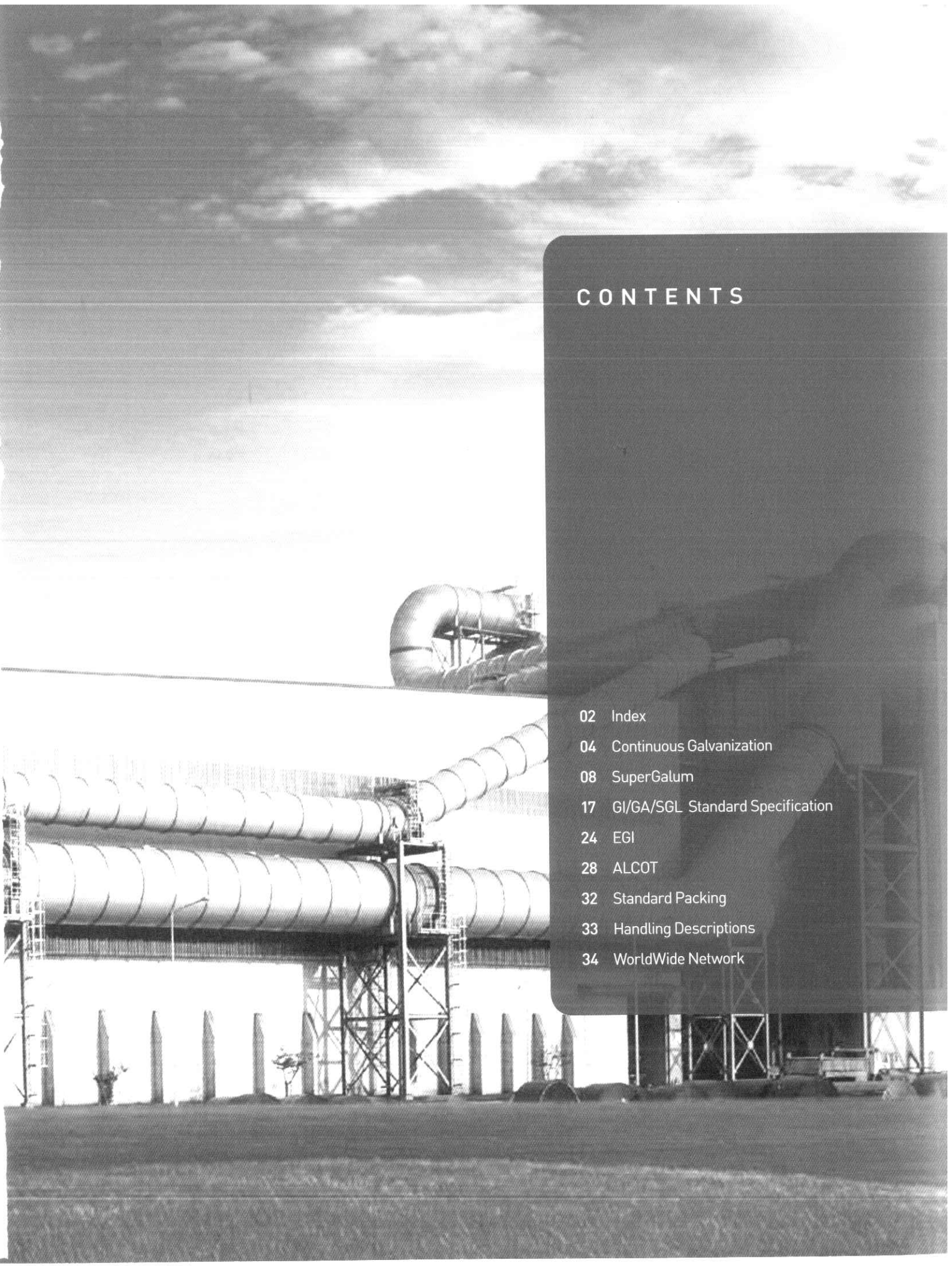
Sales Business Unit

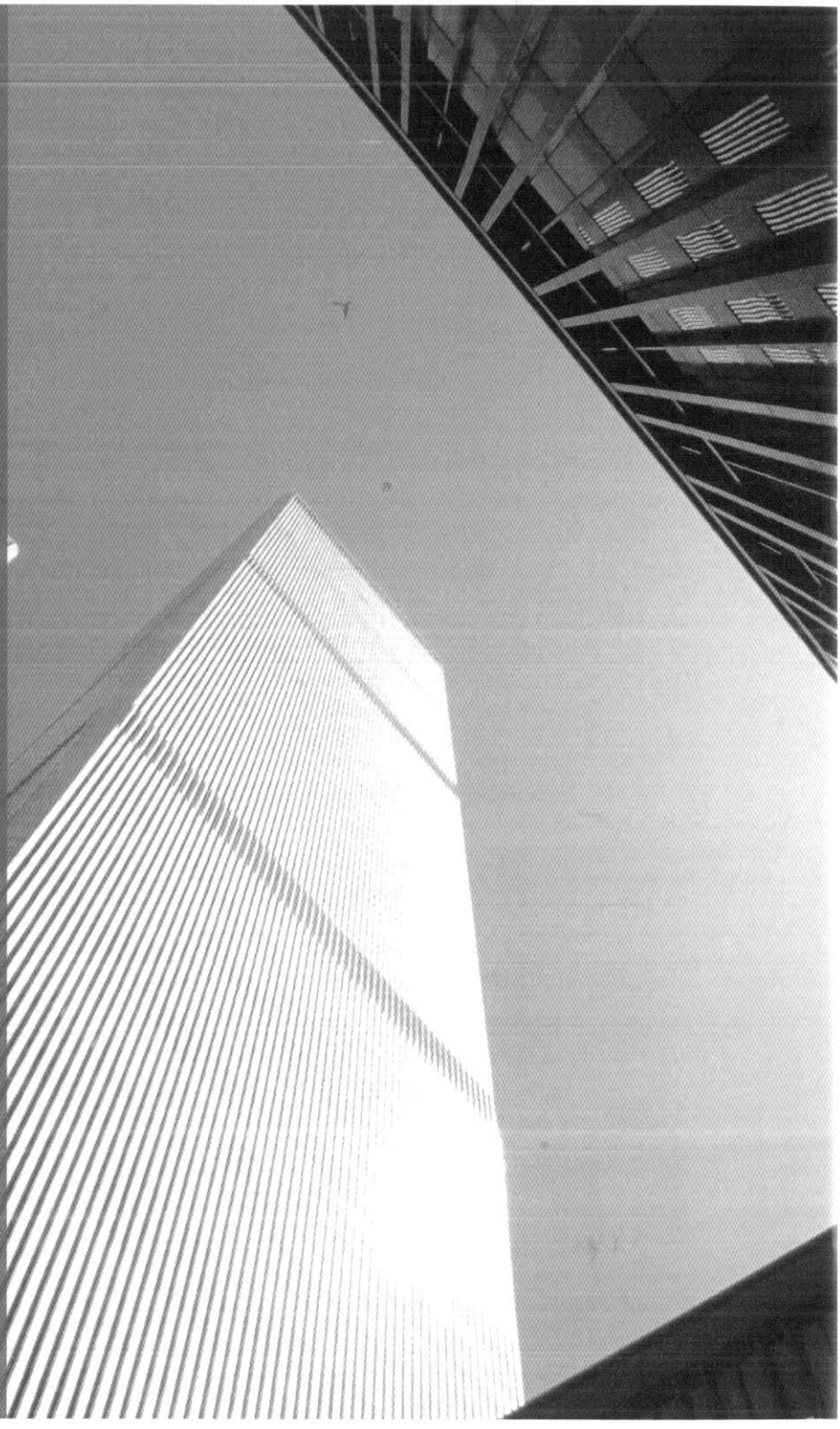
SGL/EGI/ALCOT

ring in the Dongbu Group
cellent Company" philosophy,
are committed to enriching
quality of all human life.



CONTENTS

Galvanization GI



Products Features

Continuous Galvanization

Produced in a thoroughly modern continuous galvanizing line based on techniques acquired through the years of experiences, Dongbu Steel's "Hot-Dip Galvanized Steel Sheet" provides a smooth and cutting-edge quality products. Dongbu Steel has been fully committed to offer galvanized steel sheets with a broad range of base metals quality, including commercial, lock-forming, drawing, and structural quality. Moreover, each product may be suppliedchromated to minimize the possibility of rust.

Super Formability

Highly workable steel sheets and strips are used as raw materials for all the galvanized steel sheet products at the Cold-Rolled Mill of Dongbu Steel Co., LTD. The raw materials in coil forms are continuously annealed, galvanized, and properly leveled, granting final products superior formability.

Excellent Corrosion Resistance

Galvanized steel sheet products are treated with chromic acid in order to minimize the possibility of rust, which also enables surface luster to last longer.

Uniform Quality

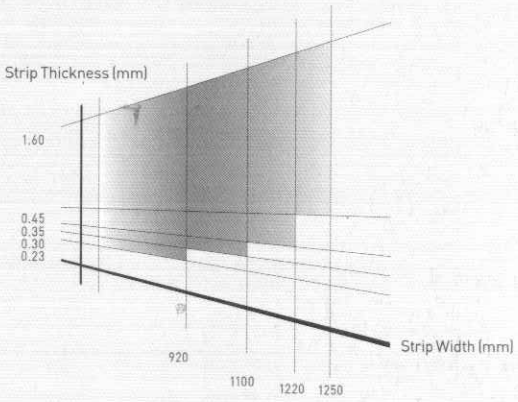
Production is carried out through a strict quality control and inspection in order to maximize customers' satisfaction.

Size Availability

Incheon Works

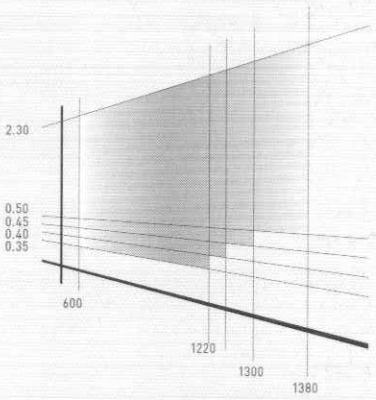
1. CGL SPECIFICATION

Thickness	0.23 ~ 1.60mm
Width	700 ~ 1380mm
Coating Mass	80 ~ 300g/m²
Coil (I.D / O.D)	508 and 610mm / 1880mm Max.
Weight	20 tons Max.
Product	GI



2. CGL SPECIFICATION

Thickness	0.35 ~ 2.30mm
Width	700 ~ 1380mm
Coating Mass	80 ~ 160g/m²
Coil (I.D / O.D)	508 and 610mm / 2100mm Max.
Weight	20 tons Max.
Product	SuperGalum ALCOT



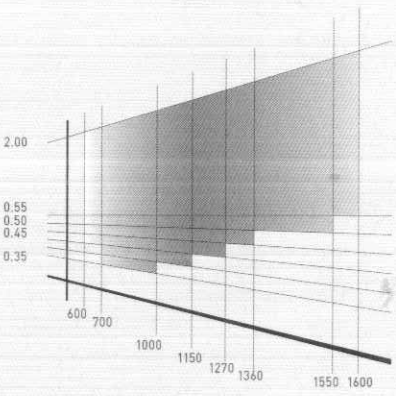
Asan Bay Works

3. CGL SPECIFICATION

Thickness	0.30 ~ 2.50mm
Width	600 ~ 1600mm
Coating Mass	80 ~ 720g/m²
Coil (I.D / O.D)	508 and 610mm / 2100mm Max.
Weight	25 tons Max.
Product	GI GA SuperGalum

4. CGL SPECIFICATION

Thickness	0.25 ~ 0.80mm
Width	600 ~ 1300mm
Coating Mass	80 ~ 720g/m²
Coil (I.D / O.D)	508 and 610mm / 2100mm Max.
Weight	25 tons Max.
Product	GI SuperGalum



Specification

Designation	KS D 3506		JIS		ASTM		EN	
Type	CR	HR	CR	HR	A525	653-96	10327	10326
Commercial Quality	SGCC	SGHC	SGCC	SGHC	-	CS Type A&B	DX51D	-
Lock Forming Quality	SGCC-F	-	SGCC-F	-	A 527	CS Type C		-
Commercial Soft Quality	SGCC-L	-	SGCC-L	-	A 526-L	FS Type A&B	DX52D	-
Commercial Hard Quality	SGCH	-	SGCH	-	-	-	DX53D	-
Drawing Quality	SGCD1	-	SGCD1	-	A 528	DDS	DX55D	-
	SGCD2		SGCD2				DX54D	
	SGCD3		SGCD3			EDDS	DX56D	
							DX57D	
Structural Quality	SGC340	SGH340	SGC340	SGC340	A 446	Grade 230	-	S220GD
	SGC400	SGH400	SGC400	SGC400		Grade 255	-	S250GD
	SGC440	SGH440	SGC440	SGC440		Grade 275	-	S280GD
	SGC490	SGH490	SGC490	SGC490		Grade 340 class 1,2,3	-	S320GD
	SGC570	SGH540	SGC570	SGC570		Grade 550	-	S550GD

Surface Treatment

Type	Main Applications
Chromate	General
Non-Cr	Electric home appliances
No Chromate	General painting
Organic	Drawing

* Organic Coating enhances Anti Fingerprint Properties and drawability.

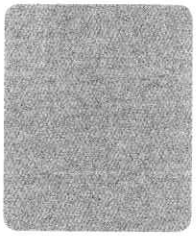
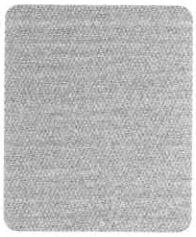
Oiling

Oiling classification
No-oiled
oiled

Surface Finish

Type	Surface Finish
Zero Spangle Finish	Minimized spangles make this finish suitable for general painting applications.
Ultra Smooth Finish	Minimized spangles extremely, suitable for special painting applications.
Galvannealed Finish	Galvannealed steel sheets have a highly workable iron-zinc alloy layer. Good paint-adherence properties, corrosion resistance and weldability make them ideal for use in automobile home electrical appliances and buildings.

Surface Finish & Applications

Classification	Weight of Zinc Coating	Surface Finish	Quality	Application
Zero Spangle Finish	Z06 - Z60		CQ DQ SQ	· Steel furniture & office equipment · For painting
Ultra Smooth Finish	Z06 - Z60		CQ DQ SQ	· Steel furniture & office equipment · For painting · Home electric applications
Galvannealed Finish	F04 - F18		CQ DQ SQ	· Home electric applications (Washer, Micro wave oven) · Building materials · Auto mobile parts · Various fuel tanks

SuperGalum®

Products Features

Excellent Durability

SuperGalum has three to six times better corrosion resistance compared to zinc coated (galvanized) steel sheet of the same coating thickness. Dongbu Steel issues a 20-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 degrees Celsius 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.

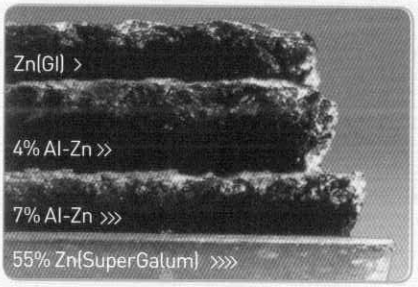
SuperGalum®

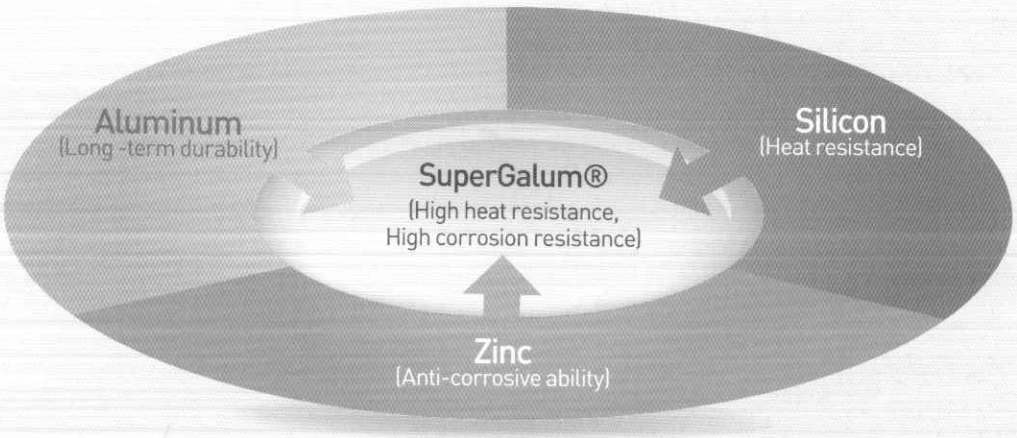
Supergalum® is a brand name for 55% aluminum-zinc coated steel sheet produced by Dongbu Steel. Having combined properties of aluminum and zinc, SuperGalum® provides excellent heat and corrosion resistance, durability, and formability. SuperGalum® has three to six times superior corrosion resistance compared to zinc coated (galvanized) steel sheet of the same coating thickness. Dongbu Steel issues 20-year warranties for SuperGalum® in case of residential applications. Since 1998, Dongbu Steel has been producing SuperGalum® under the licensing agreement with BIEC International Inc.

Composition of Coated Layers

Composition	Weighe Ratio(%)	Capacity Ratio(%)
Aluminum	55.0	80
Zinc	43.4	19
Silicon	1.6	1

Results of a 17-year exposure test





SuperGalum® Specifications

Classification by Coating Weight

KS	ASTM	EN	Single-sided Coating thickness (μm)	Double-sided(g/m²)	
				Triple-Spot Test	Single-Spot Test
(AZ 70)	-	-	9	(70)	(60)
AZ 90	-	-	12	90	76
-	-	100	13	100	85
AZ 120	-	-	16	120	102
AZ 150	AZM 150 AZ 50	150	20	150	130
-	AZM 165 AZ 55	-	22	165	150
AZ 170	-	-	22	170	145
-	AZM 180 AZ 70	-	24	180	155
(AZ 185)	-	185	25	185	160
(AZ 200)	-	-	26	(200)	(170)

Classification by Post-Treatment

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

Oiling

Oiling classification
No-oiled
oiled

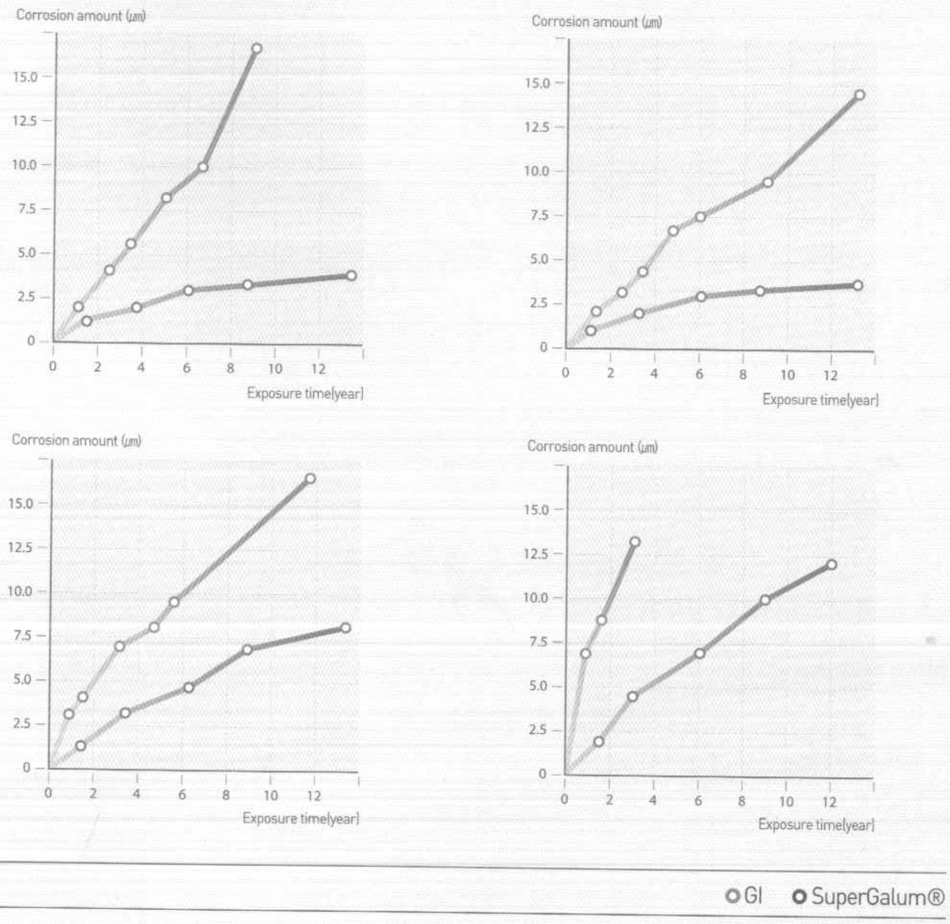
SuperGalum® Performance

Durability

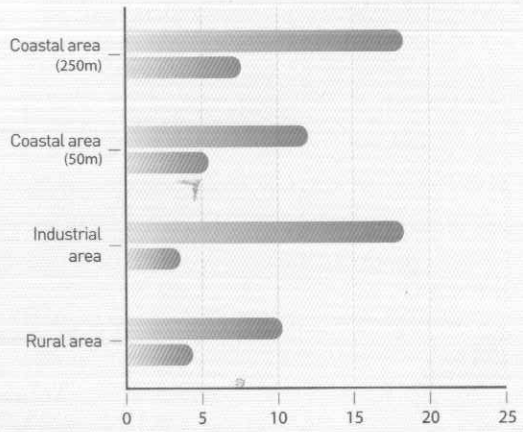
SuperGalum® has three to six times superior corrosion resistance compared to zinc coated (galvanized) steel sheet of the same coating thickness. Sheared or cut spot of Supergalum® has better corrosion and stretch resistance compared to aluminum coated steel sheet. Dongbu Steel issues 20-year warranties 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.

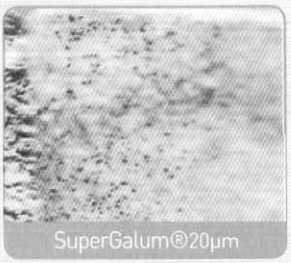


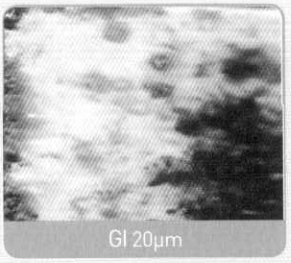
° Exposure test comparing levels of corrosion (Test period: 13 Years)



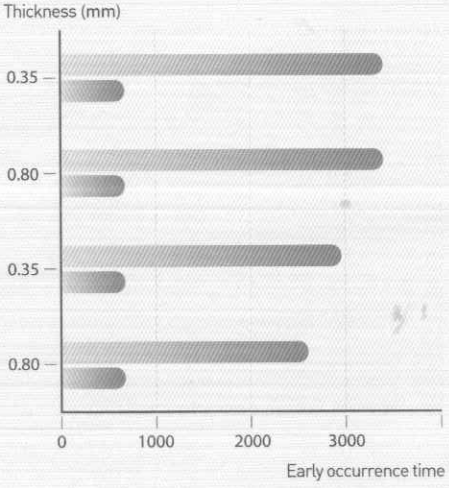
SuperGalum®20μm
GI 20μm

° Results of exposure tests conducted in a coastal region (Test period: 13 Years)


SuperGalum®20μm


GI 20μm

° Salt spray test on SuperGalum Steel Sheet : The initial occurrence of red rust is considerably slower than that of galvanized steel sheet.

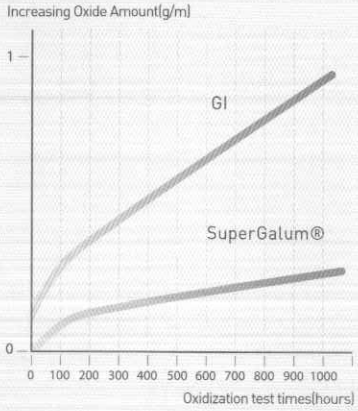


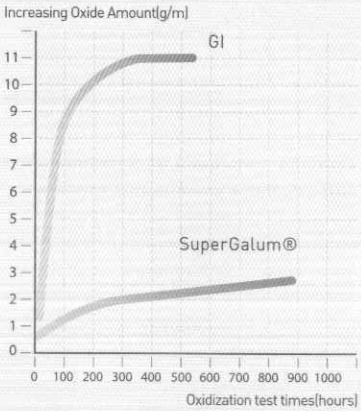
SuperGalum® : AZ 150
GI : Z 25

○ Heat Resistance

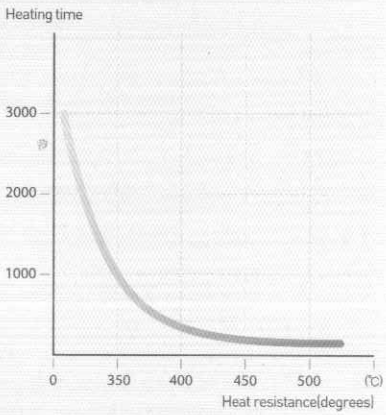
The capacity ratio of the aluminum in coated layer of SuperGalum is over 80%, enabling the products to withstand a prolonged temperature of 315 degrees Celsius without discoloration or oxidization.

• Rate of oxidization from continuous heat

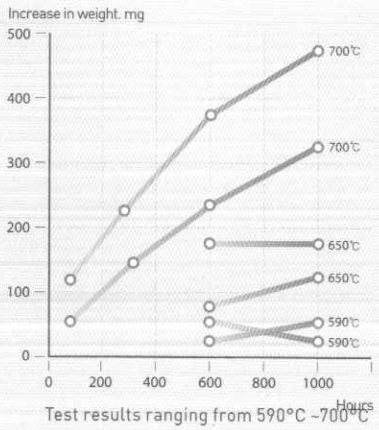




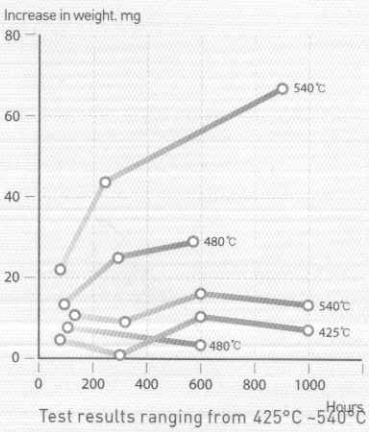
• Heat Resistance of SuperGalum Steel Sheet



• Comparison of corrosion resistance at high temperatures



Test results ranging from 590°C ~700°C



Test results ranging from 425°C ~540°C

480°C~540°C, SuperGalum® Steel ← Al Coated Steel
590°C~650°C, SuperGalum® Steel = Al Coated Steel
700°C or higher, SuperGalum® Steel → Al Coated Steel

o Heat Reflectivity

SuperGalum® steel sheet boasts superior heat reflectivity, which produces increased energy efficiency, making it an excellent material for the interior of electronic home appliances. 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

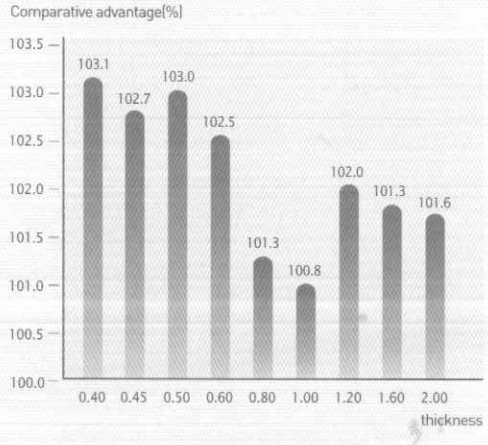
• Comparison of heat transfer by product

Product	Heat Transfer(W/m²)
ALCOT Steel(Type2, 300g/m²)	40
SuperGalum Steel(150g/m²)	65
Galvanized Steel(275g/m²)	120
Asbestos Ciment	150
Clay Tile	150

o Economical Efficiency

The density of the coated layer of SuperGalum® steel shows 3.75g/cm2, which is lower than that of galvanized steel (7.14g/cm2), thereby increasing the surface area per ton and enhancing the economical efficiency.

Thickness (mm)	Area Per Ton(m²/ton)			
	SuperGalum®		GI	
0.40	AZ 150	299	Z 275	290
0.45		268		261
0.50		243		236
0.60		204		199
0.80		154		152
1.00		124		123
1.20		104		102
1.60		78		77
2.0		63		62



o Paintability

SuperGalum® has better adhesiveness of paints to its coated layer compared to galvanized steel sheet.
SuperGalum® used for general purposes does not require any pre-treatment before painting.

Weldability

The weldability of SuperGalum® is similar to that of galvanized steel sheet. Special attention, however, is required before welding, including welding current, time, electrode pressure, and so forth.

• Spot Welding Conditions

Thickness(mm)	Electric Current(A)	Pressure(Kg)	Welding Time, Cycle(1/60sec.)	Electrode Diameter(mm)
0.56	11000	160	10	4.75
0.71	11300	180	12	4.75
0.91	12500	230	14	6.35
1.02	12800	230	14	6.35
1.35	13000	250	14	6.35
1.65	13400	300	18	6.35

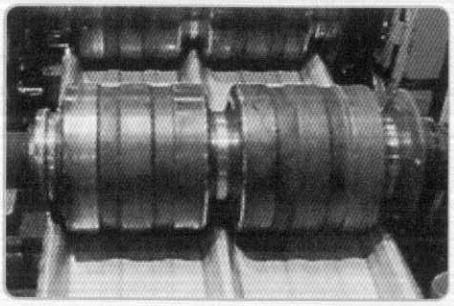
• Seam Welding Conditions

Thickness (mm)	Electrode Shape(mm)	Thickness of Electrode(mm)	Pressure (Kg)	Electric Current(A)	Weld time(Cycle(1/60sec.)		Weld Speed (mm/min)
					Heating	Cooling	
0.43	12.70 Radius	9.53	320	14500	2	2	1500
0.56	12.70 Radius	9.53	390	1600	3	2	1500
0.86	6.35 Radius	12.70	450	21500	4	2	1500
1.24	6.35 Flat	12.70	500	2200	4	2	1500
2.11	7.94 Flat	15.88	730	2700	10	6	760

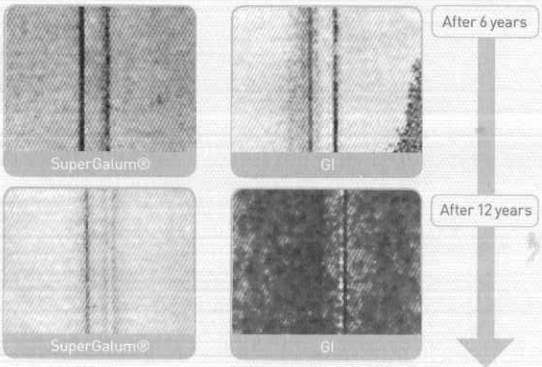
Workability

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



• Treatment area ; excellent durability

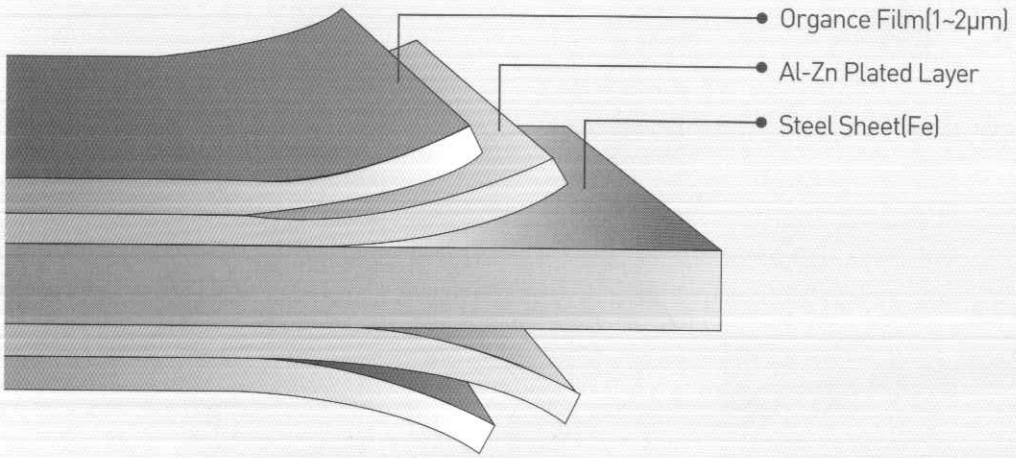


Test results from exposure in coastal area

SuperGalum® Organic Coating Process

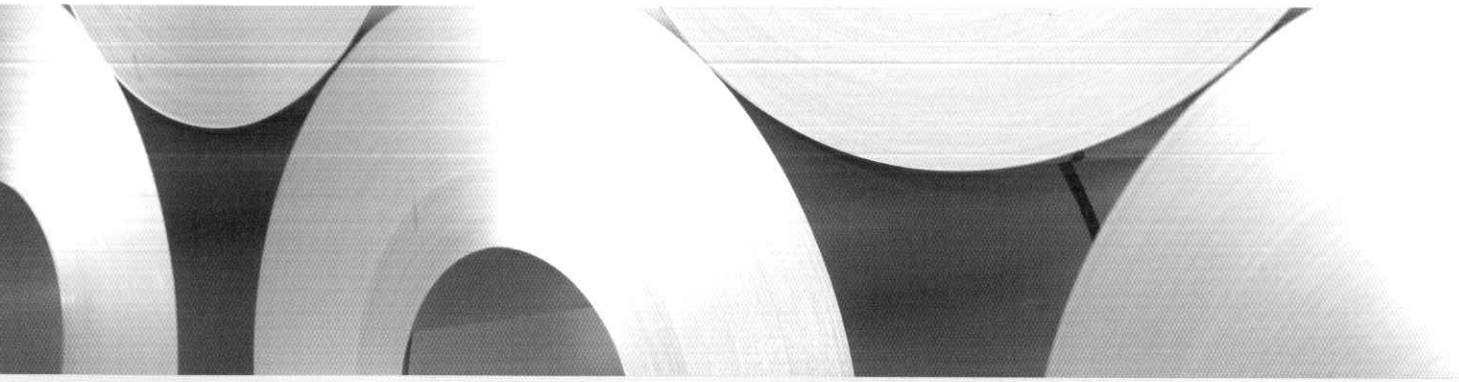
Organic film treatment of the SuperGalum® steel sheet is carried out in an in-line coater, applying acryl resin organic film containing 1~2um of chromate. In comparison with the temporary corrosion resistant property of the conventional chromate passivation, organic treatment offers superior quality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

• Production process of organic film lay-



STANDARD SPECIFICATION

JIS	GI : G3302(2007) SGL : G3221(2007)
ASTM	GI : A653 / SGL : A729
EN	GI,SGL : 10326, 10327



THICKNESS TOLERANCES

1-1> 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	1600 and over
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	-

1-2> Thickness Tolerances / ASTM

Specified Width, In.		Thickness Tolerance, plus and Minus, In.					
		Specified Thickness, In.					
Over	Through	Through 0.023	Over 0.023 Through 0.043	Over 0.043 Through 0.061	Over 0.061 Through 0.075	Over 0.075 Through 0.101	Over 0.101 Through 0.187
-	32	0.003	0.004	0.005	0.006	0.007	0.008
32	40	0.003	0.004	0.005	0.006	0.008	0.008
30	60	0.003	0.004	0.005	0.006	0.008	0.009
60	72	-	0.004	0.005	0.006	0.009	0.009

1-2> Thickness Tolerances / ASTM

Specified Width, mm		Thickness Tolerance, plus and Minus, mm					
		Specified Thickness, mm					
Over	Through	Through 0.4	Over 0.4 Through 1.0	Over 1.0 Through 1.5	Over 1.5 Through 2.0	Over 2.0 Through 2.5	Over 2.5 Through 5.0
-	1500	0.08	0.10	0.13	0.15	0.20	0.23
1500	-	***	0.10	0.13	0.15	0.23	0.23

* Thickness is measured at any point across the width not less than in. from a side edge.
* Thickness is measured at any point across the width not less than 100mm from a side edge.

1-3> Thickness Tolerances / EN

Unit | Dimensions in mm

Nominal Thickness	Normal Tolerance for nominal width [1][2]			Special Tolerance(S) for nominal width [1][2]		
	≤1200	>1200 ≤1200	>1500	≤1200	>1200 ≤1500	>1500
≤0.40	±0.05	±0.06	-	±0.03	±0.04	-
>0.40 ≤0.60	±0.06	±0.07	±0.08	±0.04	±0.05	±0.06
>0.60 ≤0.80	±0.07	±0.08	±0.09	±0.05	±0.06	±0.06
>0.80 ≤1.00	±0.08	±0.09	±0.10	±0.06	±0.07	±0.07
>1.00 ≤1.20	±0.09	±0.10	±0.11	±0.07	±0.08	±0.08
>1.20 ≤1.60	±0.11	±0.12	±0.12	±0.08	±0.09	±0.09
>1.60 ≤2.00	±0.13	±0.14	±0.14	±0.09	±0.10	±0.10
>2.00 ≤2.50	±0.15	±0.16	±0.16	±0.11	±0.12	±0.12
>2.50 ≤3.00	±0.17	±0.18	±0.18	±0.12	±0.13	±0.13

* [1] In the case of wide strip and slit wide strip, the thickness tolerances in the region of cold-rolled welds shall be increased by max. 60% over a length of 15m.+)
* [2] For zinc coating Z450 and Z 600, the thickness tolerances shall be increased by 0.20mm.

ZINC COATING

• GI

Unit : g/m²

Nominal Thickness	Triple	Single	JIS	ASTM	EN
060	060	51	Z 06	-	-
080	080	68	Z 08	-	-
90	90	77	-	G 30	-
100	100	85	Z 10	-	Z 100
120	120	102	Z 12	G 40	-
140	140	120	Z 14	-	Z 140
180	180	153	Z 18	G 60	-
200	200	170	Z 20	-	Z 200
220	220	187	Z 22	-	-
225	225	195	-	-	Z 225
250	250	213	Z 25	-	-
275	275	234	Z 27	G 90	Z 275
300	300	255	-	-	-
350	350	298	Z 35	G 115	Z 350
370	370	315	Z 37	-	-
450	450	383	Z 45	G 140	Z 450
500	500	426	-	G 165	-
600	600	510	Z 60	G 21	Z 600

• GA

Coating Weight Code	Triple Spot Test	Singles Spot Test	JIS	ASTM	EN
040	40	34	F 04	-	-
060	60	51	F 06	-	-
075	75	60	-	A 25	-
080	80	68	F 08	-	-
100	100	85	F 10	-	ZF 100
120	120	102	F 12	A 40	ZF 120
140	140	120	-	-	ZF 140
180	180	153	F 18	A 60	-

ZINC COATING

• SGL

Coating Weight Code	Triple Spot Test	Singles Spot Test	JIS	ASTM	EN
070	70	60	AZ 70	-	-
090	90	76	AZ 90	-	-
100	100	85	-	AZ 30	AZ 100
110	110	95	-	AZ 35	-
120	120	102	AZ 120	AZ 40	-
150	150	130	AZ 150	AZ 50	AZ 150
165	165	150	-	AZ 55	-
170	170	145	AZ 170	-	-
180	180	155	-	AZ 60	-
185	185	160	AZ 185	-	AZ 185
200	200	170	AZ 200	-	-
210	210	180	-	AZ 70	-

TYPE

Designation Type	JIS		ASTM	EN
	GI	SGL		
Commercial Quality	SGCC	SGLCC	CS	DX51D, DX52D
Lock Forming Quality			FS	DX53D
Drawing Quality	SGCD1	SGLCD	DDS	DX54D
	SGCD2			DX54D
	SGCD3	SGLCD	EDDS	DX56D, DX57D
Structural Quality	SGC340	Grade 230	S220GD	
	SGC400	SGLC 400	Grade 255	S280GD
	SGC440	SGLC440	Grade 275	S320GD
	SGC490	SGLC490	Grade 340	S350GD
	SGC570	SGLC570	Grade 550	S550GD

MECHANICAL PROPERTIES & CHEMICAL COMPOSITION

4-1> JIS

• GI / GA

Classified Symbol	Yield Point (N/mm²)	Tensile Strength (N/mm²)	Elongation % Nominal Thickness mm						Test Piece and direction of tensile test
			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	
SGCC	-	-	-	-	-	-	-	-	No.5 in rolling direction
SGCH	-	-	-	-	-	-	-	-	
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	-	
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	-	-	-	-	-	-	

• SGL

Classified Symbol	Yield Point (N/mm²)	Tensile Strength (N/mm²)	Elongation % Nominal Thickness mm					Test Piece and direction of tensile test
			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↑	-	32↑	34↑	34↑	35↑	
SGLC400	295↑	400↑	16Đ	17↑	18↑	18↑	18↑	
SGLC440	335↑	440↑	14Đ	15↑	16↑	18↑	18↑	
SGLC490	365↑	490↑	12Đ	13↑	14↑	16↑	16↑	
SGLC570	560↑	570↑	-	-	-	-	-	

4-2> 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	0.030	-	24/45(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
DDS	0.02	0.40	0.020	0.020	0.01	15/25(105/170)	40	1.6/2.1	0.221/0.27

* 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.

4-3> ASTM / Structural Quality

	Designation	Chemical Composition %					Mechanical Properties(Nonmandatory)				
		C, Max.	Mn, Max.	P, Max.	S, Max.	Al, Max.	Tensile Strength.Min Ksi	Tensile Strength.Min Mpa	Yield Point.Min Ksi	Yield Point.Min Mpa	Elongation Min %
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)	0.20	1.35	0.10	0.04	-	55	380	40	275	16
	Grade 50(340)Class1	0.25	1.35	0.10	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

4-4> 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	1.0226	+Z,+ZF,+AZ	-	270 to 500	22
DX52D	1.0350	+Z,+ZF,+AZ	140 to 300	270 to 420	26
DX53D	1.0355	+Z,+ZF,+AZ	140 to 260	270 to 380	30
DX54D	1.0306	+Z	120 to 220	260 to 350	36
DX54D	1.0306	+ZF	120 to 220	260 to 350	34
DX56D	1.0322	+Z	120 to 180	260 to 350	39
DX56D	1.0322	+ZF	120 to 180	260 to 350	37
DX57D	1.0853	+Z	120 to 170	260 to 350	41
DX57D	1.0853	+ZF	120 to 170	260 to 350	39

4-5> 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	-

Electrolytic Galvanized Iron

Products Features

Excellent Durability

Dongbu Steel EGI is "Non Cr (100% Cr Free)" product, excluding any hazardous substance such as Cr+6/Cr+3.

Eco-friendly

The brand-new post treatment facility is designed to focus on "Eco-Friendly" concept. We produce and supply EGI within the restriction of hazardous substances(RoHS : EU ELV directive).

Non-Cr / Phosphated EGI

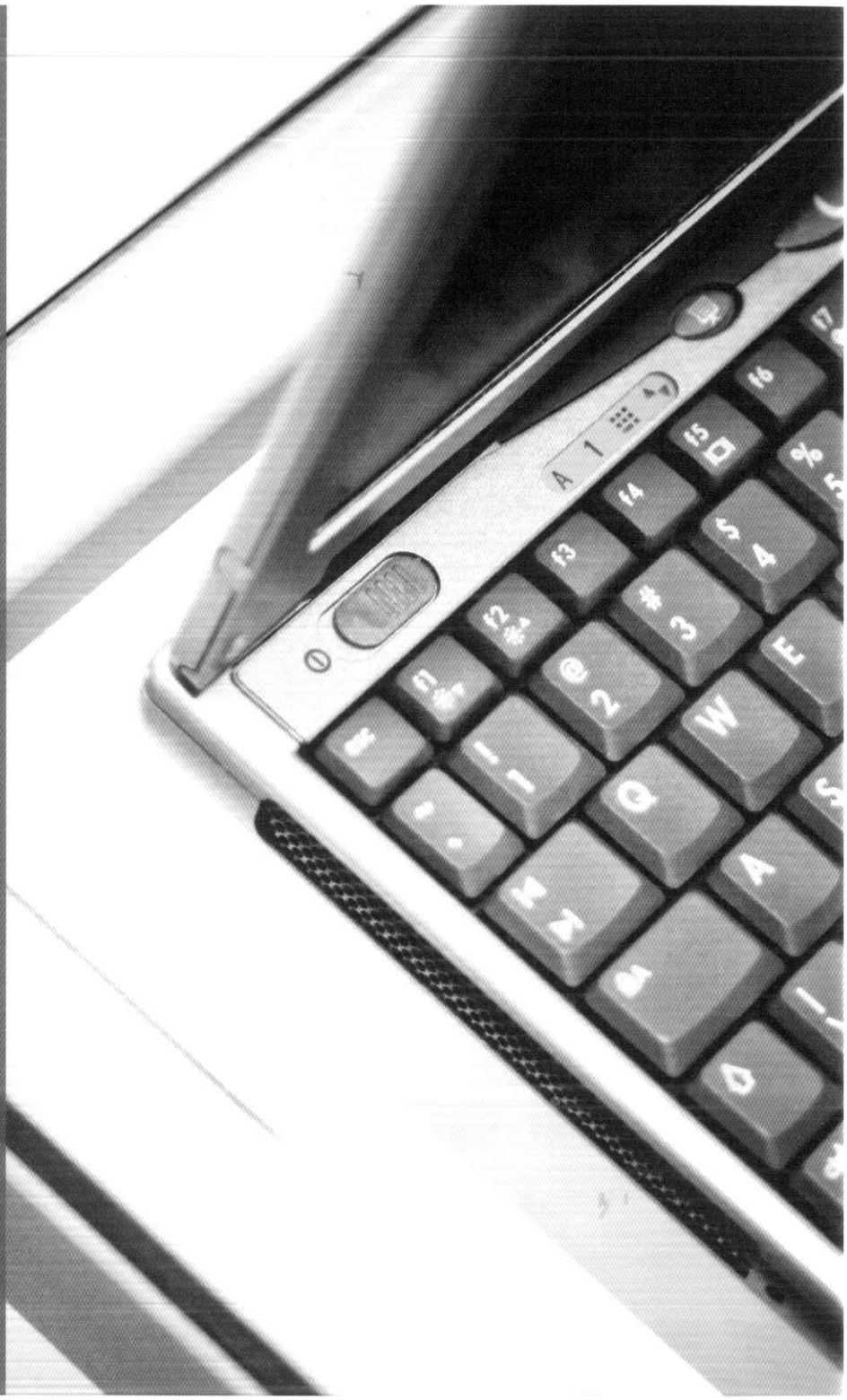
Phosphated electrolytic galvanized iron, mainly for home appliance and painting feed of construction.

Non-Cr / Phosphated & Anti-fingerprint EGI

First phosphated and organic coated electrolytic galvanized iron, excellent in anti-finger print property, lubricity, corrosion resistance and paint ability. It is mainly used for home appliance and office equipment.

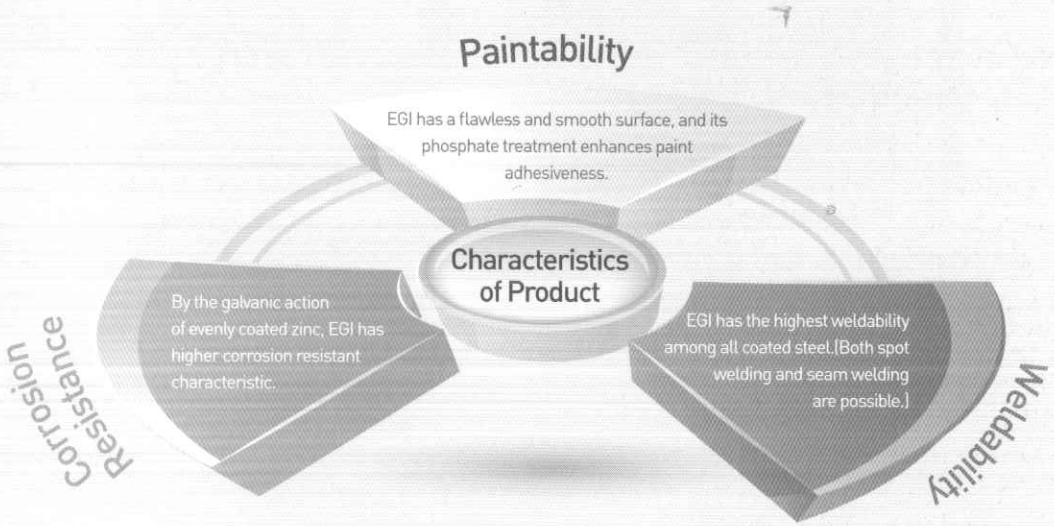
Zinc & Anti-fingerprint EGI

Organic coated electrolytic galvanized iron, excellent in anti-finger print property, lubricity and surface conductivity. It is mainly used for computer, LCD, Copy machine component.



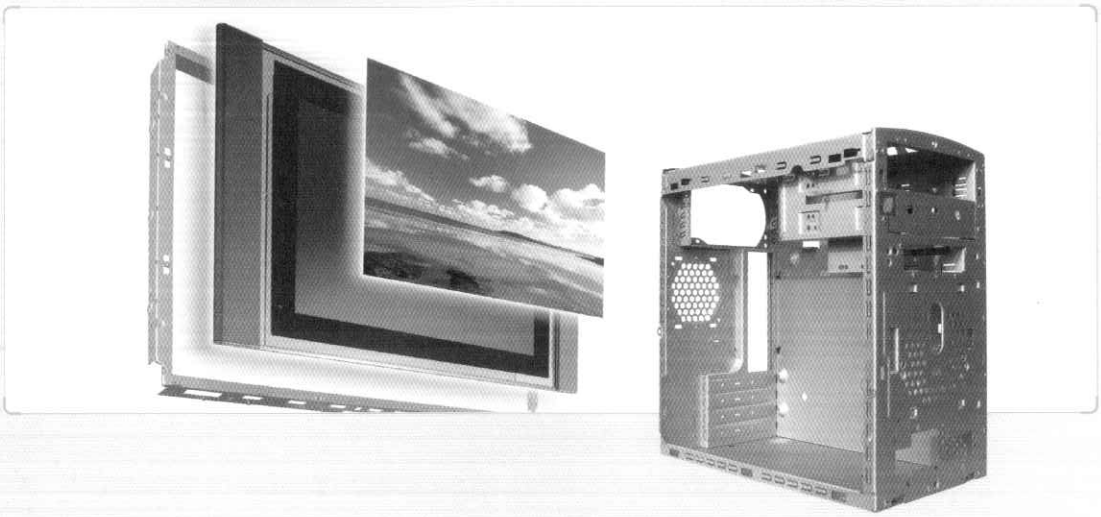
Electrolytic Galvanized Iron

Dongbu Steel is the 1st korean mill to produce thickness down to 0.2mm(0.0079 inch) EGI :
We are willing to contribute to society by localizing and building up competitiveness in related industries.



Products with Zn Base Post - Galvanized

Products		Code	Galvanized Structure	Feature	uses
Pure-Zn	Non-treatment	X	Zn (3-50g/m²) Steel	Non-treatment product does not provide guarantee of white rust and must be used immediately after delivery.	Color sheet
	Oiled			This product has superior resistance to white rust, and can be oiled either separately or after phosphate treatment.	Home appliance
	Phosphated	P	P (1.5-2.5g/m²) Zn (3-50g/m²) Steel	This type of product is appropriate for the coating steel without pre-treatment. Processability could be decreased under the decline of the friction coefficient.	Home appliance, Construction material
	AFP (Anti-finger print)	D	AFP (0.8~2.0g/m²) P (1.5-2.5g/m²) Zn (3-50g/m²) Steel	Superior in corrosion resistance and processability, this product prevents the defects caused by fingerprint.	Home appliance, Office equipment
		A	AFP (1.0-1.5g/m²) Zn (3-50g/m²) Steel	This product is specialized for the uses which required both anti-finger print characteristic and conductivity.	Computer, LCD, Duplicating machine



Size Availability

Division	Contents
Thickness	0.20 ~ 1.2mm(1.6mm)
Width	750 ~ 1300mm
Unit Coil Weight	Min 3ton / Max 25ton
Coating Weight	3/3g/m² ~50/50g/m²
Coil ID	508 / 610 Sleeve

Limit Values of Toxic Substances Prescribed in RoHS & Product Test Results

Toxic substance	Prescribed limit value(ppm)	Product Test Result		
		Test Method	MDL(ppm)	Results
Cadmium(Cd)	75	USEPA3050B ICP - AES	0.5	N.D
Lead (pb)	1000		5	N.D
Mercury(Hg)	1000	USEPA3052 ICP - AES	2	N.D
Hexavalant Chromium(CrVi)	1000	USEPA3060 UV - Vis	1	N.D
Polybrominated Biphenyls (PBBs)	1000	USEPA3050C GC/MS	5	N.D
Polybrominated Diphenyl Ethers(PBDEs)	1000		5	N.D

Non-Cr / Anti-finger Print EGI

The Non-Cr EGI is eco-friendly produced without using Cr+6 and Cr+3. In particular, it maintains the same level of corrosion resistance, formability and anti-fingerprint properties as existing products.

Indication of Zinc Coating Weight

Designation of Zn Coating Weight	Minimum Coating Weight of Zn(One Side)(g/m²)		Standard Coating Weight (g/m²)
	Both-side coating	One-side, differential coating	
E8	8.5	8	10
E16	17	16	20
E24	25.5	24	30
E32	34	32	40
E40	42.5	40	50

ASTM Standard

Coating Class	Minimum Value/Triplespot Coating Weight (both side)		Minimum Value/one spot Coating Weight (both side)	
	OZ/ft2	g/m²	OZ/ft2	g/m²
A	-	-	-	-
B	0.08	24	0.07	22
C	0.16	48	0.15	45

Mechanical Properties

Div.	Pure-Zn (KS/JIS)	Bending Test		Mechanical Properties(Kgf/mm², (%))			Remarks
		Angle	Radius	YP	TS	EL	
Commercial quality	SECC			-	↗ 28	↗ 37	For lock forming
Drawing quality	SECD S	180°	Close adhesion	-	↗ 28	↗ 39	For drawing
Deep drawing quality	SECE(N)			-	↗ 28	↗ 40	For non-aging deep drawing

ALCOT®

Products Features

Superior Heat Resistance

Lengthy exposure to temperatures up to 450℃ causes very little change in ALCOT® and does not affect its attractive surface brightness, compared with galvanized steel sheet and cold-rolled steel sheet.

Superior Heat Reflexibility

The highly elegant surface of ALCOT® reflects about 80% of the heat at a temperature of 450℃ . Its reflection rate goes up to 95% where infrared rays are present. This makes ALCOT® the ideal choice for producing the heat reflector plates in toasters, ovens, gas ranges and oil stoves.

Superior Corrosion Resistance

Because the aluminum easily forms a fine oxide
film when exposed to air, ALCOT® has an excellent corrosion resistance. The aluminum, as a sacrificial anode, protects the steel from the corrosion in saltwater.

Superior Heat Resistance

Heat Resistance Test Results

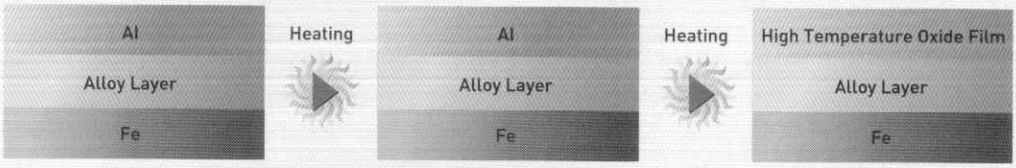
Test conditions : Naked eye comparison the sheet after two rounds of test procedures
(Heating (1.5 Hr), maintaining (5 Hr), cooling (17 Hr))

	300	350	400	450	500	550	600
ALCOT®	○	○	○	○	○	○	△
Super Galum	○	○	○	△	△~X	X	X
GI	△	△~X	X	X	X	X	X

○ : No change △ : Luster down X : Tums blackish

Heat Resistant Equipment using ALCOT® steel

When heated, an oxide film is formed on the surface as the alloy layer is activated, protecting its surface.

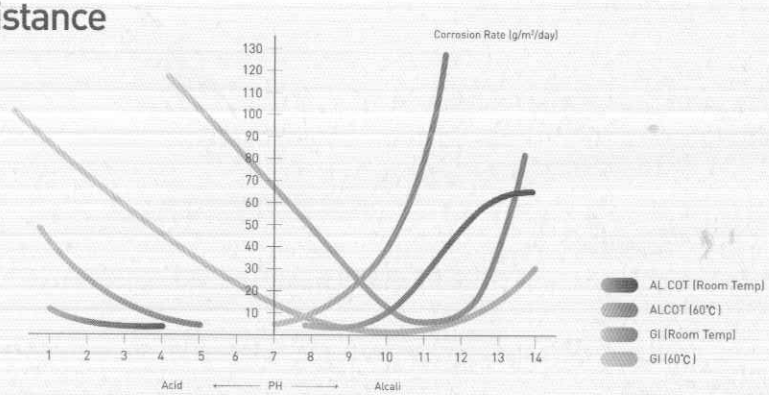


Superior Heat Reflectivity

Heat Reflectivity

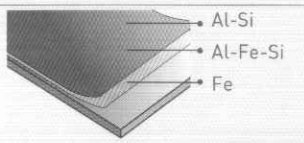
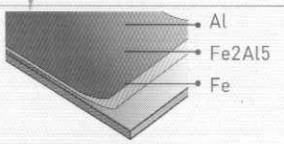
Classification	ALCOT	GI
100°CX 24hr	80%	80%
450°CX 24hr	80%	15%

Superior Corrosion Resistance

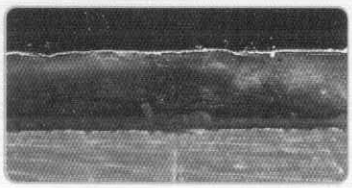


ALCOT® Coating Layers

Types of ALCOT® steel sheet are categorized by the components of the molten pot. Applications are as follows.

Classification	Type I Alumininized	Type II Alumininized
Components of the molten pot	Al-Si(8~10%)	Al
Components of the alloy layer		
Application	Heat Resistance Treatment	Weather Resistance(Construction material)

Cross section of ALCOT® steel sheet of the coated layers

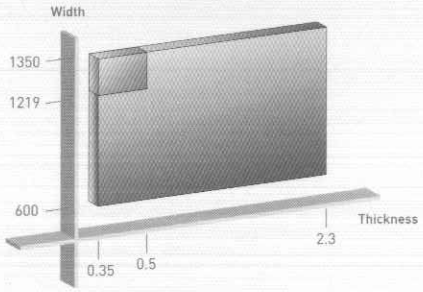


Al-Si Plated Layer

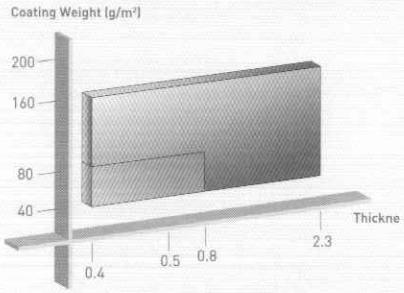
Alloy Layer

Steel

Size Availability



Size Availability by Coating Weight



Available size range

Subject to prior negotiation

Post-Treatment

Chromated	Oiled	Chromated & Oiled	No Treatment	Non-Cr
○	○	○	○	○

*** Chromating**
- Average : 11.5 mg/m² (One side)
- Range : 6.8~18.9mg/m² (One side)

*** Oiling**
- Slightly : 500~800mg/m² (Both side)
- Normal : 1,000~1,400mg/m² (Both side)
- Heavy : 1,400~2,000mg/m² (Both side)

*** Non-Cr**
- Average : 250~400mg/m² (t≤1.5)

Grade and Symbol

	KS D3544 / JIS G3314	ASTM A 463	ASTM A 463-96a	EN 10346	EN 10346
CQ	SA1C	CQ	CS TYPE A	DX51D	-
			CS TYPE B	DX52D	-
			CS TYPE C		-
DQ1		ADQ	-	DX53D	-
DQ2	SA1D	DQ	FS	DX54D	-
			DDS	DX56D	-
DQ3	SA1E	DQSK	EDDS	DX57D	-
Grade A	SAC31		Grade230	-	S220GD
Grade B	SAC35	SQ-B	Grade255	-	S250GD
				-	S280GD
Grade c	SAC41	SQ-C	Grade275	-	S320GD
Grade D	SAC45	SQ-D	Grade340 Class1	-	S350GD
			Grade340 Class2	-	
		-	Grade340 Class3	-	
Grade E	-	-	Grade550	-	S550GD

Mechanical Properties

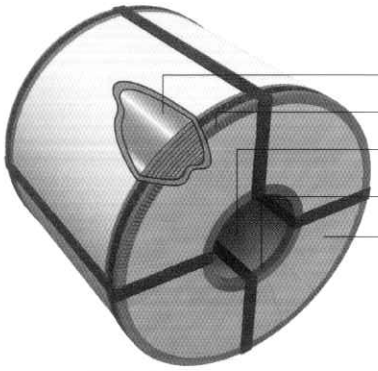
Classification				Tensile Strength (kgf/mm²) Thickness(mm)	Yield point(kgf/mm²) Thickness(mm)		Elongation(%) Thickness(mm)		
					t≤0.5	0.5<t	t≤0.5	0.5<t≤1.2	1.2<t
Commercial	1-C	CQ	SA1C, CQ						
Quality (Type 1)	1-L	CQ	SA1L, CQ-L	(40)↓	30	30	32	36	38
	1-N	CQ-N	SA1C-N	-	-	-	-	-	-
Drawing Quality (Type 1)	3-A	DQ1	SA1D-A, ADQ	28	26	25	34	36	38
	3-D	DQ2	SA4D, DQ	28	24	23	36	38	40
	3-E	DQ3	SA1E, DQSK	28	21	20	38	40	42
	(3-S)	(EDDQ)	(SA1E-S, EDDQ)	(26)	19	18	40	42	44
Structural Quality (Type 1)	4-A	Grade A	SAC31, SQ-A	31~45	21	21	20	20	20
	4-B	Grade B	SAC35, S-B	35~48	25	25	20	20	20
	4-C	Grade C	SAC41, SQ-C	41~52	30	30	18	18	18
	4-D	Grade D	SAC45, SQ-D	45~56	37	37	18	18	18

Applications

- **Automotive Components :** Muffler, Exhaust Pipe, Fuel Tank
- **Home Electrical Appliances :** Electric stove, Gas range, Bread machine, Electric stove, Toaster, Frying pan, Dryer
- **Heating Equipment :** Heat exchanger, Stovepipe, Pre-heater, Dryer, Duct
- **Construction :** Wall and roof of chemical factories, Fireproof wall
- **Other :** Steam cover, Other chemical equipments

STANDARD PACKING

Dongbu Steel's GI/SGL sheets and coils are properly packed to avoid possible damages while handling, transportation, and long-distance shipping. Special care is taken to prevent abrasion, rusting and scratching; Please kindly refer to the below illustration of our packing procedure. The unit weight per package is usually between 2 and 4 metric tons for sheets, and between 4 and 20 metric tons for coils.

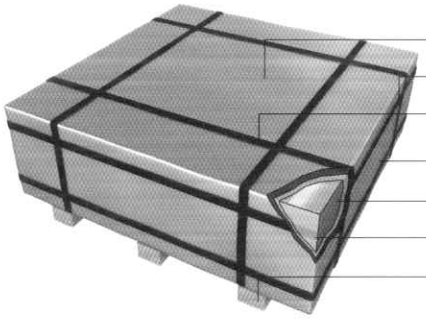


Coil (for Domestic Market)

- Rust Proof Paper
- Corrugated Coner Protector
- Inner Ring
- Inside Steel Sheet
- Water Proof Paper

Coil (for Overseas Market)

- Protector(Outside)
- Protector(Inside)
- Coil
- Water-Proof Paper (OPP)
- Metal Cover
- Steel Band Wooden Skid(Optional)



Sheets Packing

- Top Cover (Metal)
- Angle Protector
- Steel Band
- Side Cover (Metal)
- Water-Proof Paper(OPP)
- Sheet
- Wooden Ski

HANDLING DESCRIPTIONS

During Transportation

- In the process of transportation, attaching a rubber pad on the skid is highly recommended in order to avoid blocking problems. Covering coils with proper materials is also recommended to protect them from rain or snow which may cause white rust.

Storage & Handling

- When keeping coils in warehouses, it is recommended that coils be handled with care and should not be piled up higher than two stories.

Handling Contamination & Peel-off

- In the event of contaminated surface, a solvent must be applied to remove it. In case of peel-off, instructions would be given by Dongbu Steel, depending on circumstances.

Warranty Issue

Long term Storage

- Storing products for longer than 6 months may bring age-hardening or peel-off. Improper usage and mis-handling of our products are not covered by the warranty.

WorldWide Network

Customer Satisfaction

Export Team 1.

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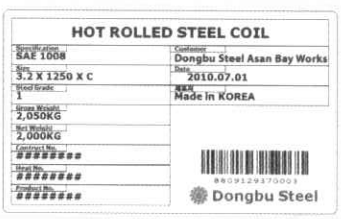
VIETNAM OFFICE

Unit2, 10th Floor,35Ton Duc Thang Street, District 1, Ho Chi Minh City, Vietnam
Tel : 84-2220-5325/5326 | Fax : 84-2220-5327

Product information such as Label, Shipping mark, Color Stripes are attached to the inside of every products.

LABEL



SHIPPING MARK