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ISO 5002

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Hot-rolled and cold-reduced electrolytic zinc-coated carbon steel sheet of commercial and drawing qualities

Tôles en acier au carbone laminées à chaud et à froid, revêtues par zingage électrolytique (tôles électro-zinguées) de qualité commerciale et pour emboutissage

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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.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 5002 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 12, *Continuous mill flat rolled products*.

This third edition cancels and replaces the second edition (ISO 5002:1999), which has been technically revised.

Hot-rolled and cold-reduced electrolytic zinc-coated carbon steel sheet of commercial and drawing qualities

1 Scope

1.1 This International Standard specifies the characteristics of carbon steel sheet of commercial and drawing qualities in cut length or coil form, zinc coated by electrolytic deposition. Electrolytic zinc-coated sheet is intended for the manufacture of formed or of miscellaneous parts, and can be supplied chemically treated to render it more suitable for painting. The zinc coating is expressed in micrometres of thickness per side, for either equally coated, differentially coated or one-side-coated sheets. These sheets are generally produced with coatings which are not intended to withstand outdoor exposure without chemical treatment and painting. Electrolytic zinc-coated sheet can be produced in thicknesses of 0,36 mm and thicker (normally up to 4,0 mm) and in widths of 600 mm and over in coils or cut lengths. It is recognized that materials thinner than 0,36 mm or thicker than 4,0 mm can be suitable for electrolytic zinc coating, and, if required, be the subject of agreement between the interested parties.

1.2 The thickness of zinc-coated sheet can be specified as a combination of the base metal and metallic coating, or as the base metal alone. The purchaser indicates on the order which method of specifying thickness is required. In the event that the purchaser does not indicate any preference, the thickness as a combination of the base metal and coating will be provided. Annex A describes the requirement for specifying the thickness as base metal alone.

1.3 Electrolytic zinc-coated sheet less than 600 mm wide can be slit from wide sheet and will be considered as sheet.

1.4 Commercial quality electrolytic zinc-coated sheet (HR1 or CR1) is intended for general fabricating purposes where sheet is used in the flat state, or for bending or moderate forming.

1.5 Drawing quality electrolytic zinc-coated sheet (HR2. HR3. HR4. or CR2, CR3, CR4, CR5) is intended for drawing or severe forming. It is furnished according to all requirements of this International Standard or, by agreement when ordered, to fabricate an identified part, in which case, the mechanical properties of Table 4 (for hot-rolled steel sheet) and Table 5 (for cold-reduced steel sheet) do not apply.

Drawing qualities are identified as follows:

— HR2/CR2 — Drawing quality

— HR3/CR3 — Deep drawing quality

— HR4/CR4 — Deep drawing quality aluminum killed (see 4.8)

— CR5 — Extra deep drawing quality (stabilized interstitial free).

2 Normative references

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

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

ISO 7438, *Metallic materials — Bend test*

ISO 16160, *Continuously hot-rolled steel sheet products — Dimensional and shape tolerances*

ISO 16162, *Continuously cold-rolled steel sheet products — Dimensional and shape tolerances*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
electrolytic zinc-coated steel sheet
product obtained by electrolytic deposition of a zinc coating on steel sheet on a zinc coating line to produce either electrolytic zinc-coated coils or electrolytic zinc-coated cut lengths

3.2
skin pass
light cold rolling of hot-rolled descaled sheet or of the cold-reduced and annealed steel sheet prior to zinc coating

NOTE 1 The purposes of skin passing are one or more of the following:

a) to temporarily minimize the appearance of coil breaks, stretcher strains (Luders lines) or fluting during fabrication of finished parts;

b) to minimize the appearance of coil breaks;

c) to control shape.

NOTE 2 Some increase in hardness and some loss in ductility will result from skin passing.

3.3
stabilized interstitial free steel
extra low carbon steel in which all interstitial elements are combined with titanium and/or equivalent elements

3.4
grade substitution
intersitial free steel (IF steel) may be applied on orders specifying CR2 Drawing, CR3 Deep drawing, or CR4 Deep drawing special killed, provided that the customer is informed of the substitution and related shipping documents reflecting the actual material shipped.

4 Conditions of manufacture

4.1 Steelmaking

The processes used in making the steel and in manufacturing electrolytic zinc-coated cold-reduced sheet and hot-rolled sheet are left to the discretion of the manufacturer. When requested, the purchaser shall be informed of the steelmaking process being used.

4.2 Chemical composition

The chemical composition (heat analysis) shall not exceed the values given in Tables 1, 2 and 3.

Table 1 — Chemical composition (heat analysis) for hot-rolled electrolytic zinc-coated carbon steel sheet

Mass fractions in percent

Quality		C	Mn	P	S
Designation	Name	max.	max.	max.	max.
HR1	Commercial	0,12	0,60	0,045	0,035
HR2	Drawing	0,10	0,45	0,035	0,035
HR3	Deep drawing	0,08	0,40	0,030	0,030
HR4	Deep drawing aluminum killed	0,08	0,35	0,025	0,030

Table 2 — Chemical composition (heat analysis) for cold-rolled electrolytic zinc-coated carbon steel sheet

Mass fractions in percent

Quality		Carbon	Manganese	Phosphorus	Sulfur	Titanium[a]
Designation	Name	max.	max.	max.	max.	max.
CR1	Commercial	0,15	0,60	0,050	0,035	
CR2	Drawing[c]	0,10	0,50	0,040	0,035	
CR3	Deep drawing[c]	0,08	0,45	0,030	0,03	
CR4	Deep drawing aluminum killed [c] (non-ageing)	0,06	0,45	0,030	0,03	
CR5	Extra deep drawing[b] (stabilized interstitial free)	0,02	0,25	0,020	0,02	0,15

[a] Titanium may be replaced totally or partially by niobium or vanadium. Carbon and nitrogen shall be completely stabilized.

[b] By agreement, the manganese, phosphorus and sulfur maximums may be adjusted.

[c] If interstitial free (IF Steel) is to be applied to CR2, CR3 and CR4 orders, the values of 0,15 % maximum Ti and 0,10 % maximum Nb and V are acceptable to ensure that the carbon and nitrogen are fully stabilized.

4.3 Chemical analysis

4.3.1 Heat analysis

An analysis of each heat of steel shall be made by the manufacturer in order to determine compliance with the requirements given in Tables 1, 2, and 3. On request, at the time of ordering, this analysis shall be reported to the purchaser or his representative. Each of the elements listed in Tables 1 and 2 shall be included in the report of the heat analysis. If one or more of the elements in Table 3 is/are specified, the analysis shall be reported.

4.3.2 Product analysis

A product analysis may be made by the purchaser to verify the specified analysis of the semi-finished or finished steel, and shall take into consideration any normal heterogeneity. Non-killed steels (such as rimmed or capped) are not technologically suitable for product analysis.

For killed steels, the sampling method and deviation limits shall be agreed upon between the manufacturer and purchaser at the time of ordering. The product analysis tolerances shall be in accordance with Table 4.

Table 3 — Limits on additional chemical elements

Mass fractions in percent

Elements	Heat analysis max.	Product analysis max.
Cu [a]	0,20	0,23
Ni [a]	0,20	0,23
Cr [a, b]	0,15	0,19
Mo [a, b]	0,06	0,07
Nb [c, d]	0,008	0,018
V [c, d]	0,008	0,018
Ti [c, d]	0,008	0,018

[a] The sum of copper, nickel, chromium, and molybdenum shall not exceed 0,50 % on heat analysis. When one or more of these elements are specified, the sum does not apply; in which case, only the individual limits on the remaining elements will apply.

[b] The sum of chromium and molybdenum shall not exceed 0,16 % on heat analysis. When one or more of these elements are specified, the sum does not apply; in which case, only the individual limits on the remaining elements will apply.

[c] An analysis greater than 0,008 % may be supplied after agreement between the producer and consumer.

[d] For interstitial free (IF steel), only the value of 0,15 % maximum titanium and 0,010 % maximum for niobium and vanadium are acceptable to ensure the carbon and nitrogen are fully stabilized.

Table 4 — Product analysis tolerances

Element	Maximum of specified element %	Tolerance over maximum specified %
Carbon	⩽ 0,15	0,03
Manganese	⩽ 0,60	0,03
Phosphorus	⩽ 0,05	0,01
Sulfur	⩽ 0,05	0,01
Titanium	⩽ 0,3	0,01

NOTE The maximum tolerance in this table is the allowable excess over the specified requirements and not the heat analysis.

4.4 Zinc coating

4.4.1 Coating mass

The amount of coating is expressed in micrometres of thickness per surface of sheet and shall conform to the requirements of minimum thickness given in Table 5.

4.4.2 Coating adherence

The zinc-coated sheet shall be capable of being bent in any direction, in accordance with the mandrel diameter requirements for the quality designations included in Table 6.

Table 5 — Zinc coatings for electrolytic zinc-coated hot-rolled and cold-reduced steel sheet

Coating designation[a]	**Nominal thickness per surface** μm	**Minimum thickness per surface** μm	**Nominal coating mass per surface** (for information only) g/m^2
ZE 04	0,4	0,4	3
ZE 10	1,0	0,9	7
ZE 14	1,4	1,2	10
ZE 25	2,5	2,2	18
ZE 28	2,8	2,4	20
ZE 38	3,8	3,4	27
ZE 42	4,2	3,6	30
ZE 50	5,0	4,5	36
ZE 56	5,6	4,8	40
ZE 70	7,0	6,0	50
ZE 75	7,5	6,8	54
ZE 100	10,1	9,1	75
ZE 135	13,5	12,2	96
ZE 150	15,0	13,5	107

NOTE The density of zinc used is 7 100 kg/m^3.

[a] Equally coated material should be designated as ZE 10/10, for example.

Differentially coated material should be designated as ZE 50/10, for example.

Single-surface-coated material should be designated as ZE 38/0, for example.

Table 6 — Coating bend-test requirements for electrolytic zinc-coated hot-rolled and cold-reduced steel sheet

Designation	**180° Bend-mandrel diameter**	
	$e < 3$	$e \geqslant 3{,}2$
HR1, HR2, HR3, HR4	0	1,0a
CR1, CR2, CR3, CR4, CR5	0	0

e = thickness of sheet, in millimetres

a = thickness of bend test piece

4.5 Weldability

The product is suitable for welding if appropriate conditions are selected.

4.6 Application

It is desirable that electrolytic zinc-coated steel sheet be identified for fabrication by the name of the part, or by the intended application. Steel sheet of drawing qualities HR2, HR3, HR4, and CR2, CR3, CR4 and CR5 may be produced to make an identified part within a properly established breakage allowance, which shall be previously agreed upon between the interested parties. In this case, the part name, the details of fabrication, and special requirements (i.e. exposed or unexposed, freedom from stretcher strains or fluting, coating performance requirements) shall be specified, and the mechanical properties of Table 7 or 8 do not apply.

4.7 Mechanical properties

Except when ordered according to an identified part as explained in 4.6, at the time that the steel is made available for shipment, the mechanical properties shall be as stated in Table 7 or 8 when they are determined on test pieces obtained according to the requirements of Clause 6. Prolonged storage of the sheet can cause a change in mechanical properties, leading to a decrease in drawability. To minimize this effect, quality CR4 or CR5 should be specified. The properties in Table 8 are after skin passing.

Table 7 — Mechanical property requirements for hot-rolled electrolytic zinc-coated carbon steel sheet

Base-metal quality		R_m [a]	A [b] min %			
			Material thickness, mm [b]			
			$e < 3$		$3 \leqslant e \leqslant 6$	
Designation	Name	max. MPa[2]	$L_o = 80$ mm	$L_o = 50$ mm	$L_o = 5{,}65\sqrt{S_o}$	$L_o = 50$ mm
HR1	Commercial	440	23	24	28	29
HR2	Drawing	420	25	26	30	31
HR3	Deep drawing	400	28	29	33	34
HR4	Deep drawing aluminum killed	380	31	32	36	37

R_m tensile strength

A percent elongation after fracture

L_o gauge length of original test piece.

S_o original cross-sectional area of gauge length

e thickness of steel sheet in millimetres

1 MPa = 1 N/mm[2]

[a] The minimum tensile strength for qualities HR2, HR3 and HR4 would normally be expected to be 270 N/mm[2]. All tensile strength values are determined to the nearest 10 N/mm[2].

[b] The non-proportional test piece with a fixed gauge length (50 mm), up to 6 mm thick sheet, can be used in conjunction with a conversion table. In case of dispute, however, only the results obtained on a proportional test piece will be valid for material 3 mm and over in thickness.

Table 8 — Mechanical property requirements [a] for cold-reduced electrolytic zinc-coated carbon steel sheet

Quality		R_e [a] max.	R_m max.	A min %[b]			
Designation	Name	MPa	MPa	$L_o = 80$ mm	$L_o = 50$ mm	$\bar{r}$ [c, d, e, g]	$\bar{n}$ [c, d, f, g]
CR1	Commercial [i]	280	410	27 ($\leqslant$ 0,6 mm) 28 (> 0,6 mm)	28	—	—
CR2	Drawing	240	370	33 ($\leqslant$ 0,6 mm) 34 (> 0,6 mm)	31	—	—
CR3	Deep drawing	220	350	35 ($\leqslant$ 0,6 mm) 36 (> 0,6 mm)	35	1,3 min.	0,16 min.
CR4	Deep drawing aluminum killed (non-ageing)	210	350	37 ($\leqslant$ 0,6 mm) 38 (> 0,6 mm)	37	1,4 min.	0,19 min.
CR5	Extra deep drawing (stabilized interstitial free)	190	350	39 ($\leqslant$ 0,6 mm) 40 (> 0,6 mm)	38	1,7 min.	0,22 min.

R_e yield stress
R_m tensile strength
A percent elongation after fracture
L_o gauge length of original test piece
$\bar{r}$ plastic strain ratio
$\bar{n}$ tensile strain hardening exponent
1 MPa = 1N/mm^2

[a] The minimum tensile strength for qualities CR2,CR3 and CR4 would normally be expected to be 270 MPa. All tensile strength values are determined to the nearest 10 MPa. For designing purposes, the lower limit for R_e may be assumed to be 140 MPa for grades CR1, CR2, CR3 and CR4, and 120 MPa for grade CR5.

[b] For material up to and including 0,6 mm in thickness, the elongation values in this table shall be reduced by 1.

[c] r and n values are only applicable to thicknesses $\geqslant$ 0,5 mm. For thicknesses > 2,0 mm, the r value is reduced by 0.2.

[d] $\bar{r}$ can also be written as r-bar and $\bar{n}$ can also be written as n-bar.

[e] r is an index of the drawability of the product.

[f] n is an index of the stretchability of the product.

[g] For grades CR3, CR4 and CR5, r-bar and n-bar values may be modified or excluded from this specification by agreement between the producer and purchaser.

[h] Mechanical properties are not generally done on commercial quality products and the values in this table are for information only.

4.8 Strain ageing

Electrolytic zinc-coated steel sheet (except CR4 and CR5) tends to strain age and this may lead to the following:

a) surface marking from stretcher strains or fluting when the steel is formed;

b) deterioration in ductility.

Cold-reduced electrolytic zinc-coated carbon steel sheet of quality CR4 supplied in the skin-passed condition may be subject to strain ageing under certain conditions.

Strain ageing can be caused by either carbon or nitrogen atoms which exist in a supersaturated solid solution and diffuse to dislocation sites with time and temperature. The addition of aluminum in sufficient quantities causes the removal of nitrogen from solid solution as particles of aluminum nitride. This practice tends to minimize room temperature ageing due to nitrogen and results in the general understanding that cold-rolled aluminum killed steel is free of ageing concerns generally associated with CR4. However, carbon, which is usually not retained in solid solution with the slow cooling typical of batch annealing, can be retained in solid solution during the continuous annealing process. If the annealing process and steel chemistry are not properly controlled, material with carbon remaining in solid solution after continuous annealing may result and such material will strain age at room temperature and the problems noted above can occur. Chemical stabilization, as with CR5, prevents this problem, as does proper processing with CR4 material.

Because of these factors, it is essential that the period between final processing at the mill and fabrication be kept to a minimum. Rotation of stock, by using the oldest material first, is important. Stocking of such steels for extended periods of time should be avoided.

For skin-passed sheet, reasonable freedom from stretcher strain can be achieved by effective roller levelling immediately prior to fabrication at the manufacturer's plant. Freedom from stretcher strain for a period of 6 months can be achieved by the supply of skin-passed non-ageing steel. Grades CR4 or CR5 should be specified in such cases where Luders lines are not acceptable and where roller levelling is not possible.

4.9 Surface treatment of electrolytic zinc-coated products

4.9.1 General

The requirements for solutions used in surface treatments for paint preparation, surface passivation or both, should be agreed upon between the interested parties at the time of ordering, taking into consideration the user's paint schedule and paint systems.

4.9.2 Surface preparation for painting

Electrolytic zinc-coated steel sheet may be processed chemically (such as phosphating or other suitable methods) at the manufacturer's mill to prepare the sheet for painting without further treatment, except normal cleaning, if required.

4.9.3 Mill passivation

A chemical treatment is normally applied to zinc to minimize the hazard of wet storage stain (white rust) during shipment and storage. The type of chemical treatment may be agreed upon between the manufacturer and purchaser. However, the inhibiting characteristics of the treatment are limited and, if the material becomes wet during shipment or storage, the material should be used immediately or dried.

4.10 Oiling

The electrolytic zinc-coated steel sheet as produced may be oiled to minimize wet storage stain. When the zinc-coated sheet has received a passivating treatment, oiling will minimize further the hazard of wet storage stain. Removal of the oil may create difficulties (such as staining) if an unsuitable cleaning solution is used.

4.11 Painting

Electrolytic zinc-coated steel sheet is a suitable base for paint but the first treatments may be different from those used on mild steel. Pretreatment primers, chemical conversion coatings and some paint specially formulated for direct application to zinc surfaces are all appropriate first treatments for electrolytic zinc-coated sheet (see 4.9).

5 Dimensional tolerances

Dimensional tolerances applicable to hot-rolled electrolytic zinc-coated carbon steel sheet of commercial and drawing qualities shall be as given in ISO 16160. Dimensional tolerances applicable to cold-reduced zinc-coated carbon steel sheet of commercial and drawing qualities shall be as given in ISO 16162.

6 Sampling

6.1 Tensile sampling

When ordered according to mechanical properties, a representative sample for the tensile property test required in Tables 6 and 7 shall be taken from each lot of sheet for shipment. A lot consists of 50 t or less of sheet of the same designation rolled to the same thickness and condition.

6.2 Coating tests

6.2.1 Coating mass

The producer shall develop a testing plan with a frequency sufficient to adequately characterize the lot of material and ensure conformance with specification requirements.

6.2.2 Coating adherence

One representative sample for the coating adherence bend test shall be taken from each lot of sheet for shipment. The specimens for the coated bend test shall not be taken closer than 25 mm from a side edge. The minimum width for the test specimen shall not be less than 50 mm.

7 Test methods

7.1 Tensile test

The tensile test shall be carried out in accordance with ISO 6892-1. Transverse test pieces shall be taken mid-way between the centre and edge of the sheet as rolled. The base-metal thickness shall be used to calculate the cross-sectional area needed for the tensile test; however, for orders specifying thickness “as base metal only” there are two permissible methods for determining the base-metal thickness:

a) Option A — Determine the actual base-metal thickness by direct measurement of the substrate of a specimen whose coating has been removed.

b) Option B — Calculation of the base-metal thickness by subtraction of the average coating thickness for the appropriate coating designation included in Annex A from the actual coated thickness of the test specimen.

7.2 Coating tests

7.2.1 Coating mass

7.2.1.1 The purchaser may conduct verification tests by securing a sample piece approximately 300 mm in length by the as-coated width, and cutting three test specimens, one from the mid-width position and one from each side, not closer than 25 mm to the side edge. The minimum area of the three specimens shall be 2 000 mm^2.

7.2.1.2 The coating mass shall be the minimum coating mass found on any one of the three specimens taken in accordance with 7.2.1.1. The zinc coating mass may be determined by any of the recognized and acceptable analytical methods.

7.2.1.3 When the purchaser wishes to relate the thickness of coating to the mass of coating, the spot test procedure may be used.

The spot test result shall be the lowest coating mass found in any of the three specimens taken in accordance with 6.2. The zinc coating mass may be determined by any of the recognized and acceptable analytical methods.

7.2.2 Coating adherence

The bend test shall be conducted in accordance with the methods specified in ISO 7438. The bend test may be substituted for another type of test by agreement between the purchaser and manufacturer. The acceptance criteria for the bend test is no flaking of the coating.

8 Retests

If a test does not give the required results, two additional tests shall be taken at random from the same lot. Both retests shall conform to the requirements of this International Standard; otherwise, the lot may be rejected.

9 Resubmission

The manufacturer may resubmit, for acceptance, the products that have been rejected during earlier inspection because of unsatisfactory properties, after it has subjected them to a suitable treatment, which, on request, will be indicated to the purchaser. In this case, the tests should be carried out as if they applied to a new batch.

The manufacturer has the right to present the rejected products for a new examination for compliance with the requirements for another grade.

10 Workmanship

The electrolytic zinc-coated steel sheet in cut lengths shall be free from any laminations, surface flaws and other imperfections that are detrimental to subsequent appropriate processing. Processing for shipment in coils does not afford the manufacturer the opportunity to readily observe or to remove defective portions as can be carried out on the cut-length product.

11 Inspection and acceptance

While not usually required for products covered by this International Standard, when the purchaser specifies that inspection and tests for acceptance be observed prior to shipment from the manufacturer's works, the manufacturer shall provide the purchaser's inspector with all reasonable facilities to determine that the steel is being furnished in accordance with this International Standard.

Steel that is reported to be defective after arrival at the user's works shall be set aside, properly and correctly identified and adequately protected. The supplier shall be notified in order that it may properly investigate.

12 Coil size

When zinc-coated steel is ordered in coils, a minimum or range of acceptable inside diameters (ID) shall be specified. In addition, the maximum outside diameter (OD) and maximum acceptable coil mass shall be specified.

13 Marking

13.1 Unless otherwise stated, the following minimum requirements for identifying the steel shall be legibly stencilled on the top of each lift, or shown on a tag attached to each coil or shipping unit:

a) the manufacturer's name or identifying brand;

b) the number of this International Standard, i.e. ISO 5002;

c) the quality designation number;

d) the coating designation number;

e) the order number;

f) the product dimensions;

g) the lot number;

h) the mass.

i) the surface treatment.

13.2 In the case of differential coatings, the coating thicknesses shall be marked as follows:

a) for cut lengths: the coating designation on the upper surfaces of a sheet of these piled over the coating designation of the lower surfaces;

b) for coils: the coating designation on the outer surface of a coil over the coating designation on the inner surface;

c) in cases where a mark expressing differential coating is required on a cut length or coil, the symbol D shall be suffixed to the symbol of minimum coating mass on the marked surface.

EXAMPLE

ZE 38/25D

See Clause 14.

14 Designation

The electrolytic zinc-coated material is designated as HR (for hot rolled), followed by the numbers 1, 2, 3 or 4 and CR (for cold reduced), followed by the numbers 1, 2, 3, 4 or 5 which are common to other International Standards, indicating the qualities of commercial, drawing, deep drawing, deep drawing aluminum killed (non-ageing) and extra deep drawing (stabilized interstitial free). The letters ZE are used to designate the electrolytic zinc-coated product. The coating thickness designation follows the ZE, as indicated in Table 5. Superimposed numbers are used to designate the coating thickness per side. When the numbers are different, a differential coating is indicated. When the notation 0 appears as one number in the designation, a one-side coating is indicated.

The surface treatment is designated as C (mill passivated), P (mill phosphated), N (non-treatment), O (oiled), X (unoiled) or a combination of C, P, N and O, X. Another chemical treatment may be applied by agreement between the purchaser and manufacturer.

EXAMPLE Hot-rolled steel sheet with an electrolytically deposited zinc coating of 2,5 µm thickness on each side, chemically passivated and oiled, is designated as follows:

HR1 ZE 25/25CO

Cold-reduced steel sheet with an electrolytically deposited zinc coating of 2,5 µm thickness on each side, chemically passivated and oiled, is designated as follows:

CR1 ZE 25/25CO

15 Information to be supplied by the purchaser

To adequately specify requirements of this International Standard, enquiries and orders shall include the following information:

a) a reference to this International Standard, i.e. ISO 5002;

b) the name and quality of the material, for example, cold-reduced electrolytic zinc-coated sheet (CR2) (see 1.4 and 1.5);

c) coating designation number (see Table 5);

d) dimensions of product and quantity required; for cut lengths, thickness (combination of base metal and coating or base metal alone), width, length and bundle mass and the total quantity required; for coils, thickness (combination of base metal and coating or base metal alone), width, minimum or range of inside diameter, outside diameter, and the maximum acceptable coil mass, and the quantity required;

NOTE 1 When the base metal alone is specified, see Annex A for details.

NOTE 2 When the method of specifying thickness is not indicated, the combination of base metal and coating will be provided.

e) the application (name of part), if possible (see 4.6);

f) for drawing qualities HR2, HR3, HR4, CR2, CR3, CR4 and CR5, whether ordered according to mechanical properties or to fabricate an identified part (see 4.6 and 4.7);

g) surface treatment (see 4.9);

h) oiled, if required (see 4.10);

i) coil size requirements (see Clause 12);

j) report of heat analysis, if required (see 4.3.1);

k) details of fabrication or special requirements (fluting or coating performance);

l) inspection and tests for acceptance prior to shipment from the producer's works, if required (see Clause 11).

EXAMPLE International Standard ISO 5002, cold-reduced electrolytic zinc-coated sheet, drawing quality CR2, coating designation ZE 25/25, normal thickness tolerance, 0,6 mm × 1 000 mm × 2 000 mm, 20 000 kg, roll-formed tracks.