

www.bn-steela.com

**Pre-coated metal
PVC film laminated metal**

Bⁿ STEELA

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Bⁿ STEELA

Table of Contents

03	Vision
04	CEO Vision
06	Production capacity
08	Manufacturing process
12	Section of products
14	products :
14	PCM (Pre-coated metal)
20	VCM (PVC Laminated metal)
24	Packing
26	Precautions for handling and use
28	Scope of manufacturing
29	Address & Overseas network
30	Epilogue



VISION

**Customer-oriented
company equipped for
global competition**

“With continued creativity
we are ready to become
the leading company using
flexible counter-measurement”



CEO Vision

BN STEELA IS SPECIALIZED IN SUPPLYING A WIDE RANGE OF VINYL FILM LAMINATED STEEL IN NUMEROUS PATTERNS AND COLORS FOR HOME APPLIANCES, CONSTRUCTION AND SHIPBUILDING MATERIALS, ETC.

With our vast experience and advanced technology in the field of producing PVC film laminated metal since 1989, we continue to diversify the use of steel in creating new and high quality goods based on our customer's demands. We are also focusing on R&D investment creating new and high value applications for steel products through.

In addition, various top-quality paint coated metal sheets are available from our newly expanded production line with 4-coating and 3-baking continuous coating systems.

With continued creativity and flexible counter-measurement, BN STEELA, as a global leader in the metal sheets industry, is dedicated to developing high quality products for our customers and ensuring their timely delivery through expanding production facilities.

CEO _ Dong-Oh Lee

BN STEELA PRODUCTION CAPACITY

Asan Factory - PCM(Paint Coated Metal)

- 01** Production capacity : 80,000M / T per year
Base metal : Cold-Rolled Steel / Galvanized Steel / Electrolytic-Galvanized Steel / Galvalume Steel / Aluminum
Products range : Thickness 0.3~1.2mm / Width 500~1285mm / Length 350~5,000mm



Noksan Factory - VCM(Vinyl Coated Metal)

- 02** Production capacity : 60,000M/T per year
Base metal : Cold-Rolled Steel / Galvanized Steel / Electrolytic-Galvanized Steel / Galvalume Steel
Products range : Thickness 0.4~1.2mm / Width 400~1,350mm / Length 300~5,000mm
- 03** Production capacity : 80,000M/T per year
Base metal : Cold-Rolled Steel / Galvanized Steel / Electrolytic-Galvanized Steel / Galvalume Steel / Aluminum
Products range : Thickness 0.3~1.2mm / Width 400~1,500mm / Length 600~4,500mm





PRODUCT FEATURES MANUFACTURING PROCESS



Durability

Produced in the latest 4-coating, 3-baking system, these items have excellent resistance to corrosion and weather.

Excellent Workability and Beautiful Color

The "roll coating system" provides uniform coating thickness and extra-smooth surfaces, and products are available in a wide range of colors. Our facilities are equipped with the continuous "clear layer" coating system to provide high gloss and improved resistance to corrosion and weather exposure.

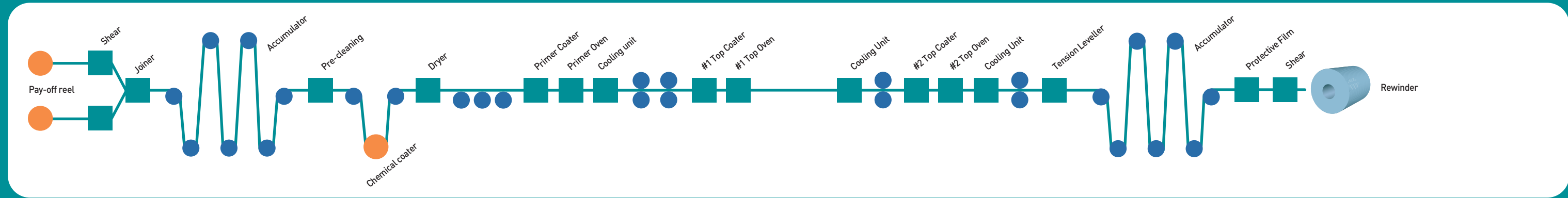
Workability

Through pre-processing and coating techniques, we ensure that paint adheres firmly to the base metal and does not peel off during roll forming, bending or any other processing.

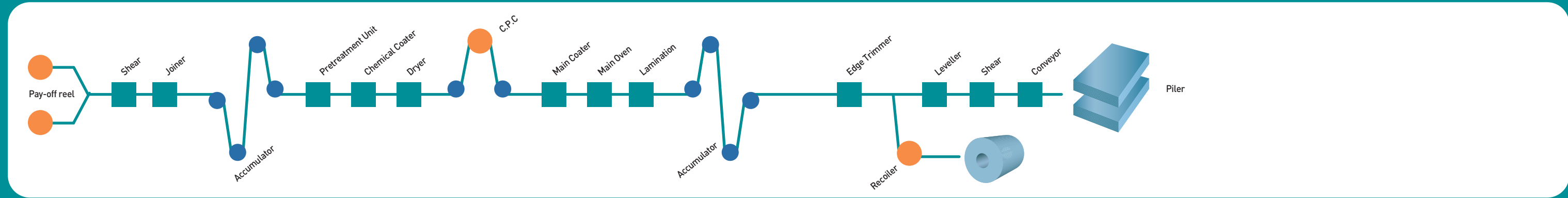
Base Metals

Customers have a wide range of choices to better satisfy individual needs. We produce PCM using various base metals such as cold-rolled steel, hot-dipped galvanized steel, electrolytic galvanized steel and aluminum-zinc alloy coated steel.

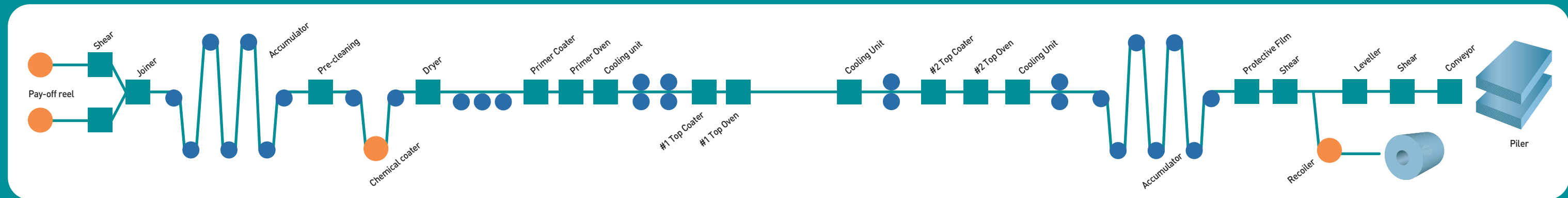
Asan Factory
PCM (Paint Coated Metal)



Noksan Factory
VCM (Vinyl Coated Metal)



Noksan Factory
PCM (Paint Coated Metal)

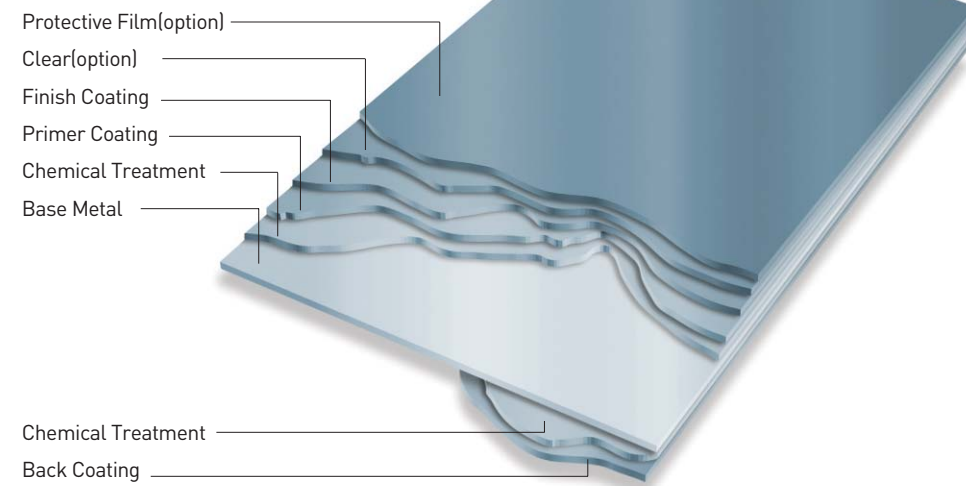


SECTION OF PRODUCTS

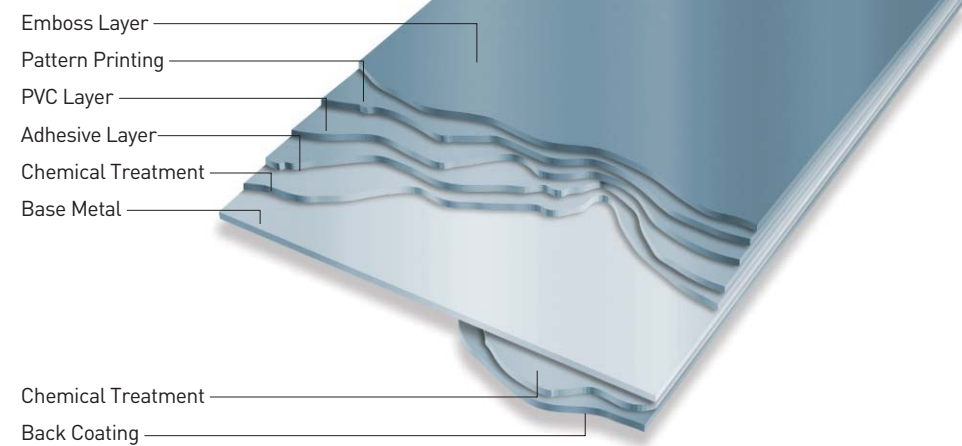
We are manufactures to produce various high-quality Pre-painted Metal and PVC, PVF, PET/PVC laminated steel using a state of the art system.



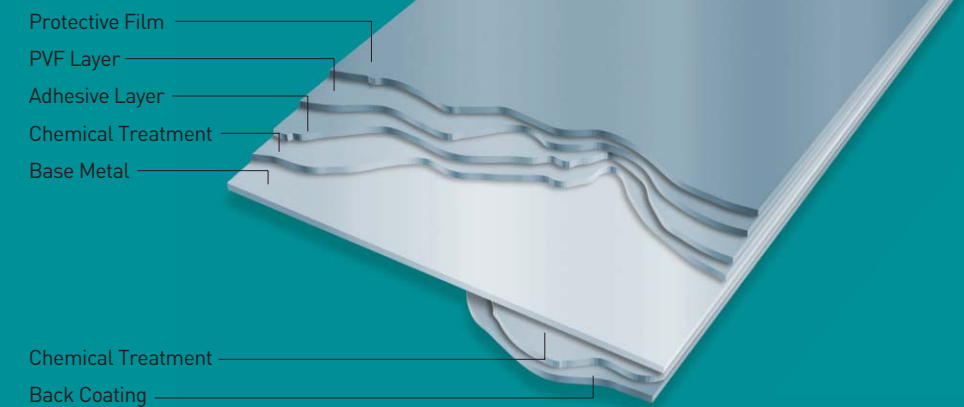
Pre-coated Steel



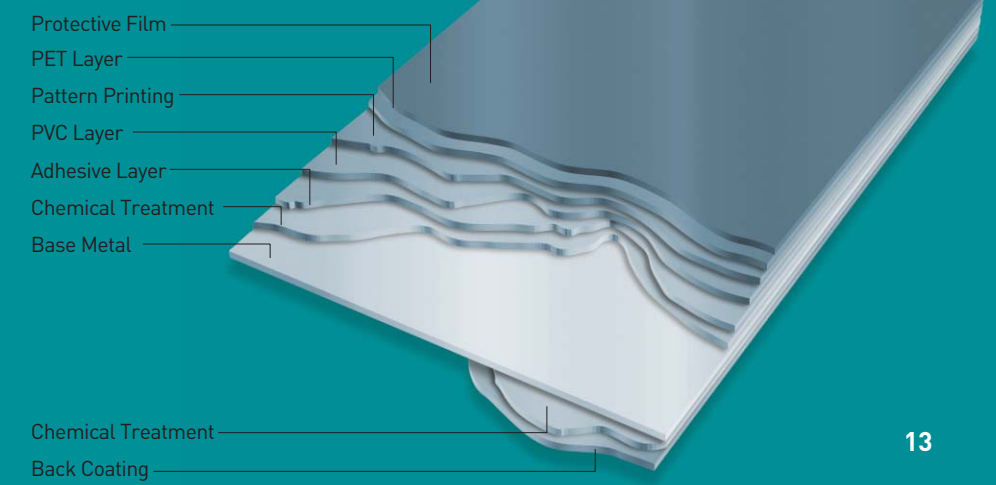
PVC Laminated Steel



PVF Laminated Steel



PET/PVC Laminated Steel



PRODUCTS: PCM (PRE-COATED METAL)

Our products include the widely used Regular Modified Polyester(RMP) coated steel, High Durability Polyester coated steel with excellent weather resistance, High Polymer Polyester coated steel with excellent workability and fine surface for use in home appliances, Textured High Polymer Polyester coated steel with a textured surface and Printed steel available in various patterns and beautiful colors.



TECHNICAL SPECIFICATIONS TEST METHOD & RESULTS-PCM

Test Item	Test Methods	Test Result					Related Specification
		RMP	HDP	HPP	THP	PRINT	
Gloss	60° gloss meter	5-110%	5-110%	5-110%	5-30%	80-110%	(option)
Pencil hardness test	Scratched Mitsubishi uni-pencil harder than "H"	H Good	2H Good	F-H Good	2H Good	H Good	KS D 3520
Cross cut erichsen test	100 grids of 1mm x 1mm by knife and pushed up by 6mm with Erichsen tester	Good	Good	Good	Good	Good	KS B 0812, KS M 3343
Cross cut test	Leave 1 hour after boiling test, 100 grids of 1mm x 1mm by knife	Good	Good	Good	Good	Good	
Impact test	Drop steel ball of 1000gr weight and 12.7mm diameter at 500mm height	No crack	No crack	No crack	No crack	No crack	KS D 3520
Bending test	Completely folded, wrapping Mendril bar of diameter equivalent to 2 layers of test sample	1-2T No crack	2T No crack	0-1T No crack	0T No crack	1-2T No crack	KS D 3520, KS M 3343
Salt spray test	Sprayed with 5% salt water at 35°C	500Hrs	500Hrs	500Hrs	500Hrs	500Hrs	KS D 9502, ASTM B 117
Weathering test	Over 1000 hours with Weather-O-Meter	500Hrs Good	1000Hrs Good	500Hrs Good	500Hrs Good	1000Hrs Good	JIS Z 0230
Resistance to acid test	Spot 5% HCl(of H2SO4) and leave 24 hours	24Hrs Good	24Hrs Good	48Hrs Good	48Hrs Good	24Hrs Good	KS M 3343, PCTM 61310
Resistance to alkali test	Spot 5% NaOH and leave 24 hours	24Hrs Good	24Hrs Good	48Hrs Good	48Hrs Good	24Hrs Good	KS M 3343, PCTM 61310
Resistance to solvent test	Rubbed by gauze soaked in M.E.K until the base metal exposed	50times Good	100times Good	100times Good	50times Good	50times Good	
Resistance to boiling test	Dipped in boiled water for 1 hours			No change	No change	No change	
Ultraviolet rays test	Exposed at 100V/10W ultraviolet rays lamp from 150mm distance for 6 hours			No change	No change	No change	



PRODUCTS:
PCM



Regular Modified Polyester Coated Steel

01 Characteristics

- Corrosion resistance, Weather resistance, Chemical resistance, Workability

02 Main Applications

- Factory walls and roofs, Warehouse, Pre-fabricated house, Interior, Partition, Door, Air-dryer, Show case etc.
- Other electric home appliances

03 Dry Film Thickness

- Top side : Primer 5 μ m / Finish 10-15 μ m / Clear 5-10 μ m (option)
- Back side : Wash 5 μ m

04 Test Results

- 1) Bending test : 1T(without clear), 2T(with clear)
- 2) Pencil hardness test : over "H"(uni-pencil/500gr weight)
- 3) Impact test : good(dropped 1000gr/500mm)
- 4) Gloss : 5-110%(60° gloss meter), (option)
- 5) Solvent resistance : good (M.E.K test, 50times)
- 6) Salt spray test : #6 blister less than 5% for 500Hr and creeping below 3mm
- 7) Resistance to chemicals : good(for 24Hr with 5% NaOH and 5% HCl of H2SO4)

High Durability Polyester Coated Steel

01 Characteristics

- Super corrosion resistance, Super weather resistance, Heat resistance

02 Main Applications

- Roof and wall of factory, Partition, Door etc.

03 Dry Film Thickness

- Top side : Primer 5 μ m / Finish 10-15 μ m / Clear 5-10 μ m (option)
- Back side : Wash 5 μ m

04 Test Results

- 1) Bending test : 2T
- 2) Pencil hardness test : above 2H(uni-pencil/500gr weight)
- 3) Impact test : good(dropped 1000gr/500mm)
- 4) Gloss :5-110%(60° gloss meter)
- 5) Solvent resistance : good(M.E.K test, 100times)
- 6) Salt spray test : #6 blister less than 5% for 500Hr and creeping below 3mm
- 7) Resistance to chemicals : good(for 24Hr with 5% NaOH and 5% HCl or H2SO4)

High Polymer Polyester Coated Steel

- 01** Characteristics
- Excellent workability, Excellent corrosion resistance, High gloss, Wide choice of color
- 02** Main Applications
- Refrigerator, Washing machine, Microwave oven, Air conditioner, Audio, Other electric home appliances, Door, Panel and Interior etc.
- 03** Dry Film Thickness
- Top side : Primer $5\mu\text{m}$ / Finish 15-20 $15\mu\text{m}$ / Clear 5-10 μm , (option)
 - Back side : Wash $5\mu\text{m}$
- 04** Test Results
- 1) Bending test : 0T(without clear), 1T(with clear)
 - 2) Pencil hardness test : F~H(uni-pencil/500gr weight)
 - 3) Impact test : good(dropped 1000gr/500mm)
 - 4) Gloss : 90-110%(60° gloss meter), (option)
 - 5) Solvent resistance : good(M.E.K test,100times)
 - 6) Salt spray test : #6 blister less than 5% for 500Hr and creeping below 2mm
 - 7) Resistance to chemicals : good(for 48Hr with 5% NaOH and 5% HCl or H2SO4)

Textured High Polymer Polyester Coated Steel

- 01** Characteristics
- Soft appearance, Excellent workability, Rubbing resistance
- 02** Main Applications
- Audio, VTR, Computer case etc.
 - Partition and steel furniture for offices
- 03** Dry Film Thickness
- Top side : Primer $5\mu\text{m}$ / Finish 20~25 μm
 - Back side : Wash $5\mu\text{m}$
- 04** Test Results
- 1) Bending test : 0T
 - 2) Pencil hardness test : above 2H(uni-pencil/500gr weight)
 - 3) Impact test : good(dropped 1000gr/500mm)
 - 4) Gloss : 5-30%(60° gloss meter)
 - 5) Solvent resistance : good(M.E.K test,50times)
 - 6) Salt spray test : #6 blister less than 5% for 500Hr and creeping below 2mm
 - 7) Resistance to chemicals : good(for 48Hr with 5% NaOH and 5% HCl or H2SO4)

PRODUCTS: PCM

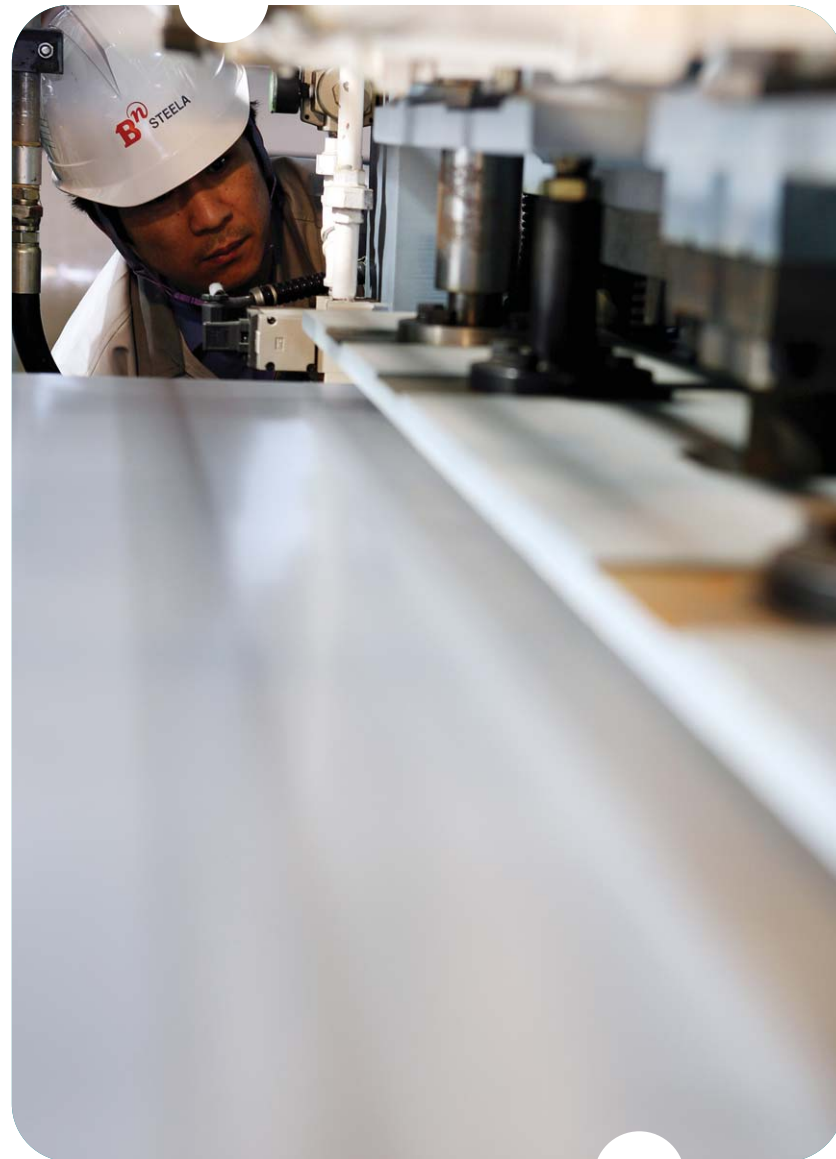


Printed Steel

- 01** Characteristics
- Choice of patterns and color, Excellent workability, Weather resistance
- 02** Main Applications
- Refrigerator, Washing machine, Microwave oven, Air conditioner, Audio, Other electric home appliances
 - Door, Panel and Interior etc.
- 03** Dry Film Thickness
- Top side : Primer(Polyester) $5\mu\text{m}$ / Finish(Polyester) $15\mu\text{m}$ / Print(ink) $1-3\mu\text{m}$ / Clear(Polyester or Acryl) $5-10\mu\text{m}$
 - Back side : Wash $5\mu\text{m}$
- 04** Test Results
- 1) Bending test : 0T(without clear), 1T(with clear)
 - 2) Pencil hardness test : F~H(uni-pencil/500gr weight)
 - 3) Impact test : good(dropped 1000gr/500mm)
 - 4) Gloss : 90-110%(60° gloss meter), (option)
 - 5) Solvent resistance : good(M.E.K test,100times)
 - 6) Salt spray test : #6 blister less than 5% for 500Hr and creeping below 2mm
 - 7) Resistance to chemicals : good(for 48Hr with 5% NaOH and 5% HCl or H2SO4)

PRODUCTS: VCM (PVC LAMINATED METAL)

We also enjoy a fine reputation as a manufacturer of PET/PVC, PVF and PVC laminated steel using high-valued applications.



TECHNICAL SPECIFICATIONS TEST METHOD & RESULTS-VCM

Test Item	Test Methods	Test Result			Related Specification
		PET/PVC Laminated Steel	PVC Laminated Steel	PVF Laminated Steel	
Erichsen Test	Cross cutting 5mm interval pushing by 8mm in depth in Erichsen tester	No Peeling	No Peeling	No Peeling	KS B 0812, KS M 3343
Impact Test	Drop 500g & 1/2 inch Dupont diameter steel ball from 500mm height three time	No Peeling, No Crack	No Peeling, No Crack	No Peeling, No Crack	KS D 3520
Bending Test	180° 1T Bending at 20°C(EGI, GI), 180° 0T Bending at 20°C(CR)	No Peeling, No Crack	No Peeling, No Crack	No Peeling, No Crack	KS D 3520, KS M 3343
Pencil Hardness Test	Using Mitsubishi Uni pencil, checking pencil trace mark when mark down at 45° direction with 500g	Over HB grade		H-2H	KS D 3520
Salt spray test (Flat surface)*	Spray with 5% salt water at 35°C	No change of surface (CR:240 Hrs, EGI:360Hrs)	No change of surface (CR:240 Hrs, EGI:360Hrs)	No change of surface (GI:1000Hrs)	KS D 9502
Salt spray test (Cross cut)*	Cross cut with razor blade till it slightly touches base metal and then test as same as above	No rust (CR:90 Hrs, EGI:240Hrs)	No rust (CR:90 Hrs, EGI:240Hrs)	No rust (GI:1000Hrs)	KS D 9502
Resistance to alkali test*	20±5°C x 5% NaOH x 72 Hrs	No change of surface	No change of surface	No change of surface	KS M 3343
Resistance to acid test*	20±5°C x 5% CH3COOH x 72 Hrs	No change of surface	No change of surface	No change of surface	
Resistance of boiling water	95°C water x 2Hrs and leave it for 1hr & crosscut base on	No rust, peeling, crack and blister	No rust, peeling, crack and blister	No rust, peeling, crack and blister	
Pollution resistance test	Leave coffee, olive oil for 24Hrs, and then erase with methyl alcohol			No change of surface	

* Remark : Test with *is to be done through sealing edges with hot melt resin

PET/PVC Laminated Steel

01 Characteristics

- Choice of patterns and color, Good workability, Excellent chemical resistance, Excellent abrasion and stain resistance, Excellent Hi-gloss surface

02 Main Applications

- Refrigerator, Washing machine, Air conditioner, Unit bathroom, Rice-box, Other electric home appliances

03 Dry Film Thickness

- Protective film : $50\pm 5\mu\text{m}$
- PET layer : $36\pm 5\mu\text{m}$
- PVC layer : $100\pm 10\mu\text{m}$
- Adhesive layer : $5\sim 7\mu\text{m}$
- Service coating : $5\sim 7\mu\text{m}$

04 Test Results

- 1) Erichsen test : No peeling(8mm Depth)
- 2) Impact test : No peeling(Dropped 500g/500mm)
- 3) Bending test : No peeling, No Crack(EGI:1T.CR:0T)
- 4) Pencil hardness test : over HB grade
- 5) Resistance of boiling water : No peeling(95°C x2 Hrs)

PVF Laminated Steel

01 Characteristics

- Long lasting color
- Excellent abrasion and pollution resistance
- Excellent workability
- Excellent inhalation ability
- More than 20 years guaranteed
- Excellent chemical resistance
- Moisture resistance
- Weather resistant against severe environments

02 Specification

- Base Metal : GI, AL or SUS steel sheet
- Film : TEDLAR PVF Film made by DUPONT in the U.S.A

03 Main Applications

- Roofing panel of factory, Gymnasium
- Wall panel of factory, building, station
- Sound proof wall

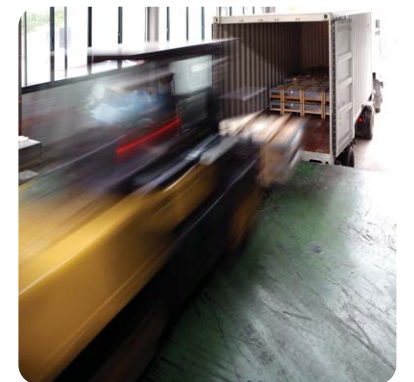
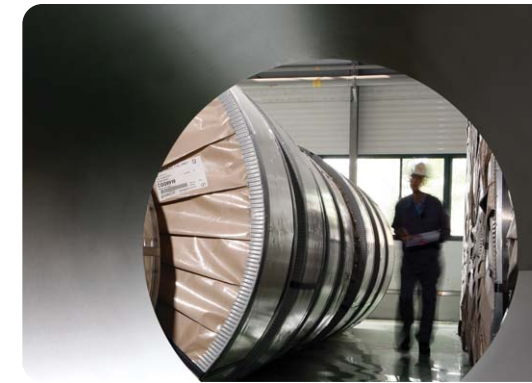
04 Dry Film Thickness

- Protective film : $60\pm 5\mu\text{m}$
- PVF layer : $36\pm 5\mu\text{m}$ / $30\pm 5\mu\text{m}$
- Adhesive layer : $5\sim 7\mu\text{m}$
- Service coating : $5\sim 7\mu\text{m}$

05 Test Results

- 1) Erichsen test : No peeling(8mm Depth)
- 2) Impact test : No peeling(Dropped 500g/500mm)
- 3) Bending test : No peeling, No Crack(GI:1T)
- 4) Resistance of boiling water : No peeling(95° 2 Hrs)
- 5) Pencil hardness test : H-2H
- 6) Resistance of pollution : No change of surface (Dropped coffee, Olive oil, Oil pen etc)

PRODUCTS: VCM



PVC Laminated Steel

01 Characteristics

- Choice of patterns and color
- Good workability
- Excellent scratch and stain resistance
- Excellent flame resistance(option)

02 Main Applications

- Audio, VTR, Microwave oven, Computer case, Freezer door, Partition and other interiors, Ship, Train, Bus, Other interior of industrial appliances

03 Dry Film Thickness

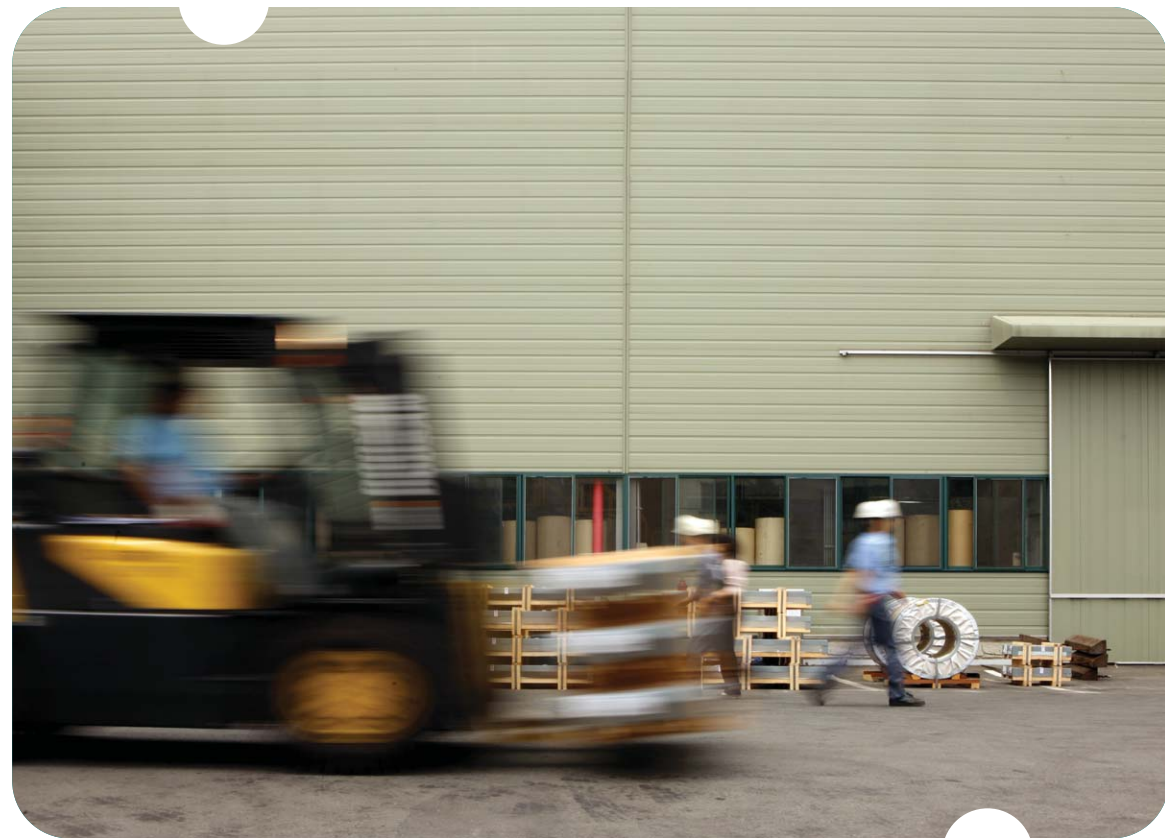
- PVC layer : $200\pm 50\mu\text{m}$
- Adhesive layer : $5\sim 7\mu\text{m}$
- Service coating : $5\sim 7\mu\text{m}$

04 Test Results

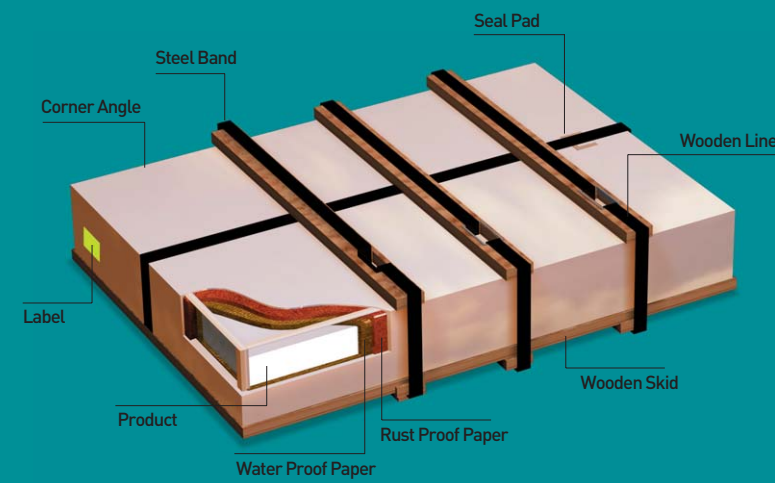
- 1) Erichsen test : No peeling(8mm Depth)
- 2) Impact test : No peeling(Dropped 500g/500mm)
- 3) Bending test : No peeling, No crack(EGI:1T.CR:0T)
- 4) Resistance of boiling water : No peeling(95°C x2 Hrs)

PACKING

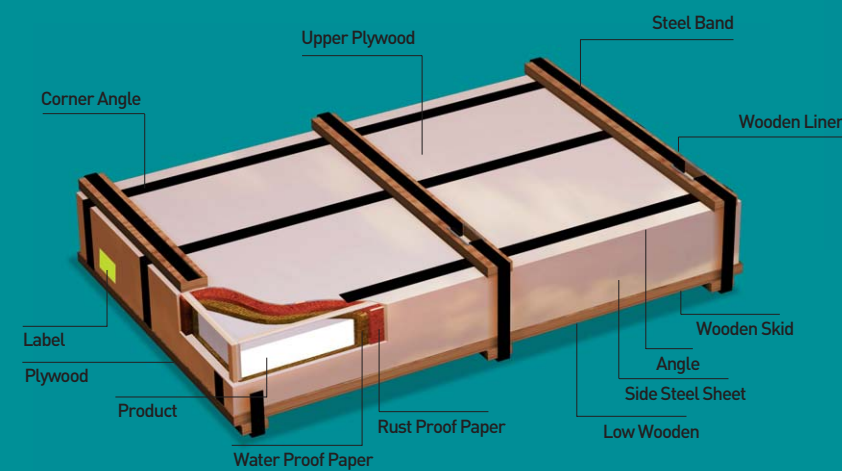
Our products are packaged to best prevent damage from percussion, moisture and seawater.



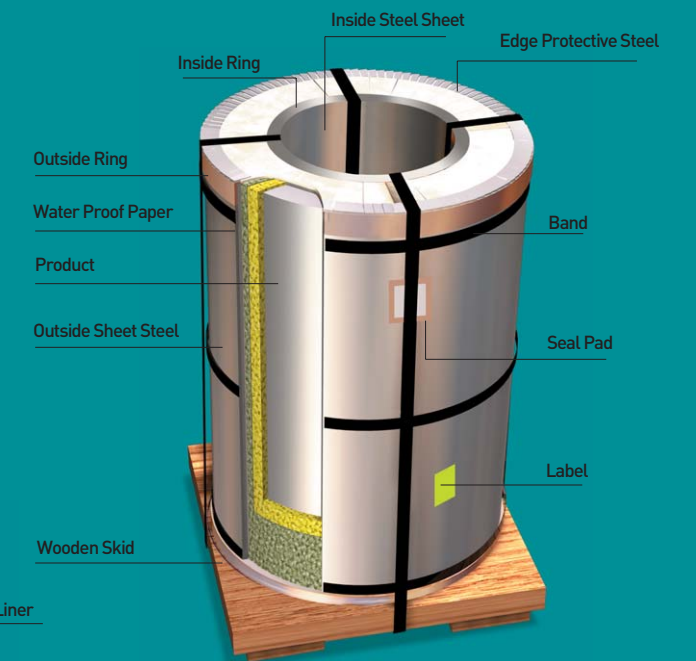
Sheet (Domestic)



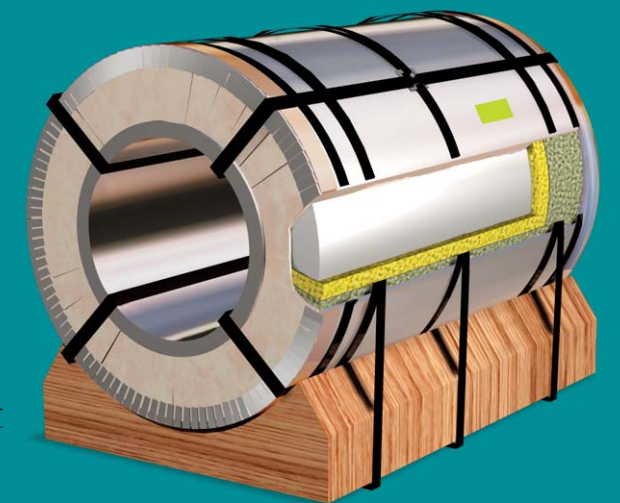
Sheet (Export)



Coil (Vertical)

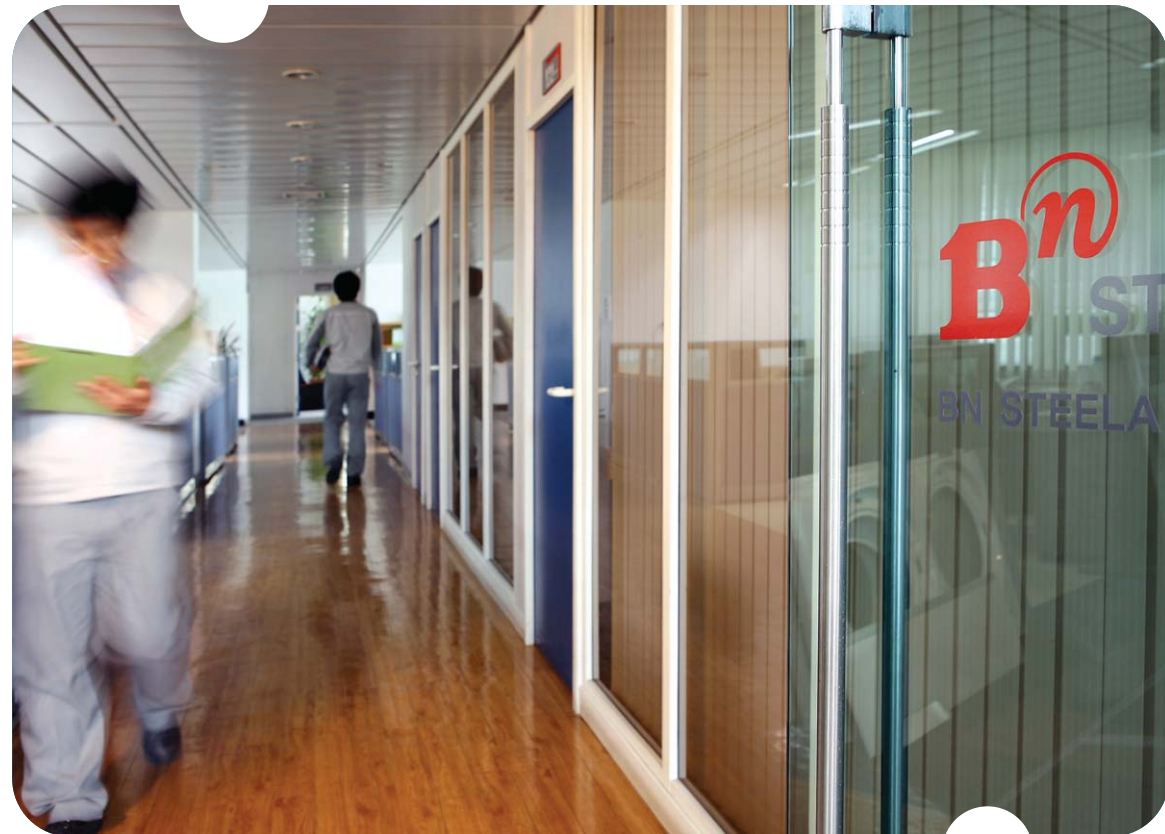


Coil (Horizontal)



PRECAUTIONS FOR HANDLING & USE

Vinyl coated metal(VCM) and Pre-coated metal(PCM) are sensitive, so all parties involved in PCM & VCM distribution and processing should pay special care to the following:



01 Transport

When lifting with cable, place protective pads under the sheets so that the cable does not come in direct contact with the sheets and damage the sheet edges. Even when packed, these products should be handled carefully to prevent impact with forklifts or other conveyance equipment. Also, all packages should be protected from moisture.

02 Storage

To prevent deformation, do not pile more than three packages of cut sheet on top of one another. Maintain a "first in, first out" stock control system to keep stock from remaining in the lower layers of a stack for an extended period of time.

03 Processing

Take care to keep cut edges and corners of the sheets from scratching the coated surface.

If lubrication is required during processing, use only specified types. To protect cut edges, use the following;

- a. Epoxy paint, wash primer, zinc-rich paint
- b. Plastic or steel cover

04 Washing

In order to remove dirt, use neutral detergent, soap, alcohol or benzene.

Do not use ketone or ester-based thinner.

05 Protective Film

Protective film can keep PCM & VCM surfaces from being damaged during transport, storage, or processing.

However, it may damage the coated surface if the surface is exposed to the sun for a long time.

SCOPE OF MANUFACTURING

Standard of Base Metal (VCM/PCM)

Item	Standard	POSCO	KS	JIS	ASTM
CR		CSP 1	SCP1(KSD 3512)	SPCC(JIS G 3141)	A 366
EGI		EGS 1	SECC(KSD 3528)	SECC(JIS G 3313)	A591-CQ
GI		CGCC	SGCC(KSD 3506)	SGCC(JIS G 3302)	A 526

Standard

	VCM	ASAN PCM	NOKSAN PCM
Thickness	0.4~1.2	0.3~1.2	0.3~1.2
Width	400~1350	500~1285	500~1500
Length	300~5000	350~5000	600~4500

Tensility

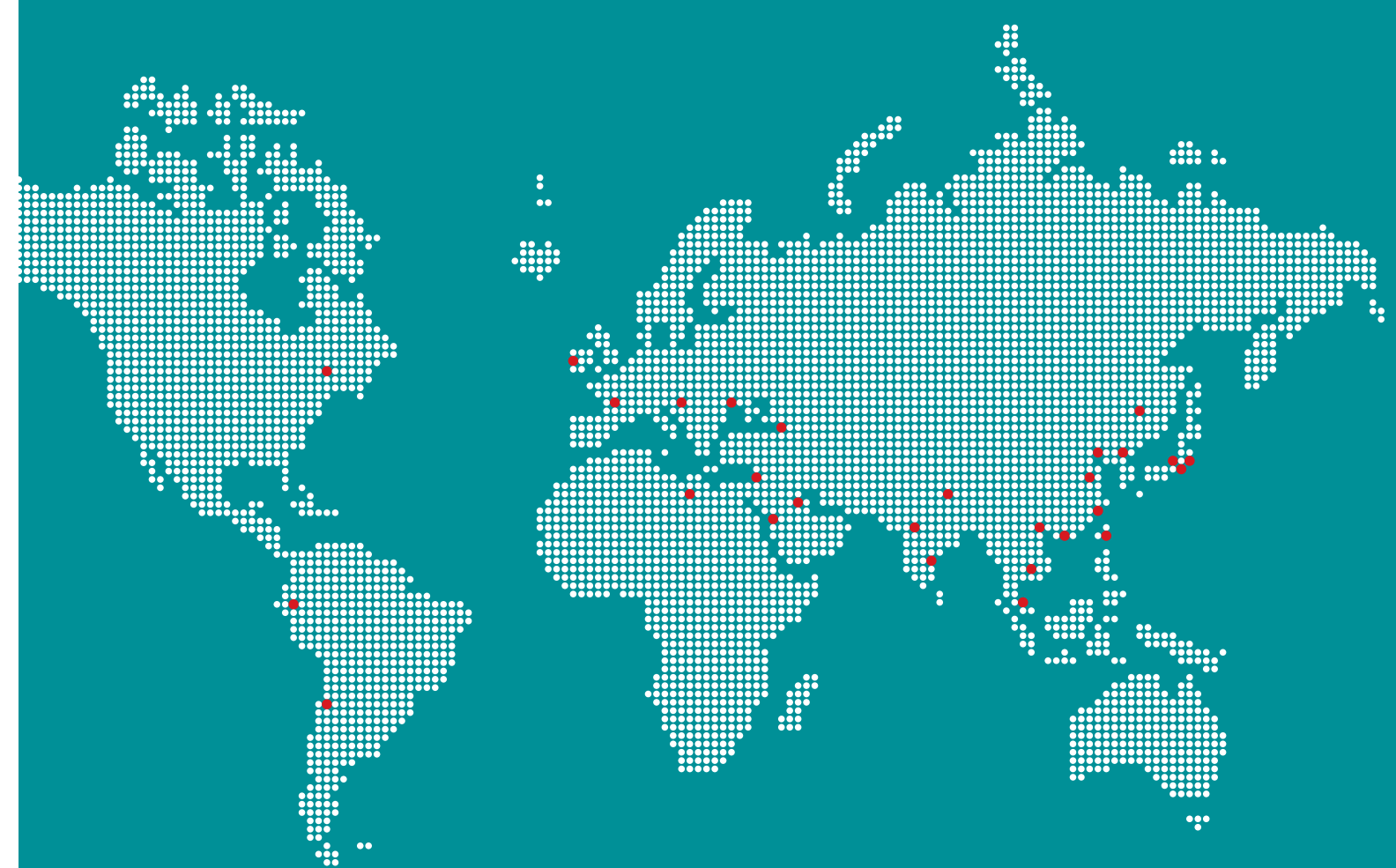
	Standard
Yield Point(Kg/mm ²)	Less than 36
Tensile Strength(Kg/mm ²)	Over 28
Elongation(%)	Over 30

• Tensility is applied to CR & EGI • Yield point is available subject to discussion

Dimensions

	Tolerance
Width	±0.5
Length	±0.5
Perpendicularity	±0.5

(units: mm)



Address & Overseas network

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Our ambition is to make for a better tomorrow

Your imagination is our guide

