BRITISH STANDARD

BS EN
13920-1:2003

Aluminium and aluminium alloys — Scrap —

Part 1: General requirements, sampling and tests

The European Standard EN 13920-1:2003 has the status of a British Standard

ICS 13.030.50; 77.120.10

BSI
British Standards

National foreword

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The UK participation in its preparation was entrusted to Technical Committee NFE/35, Light metals and their alloys, which has the responsibility to:

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— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep the UK interests informed;

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Foreword

This document (EN 13920-1:2003) has been prepared by Technical Committee CEN /TC 132, "Aluminium and aluminium alloys", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by October 2003, and conflicting national standards shall be withdrawn at the latest by October 2003.

Within its programme of work, Technical Committee CEN/TC 132 has entrusted CEN/TC132/WG 20 "Scrap" to prepare the following Standard.

EN 13920 comprises the following parts under the general title "*Aluminium and aluminium alloys — Scrap*":

- *Part 1: General requirements, sampling and tests*
- *Part 2: Unalloyed aluminium scrap*
- *Part 3: Wire and cable scrap*
- *Part 4: Scrap consisting of one single wrought alloy*
- *Part 5: Scrap consisting of two or more wrought alloys of the same series*
- *Part 6: Scrap consisting of two or more wrought alloys*
- *Part 7: Scrap consisting of castings*
- *Part 8: Scrap consisting of non-ferrous materials from shredding processes destined to aluminium separation processes*
- *Part 9: Scrap from aluminium separation processes of non-ferrous shredded materials*
- *Part 10: Scrap consisting of used aluminium beverage cans*
- *Part 11: Scrap consisting of aluminium-copper radiators*
- *Part 12: Turnings consisting of one single alloy*
- *Part 13: Mixed turnings consisting of two or more alloys*
- *Part 14: Scrap from post-consumer aluminium packagings*
- *Part 15: Decoated aluminium scrap from post-consumer aluminium packagings*
- *Part 16: Scrap consisting of skimmings, drosses, spills and metallics*

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Luxembourg, Malta, Netherlands, Norway, Portugal, Slovakia, Spain, Sweden, Switzerland and the United Kingdom.

1 Scope

This European Standard specifies general requirements and guidelines for the delivery and classification of the different categories of aluminium scrap, including quality requirements, sampling and tests.

NOTE Special requirements and guidelines for each of the scrap categories are specified in EN 13920-2 to EN 13920-16.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

prEN 12258-3:2000, *Aluminium and aluminium alloys — Terms and definitions — Part 3 : Scrap*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in prEN 12258-3:2000 and the following apply.

3.1
free from
term used to indicate that the presence of foreign materials is negligible

4 Ordering information

The ordering information shall define the scrap and should cover aspects such as the following, in order to achieve a transparent transaction:

- scrap category, with reference to the relevant part of this European Standard;
- condition of the scrap, e.g. moisture and contamination with other materials, size, physical characteristics of pieces or particles, whenever meaningful;
- gross mass and assumed percentages of foreign materials;

NOTE Operators traditionally use the term weight instead of mass.

- condition in which the scrap shall be delivered (loose, baled etc.);
- the expected minimum metal (aluminium) yield;
- the required chemical composition, if not otherwise specified;
- any available certification and control documents;
- shipment documents required by law.

The contract shall contain the definition of the beginning and end of the period during which the scrap shall be delivered. Deliveries outside this period shall not be admitted unless the purchaser insists on the delivery at the contractual conditions.

5 General requirements

5.1 Hazardous contaminants

The scrap shall not contain materials like asbestos, cadmium, mercury, lithium, selenium, PCBs (polychlorinated bisphenyls) or PCB impregnated materials, explosive or radioactive materials, medical and hospital disposal. If there is any evidence or suspicion that the scrap might contain any such hazardous contaminant, this shall be notified to the potential purchaser, whose agreement to receive the scrap shall be obtained before shipment.

Closed hollow articles, if present, shall be perforated to avoid risks of explosion during processing and/or melting.

NOTE Other restrictions relevant to specific scrap categories are specified in EN 13920-2 through EN 13920-16.

5.2 Condition of scrap

If not otherwise agreed or specified in the relevant standard:

¾ the scrap shall be supplied as loose scrap;

¾ the dimensions of each piece shall not be larger than (600 600 400) mm. The mass of each piece shall not exceed 200 kg.

5.3 Foreign materials

If not otherwise specified, the scrap shall be free from foreign material.

5.4 Mass tolerances

The difference between the consigned quantity and the ordered quantity shall not exceed ± 5 % if the ordered quantity is lower than 30 and delivered in one single shipment. For larger quantities that require multiple shipments, the total delivered mass shall not differ from the ordered mass by more than 3 000 kg.

For each shipment, the mass difference between the unloaded mass verified by the purchaser at the arrival of the delivery and the mass declared in the shipment documents shall not exceed 0,2 %.

6 Sampling

6.1 General

The objective of a sampling procedure specified in 6.2, 6.3 and 6.4 is to collect from an inspection lot a representative sample on which it is possible to perform the following basic tests representative for the whole inspected mass:

¾ determination of the average chemical composition;

¾ determination of the percentage of each foreign material;

¾ determination of the metal yield.

The definition of the inspection lot shall be left to the purchaser.

For classification, sampling and test procedures different from and simpler than those specified in clauses 6 and 7 may be used. Nevertheless, upon special request of the supplier, e. g. in the case of non-conformities, sampling and tests shall be based on the procedures specified in clauses 6 and 7, as far as applicable, or on other procedures, if agreed upon between supplier and purchaser or proposed by a neutral professional sampler.

6.2 Sampling procedures for granulated aluminium scrap and turnings

6.2.1 This procedure applies to those materials that by nature are constituted by relatively small and loose particles allowing small quantities to be easily picked up (e. g. with a shovel) in different places of the consignment.

6.2.2 During or immediately after the unloading of the material, after a visual inspection, collect a quantity of 1 % to 5 % of the inspection lot.

6.2.3 Mix accurately the various portions taken from the inspection lot, spread the collected material in a form of a round flat disk and take as quickly as possible a sample from different parts of the disc for moisture determination as described in 7.1. Store this sample in a closed container in order to avoid any change of the moisture content before testing. The moisture test shall be carried out as soon as possible.

6.2.4 Divide the remainder of the sample in quarts along two perpendicular diameters as indicated in Figure 1.

6.2.5 Take two quarts opposite to each other and disregard the other two. Mix well the two quarts collected, in a disc form flattened and requartered.

6.2.6 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 7.2 and 7.3.

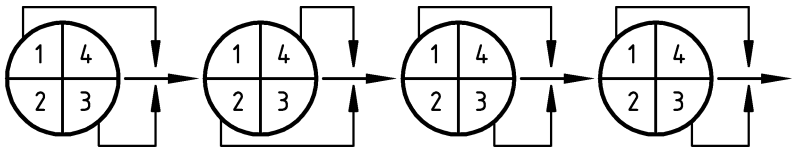

Figure 1 — Sampling procedure for granulated scrap and turnings

6.3 Sampling procedures and sample preparation for skimmings

6.3.1 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 6.3.2 to 6.3.4 shall be used:

6.3.2 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, spillings, 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 (0,84 mm) from the fines (< 0,84 mm) and eliminate the latter. Further, test the large blocks and the obtained metallics as specified in 7.2 and 7.3.

6.3.3 Alternative procedure 2

Sort the inspection lot into two fractions as follows:

¾ the large, heavy blocks rich in metal;

¾ the remaining part constituted by the smaller pieces of dross mixed with the powdery fraction.

Determine the mass proportion 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 skimmings/drosses shall be such as to obtain metallics with a metal yield of about 65 %.

Obtain a representative sample of not less than 20 kg from the concentrated fraction of metallics according to the procedure laid down in 6.2. Determine the free iron, chemical composition and metal yield as described under 7.2 and 7.3.

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

6.3.4 Alternative procedure 3

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

6.4 Sampling of other scrap

Take a quantity of scrap, as indicated in Table 1, during or immediately after the unloading of the material, after a visual inspection.

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

Table 1 — Minimum sample size for determination of moisture, free iron, metal yield and chemical composition

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 < 50mm	10	2
Granulated scrap[a], particle diameter > 50 mm	50	50
Drosses/skimmings	-	see 6.3
All other scrap	100	100
[a] Including scrap as specified in EN 13920-8 and EN 13920-9.		

7 Tests

7.1 Removal and determination of moisture/volatile substances

If the scrap is wet, dry the sample taken as specified in 6.2, 6.3 and 6.4 and in a quantity as specified in Table 1 in an oven at approximately 105 °C for the determination of water. For materials containing oil or emulsion (e.g. turnings) set the drying temperature at about 360 °C. Calculate the quantity of moisture (inclusive of oil) present in the sample as the difference between the two masses, before and after the drying. If other volatile substances are present after moisture/oil determination, carefully heat the sample at higher temperatures until complete elimination of such substances is obtained avoid unnecessary heating up at higher temperatures in order to prevent metal oxidation.

7.2 Removal and determination of free iron

7.2.1 General

Generally, the presence of free iron shall be investigated on each scrap delivery.

While the magnetic iron can be efficiently removed from a representative sample of loose scrap by using a magnet, the non-magnetic stainless steel shall be identified by careful visual inspection, and removed manually.

Where necessary (e.g. when the scrap is in the form of large pieces) and practicable the removal of the free iron shall follow a shredding operation in order to favour the mechanical detachment of the iron inserts from the aluminium scrap.

NOTE A sweating furnace may be used when the nature of the scrap does not allow a good separation of the free iron by shredding.

7.2.2 Turnings

The free iron shall be removed with a magnet from the dried sample used for the determination of the moisture according to 7.1. The removed iron shall be weighed and related to the mass of the wet sample to calculate its percentage.

7.2.3 Granulated scrap, metallics, and other small sized aluminium scrap

The free iron shall be removed from the sample with a magnet. The removed iron shall be weighed and its percentage calculated.

7.3 Determination of the metal yield and the chemical composition

The sample or a representative part of it (see Table 1), after drying and elimination of volatile substances as described in 7.1 and removal of iron as in 7.2, shall be transferred to a graphite crucible and melted in a suitable oven. When using crucibles, covering salts (sodium and potassium chloride) shall be added equal to 50 % of the scrap mass. After melting, the liquid metal and the slag shall be cast into a mould and solidified.

As an alternative a small rotary furnace of a size suitable for these tests may be used. In this case the salt is usually melted before charging the sample.

A sample shall be taken during the casting for the determination of the chemical composition.

The salt slag produced shall be ground in order to verify the presence of metallic inclusions. If present these metallics shall be added to the mass of the metal.

NOTE Laboratory tests usually render a slightly higher metal yield than is obtained in industrial production.

8 Classification procedure, treatment of non-conformities and arbitration

8.1 Classification procedure

8.1.1 General

All scrap delivered against a specific order shall be accepted with reservation until the classification at the purchaser's premises is accomplished. Any observation on the incoming shipment which indicates a non-compliance shall be notified by the purchaser as soon as possible.

The classification shall include:

¾ the control of the arrival date and times of the delivery;

¾ the control of mass;

¾ visual inspection during unloading.

The classification can include:

¾ the determination of moisture;

¾ the determination of total volatile substances;

¾ the determination of free iron;

¾ the determination of the metal yield;

¾ the determination of the chemical composition.

As soon as possible from the receipt of the scrap the purchaser shall communicate to the supplier the results of the classification of the scrap up to then accepted with reservation. If a complex chemical/physical examination is necessary to determine the quality, or when the scrap appears to be highly different from that specified in the order the parties agree on the time necessary to carry out the tests.

8.1.2 Control of the scrap mass

The control of the mass of the scrap shall be accomplished for each shipment by the purchaser with the registration of the entry data that include arrival date, the total mass, the tare and the net unloaded mass.

8.1.3 Other tests

The sampling procedures for the other tests are specified in clause 6. The tests are specified in clause 7.

8.2 Treatment of non-conformities

8.2.1 Mass differences

For mass differences greater than 0,2 % between the verified mass and the mass declared in the shipment documents, the purchaser shall make a note of the non-conformity on the copy of the shipment documents which are returned to the supplier. Within two working days from the reception of the scrap, the purchaser shall notify the observed differences to the supplier by electronic mail, fax or telex.

NOTE The supplier may request a reweighing in arbitration in the presence of a third party accepted by supplier and purchaser.

8.2.2 Other non-conformities

If the delivered scrap does not conform to the contract, the purchaser may reject the scrap and require its substitution within 30 days. Transportation and all loading/unloading expenses due to rejection and substitution shall be paid by the supplier. Alternatively, supplier and purchaser may agree upon a compensation which covers the losses and extra costs.

Deliveries in dispute, either for quantity or quality, shall be kept at the disposal of the supplier for 10 working days from the arrival unless different agreements between supplier and purchaser are made.

8.3 Arbitration

The supplier may reject the classification of the purchaser and ask for an audit in arbitration in the presence of a third party accepted by both supplier and purchaser.

The total cost of such arbitration shall be paid by the losing party.

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