International Standard ISO 5002

INTERNATIONAL ORGANIZATION FOR STANDARDIZATION•МЕЖДУНАРОДНАЯ ОРГАНИЗАЦИЯ ПО СТАНДАРТИЗАЦИИ•ORGANISATION INTERNATIONALE DE NORMALISATION

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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Price based on 12 pages

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards institutes (ISO member bodies). The work of developing International Standards is carried out through ISO technical committees. Every member body interested in a subject for which a technical committee has been set up 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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council.

International Standard ISO 5002 was developed by Technical Committee ISO/TC 17, *Steel*, and was circulated to the member bodies in November 1981.

It has been approved by the member bodies of the following countries :

Austria	India	South Africa, Rep. of
Belgium	Italy	Spain
Bulgaria	Japan	Sweden
Canada	Kenya	Switzerland
Czechoslovakia	Korea, Dem. P. Rep. of	Turkey
Egypt, Arab Rep. of	Korea, Rep. of	United Kingdom
France	Netherlands	USA
Germany, F.R.	Norway	USSR
Hungary	Romania	

The member body of the following country expressed disapproval of the document on technical grounds :

Australia

Printed in Switzerland

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

1 Scope and field of application

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 may 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 heavier than 4,0 mm may be suitable for electrolytic zinc coating, and if required should be the subject of agreement between the interested parties.

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

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

1.4 Drawing quality electrolytic zinc-coated sheet (HR2, HR3, HR4 or CR2, CR3, CR4) is intended for drawing or severe forming. It is furnished to all requirements of this International Standard, or with agreement when ordered, to fabricate an identified part, in which case the mechanical properties in tables 3 (for hot rolled) and 3A (for cold reduced) do not apply. Drawing qualities are identified as follows :

HR2 — CR2 — Drawing quality

HR3 — CR3 — Deep-drawing quality

HR4 — CR4 — Deep-drawing quality special killed (non-ageing)

2 References

ISO 82, *Steel — Tensile testing.*

ISO/R 85, *Bend test for steel.*

ISO 86, *Steel — Tensile testing of steel sheet and strip less than* 3 mm *and not less than* 0,5 mm *thick.*

ISO/R 87, *Simple bend testing of steel sheet and strip less than* 3 mm *thick.*

ISO 1460, *Metallic coatings — Hot-dip coatings on ferrous materials — Determination of the mass per unit area — Gravimetric method.*

ISO 3573, *Hot-rolled carbon steel sheet of commercial and drawing qualities.* [1]

ISO 3574, *Cold-reduced carbon steel sheet of commercial and drawing qualities.* [2]

ISO 3575, *Continuous hot-dip zinc-coated carbon steel sheet of commercial, lockforming and drawing qualities.*

3 Definitions and other information

3.1 electrolytic zinc-coated steel sheet : A 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 Designation system — Electrolytic zinc coating and qualities

The electrolytic zinc-coated material is designated as HR (for hot rolled) and CR (for cold reduced), followed by the numbers 1, 2, 3 and 4, which are common to other International Standards, indicating the qualities of commercial, drawing, deep drawing and deep drawing special killed (non-ageing). The letters ZE are used to designate the electrolytic zinc-coated product. The coating thickness designation follows the ZE, as indicated in table 2. 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.

1) At present at the stage of draft. (Revision of ISO 3573-1976.)

2) At present at the stage of draft. (Revision of ISO 3574-1976.)

Examples of a complete designation, including coating thickness, coating condition and quality are :

HR1 ZE 25/25 CR1 ZE 25/25

which are composed from the following combination :

HR — hot-rolled steel sheet

CR — cold-reduced steel sheet

1 — commercial quality

ZE — zinc electrolytic

25 — coating designation

3.3 skin pass : A light cold rolling of hot-rolled descaled sheet or of the cold-reduced and annealed steel sheet prior to electrolytic zinc coating. The purposes of skin passing are one or more of the following :

a) to minimize temporarily the occurrence of conditions known as stretcher strains (Lüders line) or fluting during fabrication of finished parts. This process may adversely affect the ductility of the base metal;

b) to minimize the appearance of coil breaks;

c) to control shape.

3.4 Strain ageing

Electrolytic zinc-coated steel sheet (except HR4 and CR4) 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.

Because of these factors, it is essential that the period between final processing at the mill and fabrication is 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 and for optimum performance should not exceed 6 weeks.

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. Grade HR4 or CR4 should be specified in such cases where Lüders line are not acceptable and where roller levelling is not possible.

3.5 Surface treatment of electrolytic zinc-coated products

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.

3.5.1 Surface preparation for painting

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

3.5.2 Surface passivation

A chemical treatment is normally applied to zinc to minimize the hazard of wet storage stain (white rust) during shipment and storage. 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.

3.6 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 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 producer. When requested, the purchaser shall be informed of the steelmaking process being used.

4.2 Chemical composition

The chemical composition (cast analysis) shall not exceed the values given in table 1.

4.3 Chemical analysis

4.3.1 Cast analysis

A cast analysis of each cast of steel shall be made by the producer to determine the percentage of carbon, manganese, phosphorus, and sulphur. When requested, this analysis will be reported to the purchaser or his representative.

4.3.2 Verification analysis

A verification 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 suited to verification analysis.

For killed steels, the sampling method and deviation limits shall be agreed upon between producer and purchaser at the time of ordering.

Table 1 — Chemical composition

Quality		Carbon max. %	Manganese max. %	Phosphorus max. %	Sulphur max. %
Designation	Name				
HR1 or CR1	Commercial	0,15	0,60	0,05	0,05
HR2 or CR2	Drawing	0,12	0,50	0,04	0,04
HR3 or CR3	Deep drawing	0,10	0,45	0,03	0,03
HR4 or CR4 (N.A.)	Deep drawing, special killed (non-ageing)	0,08	0,45	0,03	0,03

4.4 Zinc coating

The amount of coating is expressed in micrometres of thickness per side of sheet and shall conform to the requirements expressed in table 2.

4.5 Weldability

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

4.6 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. Pre-treatment 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 3.5).

4.7 Application

It is desirable that electrolytic zinc-coated steel sheet be identified for fabrication by name of the part or by the intended application. Steel sheet of drawing qualities (HR2, HR3, HR4 and CR2, CR3 CR4) 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 tables 3 or 3A do not apply.

4.8 Mechanical properties

Except when ordered to an identified part, as explained in 4.7, at the time that the steel is made available for shipment, the mechanical properties shall be as stated in tables 3 or 3A when they are determined on test pieces obtained according to the requirements of 6.1. Prolonged storing of the sheet can cause a change in mechanical properties, leading to a decrease in drawability. To minimize this effect, quality HR4 or CR4 should be specified.

5 Dimensional tolerances

Applicable tolerance limits for electrolytic zinc-coated sheets are shown in tables 4 to 12 inclusive.

6 Sampling

6.1 Mechanical property tests

6.1.1 Tensile test

When ordered to mechanical properties, one representative sample for the tensile property test required in tables 3 or 3A shall be taken from each lot of sheet for shipment. A lot consists of 50 t or less of sheet of the same quality rolled to the same thickness and condition.

6.1.2 Bend test

One representative sample for the bend test (applicable only to HR1 or CR1) shall be taken from each lot of sheet for shipment. A lot consists of all sheets of the same quality rolled to the same thickness and condition.

6.2 Coating tests

6.2.1 Thickness of coating

The manufacturer shall make such tests and measurements as he deems necessary to ensure that the material produced complies with the values in table 2. The purchaser may relate the thickness of coating to the mass by the use of the following sampling method :

Three specimens shall be cut, one from the mid-width position and one from each side not closer than 50 mm from the side edge. The minimum specimen area shall be 2 000 mm^2.

7 Test methods

7.1 Mechanical property tests

7.1.1 Tensile test (base metal)

The tensile test shall be carried out in accordance with ISO 82 and ISO 86.

Transverse test pieces shall be taken mid-way between the centre and edge of the sheet as rolled.

7.1.2 Bend test

The transverse bend test specimen (applicable only to HR1 and CR1) shall withstand being bent in the direction shown in figure 1 through 180° without cracking on the outside of the bent portion around the inside diameter as shown in table 3 or 3A. The bend test is to be performed at ambient temperature and is described in ISO/R 85 and ISO/R 87.

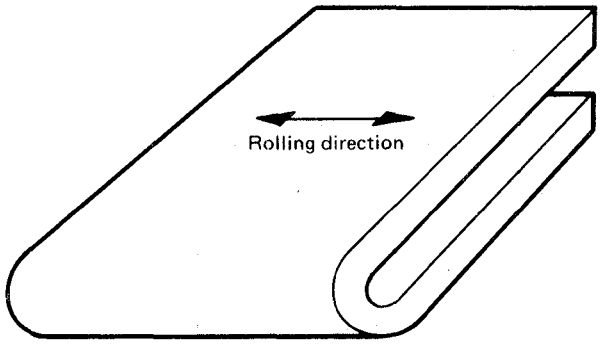

Figure 1 — Transverse bend test piece (after bending)

7.2 Coating tests

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

7.2.1 Spot test

The spot test result shall be the lowest coating mass found in any of the three (3) specimens taken in accordance with 6.2.1. The zinc coating mass may be determined by any of the recognized and acceptable analytical methods.

8 Retests

If a test does not give the required results, two more 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

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

9.2 The manufacturer has the right to present the rejected products to 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 amounts of 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 observe readily or to remove defective portions as can be carried out on the cut length product.

11 Inspection and acceptance

11.1 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 afford the purchaser's inspector all reasonable facilities to determine that the steel is being furnished in accordance with this International Standard.

11.2 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 he may properly investigate.

12 Coil size

When zinc-coated steel is ordered in coils, a minimum or range of acceptable inside diameter (I.D.) shall be specified. In addition, the maximum outside diameter (O.D.) 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;

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.

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

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

Example : ZE 38/25.

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

Example : ZE 38/25.

14 Information to be supplied by the purchaser

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

a) the number of this International Standard;

b) name and quality of material, for example, cold-reduced electrolytic zinc-coated sheet (CR2) (see 1.3 and 1.4);

c) coating designation number (see table 2);

d) dimensions of product and quantity required;

e) application (name of part), if possible (see 4.7);

f) for drawing qualities HR2, HR3, HR4, CR2, CR3 and CR4, whether ordered to mechanical properties (see 4.8) or to fabricate an identified part (see 4.7);

g) mill phosphated, if required (see 3.5);

h) mill passivated or not passivated (see 3.5);

j) oiled, if required (see 3.6);

k) coil size requirements (see clause 12);

m) report of cast analysis, if required (see 4.3);

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

p) inspection and tests for acceptance prior to shipment from the producer's works, if required (see 11.1).

NOTE — A typical ordering description is as follows :

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

Table 2 — Zinc coatings for electrolytic zinc-coated hot-rolled and cold-reduced steel sheet

Coating designation	Nominal thickness per side	Nominal coating mass per side (For information only)
	μm	g/m²
ZE 10/10	1,0	7
ZE 25/25	2,5	18
ZE 38/38	3,8	27
ZE 50/50	5,0	36
ZE 75/75	7,5	54
ZE 135/0	13,5	96
ZE 150/0	15,0	107

NOTES

1 a) Equally coated material should be designed as ZE 10/10.

b) Differentially coated material should be designated as ZE 50/10.

c) One-side coated material should be designated as ZE 38/0.

2 The minimum thickness should not be less than 90 % of the nominal thickness shown in the above table.

3 The density of zinc used is 7 100 kg/m³.

Table 3 — Hot-rolled electrolytic zinc-coated steel sheet — Mechanical properties[1] (see 4.8)

Quality		R_m, max.[2] N/mm²	A min. %[3]				180° Bend mandrel diameter	
			$e < 3$		$3 \leqslant e < 6$			
Designation	Name		L_o = 80 mm	L_o = 50 mm	$L_o = 5{,}65\sqrt{S_o}$	L_o = 50 mm	$e < 3$	$3 \leqslant e < 6$
HR1	Commercial	--	—	—	—	—	1a	2a
HR2	Drawing	430	25	26	28	29	—	—
HR3	Deep drawing	370	28	29	32	33	—	—
HR4	Deep drawing special killed (non-ageing)	390	28	29	32	33	—	—

1) R_m = tensile strength;

A = percentage elongation after fracture;

L_o = gauge length of test piece;

S_o = original cross-sectional area of gauge length;

e = thickness of steel sheet, in millimetres;

a = thickness of bend test piece.

1 N/mm² = 1 MPa

2) Minimum tensile strength for qualities HR2, HR3 and HR4 would normally be expected to be 270 N/mm². All tensile strength values are determined to the nearest 10 N/mm².

3) The non-proportional test piece with a fixed original 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 3A — Cold-reduced electrolytic zinc-coated steel sheet — Mechanical properties[1] (see 4.8)

Quality		R_m, max.[2] N/mm²	A min. %[3]		180° Bend mandrel diameter		Hardness max.[4]	
Designation	Name		L_o = 80 mm	L_o = 50 mm	$e < 3$	$e \geqslant 3$	HRB	HR30T
CR1	Commercial	—	—	—	(flat on itself)	1a	note 5)	—
CR2	Drawing	370	30	31	—	—	57	55
CR3	Deep drawing	350	34	35	—	—	53	52
CR4	Deep drawing special killed (non-ageing)	340	36	37	—	—	50	50

1) R_m = tensile strength;

A = percentage elongation after fracture;

L_o = gauge length on test piece;

e = thickness of steel sheet, in millimetres;

a = thickness of bend test piece;

HRB = hardness Rockwell B scale;

HR30T = hardness Rockwell 30T scale;

S_o = cross section of the specimen gauge length.

1 N/mm² = 1 MPa

2) Minimum tensile strength for qualities CR2, CR3 and CR4 would normally be expected to be 270 N/mm². All tensile strength values are determined to the nearest 10 N/mm².

3) For material up to and including 0,6 mm in thickness, the elongation values in the table shall be reduced by 1. Minimum elongation values on a gauge length of $L_o = 5{,}65\sqrt{S_o}$ may be the subject of agreement between producer and purchaser.

4) Equivalent Vickers hardness values are allowed by agreement between the producer and the purchaser at the time of ordering. By agreement between the producer and purchaser, no hardness requirements need apply. The hardness of sheet thinner than 0,6 mm shall be measured exclusively in compliance with HR30T scale..

5) The hardness of quality CR1 is expected not to exceed the equivalent of Rockwell HRB 65 at the time it is made available for shipment.

Table 4 — Thickness tolerances for hot-rolled descaled, electrolytic zinc-coated steel sheet coils[1] and cut lengths

Values in millimetres

Specified width	Thickness tolerances[2], over and under, for specified thicknesses					
	up to and including 2,00	over 2,00 up to and including 2,50	over 2,50 up to and including 3,00	over 3,00 up to and including 4,00	over 4,00 up to and including 5,00	over 5,00 up to and including 6,00
600 up to and including 1 200	0,17	0,18	0,20	0,22	0,24	0,26
over 1 200 up to and including 1 500	0,19	0,21	0,22	0,24	0,26	0,28
over 1 500 up to and including 1 800	0,21	0,23	0,24	0,26	0,28	0,29
over 1 800	—	0,25	0,26	0,27	0,29	0,31

1) The values specified do not apply to the uncropped ends for a length l of a mill edge coil.

$$\text{length } l \text{ in metres} = \frac{90}{\text{thickness in millimetres}}$$

provided that the result was not greater than 20 m (total both ends).

2) Thickness is measured at any point on the sheet not less than 25 mm from a side edge.

Table 4A — Thickness tolerances for cold-reduced electrolytic zinc-coated steel sheet coils[1] and cut lengths

Values in millimetres

Specified width	Thickness tolerances[2] over and under, for specified thicknesses									
	up to and including 0,4	over 0,4 up to and including 0,6	over 0,6 up to and including 0,8	over 0,8 up to and including 1,0	over 1,0 up to and including 1,2	over 1,2 up to and including 1,6	over 1,6 up to and including 2,0	over 2,0 up to and including 2,5	over 2,5 up to and including 3,0	over 3,0 up to and including 4
600 up to and including 1 200	0,04	0,05	0,07	0,08	0,09	0,11	0,13	0,15	0,18	0,20
over 1 200 up to and including 1 500	0,05	0,06	0,08	0,09	0,10	0,12	0,14	0,16	0,19	0,21
over 1 500	—	0,08	0,09	0,10	0,12	0,14	0,16	0,18	0,21	0,23

1) The thickness tolerances for sheets in coil form are the same as for sheets supplied in cut lengths but in cases where welds are present, the tolerances shall be double those given over a length of 15 m in the vicinity of the weld.

2) Thickness is measured at any point on the sheet not less than 25 mm from a side edge.

Table 5 — Width tolerances for hot-rolled, descaled, cut edge, not resquared electrolytic zinc-coated steel sheet coils and cut lengths

Values in millimetres

Specified width	Tolerance
Up to and including 1 200	$+\ ^{6}_{0}$
Over 1 200 up to and including 1 500	$+\ ^{8}_{0}$
Over 1 500	$+\ ^{10}_{0}$

Table 5A — Width tolerances for cold-reduced electrolytic zinc-coated steel sheet, not resquared coils and cut lengths

Values in millimetres

Specified width	Tolerance
Up to and including 1 200	$+\ ^{5}_{0}$
Over 1 200 up to and including 1 500	$+\ ^{7}_{0}$
Over 1 500	$+\ ^{9}_{0}$

Table 6 — Length tolerances for hot-rolled, descaled not resquared electrolytic zinc-coated steel, sheet cut lengths

Values in millimetres

Specified length	Tolerance
Up to and including 3 000	$+\ ^{20}_{0}$
Over 3 000 up to and including 6 000	$+\ ^{30}_{0}$
Over 6 000	$+\ ^{0,5\ \%\ \times\ \text{length}}_{0}$

Table 6A — Length tolerances for cold-reduced, electrolytic zinc-coated steel sheet, *cut lengths, not resquared*

Values in millimetres

Specified length	Tolerance
Up to and including 3 000	$+\ ^{20}_{0}$
Over 3 000 up to and including 6 000	$+\ ^{30}_{0}$
Over 6 000	$+\ ^{0,5\ \%\ \times\ \text{length}}_{0}$

Table 7 — Camber tolerances for hot-rolled, descaled, not resquared electrolytic zinc-coated steel sheet

Form	Camber tolerance
Cut lengths	0,5 % × length
Coils	25 mm in any 5 000 mm length

Table 7A — Camber tolerances for cold-reduced electrolytic zinc-coated steel sheet

Form	Maximum tolerance
Cut lengths	0,4 % × length
Coils	20 mm in any 5 000 mm length

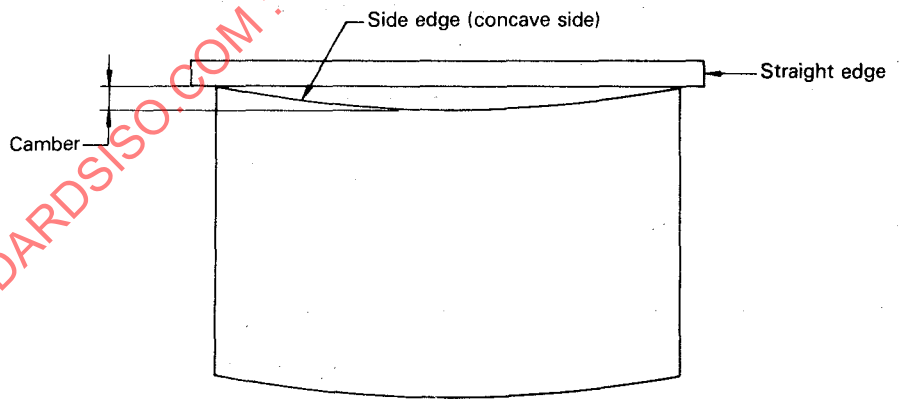

Figure 2 — Measurement of camber

Camber is the greatest deviation of a side edge from a straight line, the measurement being taken on the concave side with a straightedge.

Table 8 — Out-of-square tolerance for hot-rolled and cold-reduced electrolytic zinc-coated steel sheet in cut lengths, not resquared

Dimensions	Out-of-square tolerance
All thicknesses and all sizes	1,0 % × width

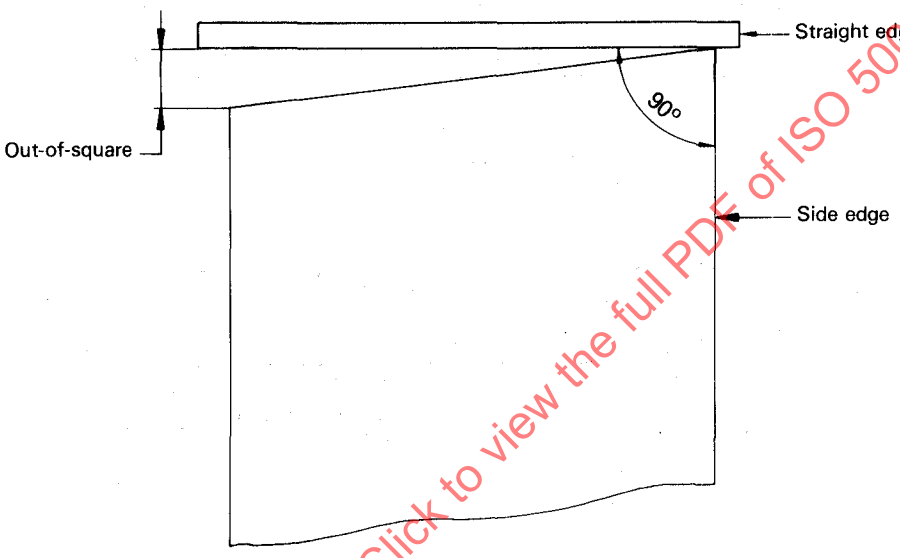

Figure 3 — Measurement of out-of-square

Out-of-square is the greatest deviation of an end edge from a straight line at right angles to a side and touching one corner, the measurement being taken as shown in figure 3. It can also be measured as one-half the difference between the diagonals of the cut length sheet.

Table 9 — Out-of-square, width, and length tolerances[1), 2)] for hot-rolled and cold-reduced electrolytic zinc-coated steel sheet, resquared

Values in millimetres

Specified length	Specified width	Tolerances	
		Up to and including 5 mm in thickness	Over 5 mm in thickness
Up to and including 3 000	Up to and including 1 200	$+\ 2\ 0$	To be subject to an agreement between the interested parties
	Over 1 200	$+\ 3\ 0$	
Over 3 000	All widths	$+\ 3\ 0$	

1) See figure 3.

2) When measuring material to resquared tolerances, consideration may have to be given to extreme variations in temperature.