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Cold-reduced blackplate in coil form for the production of tinsplate or electrolytic chromium/chromium oxide-coated steel

Fer noir laminé à froid en bobines destiné à la fabrication de fer-blanc ou de fer chromé électrolytique
[Revision of first edition (ISO 11951:1995)]

ICS: 77.140.50

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

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ISO/DIS 11951:2013 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 9, *Tinplate and blackplate*.

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Cold-reduced blackplate in coil form for the production of electrolytic tinplate or electrolytic chromium/chromium oxide-coated steel

1 Scope

This International Standard specifies requirements for single and double cold-reduced blackplate in the form of coils which are intended for manufacturing electrolytic tinplate or electrolytic chromium/chromium oxide-coated steel (ECCS) in accordance with ISO 11949 or ISO 11950.

In general, single cold-reduced blackplate is specified in nominal thicknesses that are multiples of 0,005 mm, from 0,15 mm up to and including 0,60 mm. Double cold-reduced blackplate is specified in nominal thicknesses that are multiples of 0,005 mm, from 0,10 mm up to and including 0,36 mm.

This International Standard applies to coils in nominal minimum rolling widths of 600 mm¹⁾, with either trimmed or untrimmed edges.

In addition, the general technical delivery requirements of ISO 404 are applicable.

2 Normative references

The following referenced documents are indispensable for the application of this International Standard. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 404, *Steel and steel products – General technical delivery condition*

ISO 4288, *Geometrical Product Specifications (GPS) – Surface texture : Profile method – Rule and procedures for the assessment of surface texture*

ISO 6508-1:2005, *Metallic materials – Rockwell hardness test – Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*.

ISO 6892-1:2009, *Metallic materials – Tensile testing – Part 1: Method of test at room temperature*.

ISO/TR 9769, *Steel and iron – Review of available methods of analysis*

ISO 10474, *Steel and steel products – Inspection documents*

ISO 11949, *Cold-reduced electrolytic tinplate*.

ISO 11950, *Cold-reduced electrolytic chromium/chromium oxide-coated steel*.

1) Nominal minimum rolling widths of 500 mm may be applied by agreement between the purchaser and the manufacturer.

3 Definitions

For the purposes of this International Standard, the following definitions apply.

- 3.1 blackplate:**
cold-reduced low-carbon mild steel, normally oiled, for the production of electrolytic tinplate or ECCS in accordance with ISO 11949 or ISO 11950.
- 3.2 single cold-reduced:**
term used to describe blackplate which has been reduced to the desired thickness in a cold-reduction mill and subsequently annealed and temper rolled.
- 3.3 double cold-reduced**
term used to describe blackplate which has had a second major reduction after annealing.
- 3.4 batch annealed; box annealed (BA)**
annealed by the process in which the cold-reduced strip is annealed in coil form, within a protective atmosphere, for a predetermined time-temperature cycle.
- 3.5 continuously annealed (CA)**
annealed by the process in which cold-reduced coils are unwound and annealed in strip form within a protective atmosphere.
- 3.6 finish**
appearance of the surface of blackplate, resulting from controlled preparation of the work rolls used for the final stages of rolling.
- 3.6.1 matt finish**
finish resulting from the use of temper-mill work rolls with dull surface textured by Shot Blast, EDT(Electro Discharge Texturing), EBT (Electron Beam Texturing) and so on,
- 3.6.2 smooth finish**
finish resulting from the use of temper-mill work rolls that have been ground to a low roughness. This finish is used for the production of bright finish tinplate or smooth finish ECCS.
- 3.6.3 stone finish**
finish characterized by a directional pattern, resulting from the use of final-mill work rolls that have been ground to a higher level of roughness than those used for the smooth finish.
- 3.7 coil**
rolled flat strip product which is wound into regularly superimposed laps so as to form a coil with almost flat sides.
- 3.8 longitudinal bow; line bow**
residual curvature in the strip remaining along the direction of rolling.

3.9**transverse bow; cross bow**

mode of curvature in the strip such that the distance between its edges parallel to the direction of rolling is less than the strip width.

3.10**centre fullness; centre buckle, full centre**

intermittent vertical displacement or wave in the strip occurring other than at the edges (see Figure 6).

3.11**edge wave**

intermittent vertical displacement occurring at the strip edge when the strip is laid on a flat surface. This parameter is only applicable to material supplied with trimmed edges.

3.12**feather edge; transverse thickness profile**

variation in thickness, characterized by a reduction in thickness close to the edges, at right angles to the direction of rolling. This parameter is only applicable to material supplied with trimmed edges.

3.14**Edge camber**

deviation of edge of coil from a straight line forming its chord.

3.15**burr**

metal displaced beyond the plane of the surface of the strip by shearing action.

3.16**rolling width**

width of the rolled strip perpendicular to the direction of rolling.

3.17**consignment**

quantity of material of the same specification made available for dispatch at the same time.

3.18**pallet**

base platform on which a coil is placed to facilitate ready transportation.

3.19**anvil effect**

effect which a hard anvil can produce on the numerical hardness value obtained when a hardness test is performed on very thin material supported on such an anvil.

4 Classification

Steel grades for this International Standard are generally classified as non-alloy quality steels.

5 Information to be supplied by the purchaser**5.1 Designation**

For the purposes of this International Standard, blackplate is designated in terms of a steel grade classification based either on the Rockwell HR30Tm hardness values or on the tensile properties. For the hardness requirement, the steel grade designations are given in Table A.1 for single cold-reduced blackplate

and in Table A.2 for double cold-reduced blackplate. For the tensile properties requirement, the steel grade designations are given in Table B.1.

Blackplate covered by this International Standard shall be designated by the following characteristics in the given sequence:

- a) the number of this International Standard;
- b) the steel grade designation in accordance with Table A.1, Table A.2 or Table B.1;
- c) the type of annealing used by the manufacturer (see 6.2);
- d) the type of finish (see 6.3);
- e) the dimensions of the thickness and width, in millimetres;
- f) whether mill-edge or trimmed.

EXAMPLE

ISO 11951 - T61 - CA - stone - 0,22 x 800 trimmed

ISO 11951 - T75 - CA - stone - 0,18 x 750 mill-edge

ISO 11951 - TH415 - CA - ST - 0,20 x 750 mill-edge

ISO 11951 - TS520 - BA - stone - 0,14 x 844 trimmed

5.2 Mandatory information

The following information shall be given in the enquiry and order to assist the manufacturer in supplying the correct material:

- a) the designation as given in 5.1
- b) the quantity, expressed on a mass basis;
- c) the orientation of the coils on delivery, i.e. with the cores vertical or horizontal (see 14.1);
- d) whether the coil shall be supplied with the edges trimmed or not.
- e) whether the coil shall be coated with a suitable oil or not.

NOTE Appropriate classifications are suitable for shaping operations such as stamping, drawing, folding, beading and bending, and assembly work such as joint forming and welding. The end use should be borne in mind when the classification is selected.

5.3 Options

When ordering, the purchaser shall supply all the necessary information concerning

- a) his production facilities which he anticipates will be appropriate to the ordered blackplate;
- b) the intended end use.