

SuperGalum[®]



Excellent Durability

SuperGalum[®] has three to six times better corrosion resistance compared to zinc coated (galvanized) steel sheet of the same coating thickness. KG Steel issues a 25.5 year warranty for SuperGalum in case of residential applications.



Heat Resistance

The capacity ratio of the aluminum in coated layer of SuperGalum[®] is over 80%, enabling the products to withstand a prolonged temperature of 315°C without discoloration or oxidization.



Heat Reflectivity

SuperGalum[®] provides high energy efficiency with its superior heat reflectivity, resulting in low heat consumption.



Smooth Surface

Having a consistent and brilliant silver spangle, SuperGalum[®] is highly appropriate for decorative uses.



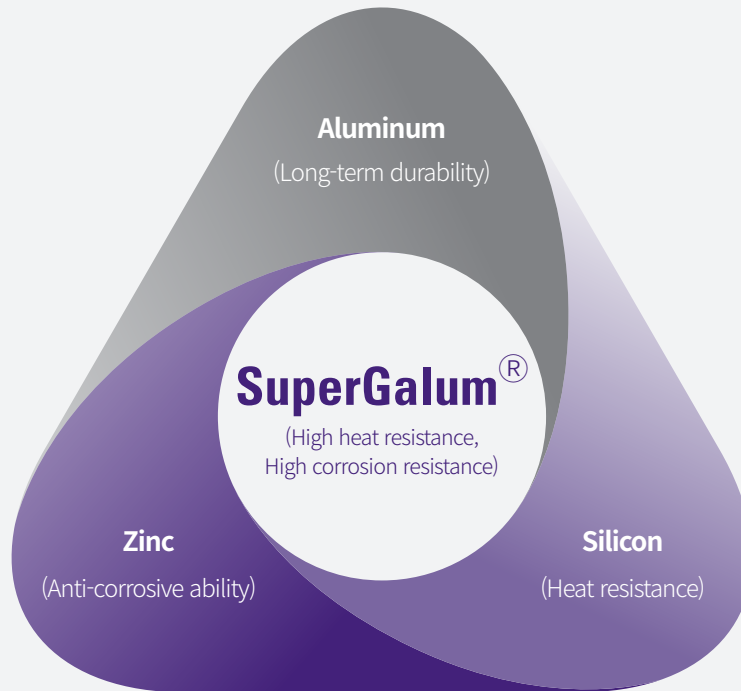
Economical Efficiency

With available widths of five feet (Maximum 1600mm), SuperGalum[®] reduces the loss and is suitable for manufacturing ducts and other construction materials.



Excellent Paintability and Workability

SuperGalum[®] has better adhesiveness of paints to its coated layer compared to galvanized steel sheet. The workability of SuperGalum is similar to that of galvanized steel sheet. Its ability to suppress fine cracks on the coating layer enhances the durability of the processed area.



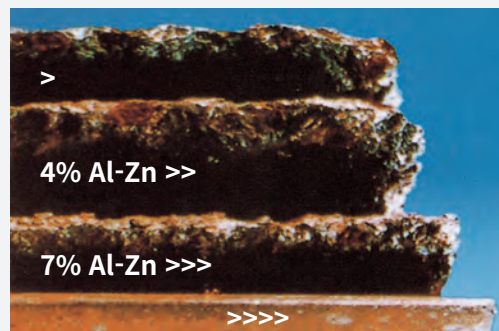
SuperGalum®

Supergalum® is a brand name for 55% aluminum-zinc coated steel sheet produced by KG Steel. Combining the properties of aluminum and zinc, SuperGalum® provides excellent resistance, and corrosion resistance, durability, and formability. SuperGalum® has three to six times superior corrosion resistance compared to zinc coated (galvanized) steel sheet of the same coating thickness. KG Steel issues 25.5 year warranties for SuperGalum® in case of residential applications. Since 1998, KG Steel has been producing SuperGalum® under a licensing agreement with BIEC International Inc.

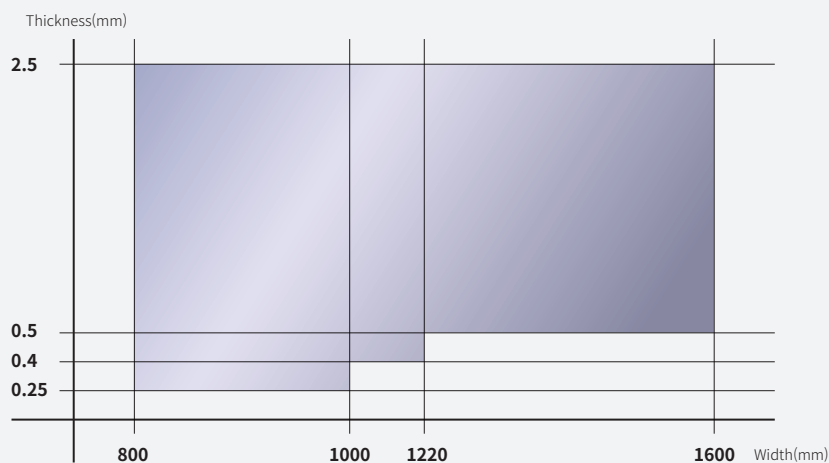
Composition of Coated Layers

Composition	Weight Ratio(%)	Capacity Ratio(%)
Aluminum	55.0	80
Zinc	44	19
Silicon	1.6	1

Results of a 17 year exposure test



Size Availability



※ There may be restrictions for each type of steel, so please consult with the sales and quality department in advance when ordering new products.

Classification by Coating Weight

KS D 3770 JIS G 3321	ASTM A792	EN 10346	Single-sided Coating thickness (mm)	Double-sided(g/m ²)	
				Triple-Spot Test	Single-Spot Test
(AZ070)	-	-	9	(70)	(60)
AZ090	-	-	12	90	76
-	AZ030, AZM100	100	13	100	85
AZ120	AZ040, AZM120	-	16	120	102
AZ150	AZ050, AZM150	150	20	150	130
-	AZ055, AZM165	-	22	165	150
AZ170	-	-	22	170	145
-	AZ070, AZM180	-	24	180	155
(AZ185)	-	185	25	185	160
(AZ200)	-	-	26	(200)	(170)

* () May be applied according to the agreement between the order and the manufacturer.

Classification by Post-Treatment

Type	Main Applications
No Chromate	General painting
Chromate	General
Organic	Drawing
Non-Cr	Home appliances
Antimicrobial Coating	Antimicrobial

Oiling

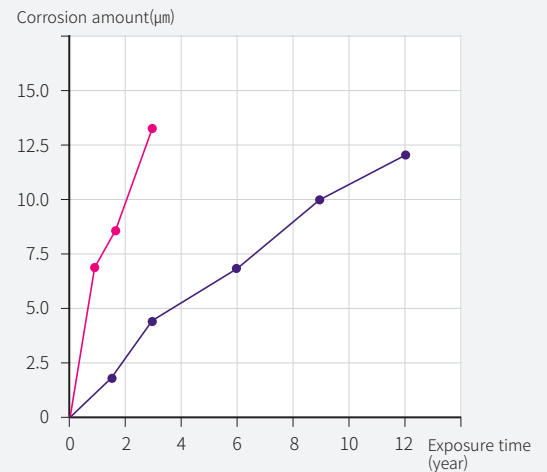
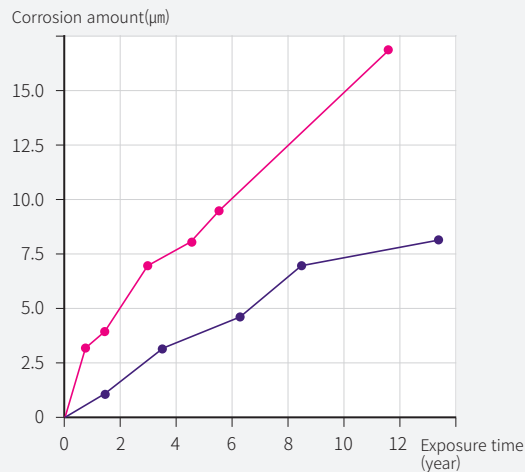
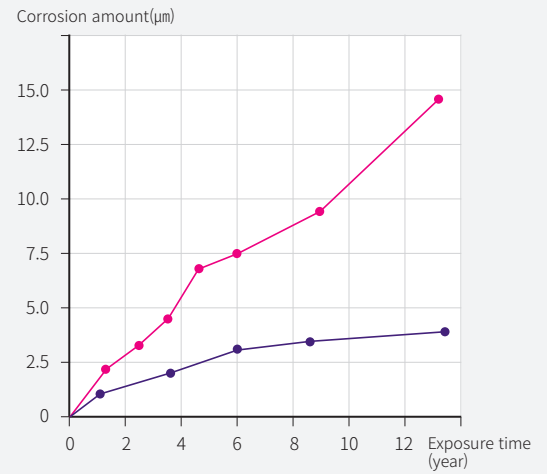
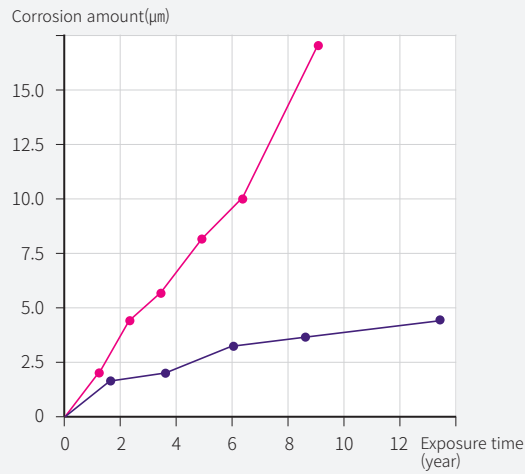
Oiling Classification
No-oiled
Oiled

Durability

SuperGalum® has three to six times superior corrosion resistance compared to zinc coated (galvanized) steel sheet of the same coating thickness. Sheared or cut spot of SuperGalum® has better corrosion and stretch resistance compared to aluminum coated steel sheet. KG Steel issues 25.5 year warranties for SuperGalum® in case of residential applications.

Corrosion Test(Outdoor Exposure Test)

While galvanized steel shows a continuous rate of corrosion, corrosion of SuperGalum® tends to slow down over time. This outstanding corrosion resistance is attributed to the anti-corrosion properties of its coated layer.



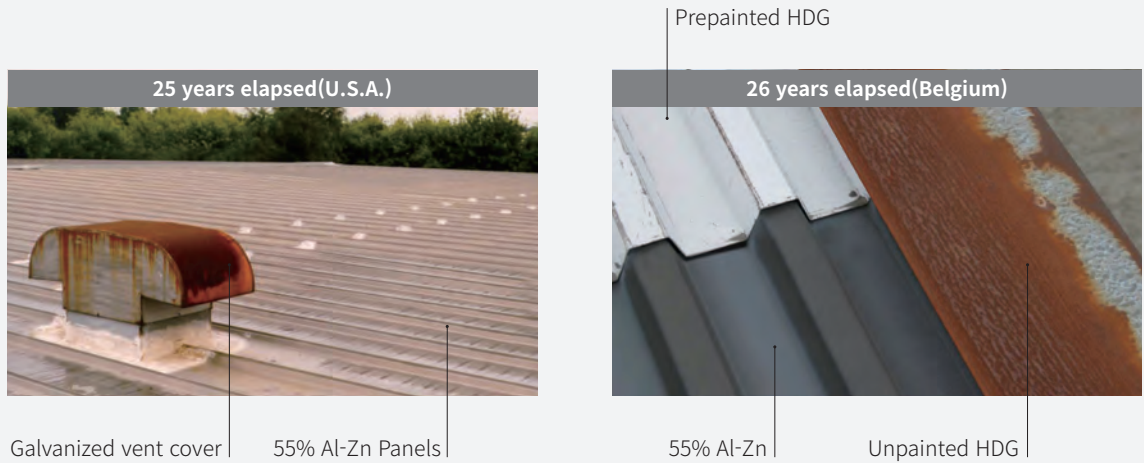
The Outdoor exposure test results under various corrosive environments of each material

● GI ● SuperGalum®

Exposure test comparing levels of corrosion (Test period: 13 Years)

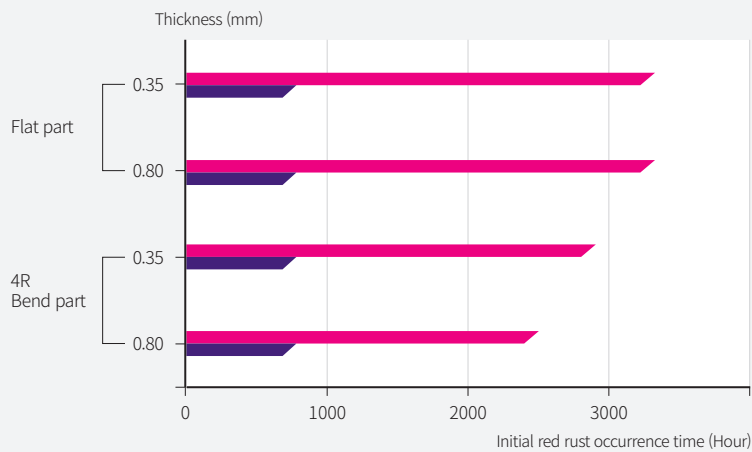


Building long term use result



※ InterZac '04, An Overview of the Long-Term Performance of 55% Al-Zn Coated Steel, BIEC

Salt spray test



The Salt spray test on SuperGalum® Steel Sheet

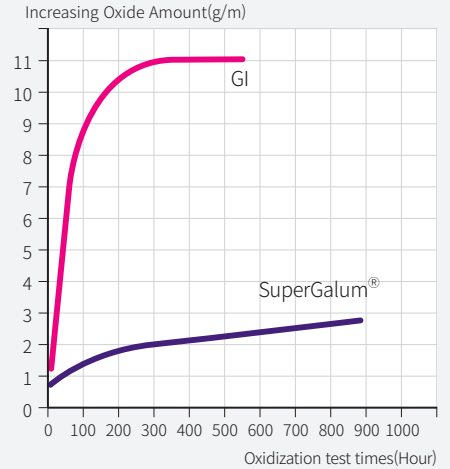
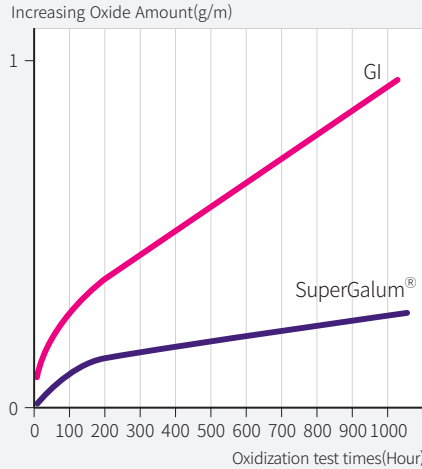
The initial occurrence of red rust is considerably slower than that of galvanized steel sheet.

■ SuperGalum® 20µm
■ GI 20µm

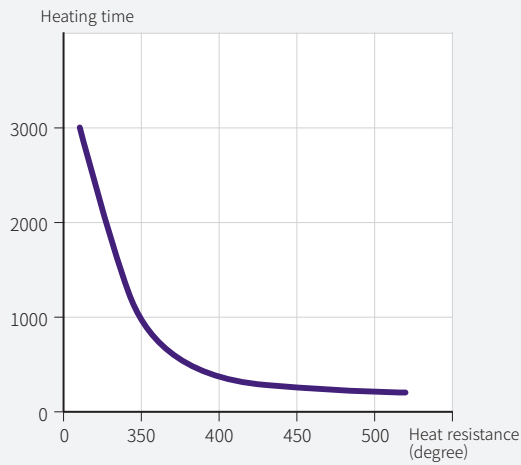
Heat Resistance

The capacity ratio of the aluminum in coated layer of SuperGalum® is over 80%, enabling the products to withstand a prolonged temperature of 315°C without discoloration or oxidation.

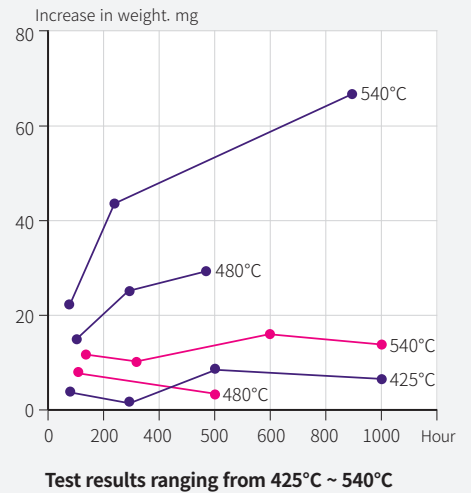
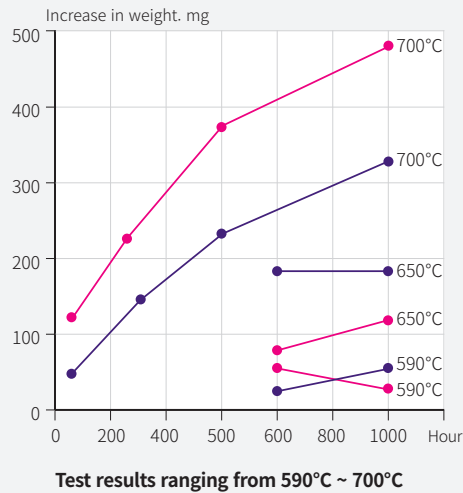
Rate of oxidization from continuous heat



Heat Resistance of SuperGalum® Steel Sheet



Comparison of corrosion resistance at high temperatures



- 480°C ~ 540°C, SuperGalum® < Al Coated Steel
- 590°C ~ 650°C, SuperGalum® = Al Coated Steel
- 700°C or higher, SuperGalum® > Al Coated Steel

- SuperGalum®
- Al-coated

Heat Reflectivity

SuperGalum® steel sheet offers superior heat reflectivity, which produces increased energy efficiency, making it an excellent material for the interior of electronic home appliances. When used as a roofing material, SuperGalum® inhibits the rise of temperature in buildings, thereby lowering the cost of air conditioning. Food storage buildings covered with SuperGalum® also enjoy the additional benefit of stored grains protected from quality changes.

Comparison of heat reflectivity by product

Product	Heat Reflectivity Ratio(%)
SuperGalum® Steel Sheet	70 ~ 75
Galvanized Steel Sheet	30 ~ 40
Prepainted Steel Sheet(Silver)	50 ~ 60
Prepainted Steel Sheet(Gray)	45 ~ 50
Prepainted Steel Sheet(Blue)	10 ~ 15
Prepainted Steel Sheet(Brown)	10 ~ 15
Tile, Slate	10 ~ 20

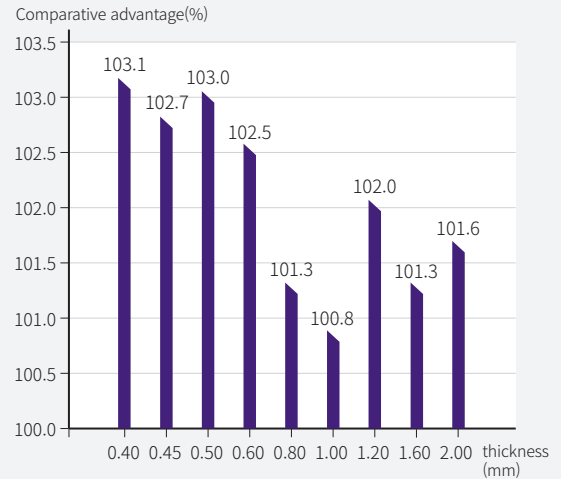
Comparison of heat transfer by product

Product	Heat Transfer(W/m ²)
ALCOT® Steel(Type2, 300g/m ²)	40
SuperGalum®(150g/m ²)	65
Galvanized Steel(275g/m ²)	120
Asbestos Ciment	150
Clay Tile	150

Economical Efficiency

The density of the coated layer of SuperGalum® steel shows 3.75g/cm³, which is lower than that of galvanized steel (7.14g/cm³), thereby increasing the surface area per ton and enhancing the economical efficiency.

Thickness (mm)	Area per ton (m ² /ton)	
	SuperGalum®	GI
0.40	336	321
0.45	297	285
0.50	266	257
0.60	220	214
0.80	AZ 150 (150g/m ²) 164	Z 275 (275g/m ²) 160
1.00	130	128
1.20	108	106
1.60	81	80
2.00	64	64



Paintability

SuperGalum® offers better paint adhesion to its coated layer compared to galvanized steel sheets. For general purposes, SuperGalum® does not require any pre-treatment before painting.

Weldability

The weldability of SuperGalum® is similar to that of galvanized steel sheets. However, special attention is required before welding, including welding current, time, electrode pressure, and other factors.

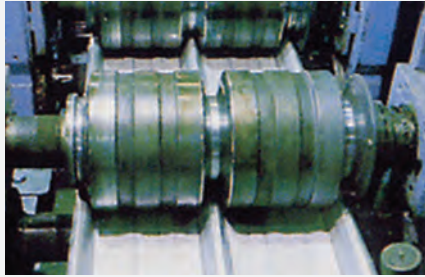
Spot Welding Conditions

Thickness(mm)	Electric Current(A)	Pressure(Kg)	Welding Time(Cycle=1/60sec.)	Electrode Diameter(mm)
0.56	11,000	160	10	4.75
0.71	11,300	180	12	4.75
0.91	12,500	230	14	6.35
1.02	12,800	230	14	6.35
1.35	13,000	250	14	6.35
1.65	13,400	300	18	6.35

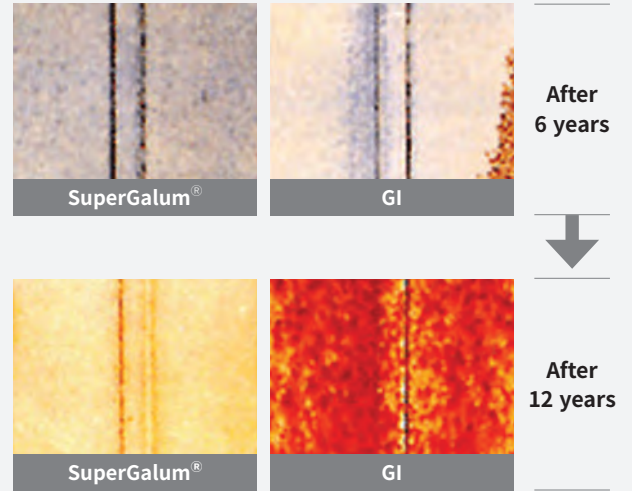
Workability

The workability of SuperGalum® is similar to that of galvanized steel sheet. Its ability to suppress fine cracks on the coating layer enhances the durability of the processed area.

• Superior roll forming property



• Excellent durability for treatment area



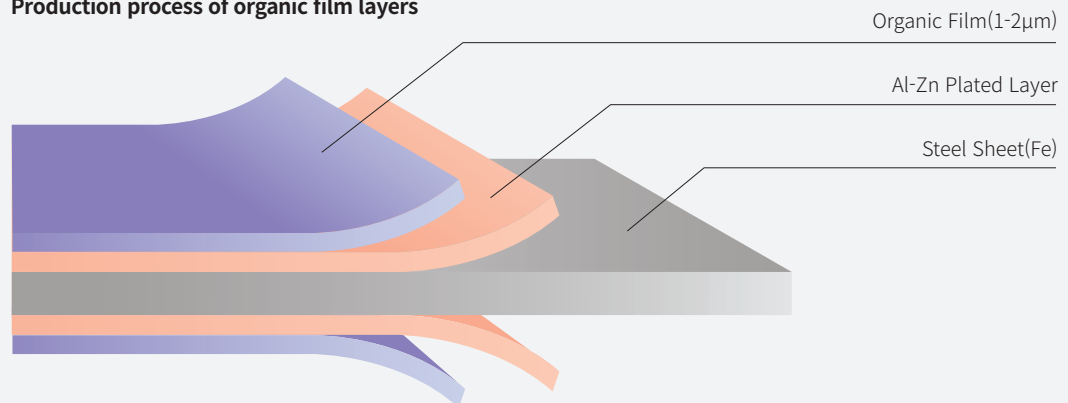
Test results from exposure in coastal area

SuperGalum® Organic Coating Process

Organic film treatment of the SuperGalum® steel sheet is carried out in an in-line coater, applying acryl resin organic film containing 1~2 μ m of chromate. In comparison with the temporary corrosion resistant property of the conventional chromate passivation, organic treatment offers superior quality as follows:



Production process of organic film layers



Thickness Tolerances

● JIS

(Unit : mm)

Nominal Thickness	Width				
	Up to 630	630 and over, up to 1000	1000 and over, up to 1250	1250 and over, up to 1600	1250 and over, up to 1600
Up to 0.25	± 0.04	± 0.04	± 0.04	-	-
0.25 and over, up to 0.40	± 0.05	± 0.05	± 0.05	± 0.06	-
0.40 and over, up to 0.60	± 0.06	± 0.06	± 0.06	± 0.07	± 0.08
0.60 and over, up to 0.80	± 0.07	± 0.07	± 0.07	± 0.07	± 0.08
0.80 and over, up to 1.00	± 0.07	± 0.07	± 0.08	± 0.09	± 0.10
1.00 and over, up to 1.25	± 0.08	± 0.08	± 0.09	± 0.10	± 0.12
1.25 and over, up to 1.60	± 0.09	± 0.10	± 0.11	± 0.12	± 0.14
1.60 and over, up to 2.00	± 0.11	± 0.12	± 0.13	± 0.14	± 0.16
2.00 and over, up to 2.50	± 0.13	± 0.14	± 0.15	± 0.16	± 0.18
2.50 and over, up to 3.15	± 0.15	± 0.16	± 0.17	± 0.18	± 0.21
3.15 and over	± 0.17	± 0.18	± 0.20	± 0.21	-

● ASTM

Specified Width, mm	SI Units							
	0.4 and thinner	Specified Thickness, mm ^A						
		Over 0.4 Through 1.0, inclusive	Over 0.4 Through 1.5, inclusive	Over 1.5 Through 2.0, inclusive ^B	Over 2.0 Through 2.5, inclusive	Over 2.5 Through 5.0, inclusive	Over 5.0 Through 6.0, inclusive	Over 6.0 Through 6.3, inclusive
Thickness Tolerances, Over, mm, No Tolerance Under ^C								
To 1500, inclusive	0.08	0.10	0.13	0.15	0.30	0.34	0.42	0.50
Over 1500	0.08	0.10	0.13	0.15	0.34	0.34	0.46	0.52

A The Specified thickness range captions apply independently of whether the ordered thickness is stated as a nominal or minimum. B

B If hot rolled substrate is used, it is permissible for the seller to provide total thickness tolerance 0.009 in. [0.23 mm], provided that the purchaser is notified and agrees.

C The tolerances provided in the table are based on minimum thickness (tolerance over, no tolerance under). For nominal thickness, the tolerance is divided equally over and under (tolerance over, tolerance under).

● EN

Tolerances for steel grades with specified minimum yield strength R_e or specified minimum proof strength $R_{p0.2} < 260$ MPa

Nominal Thickness t	Nomal tolerances ^a for a nominal width w			Special tolerances (S) ^a for a nominal width w		
	≤ 1200 ^b	$1200 < w \leq 1500$	> 1500	≤ 1200 ^b	$1200 < w \leq 1500$	> 1500
$0.20 < t \leq 0.40$	± 0.04	± 0.05	± 0.06	± 0.030	± 0.035	± 0.040
$0.40 < t \leq 0.60$	± 0.04	± 0.05	± 0.06	± 0.035	± 0.040	± 0.045
$0.60 < t \leq 0.80$	± 0.05	± 0.06	± 0.07	± 0.040	± 0.045	± 0.050
$0.80 < t \leq 1.00$	± 0.06	± 0.07	± 0.08	± 0.045	± 0.050	± 0.060
$1.00 < t \leq 1.20$	± 0.07	± 0.08	± 0.09	± 0.050	± 0.060	± 0.070
$1.20 < t \leq 1.60$	± 0.10	± 0.11	± 0.12	± 0.060	± 0.070	± 0.080
$1.60 < t \leq 2.00$	± 0.12	± 0.13	± 0.14	± 0.070	± 0.080	± 0.090
$2.00 < t \leq 2.50$	± 0.14	± 0.15	± 0.16	± 0.090	± 0.100	± 0.110
$2.50 < t \leq 3.00$	± 0.17	± 0.17	± 0.18	± 0.110	± 0.120	± 0.130
$3.00 < t \leq 5.00$	± 0.20	± 0.20	± 0.21	± 0.15	± 0.16	± 0.17
$5.00 < t \leq 6.50$	± 0.22	± 0.22	± 0.23	± 0.17	± 0.18	± 0.19

a The thickness tolerance in the region of coil welds may be increased by a maximum of 50% over a length of 10 m. This increase is applicable to all thicknesses and, unless otherwise agreed at the time of enquiry and order, to normal and special (negative and positive) tolerances.

b Wide strip : width ≥ 600 mm; slit wide strip: rolling width ≥ 600 mm, slit to width less than 600 mm.

Tolerances for steel grades with specified minimum proof strength $R_{p0.2} < 360$ MPa and for grades DX51D and S550GD

Nominal Thickness t	Nomal tolerances ^a for a nominal width w			Special tolerances (S) ^a for a nominal width w		
	≤ 1200 ^b	$1200 < w \leq 1500$	> 1500	≤ 1200 ^b	$1200 < w \leq 1500$	> 1500
$0.20 < t \leq 0.40$	± 0.05	± 0.06	± 0.07	± 0.035	± 0.040	± 0.045
$0.40 < t \leq 0.60$	± 0.05	± 0.06	± 0.07	± 0.040	± 0.045	± 0.050
$0.60 < t \leq 0.80$	± 0.06	± 0.07	± 0.08	± 0.045	± 0.050	± 0.060
$0.80 < t \leq 1.00$	± 0.07	± 0.08	± 0.09	± 0.050	± 0.060	± 0.070
$1.00 < t \leq 1.20$	± 0.08	± 0.09	± 0.11	± 0.060	± 0.070	± 0.080
$1.20 < t \leq 1.60$	± 0.11	± 0.13	± 0.14	± 0.070	± 0.080	± 0.090
$1.60 < t \leq 2.00$	± 0.14	± 0.15	± 0.16	± 0.080	± 0.100	± 0.110
$2.00 < t \leq 2.50$	± 0.16	± 0.17	± 0.18	± 0.110	± 0.120	± 0.130
$2.50 < t \leq 3.00$	± 0.19	± 0.20	± 0.20	± 0.130	± 0.140	± 0.150
$3.00 < t \leq 5.00$	± 0.22	± 0.24	± 0.25	± 0.17	± 0.18	± 0.19
$5.00 < t \leq 6.50$	± 0.24	± 0.25	± 0.26	± 0.19	± 0.20	± 0.21

a The thickness tolerance in the region of coil welds may be increased by a maximum of 50% over a length of 10 m. This increase is applicable to all thicknesses and, unless otherwise agreed at the time of enquiry and order, to normal and special (negative and positive) tolerances.

b Wide strip : width ≥ 600 mm; slit wide strip: rolling width ≥ 600 mm, slit to width less than 600 mm.

Tolerances for steel grades with specified minimum proof strength $360 \text{ MPa} \leq R_{p0.2} \leq 420 \text{ MPa}$

Nominal Thickness t	Nomal tolerances ^a for a nominal width w			Special tolerances (S) ^a for a nominal width w		
	≤ 1200 ^b	$1200 < w \leq 1500$	> 1500	≤ 1200 ^b	$1200 < w \leq 1500$	> 1500
$0.35 < t \leq 0.40$	± 0.05	± 0.06	± 0.07	± 0.040	± 0.045	± 0.050
$0.40 < t \leq 0.60$	± 0.06	± 0.07	± 0.08	± 0.045	± 0.050	± 0.060
$0.60 < t \leq 0.80$	± 0.07	± 0.08	± 0.09	± 0.050	± 0.060	± 0.070
$0.80 < t \leq 1.00$	± 0.08	± 0.09	± 0.11	± 0.060	± 0.070	± 0.080
$1.00 < t \leq 1.20$	± 0.10	± 0.11	± 0.12	± 0.070	± 0.080	± 0.090
$1.20 < t \leq 1.60$	± 0.13	± 0.14	± 0.16	± 0.080	± 0.090	± 0.110
$1.60 < t \leq 2.00$	± 0.16	± 0.17	± 0.19	± 0.090	± 0.110	± 0.120
$2.00 < t \leq 2.50$	± 0.18	± 0.20	± 0.21	± 0.120	± 0.130	± 0.140
$2.50 < t \leq 3.00$	± 0.22	± 0.22	± 0.23	± 0.140	± 0.150	± 0.160
$3.00 < t \leq 5.00$	± 0.22	± 0.24	± 0.25	± 0.17	± 0.18	± 0.19
$5.00 < t \leq 6.50$	± 0.24	± 0.25	± 0.26	± 0.19	± 0.20	± 0.21

a The thickness tolerance in the region of coil welds may be increased by a maximum of 50% over a length of 10 m. This increase is applicable to all thicknesses and, unless otherwise agreed at the time of enquiry and order, to normal and special (negative and positive) tolerances.

b Wide strip : width ≥ 600 mm; slit wide strip: rolling width ≥ 600 mm, slit to width less than 600 mm.

Tolerances for steel grades with specified minimum proof strength

420 MPa < R_{p0.2} < 900 MPa

Nominal Thickness <i>t</i>	Nomal tolerances ^a for a nominal width <i>w</i>			Special tolerances (S) ^a for a nominal width <i>w</i>		
	≤ 1200 ^b	1200 < <i>w</i> ≤ 1500	> 1500	≤ 1200 ^b	1200 < <i>w</i> ≤ 1500	> 1500
0.35 < <i>t</i> ≤ 0.40	± 0.06	± 0.07	± 0.08	± 0.045	± 0.050	± 0.060
0.40 < <i>t</i> ≤ 0.60	± 0.06	± 0.08	± 0.09	± 0.050	± 0.060	± 0.070
0.60 < <i>t</i> ≤ 0.80	± 0.07	± 0.09	± 0.11	± 0.060	± 0.070	± 0.080
0.80 < <i>t</i> ≤ 1.00	± 0.09	± 0.11	± 0.12	± 0.070	± 0.080	± 0.090
1.00 < <i>t</i> ≤ 1.20	± 0.11	± 0.13	± 0.14	± 0.080	± 0.090	± 0.110
1.20 < <i>t</i> ≤ 1.60	± 0.15	± 0.16	± 0.18	± 0.090	± 0.110	± 0.120
1.60 < <i>t</i> ≤ 2.00	± 0.18	± 0.19	± 0.21	± 0.110	± 0.120	± 0.140
2.00 < <i>t</i> ≤ 2.50	± 0.21	± 0.22	± 0.24	± 0.140	± 0.150	± 0.170
2.50 < <i>t</i> ≤ 3.00	± 0.24	± 0.25	± 0.26	± 0.170	± 0.180	± 0.190
3.00 < <i>t</i> ≤ 5.00	± 0.26	± 0.27	± 0.28	± 0.23	± 0.24	± 0.26
5.00 < <i>t</i> ≤ 6.50	± 0.28	± 0.29	± 0.30	± 0.25	± 0.26	± 0.28

a The thickness tolerance in the region of coil welds may be increased by a maximum of 50% over a length of 10 m. This increase is applicable to all thicknesses and, unless otherwise agreed at the time of enquiry and order, to normal and special (negative and positive) tolerances.

b Wide strip : width ≥ 600 mm; slit wide strip: rolling width ≥ 600 mm, slit to width less than 600 mm.

Zinc Coating

GI

Nominal Thickness	Triple	Single	JIS	ASTM	EN
060	060	51	Z06	-	-
080	080	68	Z08	-	-
90	90	75	-	G30 (Z90)	-
100	100	85	Z10	-	Z100
120	120	102	Z12	G40 (Z120)	-
140	140	120	Z14	-	Z140
180	180	153	Z18	G60 (Z180)	-
200	200	170	Z20	-	Z200
220	220	187	Z22	-	-
225	225	195	-	-	Z225
250	250	213	Z25	-	-
275	275	234	Z27	G90 (Z275)	Z275
300	300	255	-	-	-
350	350	298	Z35	G115 (Z350)	Z350
370	370	315	Z37	-	-
450	450	383	Z45	G140 (Z450)	Z450
500	500	425	-	G165 (Z500)	-
600	600	510	Z60	G21 (Z600)	Z600

GA

Coating Weight Code	Triple Spot Test	Singles Spot Test	JIS	ASTM	EN
040	40	34	F04	-	-
060	60	51	F06	-	-
075	75	60	-	A25 (ZF75)	-
080	80	68	F08	-	-
100	100	85	F10	-	ZF100
120	120	102	F12	A40 (ZF120)	ZF120
140	140	120	-	-	-
180	180	153	F18	A60 (ZF180)	-

SuperGalum®

Coating Weight Code	Triple Spot Test	Singles Spot Test	JIS	ASTM	EN
070	70	60	AZ70	-	-
090	90	76	AZ90	-	-
100	100	85	-	AZ30 (AZM100)	AZ100
110	110	95	-	AZ35 (AZM110)	-
120	120	102	AZ120	AZ40 (AZM120)	-
150	150	130	AZ150	AZ50 (AZM150)	AZ150
165	165	150	-	AZ55 (AZM165)	-
170	170	145	AZ170	-	-
180	180	155	-	AZ60 (AZM180)	-
185	185	160	AZ185	-	AZ185
200	200	170	AZ200	-	-
210	210	180	-	AZ70 (AZM210)	-

Type

Designation Type	JIS		ASTM	EN
	GI	SuperGalum®		
Commercial Quality	SGCC	SGLCC	CS	DX51D, DX52D
Lock Forming Quality			FS	DX53D
Drawing Quality	SGCD1	SGLCD	DDS	DX54D
	SGCD2			DX54D
	SGCD3	SGLCDD		EDDS
Structural Quality	SGC340		Grade 230	S220GD
	SGC400	SGLC400	Grade 255	S280GD
	SGC440	SGLC440	Grade 275	S320GD
	SGC490	SGLC 490	Grade 340	S350GD
	SGC570	SGLC570	Grade 550	S550GD

Mechanical Properties & Chemical Composition

● JIS | GI/GA

Classified Symbol	Yield Point (N/mm ²)	Tensile Strength (N/mm ²)	Elongation %						Test Piece and direction of tensile test
			Nominal Thickness mm						
			0.25 and over up to 0.40	0.40 and over up to 0.60	0.60 and over up to 1.0	1.0 and over up to 1.6	1.6 and over up to 2.5	2.5 and over up to 3.2	
SGCC	-	-	-	-	-	-	-	-	No.5 in rolling direction
SGCH	-	-	-	-	-	-	-		
SGCD1	-	Min. 270	Min. 32	Min. 34	Min. 36	Min. 37	Min. 38	-	
SGCD2	-	Min. 270	-	Min. 36	Min. 38	Min. 39	Min. 40	-	
SGCD3	-	Min. 270	-	-	Min. 40	Min. 41	Min. 42	-	
SGCD4	-	Min. 270	-	-	Min. 42	Min. 43	Min. 44	-	
SGC340	Min. 245	Min. 340	Min. 20	Min. 20	Min. 20	Min. 20	Min. 20	Min. 20	
SGC400	Min. 295	Min. 400	Min. 18	Min. 18	Min. 18	Min. 18	Min. 18	Min. 18	
SGC440	Min. 335	Min. 440	Min. 18	Min. 18	Min. 18	Min. 18	Min. 18	Min. 18	
SGC490	Min. 365	Min. 490	Min. 16	Min. 16	Min. 16	Min. 16	Min. 16	Min. 16	
SGC570	Min. 560	Min. 570	-	-	-	-	-	-	

● JIS | SuperGalum®

Classified Symbol	Yield Point (N/mm ²)	Tensile Strength (N/mm ²)	Elongation %					Test Piece and direction of tensile test
			Nominal Thickness mm					
			0.25 and over up to 0.40	0.40 and over up to 0.60	0.60 and over up to 1.0	1.0 and over up to 1.6	1.6 and over up to 2.3	
SGLCC	(205 ↑)	(270 ↑)	(20 ↑)	(21 ↑)	(24 ↑)	(24 ↑)	(25 ↑)	No.5 in rolling direction
SGLCD	-	270 ↑	-	27 ↑	31 ↑	32 ↑	33 ↑	
SGLCDD	-	270 ↑	-	29 ↑	32 ↑	34 ↑	35 ↑	
SGLC400	295 ↑	400 ↑	16	17 ↑	18 ↑	18 ↑	18 ↑	
SGLC440	335 ↑	440 ↑	14	15 ↑	16 ↑	18 ↑	18 ↑	
SGLC490	365 ↑	490 ↑	12	13 ↑	14 ↑	16 ↑	16 ↑	
SGLC570	560 ↑	570 ↑	-	-	-	-	-	

● ASTM | Commercial Drawing Quality

Designation	Chemical Composition %					Mechanical Properties(Nonmandatory)			
	C, Max.	Mn, Max.	P, Max.	S, Max.	Al, Min.	Yield Point Ksi(Mpa)	Elongation Min. %	r Value	n Value
CS Type A	0.10	0.60	0.030	0.035	-	25/55(170/380)	20	-	-
CS Type B	0.02-0.15	0.60	0.030	0.035	-	30/55(205/380)	20	-	-
CS Type C	0.08	0.60	0.100	0.035	-	25/60(170/410)	15	-	-
FS Type A	0.10	0.50	0.020	0.035	-	25/45(170/310)	26	1.0/1.4	0.17/0.21
FS Type B	0.02-0.10	0.50	0.020	0.030	-	25/45(170/310)	26	1.0/1.4	0.17/0.21
DDS Type A	0.06	0.50	0.020	0.025	0.01	20/35(140/240)	32	1.4/1.8	0.19/0.24
DDS Type C	0.02	0.50	0.020	0.025	0.01	25/40(170/280)	32	1.2/1.8	0.17/0.24
EDDS	0.02	0.40	0.020	0.020	0.01	15/25(105/170)	40	1.6/2.1	0.22/0.27

* For CS and, specify Type B to avoid carbon level 0.02%

* When a deoxidized steel is required for the application, CS may be ordered to a minimum of 0.01% total aluminum.

● ASTM | Structural Quality

Designation	Chemical Composition %					Mechanical Properties(Nonmandatory)					
	C, Max.	Mn, Max.	P, Max.	A, Max.	Al, Max.	Tensile Strength. Min.		Yield Point. Min.		Elongation Min. %	
						Ksi	Mpa	Ksi	Mpa		
SS Grade	Grade 33(230)	0.20	1.35	0.10	0.04	-	45	310	33	230	20
	Grade 37(255)	0.20	1.35	0.10	0.04	-	52	360	37	255	18
	Grade 40(275)	0.25	1.35	0.10	0.04	-	55	380	40	275	16
	Grade 50(340) Class1	0.25	1.35	0.20	0.04	-	65	450	50	340	12
	Grade 50(340) Class2	0.25	1.35	0.20	0.04	-	-	-	50	340	12
	Grade 50(340) Class3	0.25	1.35	0.04	0.04	-	70	480	50	340	12
	Grade 50(340) Class4	0.25	1.35	0.20	0.04	-	60	410	50	340	12
	Grade 55(380)	0.25	1.35	0.04	0.04	-	70	480	55	380	11
	Grade 80(550) Class1	0.20	1.35	0.04	0.04	-	82	570	80	550	-
	Grade 80(550) Class2	0.20	1.35	0.05	0.02	-	82	570	80	500	-
HSLAS	Grade40(275)	0.20	1.20	-	0.035	-	50	340	40	275	22
	Grade50(340)	0.20	1.20	-	0.035	-	60	410	50	340	20
	Grade55(380) Class1	0.25	1.35	-	0.035	-	70	480	55	380	16
	Grade55(380) Class2	0.15	1.20	-	0.035	-	65	450	55	380	18
	Grade60(410)	0.20	1.35	-	0.035	-	70	480	60	410	16
	Grade70(480)	0.20	1.65	-	0.035	-	80	550	70	480	12
	Grade80(550)	0.20	1.65	-	0.035	-	90	620	80	550	10
HSLAS-f	Grade40(275)	0.15	1.20	-	0.035	-	50	340	40	275	24
	Grade50(340)	0.15	1.20	-	0.035	-	60	410	50	340	22
	Grade55(380) Class1	0.20	1.35	-	0.035	-	70	480	55	380	18
	Grade55(380) Class2	0.15	1.20	-	0.035	-	65	450	55	380	20
	Grade60(410)	0.15	1.20	-	0.035	-	70	480	60	410	18
	Grade70(480)	0.15	1.65	-	0.035	-	80	550	70	480	14
	Grade80(550)	0.15	1.65	-	0.035	-	90	620	80	550	12

● EN | Commercial Drawing Quality

Designation		Symbols for the type of hot-dip coating	Mechanical Properties		
Steel Grade			Yield Strength, Mpa	Tensile Strength, Mpa	Elongation, % Min.
Steel Name	Steel No.				
DX51D	1.0917	+Z, +ZF, +AZ, +ZM, +AS	-	270 to 500	22
DX52D	1.0918	+Z, +ZF, +AZ, +ZM, +AS	140 to 300	270 to 420	26
DX53D	1.0951	+Z, +ZF, +AZ, +ZM, +AS	140 to 260	270 to 380	30
DX54D	1.0952	+Z	120 to 220	260 to 350	36
DX54D	1.0952	+ZF, +ZM	120 to 220	260 to 350	34
DX56D	1.0963	+Z	120 to 180	260 to 350	39
DX56D	1.0963	+ZF, +ZM	120 to 180	260 to 350	37
DX57D	1.0853	+Z	120 to 170	260 to 350	41
DX57D	1.0853	+ZF, +ZM	120 to 170	260 to 350	39

● EN | Structural Quality

Designation		Symbols for the type of hot-dip coating	Mechanical Properties		
Steel Grade			Yield Strength, Mpa Min.	Tensile Strength, Mpa Min.	Elongation, % Min.
Steel Name	Steel No.				
S220GD	1.0241	+Z, +ZF, +AZ	220	300	20
S250GD	1.0242	+Z, +ZF, +AZ	250	330	19
S280GD	1.0244	+Z, +ZF, +AZ	280	360	18
S320GD	1.0250	+Z, +ZF, +AZ	320	390	17
S350GD	1.0529	+Z, +ZF, +AZ	350	420	16
S550GD	1.0531	+Z, +ZF, +AZ	550	560	-