heading	H.S. Code	Description
76.01	Unwrought aluminium	
	7601.10 7601.20	• Aluminium, not alloyed • Aluminium alloys
76.03	Aluminium powders and flakes	
	7603.10 7603.20	• Powders of non-lamellar structure • Powders of lamellar structure; flakes
76.04	Aluminium bars, rods and profiles	
	7604.10 7604.21 7604.29	• Of aluminium, not alloyed • Of aluminium alloys • Hollow profiles • Other
76.05	Aluminium wire	
	  7605.11 7605.19 7605.21 7605.29	• Of aluminium, not alloyed • Of which the maximum cross-sectional dimension exceeds 7 mm • Other • Of aluminium alloys • Of which the maximum cross-sectional dimension exceeds 7 mm • Other
76.06	Aluminium plates, sheets and strip, of a thickness exceeding 0.2 mm	
	 7606.11 7606.12 7606.91	• Rectangular (including square) • Of aluminium, not alloyed • Of aluminium alloys • Other • Of aluminium, not alloyed

Heading	H.S. Code	Description
	7606.92	• Of aluminium alloys
76.07	Aluminium foil (whether or not printed or backed with paper, paperboard, plastics or similar backing materials) of a thickness (excluding any backing) not exceeding 0.2 mm	
	7607.11 7607.19 7607.20	• Not backed • Rolled but not further worked • Other • Backed
76.08	Aluminium tubes and pipes	
	7608.10 7608.20	• Of aluminium, not alloyed • Of aluminium alloys
76.09	7609.00	Aluminium tube or pipe fittings (for example, couplings, elbows, sleeves)
76.10	Aluminium structures and parts of structures (for example, bridges and bridge-sections, towers, lattice masts, roofs, roofing frameworks, doors and windows and their frames and thresholds for doors, balustrades, pillars and columns); aluminium plates, rods, profiles, tubes and the like, prepared for use in structures	
	7610.10 7610.90	• Doors, windows and their frames and thresholds for doors • Other
76.11	7611.00	Aluminium reservoirs, tanks, vats and similar containers, for any material (other than compressed or liquefied gas), of a capacity exceeding 300 L, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment
76.12	Aluminium casks, drums, cans, boxes and similar containers (including rigid or collapsible tubular containers), for any material (other than compressed or liquefied gas), of a capacity not exceeding 300 l, whether or not lined or heat-insulated, but not fitted with mechanical or thermal equipment	
	7612.10	• Collapsible tubular containers

Heading	H.S. Code	Description
	7612.90	• Other
76.13	7613.00	Aluminium containers for compressed or liquefied gas
76.14	Stranded wire, cables, plaited bands and the like, of aluminium, not electrically insulated	
	7614.10 7614.90	• With steel core • Other
76.15	Table, kitchen or other household articles and parts thereof, of aluminium; pot scourers and scouring or polishing pads, gloves and the like, of aluminium; Sanitary ware and parts thereof, of aluminium	
	7615.10 7615.20	• Table, kitchen or other household articles and parts thereof; pot scourers and scouring or polishing pads, gloves and the like • Sanitary ware and parts thereof
76.16	Other articles of aluminium	
	7616.10 7616.91 7616.99	• Nails, tacks, staples, screws, bolts, nuts, screw hooks, rivets, cotters, cotter-pins, washers and similar articles • Other • Cloth, grill, netting and fencing, of aluminium 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 version (including all the amendments) is applicable to this standard.

- National Waste Management Law and Implementing Regulations.
- Royal Decree No. M/10 Dated 1392-03-03 for The Saudi Standards, Metrology and Quality Organization (SASO) establishment.

- Council of Ministers order No. 457, date 11/8/1440 AH for The National Center for Waste Management establishment.
- Commission Decision of 3 May 2000 establishing a list of wastes (2000/532/EC); (EU 2023).
- ISRI Scrap Specifications Circular 2024; (ISRI SPECS 2022).
- COUNCIL REGULATION (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal (Aluminium) cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council.
- EN 13920-1:2003 Aluminium and aluminium alloys - Scrap- Part 1: General requirements, sampling, and tests.
- End-of-waste Criteria for Aluminium and Aluminium Alloy Scrap End-of-waste criteria for aluminium and aluminium alloy scrap (JRC 2010).
- Haikal, K., Yusuf, N.K., Hamdan, A. and Nasha, E., 2024. Sustainable aluminum recycling method. Journal of Multi-Disciplinary Engineering Reviews, 1(1), pp.8-19 (Haikal et al., 2024)
- Aluminium and articles thereof, World Customs Organization,1576_2022e
- European Commission (EC), Waste Framework Directive; Waste Framework Directive - European Commission (europa.eu)

3. Terms and Definitions

For the purpose of this standard, the definitions set out in the National Waste Management Law and Implementing Regulations must be considered.

The following definitions apply in this standard and do not replace the definitions in the National Waste Management Law and Implementing Regulations:

<table>
<tr><th>Item</th><th>Definition</th></tr>
<tr><td>Aluminium</td><td>Refers to material with a minimum content of 99% (by mass) of aluminium and where the content by mass of any other element does not exceed the limits specified in the table below:
<table>
<tr><td>Other Element</td><td>Limiting content % (by mass)2</td></tr>
<tr><td>Fe + Si (iron plus silicon)</td><td>1</td></tr>
<tr><td>Other elements (1), each:</td><td>0.1(2)</td></tr>
<tr><td colspan="2">(1) Other elements are, for example Cr, Cu, Mg, Mn, Ni, Zn</td></tr>
<tr><td colspan="2">(2) Copper is permitted in a proportion greater than 0.1 % but not more than 0.2 %, provided that neither the chromium nor manganese content exceeds 0.05 %.</td></tr>
</table></td></tr>
</table>

[2] *These limits are based on Aluminium and articles thereof, World Customs Organization,1576_2022e*

Item	Definition
Aluminium waste and scrap	Refers to input materials that is used for producing recycled aluminium in compliance with the requirements of this standard
By product	As specified and detailed by the MWAN and relevant competent authorities
Center	The National Center for Waste Management
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.
End of Waste	As specified and detailed by the MWAN and relevant competent authorities
European Waste Catalogue (EWC)	Refers to a comprehensive list of codes and descriptions for wastes based on their source and type
Generators	A person who produces the waste classified under MWAN Waste Management Law.
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 of waste	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 specification circular.
Law	Waste Management law
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.
Minister	Ministry of Environment, Water and Agriculture
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

Item	Definition
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.
Qualified staff	Refers to staff which is qualified by experience or training to monitor and assess the properties of the waste concerned
Recycled Aluminium or Output material	Refers to aluminium produced in compliance with the requirements of this standard
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
Regulations	Implementing Regulations of this Law.
Resource Recovery	The process of recovering energy, raw materials, or any other product from waste for reuse.
Retailers	Retailers are businesses that sell products directly to consumers. They play a crucial role in the recycling chain by influencing consumer behaviour, offering sustainable products, and facilitating recycling initiatives.
Service Provider	A person authorized to engage in a 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.
Storage	Temporarily storing all or part of the components of waste for transportation or future use
Transportation	Transporting waste using approved means of transportation to transfer stations, treatment or sorting facilities, or designated landfills
Treatment	The use of physical, biological, or chemical means; a combination of such means; or other means to change the properties of waste in order to reduce its size, make it easier to reuse or recycle, extract certain products therefrom, or remove organic pollutants and other pollutants, for the purpose of reducing particular waste components or benefiting therefrom, or eliminating their potential harm to humans or the environment.
User	Refers to electrical wiring and cables, plumbing, electronics, automotive industry, construction, industrial machinery or individual responsible for the end use of recycled aluminium
Visual inspection	Refers to inspection of the waste concerned covering all parts of a consignment and using human senses or any non-specialized equipment

Item	Definition
Waste	All discarded or disposed of materials that have a direct or indirect impact on 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 Processor	Any individual, organization, or entity responsible for managing waste. This includes the collection, transportation, treatment, recycling, recovery, or disposal of waste materials. Waste processors ensure that waste is handled in compliance with relevant environmental, health, and safety regulations
Waste Producer	A person who produces the waste classified under MWAN Waste Management Law.

4. General Requirement

4.1 General application of the waste hierarchy

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

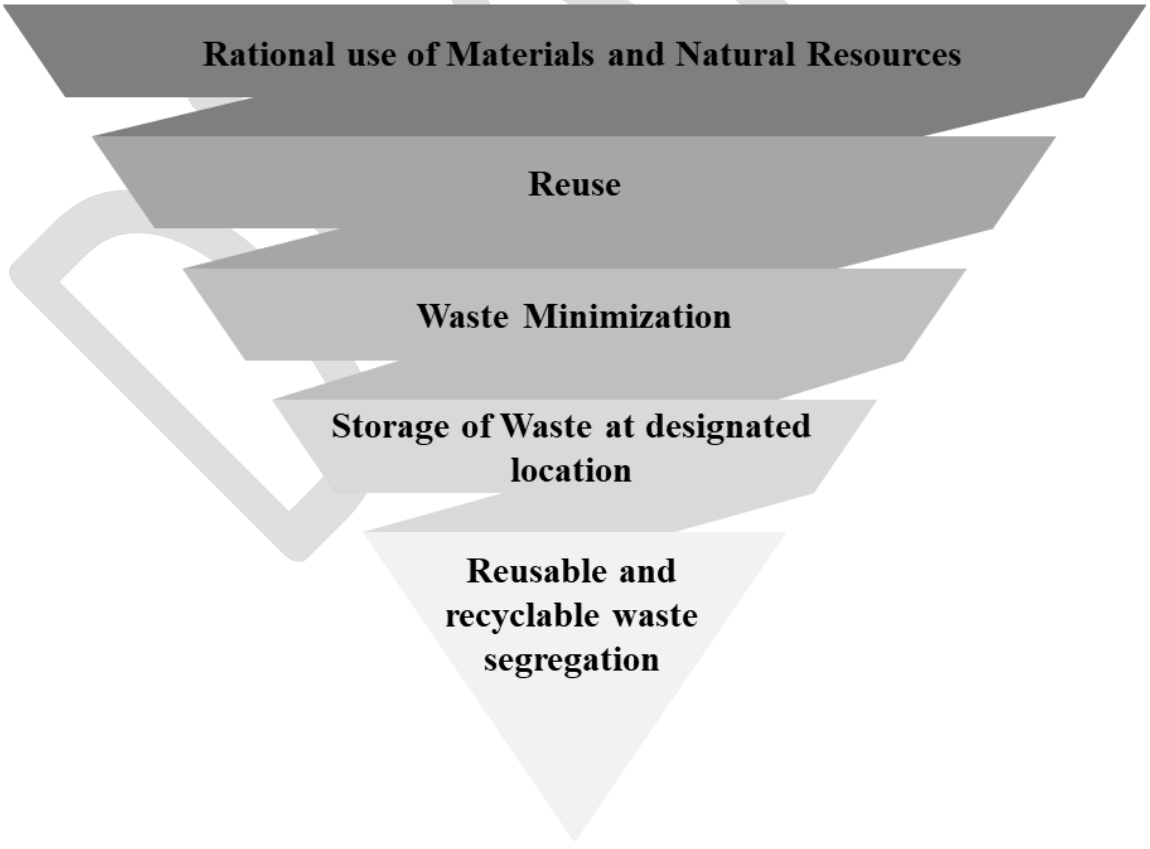

Figure *1* Waste Hierarchy

(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 treatment, recovery, or recycling of waste must hold the necessary permit(s) and/or license(s) from 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, aluminium waste and scrap is distinguished based on the below:

- New aluminium waste and scrap
- Old aluminium waste and scrap.

New scrap is generated during the initial manufacturing processes, originating from factories that produce articles from aluminium or aluminium alloys. Old scrap is collected after a consumer cycle, either separately or mixed, and it is often contaminated to a certain degree, depending highly on origin and collection systems. The main sources of aluminium waste and scrap and their characteristics are listed as follows:

- Manufacturing facilities
- Packaging materials
- Electrical and electronic equipment
- Construction materials

Note: The acceptable waste types specified in Section 1.2 are the only materials to be considered under this standard.

Aluminium waste and scrap to be used as input material in the recycling operation must meet the criteria of acceptable aluminium waste and scrap set out in Annex I and the quality of waste used as input for the recovery operation.

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 delivery inspection, whether the materials they receive, and their own materials are suitable for the production of the recovered material. In particular, incoming inspections must be made in compliance with the requirements with Annex I. The inspection scheme given in the below figure, shall be applied, any starting materials that do not meet these requirements must be excluded from the aluminium recycling process. Details including their origin, producer/importer of original waste information, type of waste, and Quantity of the consignment in tonnes, reason of noncompliance, as well as their whereabouts must be recorded separately.

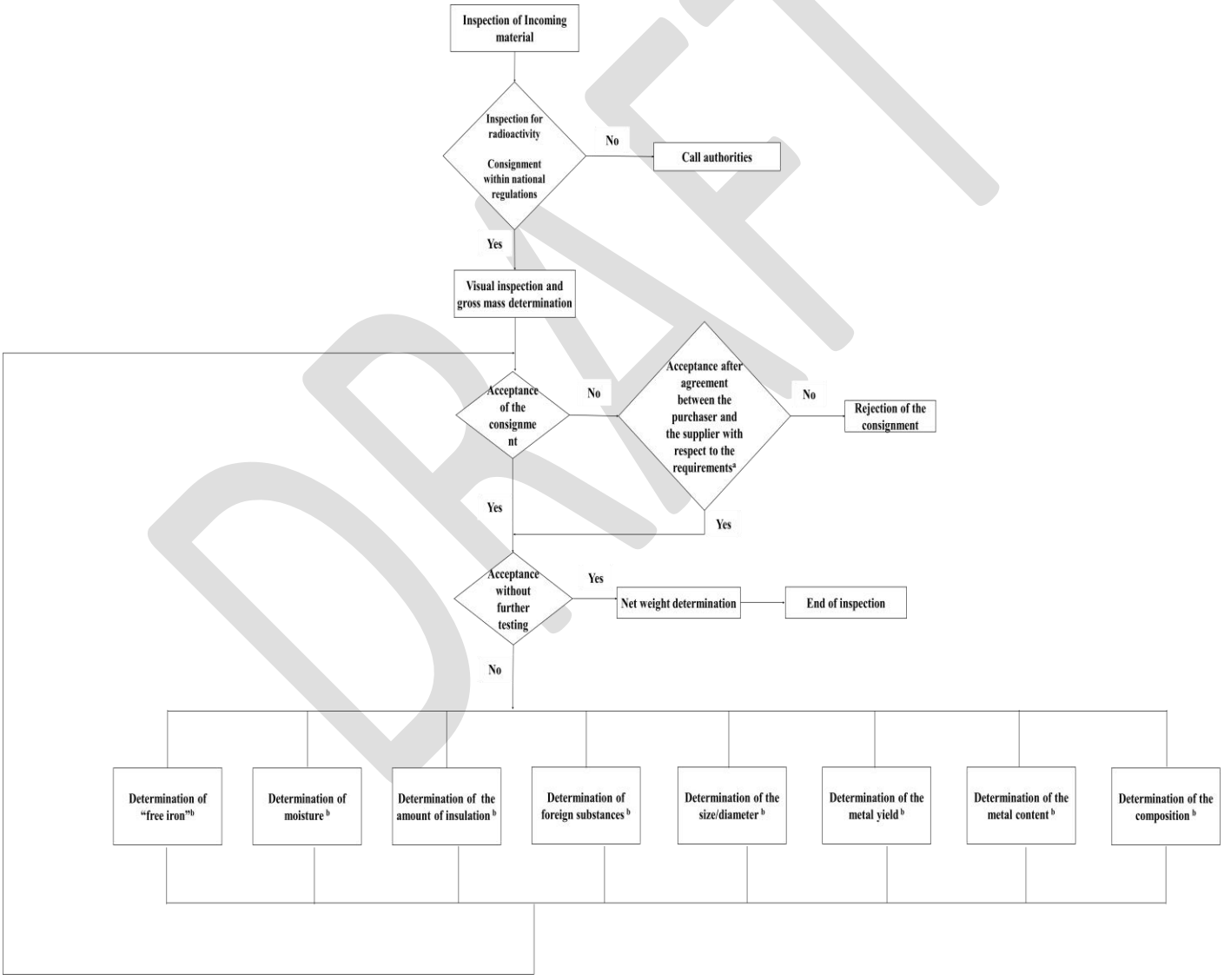

Figure 2: Incoming Delivery Inspection Scheme (BS EN 12861:2018)

5.3 Input record keeping

A record of all consignments shall be maintained by the waste processor 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 affect the materials stored and storage time should be minimized as much as possible.4.0 Processing Standard Requirements.

6. Process Requirement

6.1 Separation of contaminants

Where Consignments are contaminated with separable amounts of 'non-target materials or pollutants, a separation must be carried out in order to fulfill the requirements in Annex I 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 sent to alternative waste treatment to achieve the requirements or alternatively be disposed.

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

6.2 Recycling processes and techniques

6.2.1 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, including the appropriate construction or aluminium standard and any additional customer requirements.
- To the point that it requires no further processing before it can be used as intended

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

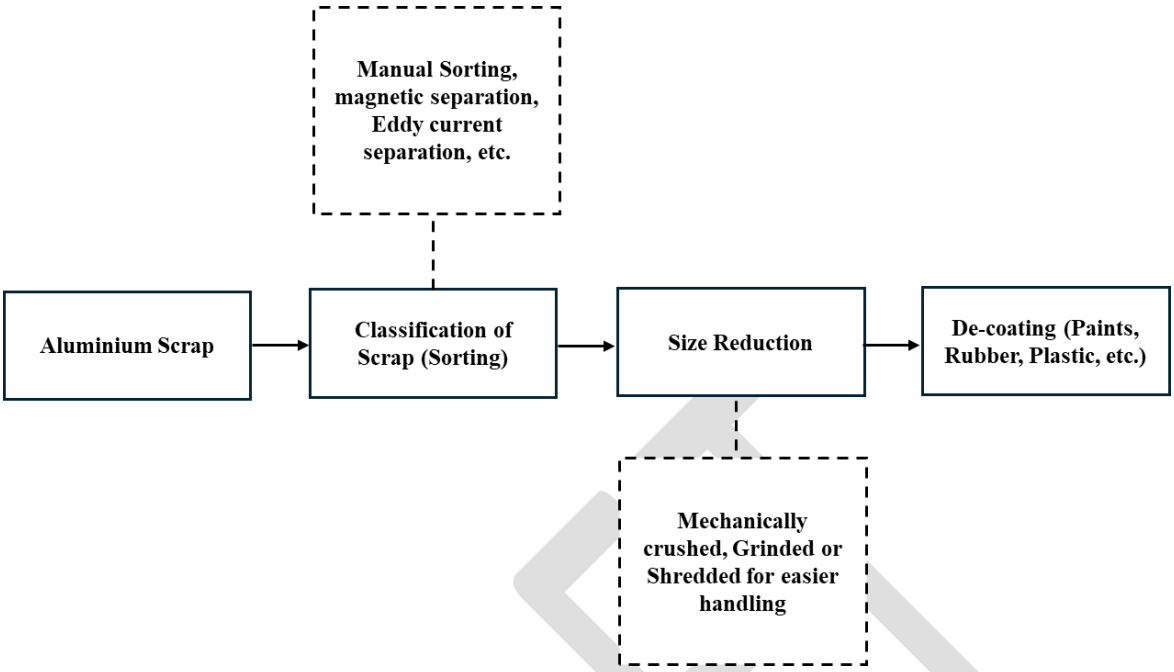

Figure 3 Common treatment stages of aluminium scrap

- **Mechanical or Manual Sorting/ Hand Picking**: Mechanical or Manual sorting, also known as hand picking, is a method 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, or weight
- **Magnetic Separation:** Magnetic separators are used to separate aluminium waste and scrap (ferrous metals) that maybe mixed with non-ferrous metals
- **Eddy current Separation:** Eddy current separation is a technique used to separate non-ferrous metals that may be mixed with aluminium waste and scrap (ferrous metals) using powerful magnetic fields.
- **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.
- **Size Reduction:** Large pieces of aluminium waste and scrap are grinded, shredded, or crushed to reduce their size, making them easier to handle and process.
- **Chemical or mechanical removal of coatings:** Coatings/paints and other layers such as plating, labelling or insulation may be present on aluminium waste and scrap 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. 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 the relevant competent authority.

7. End requirements

7.1 End-product specifications and statement of conformity

The product specification(s) to which the recovered aluminium complies will be specified. The recovered aluminium resulting from the recovery operation must complies with the criteria set out in Annex I; Annex VII shows the different categories of aluminium waste and scrap.

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.

7.2 End product record keeping

A record of all product batches shall be maintained for five years and made available for inspection upon request by the MWAN and the 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.

7.3 End use restrictions

All recovered aluminium (being graded) must at least comply with the quality requirements laid down in this standard. In general, recovered aluminium is recycled by melting and recasting. Consequently, the output against this standard needs to be melted and refined in

aluminium refineries either domestically or internationally to meet Industry and quality standards prior to use in final products

Recovered aluminium that is suitable for the recycling applications must be produced from the input materials specified in Annex VII and comply with the criteria of acceptable aluminium waste and scrap contained in Annex I.

7.3.1 Transport of output materials

Final recovered aluminium (being graded) will be transported in separate containers or 1 Cu.m bags for each grade 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 offsite for further processing. The transport will take place accompanied by the statements of conformity of all product batches on that vehicle.

7.3.2 Labelling

Where end-use restrictions apply for the recovered aluminium, 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 the container, grade, end use 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 I in terms of the levels of contamination that must not be exceeded. Any batch that exceeds those levels must be treated as a waste and recycled or disposed in keeping with the waste hierarchy.

7.3.4 External quality monitoring

The processor must have external quality monitoring of the end products produced that is carried out at regular intervals in accordance with Annex VI 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 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 processor must perform their own sampling according to the provisions listed in Annex VI. 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 processor will provide a facility for customer feedback on the quality of the output 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 quality.

7.3.6 Quality Management System

A suitable quality management system for recovered aluminium 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 ALUMINIUM WASTE AND SCRAP

Criteria for Acceptable Aluminium Waste and Scrap[3]		
Criteria		Self-monitoring requirements
1.1	The scrap shall be graded in accordance with a customer specification, an industry specification or a standard for direct use in the production of metal substance or objects by refining or re-melting.	Qualified staff shall grade each consignment.
1.2	The total amount of foreign materials shall be ≤ 5 % by weight or the metal yield shall be ≥ 90 %; Foreign materials are: (1) metals other than aluminium and aluminium alloys. (2) non-metallic materials such as earth, dust, insulation materials and glass. (3) combustible non-metallic materials such as rubber, plastic, fabric, wood and other chemical or organic substances. (4) larger pieces (brick-size) which are non-conductors of electricity such as tyres, pipes filled with cement, wood or concrete; or (5) residues arising from the melting of aluminium and aluminium alloys, heating, surface conditioning (including scarfing), grinding, sawing, welding and torch cutting operations such as	The producer of the aluminium waste and scrap shall check compliance by monitoring the amount of foreign materials or by determining the metal yield. Qualified staff shall carry out visual inspection of each consignment. At appropriate intervals (at least every 6 months), representative samples of each grade of aluminium waste and scrap shall be analyzed to measure the total amount of foreign materials or the metal yield. The representative samples shall be obtained in accordance with the sampling procedures described in standard EN 13920. The total amount of foreign materials shall be measured by weight after separating aluminium metallic particles and objects from particles and objects consisting of foreign materials by hand sorting or other means of separation (such as by magnet or by using density as a basis). Metal yield shall be measured in accordance with the following procedure:

[3] *Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council*

Criteria for Acceptable Aluminium Waste and Scrap[3]		
Criteria		Self-monitoring requirements
	slag, dross, skimming's, baghouse dust, grinder dust, sludge.	(1)Determination of mass (m_1) after removal and determination of moisture (in accordance with point 7.1 of the EN 13920-1:2002 standard). (2)Removal and determination of free iron (in accordance with point 7.2 of the EN 13920-1:2002 standard. (3)Determination of the mass of the metal after melting and solidifying (m_2) following the procedure for the determination of the metal yield in accordance with point 7.3 of the EN 13920-1:2002 standard. (4)Calculation of the metal yield m [%] = (m_2/m_1) × 100. The appropriate frequencies of analysis of representative samples shall be established taking into account the following factors: (1)The expected pattern of variability (such 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; and (4)The proximity of results to the limit values for the total amount of foreign materials or the metal yield. The process of determining monitoring frequencies should be documented as part of the management system and should be available for auditing.
1.3	The scrap shall not contain polyvinyl chloride (PVC) in form of coatings, paints, plastics.	Qualified staff shall carry out a visual inspection of each consignment.
1.4	The 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.

Criteria for Acceptable Aluminium Waste and Scrap[3]		
Criteria		Self-monitoring requirements
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. This requirement is without prejudice to the basic standards on the health protection of workers and members of the public adopted in acts falling under Chapter III of the Euratom Treaty, in particular Council Directive 96/29/Euratom.	Qualified staff shall monitor the radioactivity of each consignment. Each consignment of scrap 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 scrap shall not display any of the hazardous properties listed in KSA laws and regulations. Properties of individual elements included in aluminium alloys are not relevant for this requirement	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. Staff shall be trained on potential hazardous properties that may be associated with aluminium waste and scrap and on material components or features that allow hazardous properties to be recognized. The procedure for recognizing hazardous materials shall be documented under the quality management system.
1.7	The scrap shall not contain any pressurized, closed or insufficiently open containers that could cause an explosion in a metalwork furnace.	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[4]		
Criteria		Self-monitoring requirements
2.1	Only waste that contained recoverable aluminium or aluminium alloys 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 recognize waste that does not fulfil the criteria set out in this Section.
2.2	Hazardous waste shall not be used as an input except where proof is provided that the processes and techniques specified under 'criteria of treatment processes and techniques' of this Annex to remove all hazardous properties have been applied.	
2.3	The following waste shall not be used as an input: - filings and turnings that contain fluids such as oil or oily emulsions - barrels and containers, except equipment from end-of-life vehicles, which contain or have contained oil or paints.	

[4] *Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council*

ANNEX III (Normative)

ANNEX III. TREATMENT PROCESSES AND TECHNIQUES

Criteria for treatment processes and techniques[5]

	Criteria
1.1	The aluminium waste and scrap must be segregated at source or while being collected and shall have been kept separate or the input waste shall have been treated to separate the aluminium waste and scrap from the non-metal and non-aluminium metal components. The aluminium waste and scrap resulting from these operations shall be kept separate from any other waste.
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 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 KSA waste law and its implementing regulations Appendixes 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. (e) hazardous substances in waste not mentioned in point (a) shall have been efficiently removed in a process which is approved by the competent authority.

[5] Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council

ANNEX IV

ANNEX IV. STATEMENT OF CONFORMITY[6]

1.	Producer/importer of original waste: Name: Address: Contact person: Tel. Fax E-mail:
2.	(a) name or code of the scrap metal 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 scrap metal consignment complies with the industry specification or standard referred to in point 2(a) or with the customer specification to in point 2(b).
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:

[6] Council Regulation (EU) No 333/2011 of 31 March 2011 establishing criteria determining when certain types of scrap metal cease to be waste under Directive 2008/98/EC of the European Parliament and of the Council

ANNEX V (Informative)

ANNEX V. GENERAL QUALITY REQUIREMENTS

The general quality requirements for recovered aluminium output materials typically focus on purity, contamination levels, and physical properties. Here are some key points:

CONTAMINATION LIMITS

Contamination limits are critical in determining the usability of recovered aluminium. Contaminants can include other metals, non-metallic impurities, or organic materials.

- **Iron, Copper, Silicon, Zinc** and **Magnesium**: These are widely used in all aluminium alloys (1000s to 7000s). These are common contaminants in recovered aluminium that should be minimized because their composition can affect the final product's strength, ductility, and corrosion resistance. If the recovered aluminium is going to be used for a specific purpose, its composition must be closely monitored. Limits vary, but they should be kept at a minimum.
- **Non-Metallic Inclusions**: The content of paint, plastic, rubber, and other non-metallic materials must be minimized if the recovered aluminium is for automobiles or aerospace industries.
- **Oxides**: The aluminium oxide keeps it safe from corroding by forming a protective layer. If this layer is damaged, then the aluminium beneath will be damaged.

QUALITY SPECIFICATIONS

In the recycling of aluminium waste and scrap, the quality specifications are determined by the intended application of the recovered material. For industries with strict standards, such as aviation, automotive, and aerospace, high-purity aluminium is essential. However, for less demanding industrial applications, slightly lower purity aluminium may be acceptable. Thus, the quality of recovered aluminium is carefully adjusted to meet the specific end-use requirements, balancing functionality with efficient recycling processes.

1. **Purity:** Recovered aluminium should have a purity level of at least 99% for high-grade applications. For less critical uses, the acceptable purity may be lower. However, the total amount of foreign materials shall be ≤5 % by weight or the metal yield shall be ≥90 %.

   Foreign materials include:

   - metals other than aluminium and aluminium alloys
   - non-metallic materials such as earth, dust, insulation, and glass
   - combustible non-metallic materials such as rubber, plastic, fabric, wood, and other chemical or organic substances
   - larger pieces (brick-size) which are non-conductors of electricity such as tyres, pipes filled with cement, wood, or concrete.

2. **Form:** Recovered aluminium can be in the form of ingots, cathodes, wire, rod, or other shapes, depending on the processing and end-use requirements.

3. **Alloying Elements:** The presence of specific alloying elements may be controlled or specified, depending on whether the aluminium is to be used in alloys (numbered series alloys) or in pure form. Cu, Mg, Fe, etc. are used as alloying elements and their composition may affect various properties of alloy.

PHYSICAL PROPERTIES:

The recovered aluminium should be free from excessive oxidation and should have a consistent size and shape, which can be important for further processing.

STANDARD COMPLIANCE

Compliance with industry standards such as those set by the Institute of Scrap Recycling Industries (ISRI) or the European Committee for Standardization (CEN) is often required.

Various standards organizations provide specifications and classifications for recycled aluminium. These standards are used to ensure consistency and quality across the industry.

ASTM Standards (American Society for Testing and Materials): ASTM provides a range of standards for aluminium and aluminium alloys. For example:

- **ASTM B221M-21**: Standard Specification for Aluminium and Aluminium -Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric).
- **ASTM B209/B209M − 21**: Standard Specification for Aluminium and Aluminium -Alloy Sheet and Plate.
- **ASTM B37-18**: Standard Specification for Aluminium for Use in Iron and Steel Manufacture.

European Standards (EN): EN standards also provide specifications for aluminium and its alloys. European Committee for Standardization (CEN) has published more than 120 Standards (EN) with respect to aluminium Industry. Some examples are:

- EN 12258-3:2003 Aluminium and Aluminium alloys - Terms and definitions - Part 3: Scrap.
- EN 486:2009 Aluminium and Aluminium alloys - Extrusion ingots - Specifications.
- **EN 13920-15:2003 Aluminium and Aluminium alloys - Scrap - Part 15**: De-coated Aluminium scrap from post-consumer Aluminium packaging

ISO Standards (International Organization for Standardization): ISO standards provide a global framework for aluminium products, including recycled materials.

- ISO 209:2007 Aluminium and Aluminium alloys - Chemical composition
- **ISO 17615:2007 Aluminium and Aluminium alloys** - Alloyed ingots for remelting - Specifications

ISRI Specifications (Institute of Scrap Recycling Industries): ISRI provides a wide range of the scrap specification of different materials.

- ISRI Scrap Specifications Circular 2024: Scrap Specifications Circular

ANNEX VI (Normative)

ANNEX VI. EXTERNAL QUALITY MONITORING

External quality monitoring must meet the following minimum requirements.

MONITORING FREQUENCY

The appropriate frequencies of monitoring shall be established by 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	Quality checks should be conducted on every batch of aluminium waste and scrap received or dispatched. The frequency can be adjusted based on historical quality performance and supplier reliability for monitoring of the quality of aluminium waste and scrap resulting from the recovery operation as set out in Annex I (including sampling and analysis);
Periodic Audits	Comprehensive quality audits should be conducted quarterly to ensure long-term compliance with quality standards as set out in Annex I (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 and Annex V.

SAMPLING CRITERIA ACCORDING TO EN 13920-1:2003

SAMPLING PROCEDURES FOR GRANULATED ALUMINIUM WASTE SCRAP AND TURNINGS:

a. This procedure applies to those materials that by nature are composed of relatively small and loose particles, allowing small quantities to be easily picked up (e.g., with a shovel) in different places of the consignment.
b. During or immediately after the unloading of the material, after a visual inspection, collect a quantity of 1% to 5% of the inspection lot.
c. Mix accurately the various portions taken from the inspection lot, spread the collected material in the form of a round flat disk, and take as quickly as possible a sample from different parts of the disc for moisture determination. Store this sample in a closed container to avoid any changes in the moisture content before testing. The moisture test will be carried out as soon as possible.
d. Divide the remainder of the sample into quarts along two perpendicular diameters, as indicated in figure given below.

e. Take two quarts opposite each other and disregard the other two. The two quarts collected in a disc, flattened and quartered, should be well mixed.

f. Repeat the procedure until a sample of between 2 kg and 5 kg is obtained for the determination of free iron and the metal yield as described in the respective sections.

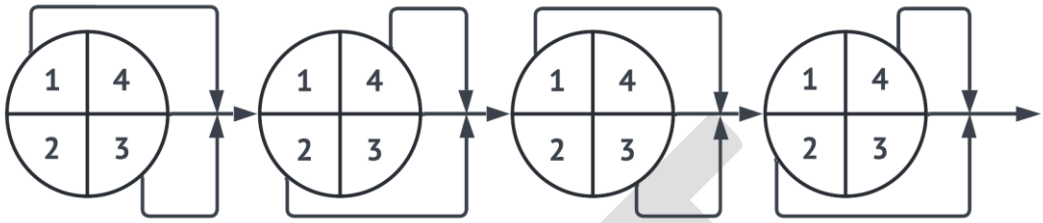

Figure 4 Sampling Procedure for Granulated Aluminium Waste Scrap And Turnings

SAMPLING PROCEDURES AND SAMPLING PREPARATION FOR SKIMMING:

GENERAL

Usually, this scrap category does not allow the extraction of a small representative sample from the delivered lot. Therefore, one of the three alternative sampling procedures given in alternative procedure 1 to 3 shall be used:

ALTERNATIVE PROCEDURE 1:

Take a sample of about 500 kg from the inspection lot. This sample shall include as far as possible large blocks rich in metal, smaller brittle parts, spilling, dust etc. in the same proportions as present in the whole mass under inspection. After removal of pieces which are too large (blocks), grind the remaining amount of the sample. Treat it on a sieve to separate the metallics (≥0.84mm) from the fines (<0.84mm) and eliminate the latter.

ALTERNATIVE PROCEDURE 2:

Sort the inspection lot into two fractions as follows:

- The large, heavy blocks rich in metal,
- The remaining part constituted by the smaller pieces of dross mixed with the powdery fraction.

Determine the mass procedure of the two fractions. Take two different samples, one from each fraction. Investigate both samples as follows:

The sample of the blocks fraction shall be representative and weigh not less than 100 kg. It shall be melted in a salt rotary furnace of a size suitable for such tests, to determine the metal yield.

Dry process the other fraction entirely through a mill and separate the fines of less than 0.84 mm diameter. The grinding time for the skimming/drosses shall as to obtain metallics with a metal yield of about 65%.

Calculate the average of the results of the investigations carried out on the two samples in order to obtain data which represents the quality of the whole inspection lot.

ALTERNATIVE PROCEDURE 3:

Sampling may also be done by direct melting of a representative sample or the whole lot.

SAMPLING OF OTHER SCRAP:

Take a quantity of scrap as indicated in Table given below, during or immediately after the unloading of the material, after a visual inspection.

The sample shall represent all the portions of the scrap similar to type, size and composition which represent the entire lot inclusive of any foreign materials present.

Scrap category	Minimum sample size	
	Determination of moisture and free iron(kg)	Determination of metal yield and chemical composition(kg)
Turnings and granulated scrap, particle diameter< 50 mm	10	2
Granulated scrap, particle diameter>50 mm	50	50
Drosses/Skimmings	-	See Sampling procedures and sampling preparation for skimming
All other scrap	100	100

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:
7.	Description of sampling: a) sampling method: b) number of sampling points or cuts:
8.	Signatures of the sampler and the recycler or his authorized representative:
9.	Other relevant comments if necessary:

ANNEX VII (Normative)

ANNEX VII. ALUMINIUM WASTE AND SCRAP CATEGORIES ACCORDING TO ISRI SPECIFICATION

The US trade association 'Institute of Scrap Recycling Industries' (ISRI) publishes yearly a so-called scrap specification circular. The specifications refer to many sectors of the metals, paper stock, plastics, glass, and electronics industries and are constructed to represent the quality or composition of the materials bought and sold in the industry.

The specifications are internationally accepted and are used throughout the world to trade the various commodities. Parties to a transaction may specify particular variations or additions to these specifications as are suited for their specific transactions and for their individual convenience. Any deviation from the standard specifications, however, should be mutually agreed to and so stipulated in writing by the parties to the transactions.

Mixing aluminum with other metals is essential to enhance its mechanical properties, improve corrosion resistance, optimize workability, tailor specific characteristics for applications, and achieve cost efficiency all of which are aligned with the principles outlined in the EN 13920 standard.

Aluminium waste and scrap as well as aluminium alloy types are provided in Nonferrous section of the circular. The following items are distinguished in the 2024 circular:

Non-ferrous Scrap Items	Description
CLEAN ALUMINIUM LITHOGRAPHIC SHEETS	To consist of 1000 and/or 3000 series alloys, to be free of paper, plastic, excessively inked sheets, and any other contaminants. Minimum size of 3” (8 cm) in any direction.
NEW, CLEAN ALUMINIUM LITHOGRAPHIC SHEETS	To consist of 1000 and/or 3000 series alloys, uncoated, unpainted, to be free of paper, plastic, ink, and any other contaminants. Minimum size of 3” (8 cm) in any direction.
MIXED LOW COPPER ALUMINIUM CLIPPINGS AND SOLIDS	Shall consist of new, clean, uncoated and unpainted low copper aluminium scrap of two or more alloys with a minimum thickness of 0.015 inches (.38 mm) and to be free of 2000 and 7000 series, hair wire, wire screen, punchings less 1/2 inch (1.25 cm) diameter, dirt, and other non-metallic items. Grease and oil not to total more than 1%. Variations to this specification should be agreed upon prior to shipment between the buyer and seller.
CLEAN MIXED OLD ALLOY SHEET ALUMINIUM	Shall consist of clean old alloy aluminium sheet of two or more alloys, free of foil, venetian blinds, castings, hair wire, screen wire, food or beverage containers, radiator shells, airplane sheet, bottle caps, plastic, dirt, and other non-metallic items. Oil and grease not to total more than 1%. Up to 10% Tale permitted.
NEW ALUMINIUM CAN STOCK	Shall consist of new low copper aluminium can stock and clippings, clean, lithographed or not lithographed, and coated with clear lacquer

	but free of lids with sealers, iron, dirt and other foreign contamination. Oil not to exceed 1%.
POST-CONSUMER ALUMINIUM CAN SCRAP	Shall consist of old aluminium food and/or beverage cans. The material is to be free of other scrap metals, foil, tin cans, plastic bottles, paper, glass, and other non-metallic items. Variations to this specification should be agreed upon prior to shipment between the buyer and seller.
SHREDDED ALUMINIUM USED BEVERAGE CAN (UBC) SCRAP	Shall have a density of 12 to 17 pounds per cubic foot (193 to 273 kg/m3). Material should contain maximum 5% fines less than 4 mesh (U.S. standard screen size) (6.35 mm). Must be magnetically separated material and free of steel, lead, bottle caps, plastic cans and other plastics, glass, wood, dirt, grease, trash, and other foreign substances. Any free lead is basis for rejection. Any and all aluminium items, other than used beverage cans, are not acceptable. Variations to this specification should be agreed upon prior to shipment between the seller and buyer.
DENSIFIED ALUMINIUM USED BEVERAGE CAN (UBC) SCRAP	Shall have a biscuit density of 35 to 50 pounds per cubic foot (562 to 802 kg/m3). Each biscuit not to exceed 60 pounds (27.2 kg). Nominal biscuit size range from 10” to 13” x 101/4” (25.4 x 33 x 26 cm) to 20” x 61/4” x 9” (50.8 x 15.9 x 22.9 cm). Shall have banding slots in both directions to facilitate bundle banding. All biscuits comprising a bundle must be of uniform size. Size: Bundle range dimensions acceptable are 41” to 44” x 51” (104 to 112 cm) to 54” x 54” (137 x 137 cm) to 56” (142 cm) high. The only acceptable tying method shall be as follows: Using minimum 5/8” (1.6 cm) wide by .020” (.05 cm) thick steel straps, the bundles are to be banded with one vertical band per row and a minimum of two firth (horizontal) bands per bundle. Use of skids and/or support sheets of any material is not acceptable. Must be magnetically separated material and free of steel, lead, bottle caps, plastic cans and other plastic, glass, wood, dirt, grease, trash, and other foreign substances. Any free lead is basis for rejection. Any and all aluminium items, other than used beverage cans, are not acceptable. Items not covered in the specifications, including moisture, and any variations to this specification should be agreed upon prior to shipment between the seller and buyer.
BALED ALUMINIUM USED BEVERAGE CAN (UBC) SCRAP	Shall have a minimum density of 14 pounds per cubic foot (225 kg/m3), and a maximum density of 17 pounds per cubic foot (273 kg/m3) for unflattened UBC and 22 pounds per cubic foot (353 kg/m3) for flattened UBC. Size: Minimum 30 cubic feet (.85 m3), with bale range dimensions of 24” to 40” (61 to 132 cm) by 30” to 52” (76 to 132 cm) by 40” to 84” (102 to 213 cm). The only acceptable tying method shall be as follows: four to six 5/8” (1.6 cm) x .020” (5 mm) steel bands, or six to ten #13 gauge steel wires (aluminium bands or wires are acceptable in equivalent strength and number). Use of skids and/ or support sheets of any material is not acceptable. Must be magnetically separated material and free of steel, lead, bottle caps, plastic cans and other plastic, glass, wood, dirt, grease, trash, and other foreign

	substances. Any free lead is basis for rejection. Any and all aluminium items, other than used beverage cans, are not acceptable. Variations to this specification should be agreed upon prior to shipment between the buyer and seller.
BRIQUETUED ALUMINIUM USED BEVERAGE CAN (UBC) SCRAP	Shall have a briquette density of 50 pounds per cubic foot (800 kg/m3) minimum. Nominal briquette size shall range from 12" to 24" (30.5 x 61 cm) x 12" to 24" (30.5 x 61 cm) in uniform profile with a variable length of 8" (20.3 cm) minimum and 48" (122 cm) maximum. Briquettes shall be bundled or stacked on skids and secured with a minimum of one vertical band per row and a minimum of one girth band per horizontal layer. Briquettes not to overhang pallet. Total package height shall be 48 (122 cm) maximum. Banding shall be at least 5/8" (1.6 cm) wide by .020" (5 mm) thick steel strapping or equivalent strength. The weight of any bundle shall not exceed 4,000 pounds (1.814 mt). Material must be magnetically separated and free of steel, plastic, glass, dirt and all other foreign substances. Any and all aluminium items other than UBC are unacceptable. Any free lead is basis for rejection. Items not covered in the specification, including moisture, and any variations to this specification should be agreed upon prior to shipment between the buyer and seller.
PAINTED SIDING	Shall consist of clean, low copper aluminium siding scrap, painted one or two sides, free of plastic coating, iron, dirt, corrosion, fiber, foam, or fiberglass backing or other non-metallic items.
ALUMINIUM COPPER RADIATORS	Shall consist of clean aluminium and copper radiators, and/or aluminium fins on copper tubing, free of brass tubing, iron and other foreign contamination.
E.C. ALUMINIUM CHOPS AND STRAWS	Shall consist of clean, 1350 and/or 1050 alloy, E.C. aluminium, chops or straws, free of screening, hairwire, iron, copper, insulation and other non-metallic items. Must be free of minus 20 mesh material. Must contain 99.45% aluminium content.
ALL ALUMINIUM RADIATORS FROM AUTOMOBILES	Shall consist of clean aluminium radiators and/or condensers. Should be free of all other types of radiators. All contaminants including iron, plastic, and foam not to exceed 1% of weight. Any deviation to this specification, including oxidation and aluminium content, to be negotiated between buyer and seller.
E.C. ALUMINIUM WIRE and CABLE	Shall consist of new, clean, 1350 and/or 1050, E.C. aluminium wire or cable free from hair wire, ACSR, wire screen, tape, iron, insulation and other non-metallic items. Must contain 99.45% aluminium content.
ALUMINIUM CHOPS and STRAWS	Shall consist of clean aluminium, chops or straws, free of screening, hair-wire, iron, copper, insulation and other non-metallic items. Must be free of minus 20 mesh material. Must contain 99% aluminium content.
NEW MIXED ALUMINIUM WIRE and CABLE	Shall consist of new, clean, unalloyed aluminium wire or cable which may contain up to 10% 6000 series wire and cable free from hair wire, wire screen, iron, insulation and other non-metallic items.

CLEAN ALUMINIUM PISTONS	Shall consist of clean aluminium pistons to be free from struts, bushings, shafts, iron rings and nonmetallic items. Oil and grease not to exceed 2%.
CLEAN ALUMINIUM PISTONS with STRUTS	Shall consist of clean whole aluminium pistons with struts. Material is to be free from bushings, shafts, iron and non-metallic items. Oil and grease not to exceed 2%.
IRONY ALUMINIUM PISTONS	Shall consist of aluminium pistons with non-aluminium attachments to be sold on a recovery basis or by special arrangement between buyer and seller.
OLD MIXED ALUMINIUM WIRE and CABLE	Shall consist of old, unalloyed aluminium wire and cable which may contain up to 10% 6000 series wire and cable with not over 1% free oxide or dirt and free from hair wire, wire screen, iron, insulation and other non-metallic items.
OLD PURE ALUMINIUM WIRE and CABLE	Shall consist of old, unalloyed aluminium wire and cable containing not over 1% free oxide or dirt and free from hair wire, wire screen, iron, insulation and other non-metallic items.
NEW PRODUCTION ALUMINIUM EXTRUSIONS	Shall consist of one alloy (typically 6063). Material may contain “butt ends” from the extrusion process but must be free of any foreign contamination. Anodized material is acceptable. Painted material or alloys other than 6063 must be agreed upon by buyer and seller.
ALUMINIUM EXTRUSIONS “10/10”	Material to consist of new production and old/used 6063 extrusions that may contain up to (but not exceed) 10 percent painted extrusions and 10 percent 6061 alloy extrusions. Must not contain other alloys of aluminium. Material should be free of zinc corners, iron attachments, felt, plastic, paper, cardboard, thermo break, and dirt and other contaminants
ALUMINIUM EXTRUSION DEALER GRADE	Shall consist of old extruded aluminium of one alloy, typically alloy 6063, 6061, or 7075. Material must be free of iron, thermo break, saw chips, zinc corners, dirt, paper, cardboard, and other foreign contamination. Percentages of paint or other alloys to be agreed upon by buyer and seller.
ALUMINIUM WIRE and CABLE	Shall consist of new, clean, aluminium wire or cable free from hair wire, ACSR, wire screen, iron, insulation and other nonmetallic items. Must contain 99% aluminium content.
TURNINGS	Shall consist of aluminium borings and turnings of one specified alloy. Material should be free of oxidation, dirt, free iron, stainless steel, magnesium, oil, flammable liquids, moisture and other non-metallic items. Fines should not exceed 3% through a 20 mesh (U.S. standard) screen
MIXED ALUMINIUM BORINGS and TURNINGS	Shall consist of clean, uncorroded aluminium borings and turnings of two or more alloys and subject to deductions for fines in excess of 3% through a 20 mesh screen and dirt, free iron, oil, moisture and all other nonmetallic items. Material containing iron in excess of 10% and/or free magnesium or stainless steel or containing highly flammable cutting

	com- pounds will not constitute good delivery. To avoid dispute, material should be sold on basis of definite maximum zinc, tin and magnesium content.
MIXED ALUMINIUM CASTINGS	Shall consist of all clean aluminium castings which may contain auto and airplane castings but no ingots, and to be free of iron, brass, dirt and other non-metallic items. Oil and grease not to total more than 2%.
AIRCRAFT SHEET ALUMINIUM	Should be sold on recovery basis or by special arrangements with purchaser.
NEW ALUMINIUM FOIL	Shall consist of clean, new, pure, uncoated 1000 and/or 3000 and/or 8000 series alloy aluminium foil, free from anodized foil, radar foil and chaff, paper, plastics, or any other non-metallic items. Hydraulically briquetted material and other alloys by agreement between buyer and seller.
POST CONSUMER ALUMINIUM FOIL	Shall consist of baled old household aluminium foil and formed foil containers of uncoated 1000, 3000 and 8000 series aluminium alloy. Material may be anodized and contain a maximum of 5% organic residue. Material must be free from radar chaff foil, chemically etched foil, laminated foils, iron, paper, plastic and other non-metallic contaminants.
NEW COATED ALUMINIUM FOIL	Shall consist of new aluminium foil coated or laminated with ink, lacquers, paper, or plastic. Material shall be clean, dry, free of loose plastic, PVC and other non-metallic items. This foil is sold on a metal content basis or by sample as agreed between buyer and seller.
ALUMINIUM GRINDINGS	Should be sold on recovery basis or by special arrangements with purchaser.
ALUMINIUM DROSSES, SPATTERS, SPILLINGS, SKIMMINGS and SWEEPINGS	Should be sold on recovery basis or by special arrangements with purchaser.
ALUMINIUM BREAKAGE	Shall consist of aluminium with miscellaneous contaminants like iron, dirt, plastic and other types of contaminants. Material can either be sold based on aluminium recovery or content as agreed upon by buyer and seller. Must contain a minimum of 33% aluminium unless otherwise agreed upon by buyer and seller.
SWEATED ALUMINIUM	Shall consist of aluminium scrap which has been sweated or melted into a form or shape such as an ingot, sow or slab for convenience in shipping; to be free from corrosion, dross or any non-aluminium inclusions. Should be sold subject to sample or analysis
SEGREGATED NEW ALUMINIUM ALLOY CLIPPINGS and SOLIDS	Shall consist of new, clean, uncoated and unpainted aluminium scrap of one specified aluminium alloy with a minimum thickness of .015” (.38 mm) and to be free of hair wire, wire screen, dirt and other nonmetallic items. Oil and grease not to total more than 1%. Also free from punchings less than 1/2” (1.27 cm) in size.

MIXED NEW ALUMINIUM ALLOY CLIPPINGS and SOLIDS	Shall consist of new, clean, uncoated and unpainted aluminium scrap of two or more alloys with a minimum thickness of .015" (.38 mm) and to be free of hair wire, wire screen, dirt and other non-metallic items. Oil and grease not to total more than 1%. Also free from punchings less than 1/2" (1.27 cm) in size.
SEGREGATED NEW ALUMINIUM CASTINGS, FORGINGS and EXTRUSIONS	Shall consist of new, clean, uncoated aluminium castings, forgings, and extrusions of one specified alloy only and to be free from sawings, stainless steel, zinc, iron, dirt, oil, grease and other non-metallic items.
ALUMINIUM AUTO OR TRUCK WHEELS	Shall consist of clean, single-piece, unplated aluminium wheels of a single specified alloy, free of all inserts, steel, wheel weights, valve stems, tires, grease and oil and other non-metallic items. Variations to this specification should be agreed upon prior to shipment between the buyer and seller.
ALUMINIUM AUTO CASTINGS	Shall consist of all clean automobile aluminium castings of sufficient size to be readily identified and to be free from iron, dirt, brass, bushings, and non-metallic items. Oil and grease not to total more than 2%.
ACSR	Aluminium Conductor Steel Reinforced (ACSR) wire is a combination of steel and aluminium wire, of various configurations, with the expected aluminium recovery agreed upon by the buyer and the seller. Material to be free of other wires and cables unless mutually agreed upon.
IAW	Insulated aluminium wire, which may or may not contain other wires or metal shielding, with the expected aluminium recovery agreed upon by the buyer and the seller. The material to be free of other wires and cables unless mutually agreed upon.
FRAGMENTIZER AIRCRAFT ALUMINIUM SCRAP (2000 and 7000 series)	The material as received must be dry and not to contain more than 2% free zinc, 1% maximum free magnesium, and 1.5% maximum free iron and stainless with a maximum of 2% analytical iron. Not to contain more than a total 5% maximum of non-metallics, of which no more than 1% shall be rubber and plastics. To be free of excessively oxidized material. Any variations to be sold by special arrangement between buyer and seller.
ALUMINIUM AIRPLANE CASTINGS	Shall consist of clean aluminium castings from airplanes and to be free from iron, dirt, brass, bushings, and non-metallic items. Oil and grease not to total more than 2%.
FLOATED FRAGMENTIZER ALUMINIUM SCRAP (from Automobile Shredders)	Derived from wet or dry media separation device, the material must be dry and not contain more than 1% maximum free zinc, 1% maximum free magnesium, and 1% maximum of analytical iron. Not to contain more than a total 2% maximum of non-metallics, of which no more than 1% shall be rubber and plastics. To be free of excessively oxidized material, air bag canisters, or any sealed or pressurized items. Any variation to be sold by special arrangement between buyer and seller.

FRAGMENTIZER ALUMINIUM SCRAP (from Automobile Shredders)	Derived from either mechanical or hand separation, the material must be dry and not contain more than 4% maximum free zinc, 1% maximum free magnesium, and 1.5% maximum of analytical iron. Not to contain more than a total 5% maximum of nonmetallics, of which no more than 1% shall be rubber and plastics. To be free of excessively oxidized material, air bag canisters, or any sealed or pressurized items. Any variation to be sold by special arrangement between buyer and seller.
BURNT FRAGMENTIZER ALUMINIUM SCRAP (from Automobile Shredders)	Incinerated or burned material must be dry and not contain more than X% (% to be agreed upon by buyer and seller) ash from incineration, 4% maximum free zinc, 1% maximum free magnesium, and 1.5% maximum of analytical iron. Not to contain more than a total 5% maximum of non-metallics, of which no more than 1% shall be rubber and plastics. To be free of excessively oxidized material, air bag canisters, or any sealed pressurized items. Any variation to be sold by special arrangement between buyer and seller.
SHREDDED NONFERROUS SCRAP (predominantly aluminium)	Shall be made up of a combination of the nonferrous metals: aluminium, copper, lead, magnesium, stainless steel, nickel, tin, and zinc, in elemental or alloyed (solid) form. The percentage of each metal within the nonferrous concentrate shall be subject to agreement between buyer and seller. Material generated by eddy current, air separation, flotation, screening, other segregation technique(s), or a combination thereof. Shall have passed one or more magnets to reduce or eliminate free iron and/or large iron attachments. Shall be free of radioactive material, dross, or ash. Material to be bought/sold under this guideline shall be identified as “Zorba” with a number to follow indicating the estimated percentage nonferrous metal content of the material (e.g., “Zorba 90” means the material contains approximately 90% nonferrous metal content). May also be screened to permit description by specific size ranges. (Refer also to Zorba under Mixed Metals.)