

# JIS

JAPANESE  
INDUSTRIAL  
STANDARD

Translated and Published by  
Japanese Standards Association

---

**JIS G 3302** : 2007

(JISF)

**Hot-dip zinc-coated steel sheet and strip**

[www.docin.com](http://www.docin.com)

---

ICS 77.140.50

Reference number : JIS G 3302 : 2007 (E)

PROTECTED BY COPYRIGHT

21 S

G 3302 : 2007

Date of Establishment: 1951-10-31

Date of Revision: 2007-09-20

Date of Public Notice in Official Gazette: 2007-09-20

Investigated by: Japanese Industrial Standards Committee  
Standards Board  
Technical Committee on Iron and Steel

---

JIS G 3302 : 2007, First English edition published in 2007-12

Translated and published by: Japanese Standards Association  
4-1-24, Akasaka, Minato-ku, Tokyo, 107-8440 JAPAN

---

In the event of any doubts arising as to the contents,  
the original JIS is to be the final authority.

© JSA 2007

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from the publisher.

Printed in Japan

KK/HN

PROTECTED BY COPYRIGHT

## Contents

	Page
Introduction .....	1
1 Scope .....	1
2 Normative references .....	1
3 Grade, symbol and applicable nominal thickness .....	2
4 Chemical composition .....	3
5 Coating .....	4
5.1 Type of coating .....	4
5.2 Coating mass .....	4
5.3 Coating surface finishes .....	5
5.4 Coating adherence .....	6
6 Chemical treatment .....	6
7 Oiling .....	6
8 Mechanical properties .....	7
8.1 Applicable mechanical properties .....	7
8.2 Bendability .....	7
8.3 Tensile test characteristics .....	8
9 Dimensions and tolerances .....	10
9.1 Expression of dimensions .....	10
9.2 Standard dimensions .....	10
9.3 Dimensional tolerances .....	11
10 Shapes .....	13
10.1 Camber .....	13
10.2 Out-of-square .....	14
10.3 Flatness .....	14
11 Mass and tolerances thereof .....	15
11.1 Mass of sheet .....	15
11.2 Mass of coil .....	15
11.3 Calculation method of mass .....	15
11.4 Tolerances on theoretical mass of sheet .....	16
12 Appearance .....	17
13 Tests .....	17
13.1 Analysis test .....	17
13.2 Coating mass test .....	17
13.3 Corrosion resistance test of coating .....	18

13.4	Mechanical test	18
14	Inspection	19
14.1	Inspection	19
14.2	Re-inspection	20
15	Markings	20
16	Items to be confirmed at the time of order	21
17	Report	22
Annex JA (normative)	Nominal thickness and coating mass symbol of sheet and coil for roofing and architectural siding	23
Annex JB (normative)	Nominal thickness, coating mass symbol and standard dimension for corrugated sheet	24
Annex JC (normative)	Test method for coating mass of hot-dip zinc-coated steel sheet and strip using fluorescent X-rays	26
Annex JD (informative)	Comparison table between JIS and corresponding International Standards	28

www.docin.com

## Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee as result of proposal for revision of Japanese Industrial Standard submitted by The Japan Iron and Steel Federation (JISF) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14.

Consequently JIS G 3302:2005 is replaced with this Standard.

This JIS document is protected by the Copyright Law.

Attention is drawn to the possibility that some parts of this Standard may conflict with a patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have technical properties. The relevant Minister and the Japanese Industrial Standards Committee are not responsible for identifying the patent right, application for a patent after opening to the public, utility model right or application for registration of utility model after opening to the public which have the said technical properties.

www.docin.com

# Hot-dip zinc-coated steel sheet and strip

## Introduction

This Japanese Industrial Standard has been prepared based on the third edition of ISO 3575 published in 2005 and the fourth edition of ISO 4998 published in 2005 with some modifications of the technical contents.

The portions given sidelines or dotted underlines are the matters in which the contents of the corresponding International Standards have been modified. A list of modifications with the explanations is given in Annex JD. Furthermore, matters in Annex JA to Annex JC are not stated in the corresponding International Standards.

## 1 Scope

This Standard specifies the steel sheet and strip (hereafter referred to as "sheet and coil") equally zinc-coated on both surfaces in a bath of molten zinc containing 97 % or over of zinc in mass fraction (provided that the aluminium content is usually 0.30 % or less). In this case, the term "sheet" includes not only sheets in flat form but also corrugated sheets of which the shapes and dimensions are specified in JIS G 3316.

NOTE : The International Standards corresponding to this Standard are as follows.

ISO 3575 : 2005 *Continuous hot-dip zinc-coated carbon steel sheet of commercial and drawing qualities*

ISO 4998 : 2005 *Continuous hot-dip zinc-coated carbon steel sheet of structural quality*

(Overall evaluation : MOD)

In addition, symbols which denote the degree of correspondence in the contents between the relevant International Standards and JIS are IDT (identical), MOD (modified), and NEQ (not equivalent) according to ISO/IEC Guide 21.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 0320 *Standard test methods for heat analysis of steel products*

JIS G 0404 *Steel and steel products — General technical delivery requirements*

JIS G 0415 *Steel and steel products — Inspection documents*

JIS G 0594 *Methods of accelerated cyclic corrosion resistance tests for anodic coat-*

*ings with exposure to salt spray, dry and wet conditions*

*JIS G 3316 Shapes and dimensions of corrugated steel sheets*

*JIS H 0401 Methods of test for hot dip galvanized coatings*

NOTE : Corresponding International Standard : **ISO 1460** *Metallic coatings — Hot dip galvanized coatings on ferrous materials — Gravimetric determination of the mass per unit area* (MOD)

*JIS H 8502 Methods of corrosion resistance test for metallic coatings*

*JIS K 0119 General rules for X-ray fluorescence spectrometric analysis*

*JIS K 5621 Anticorrosive paint for general use*

*JIS Z 2201 Test pieces for tensile test for metallic materials*

*JIS Z 2241 Method of tensile test for metallic materials*

*JIS Z 8401 Guide to the rounding of numbers*

### 3 Grade, symbol and applicable nominal thickness <sup>1)</sup>

The grade, symbol and applicable nominal thickness shall be as follows.

Note <sup>1)</sup> The nominal thickness refers to the base metal thickness before coating [see 9.1 a)].

- a) The sheet and coil shall be classified into 6 grades using hot-rolled sheets and strips (hereafter referred to as "hot-rolled base metal") and into 11 grades using cold-reduced sheets and strips (hereafter referred to as "cold-reduced base metal"), and their grade symbols and applicable nominal thicknesses shall be as given in table 1 and table 2.
- b) For the sheet and coil used for roofing and architectural siding, the symbol R indicating roofing or the symbol A indicating architectural siding shall be suffixed to the grade symbol in table 2. In this case, the applicable nominal thickness and the coating mass symbol shall be in accordance with Annex JA.
- c) For the sheet and coil subjected to corrugating in accordance with JIS G 3316, the symbol W indicating the corrugated sheet and the shape symbol for the corrugated sheet shall be suffixed to the grade symbol in table 2 (for roofing or architectural siding, after the symbol thereof). In this case, the applicable nominal thickness and the coating mass symbol shall be in accordance with Annex JB.

**Table 1 Grade symbol and applicable nominal thickness  
[using hot-rolled base metal <sup>a)</sup>]**

Unit : mm

Grade symbol	Applicable nominal thickness	Application
SGHC	1.6 or over up to and incl. 6.0	Commercial use
SGH340		Structural use
SGH400		
SGH440		
SGH490		
SGH540		
Note <sup>a)</sup> For the nominal thickness of 1.6 mm or over up to and including 3.2 mm, unless the hot-rolled base metal is particularly specified, the cold-reduced base metal which satisfies the specification of the hot-rolled base metal may be used.		

**Table 2 Grade symbol and applicable nominal thickness  
(using cold-reduced base metal)**

Unit : mm

Grade symbol	Applicable nominal thickness <sup>a)</sup>	Application
SGCC	0.25 or over up to and incl. 3.2	Commercial use
SGCH	0.11 or over up to and incl. 1.0	Commercial use of hard class
SGCD1	0.40 or over up to and incl. 2.3	Drawing use Class 1
SGCD2		Drawing use Class 2
SGCD3	0.60 or over up to and incl. 2.3	Drawing use Class 3
SGCD4		Drawing use Class 4, non-aging property <sup>b)</sup>
SGC340	0.25 or over up to and incl. 3.2	Structural use
SGC400		
SGC440		
SGC490		
SGC570	0.25 or over up to and incl. 2.0	
For the corrugated sheet, the grade of commercial use, commercial use of hard class and structural use in this table shall be used.		
Notes <sup>a)</sup> The nominal thickness other than those listed in this table may be applied upon the agreement between the purchaser and the supplier.		
<sup>b)</sup> The non-aging property refers to the property free from the stretcher strain during working.		

#### 4 Chemical composition

For the chemical composition of the base metal of sheet and coil, the test shall be performed in accordance with 13.1 and the heat analysis values shall be as given in table 3.



**Table 3 Chemical composition**

Unit : %

Grade symbol	C	Mn	P	S
SGHC	0.15 max.	0.80 max.	0.05 max.	0.05 max.
SGH340	0.25 max.	1.70 max.	0.20 max.	0.05 max.
SGH400	0.25 max.	1.70 max.	0.20 max.	0.05 max.
SGH440	0.25 max.	2.00 max.	0.20 max.	0.05 max.
SGH490	0.30 max.	2.00 max.	0.20 max.	0.05 max.
SGH540	0.30 max.	2.50 max.	0.20 max.	0.05 max.
SGCC	0.15 max.	0.80 max.	0.05 max.	0.05 max.
SGCH	0.18 max.	1.20 max.	0.08 max.	0.05 max.
SGCD1	0.12 max.	0.60 max.	0.04 max.	0.04 max.
SGCD2	0.10 max.	0.45 max.	0.03 max.	0.03 max.
SGCD3	0.08 max.	0.45 max.	0.03 max.	0.03 max.
SGCD4	0.06 max.	0.45 max.	0.03 max.	0.03 max.
SGC340	0.25 max.	1.70 max.	0.20 max.	0.05 max.
SGC400	0.25 max.	1.70 max.	0.20 max.	0.05 max.
SGC440	0.25 max.	2.00 max.	0.20 max.	0.05 max.
SGC490	0.30 max.	2.00 max.	0.20 max.	0.05 max.
SGC570	0.30 max.	2.50 max.	0.20 max.	0.05 max.

## 5 Coating

### 5.1 Type of coating

The coating shall be classified into two types: non-alloyed coating and alloyed coating <sup>2)</sup>.

Note <sup>2)</sup> The alloyed coating refers to the coating obtained in such a way that an alloyed layer of iron and zinc is produced in the entire coating layer by heating after coating.

### 5.2 Coating mass

#### 5.2.1 Coating mass symbol

For coating, both surfaces shall be equally coated in thickness, and the coating mass symbol shall be as given in table 4.

#### 5.2.2 Coating mass

For the coating mass, the test shall be performed in accordance with 13.2, and the minimum coating mass shall be as follows. The maximum coating mass (total mass on both surfaces) may be agreed between the purchaser and the supplier.

- a) The coating mass on the sheet and coil shall be expressed by the total mass on both surfaces, and the minimum average coating mass at triple spots and the minimum coating mass at a single spot shall be as given in table 4. Here, the minimum average coating mass at triple spots shall apply to the average of the measured values of the coating masses of three test pieces cut from the specimen, and the minimum coating mass at a single spot shall apply to the smallest of the measured values of the coating masses of the three test pieces of which the average value is obtained.

**Table 4 Minimum coating mass (total mass on both surfaces)**

Unit : g/m <sup>2</sup>			
Type of coating	Coating mass symbol	Minimum average coating mass at triple spots	Minimum coating mass at single spot
Non-alloyed coating	Z06 <sup>a)</sup>	60	51
	Z08	80	68
	Z10	100	85
	Z12	120	102
	Z14	140	119
	Z18	180	153
	Z20	200	170
	Z22	220	187
	Z25	250	213
	Z27	275	234
	Z35	350	298
	Z37	370	315
	Z45	450	383
	Z60	600	510
Alloyed coating	F04 <sup>a)</sup>	40	34
	F06	60	51
	F08	80	68
	F10	100	85
	F12	120	102
	F18 <sup>a)</sup>	180	153
The coating masses corresponding to Z35, Z37, Z45, Z60, F10, F12 and F18 shall not apply to SGCD1, SGCD2, SGCD3 and SGCD4.			
Note <sup>a)</sup> Applicable only when agreed between the purchaser and the supplier.			

- b) The minimum coating mass at a single spot on either surface on the sheet and coil should be 40 % or over of the minimum coating mass at a single spot (total mass on both surfaces).

### 5.3 Coating surface finishes

#### 5.3.1 Type and symbol of surface finish for non-alloyed coating

The type and the symbol of the coating surface finish shall be as given in table 5.

**Table 5 Type and symbol of surface finish for non-alloyed coating**

Type of coating surface finish	Symbol	Remarks
Regular spangle	R	A coating having spangles as a result of the unrestricted growth of zinc crystals during normal solidification.
Minimized spangle	Z	A coating having the spangles obtained by restricting normal spangle formation to a minimum.

#### 5.3.2 Skin-pass

Skin-passing to obtain surface smoothness shall be in accordance with the designa-

tion by the purchaser. In this case, the symbol shall be S.

#### 5.4 Coating adherence

For the coating adherence of the flat sheet and coil to which the non-alloyed coating is applied, when the test is performed in accordance with 13.4.2 under the bend test condition given in table 9 or table 10, there shall be no flaking of the coating on the outside of the bent portion (within an area 7 mm or over from each side of the test piece).

In addition, the coating adherence may be evaluated in accordance with other evaluation test methods or evaluation criteria in place of the bend test for coating adherence when agreed between the purchaser and the supplier.

#### 6 Chemical treatment

The type and the symbol of the chemical treatment for the flat sheet and coil shall be as given in table 6. Unless otherwise specified, the non-alloyed coating shall be subjected to the chromate treatment or chromate-free treatment, and the alloyed coating shall be untreated.

Chemical treatments other than those in table 6 may be agreed upon between the purchaser and the supplier.

**Table 6 Type and symbol of chemical treatment**

Type of chemical treatment	Symbol
Chromate treatment	C
Phosphate treatment <sup>a)</sup>	P
Chromate-free treatment <sup>b)</sup>	NC
Chromate-free phosphate treatment <sup>c)</sup>	NP
Untreated	M
Notes <sup>a)</sup> For phosphate treatment, chromate treatment shall generally be applied on the phosphate-treated surface in order to improve the corrosion resistance. <sup>b)</sup> Chromate-free treatment refers to the chemical treatment which does not contain the hexavalent chromium. <sup>c)</sup> Chromate-free phosphate treatment refers to the chemical treatment which does not contain hexavalent chromium applied on the phosphate-treated surface.	

#### 7 Oiling

The type and the symbol of oiling for the sheet and coil shall be as given in table 7. Unless otherwise specified, the non-alloyed coating shall be unoiled and the alloyed coating shall be oiled.

**Table 7 Type and symbol of oiling**

Type of oiling	Symbol
Oiled	O
Uncoiled	X

## 8 Mechanical properties

### 8.1 Applicable mechanical properties

Applicable mechanical properties for the flat sheet and coil shall be as given in table 8.

**Table 8 Applicable mechanical property**

Grade symbol	Bendability <sup>a)</sup>	Tensile test characteristics <sup>b)</sup>
SGHC	○	— <sup>e)</sup>
SGH340	○	○
SGH400	○	○
SGH440	○	○
SGH490	○	○
SGH540	○	○
SGCC	○ <sup>e)</sup>	— <sup>e)</sup>
SGCH	— <sup>d)</sup>	— <sup>e)</sup>
SGCD1	○	○
SGCD2	○	○
SGCD3	○	○
SGCD4	○	○
SGC340	○	○
SGC400	○	○
SGC440	○	○
SGC490	○	○
SGC570	— <sup>d)</sup>	○
Notes <sup>a)</sup> Apply to the non-alloyed coating and not apply to the alloyed coating.		
<sup>b)</sup> For the nominal thickness under 0.25 mm, the tensile test shall not apply.		
<sup>c)</sup> When used for corrugated sheets, the bendability shall not apply.		
<sup>d)</sup> The bendability shall not apply.		
<sup>e)</sup> The tensile test characteristics shall not apply.		

### 8.2 Bendability

For the bendability of the flat sheet and coil to which the non-alloyed coating is applied, when the test is performed in accordance with 13.4.2 under the bend test condition given in table 9 and table 10, there shall be no cracking (visible to the naked eye) or fracture of the base metal on the outside of the bent portion (within an area 7 mm or over from each side of the test piece).

NOTE : For the performance of the bend test, see 13.4.2.

**Table 9 Bendability (1)**

Grade symbol	Bending angle	Internal spacing of bend (number of sheets of nominal thickness)					
		Nominal thickness 1.6 mm or over to and excl. 3.0 mm			Nominal thickness 3.0 mm or over		
		Coating mass symbol			Coating mass symbol		
		Z06 to Z27	Z35, Z37	Z45, Z60	Z06 to Z27	Z35, Z37	Z45, Z60
SGHC	180 °	1	2	2	2	2	2
SGH340		1	1	2	2	2	3
SGH400		2	2	2	3	3	3
SGH440		3	3	3	3	3	3
SGH490							
SGH540							

**Table 10 Bendability (2)**

Grade symbol	Bending angle	Internal spacing of bend (number of sheets of nominal thickness)								
		Nominal thickness Under 1.6 mm			Nominal thickness 1.6 mm or over to and excl. 3.0 mm			Nominal thickness 3.0 mm or over		
		Coating mass symbol			Coating mass symbol			Coating mass symbol		
		Z06 to Z27	Z35, Z37	Z45, Z60	Z06 to Z27	Z35, Z37	Z45, Z60	Z06 to Z27	Z35, Z37	Z45, Z60
SGCC	180 °	1	1	2	1	2	2	2	2	2
SGCD1		1	—	—	1	—	—	—	—	—
SGCD2		0 (Flat on it-self)	—	—	0 (Flat on it-self)	—	—	—	—	—
SGCD3										
SGCD4										
SGC340		1	1	2	1	1	2	2	2	3
SGC400		2	2	2	2	2	2	3	3	3
SGC440		3	3	3	3	3	3	3	3	3
SGC490										

### 8.3 Tensile test characteristics

For the tensile test characteristics of the flat sheet and coil, when the test is performed in accordance with 13.4.3, the result shall be as given in table 11 or table 12.

The yield point shall be the upper yield point.

Table 11 Tensile test characteristics (1)

Grade symbol	Yield point or proof stress  N/mm <sup>2</sup>	Tensile strength  N/mm <sup>2</sup>	Elongation %					Test piece and direction of tensile test
			Nominal thickness mm					
			1.6 or over to and excl. 2.0	2.0 or over to and excl. 2.5	2.5 or over to and excl. 3.2	3.2 or over to and excl. 4.0	4.0 or over up to and incl. 6.0	
SGHC	(205 min.)	(270 min.)	—	—	—	—	—	No. 5 in rolling direction
SGH340	245 min.	340 min.	20 min.	20 min.	20 min.	20 min.	20 min.	No. 5 in rolling direction or perpendicular to the rolling direction
SGH400	295 min.	400 min.	18 min.	18 min.	18 min.	18 min.	18 min.	
SGH440	335 min.	440 min.						
SGH490	365 min.	490 min.	16 min.	16 min.	16 min.	16 min.	16 min.	
SGH540	400 min.	540 min.						

NOTE 1 1 N/mm<sup>2</sup> = 1 MPa  
NOTE 2 Values in parentheses are shown for reference.

Table 12 Tensile test characteristics (2)

Grade symbol	Yield point or proof stress  N/mm <sup>2</sup>	Tensile strength  N/mm <sup>2</sup>	Elongation %						Test piece and direction of tensile test
			Nominal thickness mm						
			0.25 or over to and excl. 0.40	0.40 or over to and excl. 0.60	0.60 or over to and excl. 1.0	1.0 or over to and excl. 1.6	1.6 or over to and excl. 2.5	2.5 or over	
SGCC	(205 min.)	(270 min.)	—	—	—	—	—	—	No. 5 in rolling direction
SGCH <sup>a)</sup>	—	—	—	—	—	—	—	—	
SGCD1	—	270 min.	—	34 min.	36 min.	37 min.	38 min.	—	
SGCD2	—	270 min.	—	36 min.	38 min.	39 min.	40 min.	—	
SGCD3	—	270 min.	—	38 min.	40 min.	41 min.	42 min.	—	
SGCD4 <sup>b)</sup>	—	270 min.	—	40 min.	42 min.	43 min.	44 min.	—	
SGC340	245 min.	340 min.	20 min.	20 min.	20 min.	20 min.	20 min.	20 min.	
SGC400	295 min.	400 min.	18 min.	18 min.	18 min.	18 min.	18 min.	18 min.	
SGC440	335 min.	440 min.	18 min.	18 min.	18 min.	18 min.	18 min.	18 min.	
SGC490	365 min.	490 min.	16 min.	16 min.	16 min.	16 min.	16 min.	16 min.	
SGC570	560 min.	570 min.	—	—	—	—	—	—	

NOTE 1 Values in parentheses are shown for reference.  
NOTE 2 1 N/mm<sup>2</sup> = 1 MPa  
Notes <sup>a)</sup> SGCH is a material not subjected to annealing, usually having a Rockwell hardness of 85 HRB or more or a Vickers hardness of 170 HV or more (the test load may be chosen appropriately).  
<sup>b)</sup> For the sheet and coil of SGCD4, the stretcher strain shall not be generated when working is performed during six months after manufacturing.

## 9 Dimensions and tolerances

### 9.1 Expression of dimensions

The dimensions of sheet and coil shall be expressed as follows.

- a) For the thickness of sheet and coil, the thickness of the base metal prior to coating shall be regarded as the nominal thickness and the thickness of the base metal after coating shall be regarded as the product thickness.
- b) The dimensions of sheet shall be expressed in nominal thickness, width and length in millimetres.
- c) The dimensions of coil shall be expressed in nominal thickness and width in millimetres. When the mass of coil is the theoretical mass, the length shall be expressed in metres.

### 9.2 Standard dimensions

The standard dimensions of sheet and coil shall be as follows. The standard nominal thickness of corrugated sheet, standard width and length prior to corrugation shall be in accordance with Annex JB. Further, the standard length and width of corrugated sheet after corrugation shall be in accordance with JIS G 3316.

- a) Standard nominal thickness The standard nominal thickness of sheet and coil shall be as given in table 13.

**Table 13 Standard nominal thickness**

Unit : mm

Standard nominal thickness											
(0.27)	(0.30)	(0.35)	0.40	0.50	0.60	0.70	0.80	0.90	1.0	1.2	1.4
1.6	1.8	2.0	2.3	2.8	3.2	3.6	4.0	4.5	5.0	5.6	6.0
Values in parentheses shall apply to the coating mass or more coatings corresponding to the non-alloyed Z18. Upon the agreement between the purchaser and the supplier, the thicknesses of 0.65 mm and 0.75 mm may serve as the standard nominal thicknesses.											

- b) Standard width and standard length of sheet The standard width of sheet and coil, and the standard length of sheet shall be as given in table 14.

**Table 14 Standard width and standard length of sheet**

Unit : mm

Standard width	Standard length of sheet						
762	1 829	2 134	2 438	2 743	3 048	3 353	3 658
914	1 829	2 134	2 438	2 743	3 048	3 353	3 658
1 000	2 000						
1 219	2 438	3 048	3 658				
1 524	3 048						
1 829	3 658						
As for the coil, 610 mm shall also be regarded as the standard width in addition to those given in this table.							

### 9.3 Dimensional tolerances

#### 9.3.1 Tolerances on product thickness

Tolerances on the product thickness of sheet and coil shall be as follows.

- a) Tolerances on the product thickness shall apply to the value of the nominal thickness rounded to three decimal places plus the equivalent thickness of the coating given in table 18 rounded to two decimal places in accordance with rule A of JIS Z 8401.
- b) Tolerances on the product thickness shall be as given in table 15, table 16 or table 17.
- c) The product thickness shall be measured at any point 25 mm or over from the side edge (the end in the width direction) .
- d) Shall not apply to the irregular portions such as the welds in a coil.

**Table 15 Tolerances on product thickness (applicable to SGHC)**

Unit : mm

Nominal width	Width			
	Under 1 200	1 200 or over to and excl. 1 500	1 500 or over to and excl. 1 800	1 800 or over up to and incl. 2 300
1.60 or over to and excl. 2.00	± 0.17	± 0.18	± 0.19	± 0.22 <sup>a)</sup>
2.00 or over to and excl. 2.50	± 0.18	± 0.20	± 0.22	± 0.26 <sup>a)</sup>
2.50 or over to and excl. 3.15	± 0.20	± 0.22	± 0.25	± 0.27
3.15 or over to and excl. 4.00	± 0.22	± 0.24	± 0.27	± 0.28
4.00 or over to and excl. 5.00	± 0.25	± 0.27	—	—
5.00 or over to and excl. 6.00	± 0.27	± 0.29	—	—
6.00	± 0.30	± 0.31	—	—

Note <sup>a)</sup> Applicable to those of width under 2 000 mm.

**Table 16 Tolerances on product thickness (applicable to SGH340, SGH400, SGH440, SGH490 and SGH540)**

Unit : mm

Nominal width	Width	
	Under 1 600	1 600 or over to and excl. 2 000
1.60 or over to and excl. 2.00	± 0.20	± 0.24
2.00 or over to and excl. 2.50	± 0.21	± 0.26
2.50 or over to and excl. 3.15	± 0.23	± 0.30
3.15 or over to and excl. 4.00	± 0.25	± 0.35
4.00 or over to and excl. 5.00	± 0.46	—
5.00 or over up to and incl. 6.00	± 0.51	—



**Table 17 Tolerances on product thickness (applicable to SGCC, SGCH, SGCD1 to SGCD4 and SGC340 to SGC570)**

Unit : mm

Nominal thickness	Width				
	Under 630	630 or over to and excl. 1 000	1 000 or over to and excl. 1 250	1 250 or over to and excl. 1 600	1 600 or over
Under 0.25	± 0.04	± 0.04	± 0.04	—	—
0.25 or over to and excl. 0.40	± 0.05	± 0.05	± 0.05	± 0.06	—
0.40 or over to and excl. 0.60	± 0.06	± 0.06	± 0.06	± 0.07	± 0.08
0.60 or over to and excl. 0.80	± 0.07	± 0.07	± 0.07	± 0.07	± 0.08
0.80 or over to and excl. 1.00	± 0.07	± 0.07	± 0.08	± 0.09	± 0.10
1.00 or over to and excl. 1.25	± 0.08	± 0.08	± 0.09	± 0.10	± 0.12
1.25 or over to and excl. 1.60	± 0.09	± 0.10	± 0.11	± 0.12	± 0.14
1.60 or over to and excl. 2.00	± 0.11	± 0.12	± 0.13	± 0.14	± 0.16
2.00 or over to and excl. 2.50	± 0.13	± 0.14	± 0.15	± 0.16	± 0.18
2.50 or over to and excl. 3.15	± 0.15	± 0.16	± 0.17	± 0.18	± 0.21
3.15 or over	± 0.17	± 0.18	± 0.20	± 0.21	—

**Table 18 Equivalent coating thickness**

Non-alloyed coating

Unit : mm

Coating mass symbol	Z06	Z08	Z10	Z12	Z14	Z18	Z20	Z22	Z25	Z27	Z35	Z37	Z45	Z60
Equivalent coating thickness	0.013	0.017	0.021	0.026	0.029	0.034	0.040	0.043	0.049	0.054	0.064	0.067	0.080	0.102

Alloyed coating

Coating mass symbol	F04	F06	F08	F10	F12	F18
Equivalent coating thickness	0.008	0.013	0.017	0.021	0.026	0.034

### 9.3.2 Tolerances on width

Tolerances on the width of sheet and coil shall be as given in table 19. Width shall be measured at a normal portion in a coil and at any position for sheet. However, tolerances on the width of corrugated sheet after corrugation shall be in accordance with JIS G 3316.

**Table 19 Tolerances on width**

Width	Applicable grade symbol		Unit : mm
	SGHC, SGH340, SGH400, SGH440, SGH490, SGH540		
	Tolerance A <sup>a)</sup>	Tolerance B <sup>a)</sup>	
1 500 or under	+ 25 0	+ 10 0	+ 7 0
Over 1 500			+ 10 0
Note <sup>a)</sup> Generally, tolerance A is applied to the mill edge and tolerance B is applied to the cut edge.			

**9.3.3 Tolerances on length**

Tolerances on the length of sheet shall be as given in table 20. The length shall be measured at any position of sheet.

**Table 20 Tolerances on length**

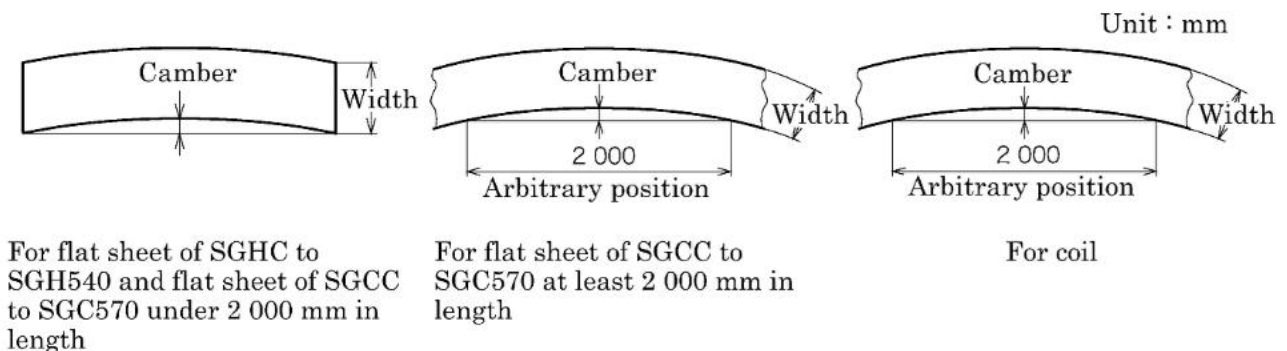
Unit : mm	
Tolerances on length	
+ 15	
0	

**10 Shapes**

**10.1 Camber**

The application of camber for the flat sheet and coil shall be as shown in figure 1. The maximum camber of the flat sheet and coil shall be as given in table 21 or table 22. However, the camber shall not apply to the irregular portions in a coil. The measurement of camber may be omitted <sup>3)</sup>, however, when particularly specified by the purchaser, the measurement shall be performed.

Note <sup>3)</sup> The measurement of camber may be omitted by the judgment of the manufacturer on the precondition that camber shall satisfy the specified value.



**Figure 1 Application of camber**

**Table 21** Maximum value of camber (applicable for SGHC, SGH340, SGH400, SGH440, SGH490 and SGH540)

Unit : mm

Width	Flat sheet			Coil
	Length			
	Under 2 500	2 500 or over to and excl. 4 000	4 000 or over	
Under 630	5	8	12	5 in any 2 000 length
630 or over to and excl. 1 000	4	6	10	
1 000 or over	3	5	8	

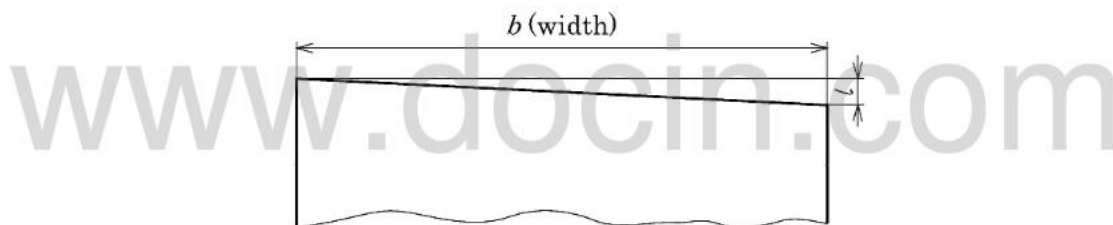
**Table 22** Maximum value of camber (applicable for SGCC SGCH, SGCD1 to SGCD4 and SGC340 to SGC570)

Unit : mm

Width	Flat sheet		Coil
	Length		
	Under 2 000	2 000 or over	
Under 630	4	4 in any 2 000 length	
630 or over	2	2 in any 2 000 length	

### 10.2 Out-of-square

The out-of-square for the flat sheet shall be expressed as  $\frac{l}{b} \times 100$  (%) in figure 2 and shall not exceed 1 %.



**Figure 2** Out-of-square for flat sheet

### 10.3 Flatness

The flatness for the flat sheet shall be as given in table 23 or table 24. The flatness shall be measured with a sheet lying under its own mass on a flat surface, and the value of flatness shall be obtained by subtracting the product thickness from the maximum deviation from the flat horizontal surface. The value thus obtained shall apply to the upper surface of the sheet.

**Table 23 Flatness for flat sheet (applicable for SGHC, SGH340, SGH400, SGH440, SGH490 and SGH540)**

Unit : mm

Nominal thickness	Width			
	Under 1 250	1 250 or over to and excl. 1 600	1 600 or over to and excl. 2 000	2 000 or over up to and incl. 2 300
1.60 or over to and excl. 3.15	16 max.	18 max.	20 max.	—
3.15 or over to and excl. 4.00	16 max.			—
4.00 or over to and excl. 6.00	14 max.			24 max.
6.00	13 max.			21 max.

**Table 24 Flatness for flat sheet (applicable for SGCC, SGCH, SGCD1 to SGCD4 and SGC340 to SGC570)**

Unit : mm

Width	Type		
	Bow	Edge wave <sup>a)</sup>	Centre buckle <sup>b)</sup>
Under 1 000	12 max.	8 max.	6 max.
1 000 or over to and excl. 1 250	15 max.	9 max.	8 max.
1 250 or over to and excl. 1 600	15 max.	11 max.	8 max.
1 600 or over	20 max.	13 max.	9 max.
Notes <sup>a)</sup> It refers to the type of flatness in which a corrugation appears at the edge (the end in the width direction) of flat sheet.			
<sup>b)</sup> It refers to the type of flatness in which a corrugation appears at the central part of flat sheet.			

## 11 Mass and tolerances thereof

### 11.1 Mass of sheet

The mass of sheet shall usually be given in the theoretical mass in kilogrammes.

### 11.2 Mass of coil

The mass of coil shall be given in either the actual or the theoretical mass in kilogrammes.

### 11.3 Calculation method of mass

The calculation method of the mass of sheet and coil shall be as given in table 25.