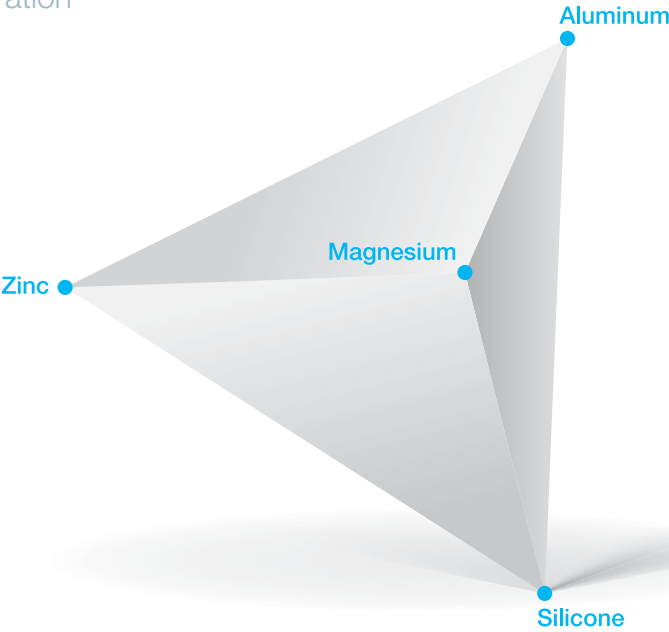




GLX

Magnesium-Aluminum-Zinc alloy coated
GalvaLume Steel for **neXt** generation



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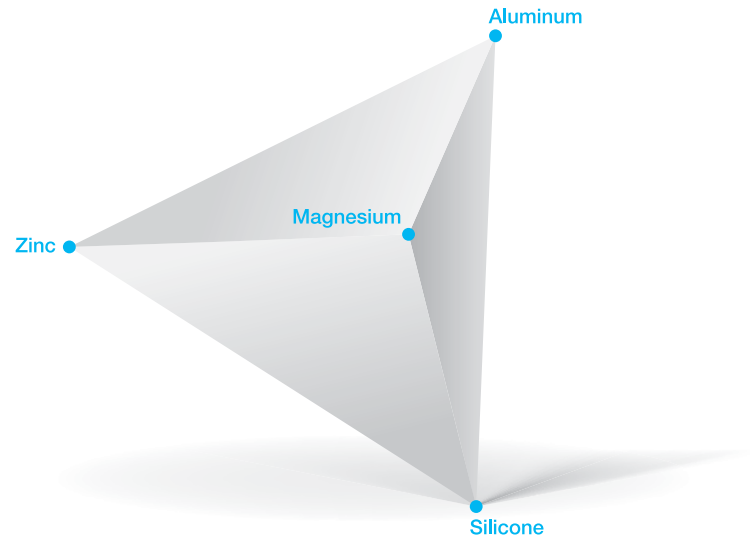
Busan Office
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What is GLX



GLX is produced by alloying the aluminum, zinc, silicon and magnesium and then hot dipping it on a steel sheet. It is designed to be suitable for the applications requiring high corrosion resistance. The coated layer of GLX consists of **55% aluminum, 43.4% zinc and magnesium and 1.6% silicon.**

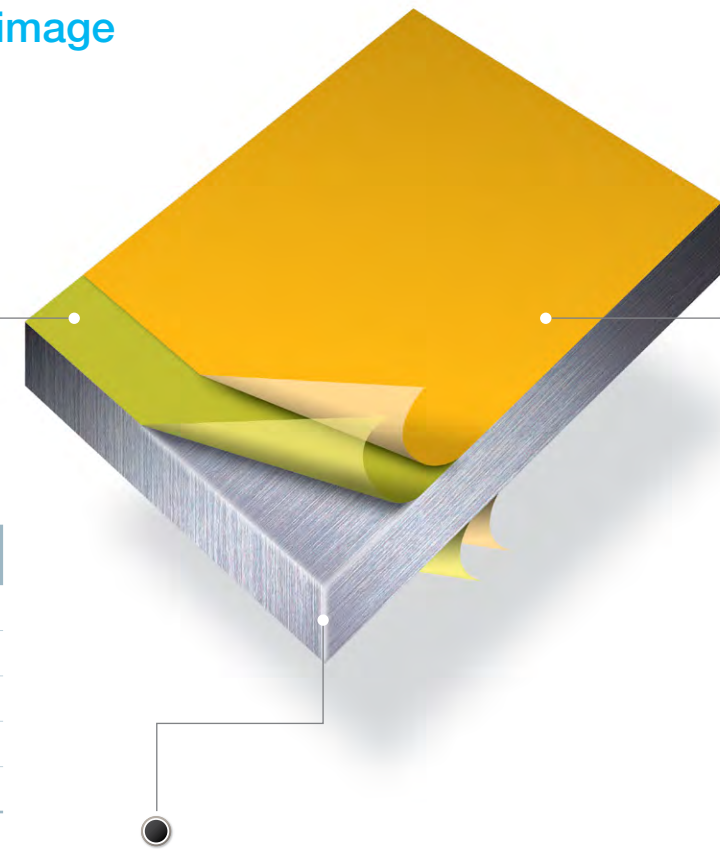
The alloy plating process used for GLX is the best technology available for all mass produced hot dipped steel plates worldwide and is patented in Australia, China, Taiwan and Korea in recognition of its uniqueness.



Schematic image

GLX Coated Layer

Al-Zn-Mg Alloy Coating	Coating Thickness
90g/m ²	24μm
100g/m ²	26μm
120g/m ²	32μm
150g/m ²	40μm
200g/m ²	52μm



Post-processing

- Chromate
- Inorganic Cr-Free resin (NT)
- Organic Cr-Free Resin (NB, E5)
- Oil ring
- Anti-finger printed
- Colored resin (Blue, Yellow or Red)
- Lubrication resin

Steel Substrate Spec

Thickness	0.23 ~ 2.5mm
Width	600 ~ 1,600mm
Length	600 ~ 5,000mm
Materials	CQ, LFQ, DQ, DDQ, EDDQ, Gr-A,B,C,D,E

Production Spec

Production Capacity	920,000ton / Year
Unit Weight	35ton MAX
Coil Inner Diameter	508 / 610mm
Coil Outer Diameter	2,300mm MAX



Certifications



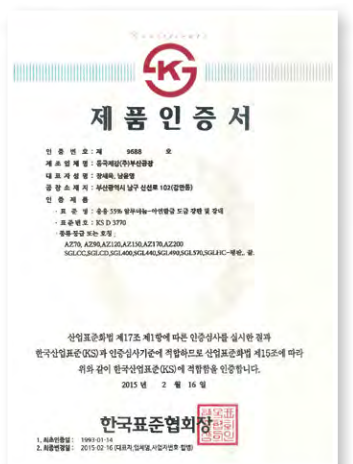
Korean Patent



Australian Patent



Taiwanese Patent



KS Certificate

55%

Aluminum

43.4%

Zinc / Magnesium

1.6%

Silicone

Corrosion Resistance

Because of alloyed magnesium and aluminum, GLX stabilizes the self-sacrificial corrosion of zinc even not only the coated surface but also the scratched and cut parts caused by bending process or installation on site. It offers outstanding corrosion resistance.

Heat Resistance

GLX offers outstanding heat resistance. Such characteristic is attributed from the high aluminum content (80% of surface volume) in the coated layer and makes it ideal for the application such as automobile muffler or electric oven which are exposed to high temperature for a long time.

Heat Reflexibility

GLX offers more than twice heat reflexibility than conventional galvanized steel sheets. As such, it can be used as the roof or wall material without being coated to save the energy for cooling or heating. It can be broadly applied for the country houses, warehouse and livestock housing.

Coatability

GLX offers outstanding cohesion between the coated layer and paint and thus does not require additional preprocessing for coating. As such, it shows superior performance compared to conventional GI and EGI steel sheets to be used as the base plate of coated hot dip steel plat such as LUXTEEL used in building interior and exterior.

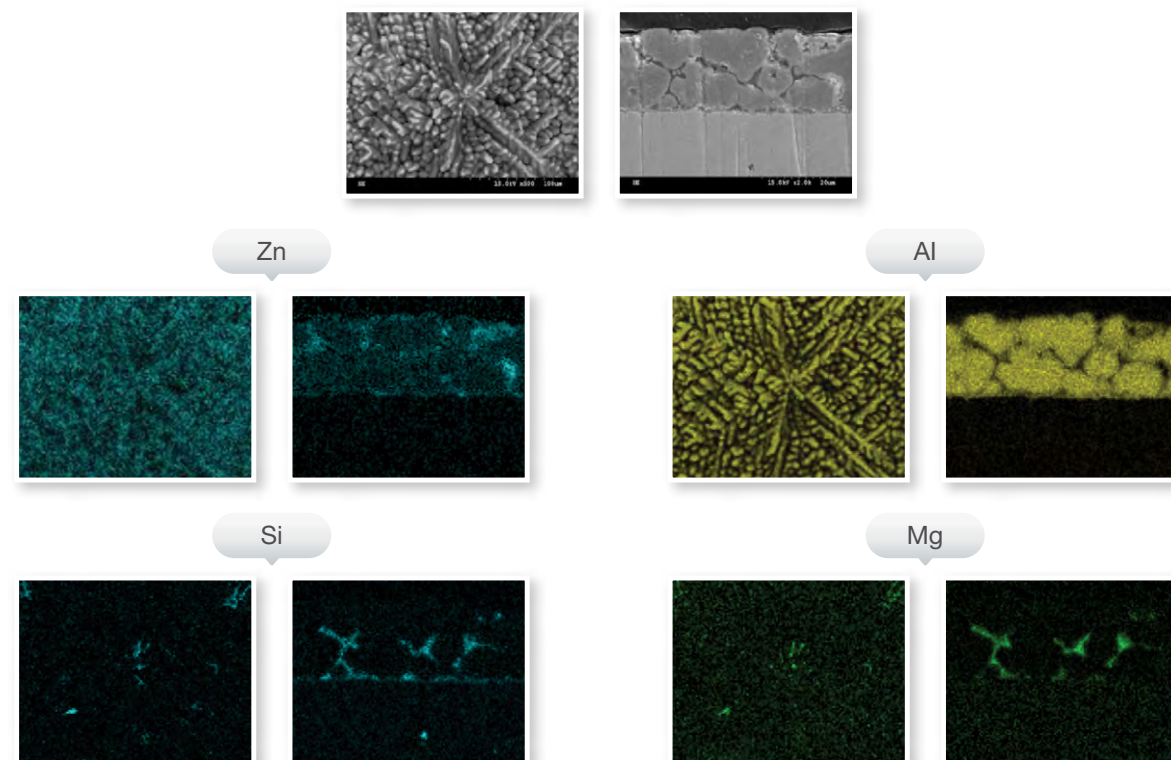


GLX Coated Layer Formation and Corrosion Resistance Improvement

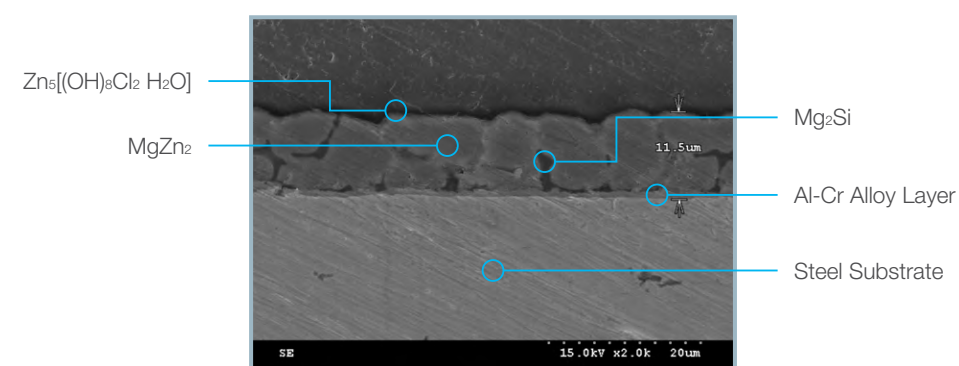
The coated layer containing magnesium promotes generation of Simonkolleite ($\text{Zn}_5(\text{OH})_6\text{Cl}_2 \cdot \text{H}_2\text{O}$) which stabilizes the self-sacrificial reaction of zinc. The thin layer of Simonkolleite formed on the coated surface significantly delays corrosion of aluminum and zinc alloy coated layer.

The Al-Cr metallic compound is formed on the interface between the material and magnesium alloy plated layer and the MgZn_2 - Mg_2Si metallic compound, which is the corrosion resistance improving element, is mixed to show outstanding corrosion resistant property.

Image



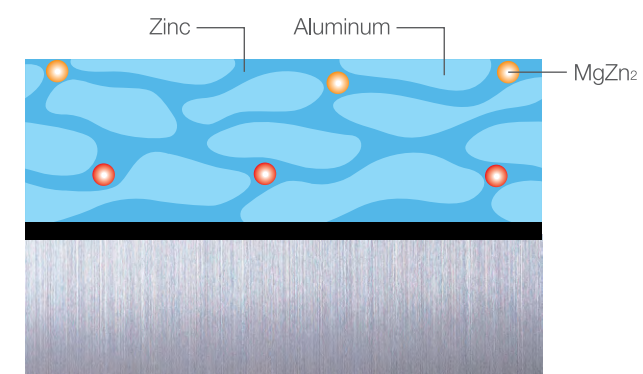
Cross Section



Self-sealing Activate Mechanism

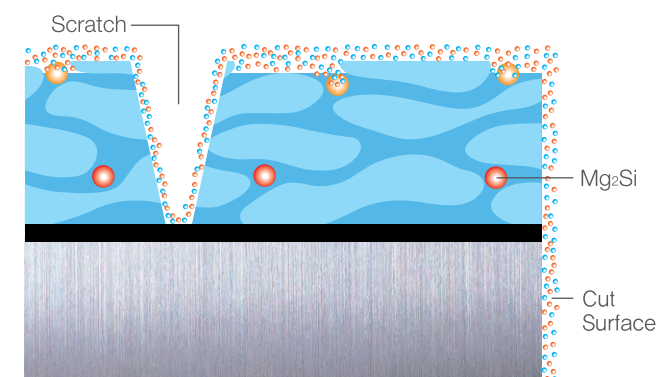
How does GLX prevents the steel substrate

on the cross section and scratched part?



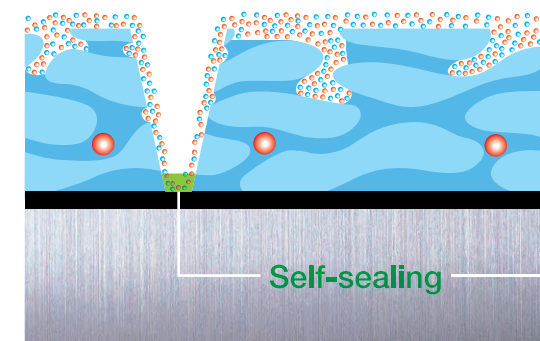
1

The whole plated layer effectively protects the steel substrate and prevents corrosion. As the GLX is installed outside and the corrosion begins in the nature, the magnesium-zinc alloy (MgZn_2) reacts the first.



2

When the steel substrate is exposed to the cut surface or scratched part, the self-sacrificial corrosion of zinc is accelerated by reaction of MgZn_2 and the oxidized zinc film is formed on the exposed area. Mg_2Si is positioned between the plated crystals and has the role of additional protective layer to prevent corrosion of steel substrate.



3














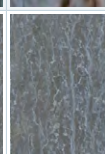




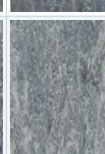




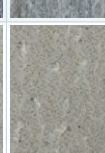
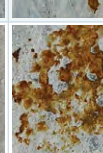
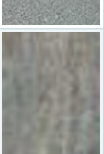

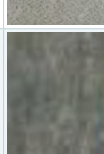




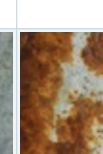
The aluminum layer remains and protects the steel sheet from external environment while the zinc in the plated layer is consumed by self-sacrificial corrosion. Such dual reactions of zinc and aluminum protect the steel substrate most effectively under the severe environment.



Comparison of Corrosion Resistance with Hot dipped Galvanized Iron

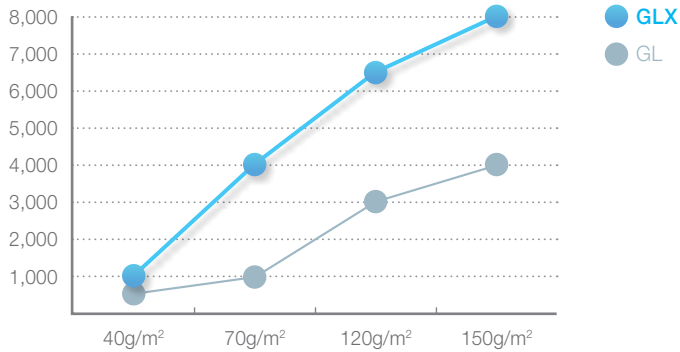
Flat Part Corrosion Test

※ ASTM B117-73 Test

Type	Plated Deposition	Post-processing	500	1,000	1,500	2,500	5,000	6,000	7,000	8,000
GI	120	Chromate								
GI	120	Organic Cr-Free Resin								
SuperDyma	180	Chromate								
ZAM	180	Inorganic Cr-Free Resin(NT)								
GL	180	Organic Cr-Free Resin(E5)								
GLX	150	None								














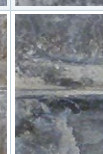











GLX offers the best performance in terms of corrosion resistance on flat part among all hot dipped steels. As shown by the test result, GLX offers more than 60% higher performance than ZAM and SuperDyma which is the high corrosion resistant alloy plated steel sheets.

Corrosion Resistance According to Amount of GLX Coating






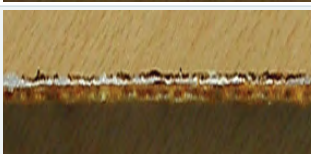

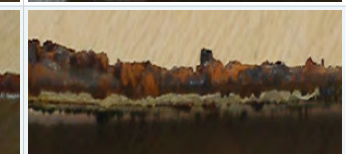
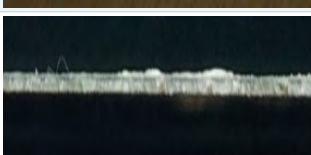
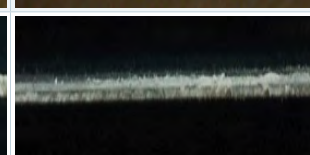
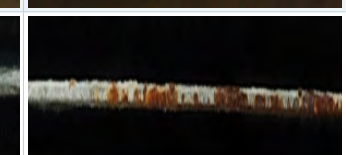
Bending Part Corrosion Test

※ Thickness: 0T

Type	Plated Deposition	Post-processing	500	1,000	1,500	2,500	5,000	7,000
SuperDyma	180	Chromate						
ZAM	180	Inorganic Cr-Free Resin(NT)						
GI	120	Organic Cr-Free Resin						
GL	180	Organic Cr-Free Resin(E5)						
GLX	150	None						

Cross Section Corrosion Test

※ Thickness: 0.8mm

Type	Plated Deposition	Post-processing	1,500	2,500	5,000
GI	120	Organic Cr-Free Resin			
GL	180	Organic Cr-Free Resin(E5)			
GLX	150	None			



Color Coating Test

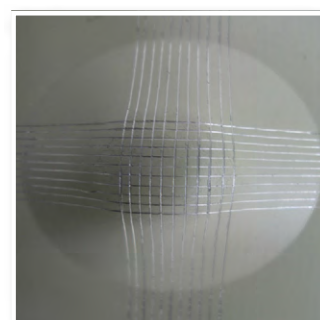
Machinability Test : Checking of crack after 180° bending

Type	Before	After (Tape Off)
CQ 0.5mm GLX-COLOR		
0T		
1T		
2T		
3T		

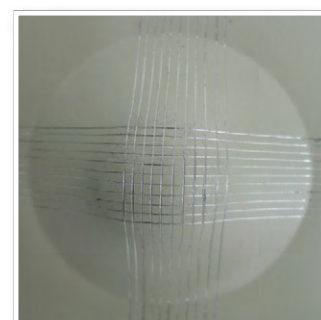
※ Bending evaluation : No crack generated / Tape Off evaluation : No color tape off generated

Coating Adhesion Test (C.E.T)

- Evaluation : Erichsen Test**
- Evaluated lines : 11×11 lines (1mm interval)
 - Erichsen Test (Cup height : 6mm)
- Evaluation result : Satisfactory**
- Erichsen Test / Tape Off Test
 - No color tape off







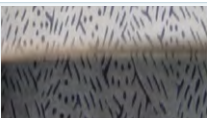
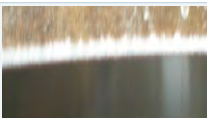
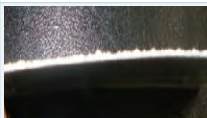





Before



After (Tape Off)

X - Cut Blister TEST

Type	Start	100hr	200hr	300hr	400hr	500hr
X-Cut						
CUT EDGE SIDE						
RESULT	<ul style="list-style-type: none"> ■ SALT SPRAY TEST [5% NaCl Fog, 35℃ / 500hrs] ■ X-Cut : 2mm No Blister - GOOD ■ Cut Edge : No Blister - GOOD 					



Heat Resistance

The heat resistance of GLX is **must better than the zinc plated steel sheet** and similar to Al plated sheet.

- Zinc plated steel sheet : The recommended operating temperature is 230℃ or less, and discoloration is generated when it is used at 250℃ or higher.
- **GLX** : No discoloration is expected when used at 315℃ for a long period. Up to 370℃ is supported when it is used intermittently.



Heat Reflexibility

The heat reflexivity of GLX is **more than twice the zinc plated steel sheet and can save energy** when used as the roof material or wall material without coating.

Heat Transmission

Plated Steel Sheet	Heat Transmission
AL-Coat	40
Zinc Plated Steel Sheet	120
Asbestos Cement	150
GLX	65





Size Tolerances

Thickness Tolerances

Thickness	Width				
	W < 630	630 ≤ W < 1,000	1,000 ≤ W < 1,250	1,250 ≤ W < 1,600	1,600 ≤ W
T < 0.25	± 0.04	± 0.04	± 0.04	-	-
0.25 ≤ T < 0.40	± 0.05	± 0.05	± 0.05	± 0.06	-
0.40 ≤ T < 0.60	± 0.06	± 0.06	± 0.06	± 0.07	± 0.08
0.60 ≤ T < 0.80	± 0.07	± 0.07	± 0.07	± 0.07	± 0.08
0.80 ≤ T < 1.00	± 0.07	± 0.07	± 0.08	± 0.09	± 0.10
1.00 ≤ T < 1.25	± 0.08	± 0.08	± 0.09	± 0.10	± 0.12
1.25 ≤ T < 1.60	± 0.09	± 0.10	± 0.11	± 0.12	± 0.14
1.60 ≤ T < 2.00	± 0.11	± 0.12	± 0.13	± 0.14	± 0.16
2.00 ≤ T < 2.50	± 0.13	± 0.14	± 0.15	± 0.16	± 0.18
2.50 ≤ T < 3.15	± 0.15	± 0.16	± 0.17	± 0.18	± 0.21
3.15 ≤ T	± 0.17	± 0.18	± 0.20	± 0.21	-

Width Tolerances

Using cold rolled base plate	
W ≤ 1,500	W > 1,500
0, +7	0, +10

Length Tolerances

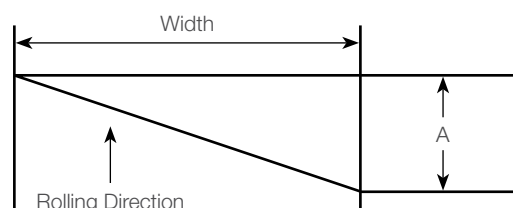
Using cold rolled base plate
0, +10

Shape Tolerances

- Linearity

Width	Type	Wave	Edge Wave	Center Wave
W < 1,000		12 or less	8 or less	6 or less
1,000 ≤ W < 1,250		15 or less	10 or less	8 or less
W ≥ 1,250		15 or less	12 or less	9 or less

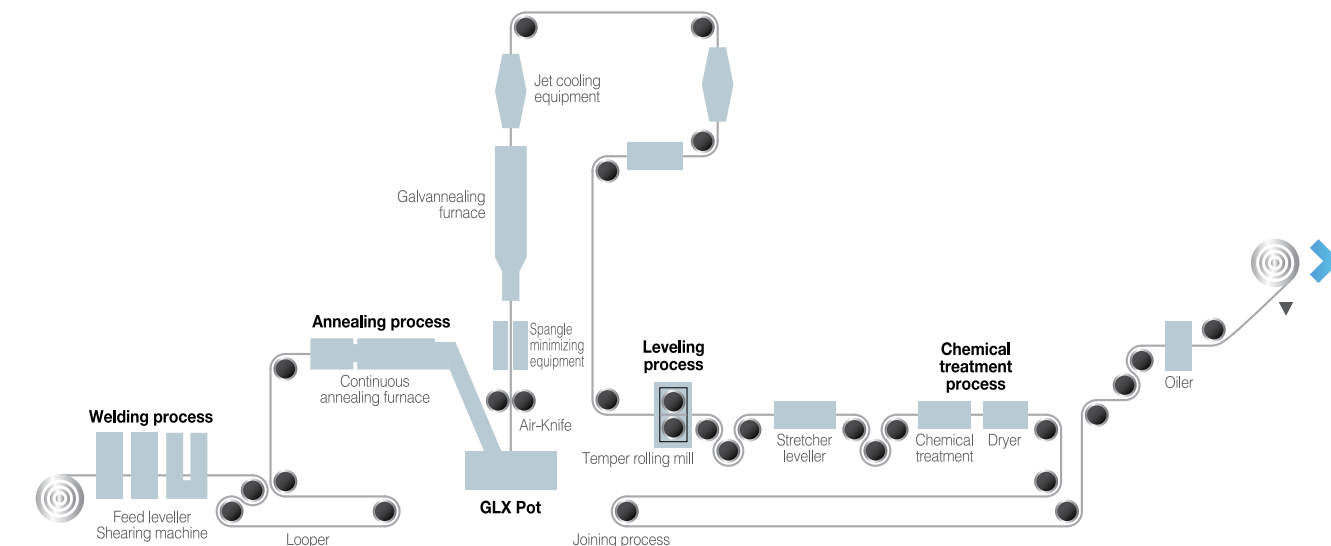
- Squareness



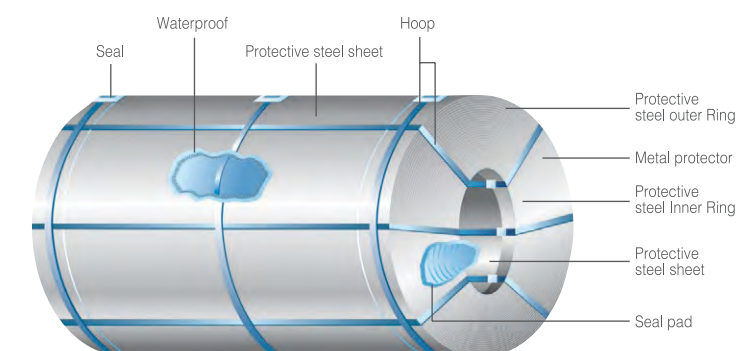
The squareness is expressed as $A/W \times 100(\%)$. It should not exceed 1%.



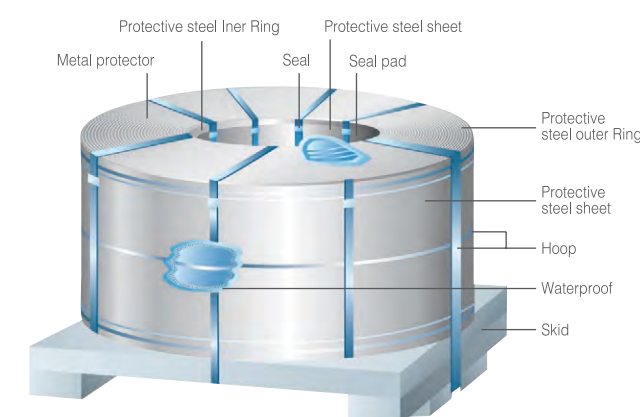
GLX Production Process



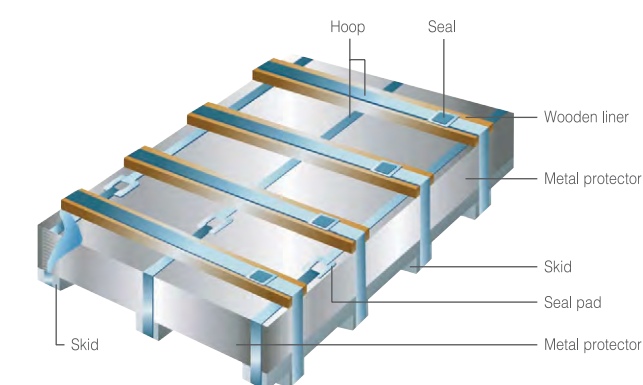
Packaging



• Horizontal Type •



• Vertical Type •



• Sheet •