With considerable support and encouragement from our customers, we have become a global manufacturer of highly versatile color metal sheet.
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 Vision

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

CE0 Dong-Oh Lee
**BN STEELA PRODUCTION CAPACITY**

**Asan Factory - PCM (Paint Coated Metal)**

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

**Noksan Factory - VCM (Vinyl Coated Metal)**

- **Production capacity:** 60,000 M/T per year
- **Base metal:** Cold-Rolled Steel / Galvanized Steel / Electrolytic-Galvanized Steel / Galvalume Steel
- **Product range:** Thickness 0.4~1.2mm / Width 400~1,350mm / Length 300~5,000mm

- **Production capacity:** 80,000 M/T per year
- **Base metal:** Cold-Rolled Steel / Galvanized Steel / Electrolytic-Galvanized Steel / Galvalume Steel / Aluminum
- **Product 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.
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
- Protective Film (option)
- Clear (option)
- Finish Coating
- Primer Coating
- Chemical Treatment
- Base Metal

Chemical Treatment
Back Coating

PVC Laminated Steel
- Emboss Layer
- Pattern Printing
- PVC Layer
- Adhesive Layer
- Chemical Treatment
- Base Metal

Chemical Treatment
Back Coating

PVF Laminated Steel
- Protective Film
- PVF Layer
- Adhesive Layer
- Chemical Treatment
- Base Metal

Chemical Treatment
Back Coating

PET/PVC Laminated Steel
- Protective Film
- PET Layer
- Pattern Printing
- PVC Layer
- Adhesive Layer
- Chemical Treatment
- Base Metal

Chemical Treatment
Back Coating
**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 METHODS & RESULTS - PCM**

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test Methods</th>
<th>Test Result</th>
<th>Related Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gloss</td>
<td>45° gloss meter</td>
<td>5~110%</td>
<td>Good</td>
</tr>
<tr>
<td>Pencil hardness test</td>
<td>Scratched Mitsubishi pencil harder than “H”</td>
<td>H Good</td>
<td>Good</td>
</tr>
<tr>
<td>Cross cut erosion test</td>
<td>100 grids of from a 5mm by scale and pushed up by 6mm with Erichsen meter</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Cross cut test</td>
<td>Leave 1 hour after bending test, 100 grids of from a 5mm by scale</td>
<td>Good</td>
<td>Good</td>
</tr>
<tr>
<td>Impact test</td>
<td>Drop steel bar of 100gr weight and 12.7mm diameter at 500mm height</td>
<td>No crack</td>
<td>No crack</td>
</tr>
<tr>
<td>Bending test</td>
<td>Completely folded, wrapping Metal bar of diameter equivalent by 2 layers of test sample</td>
<td>1-2T No crack</td>
<td>0-17 No crack</td>
</tr>
<tr>
<td>Salt spray test</td>
<td>Sprayed with 5% salt water at 95%</td>
<td>500hrs</td>
<td>500hrs</td>
</tr>
<tr>
<td>Weathering test</td>
<td>Over 1000 hours with Weather-O-Meter</td>
<td>1000hrs Good</td>
<td>1000hrs Good</td>
</tr>
<tr>
<td>Resistance to acid test</td>
<td>Spat 5% HCI/63% CS2 at and under 24 hours</td>
<td>24hrs Good</td>
<td>24hrs Good</td>
</tr>
<tr>
<td>Resistance to alkali test</td>
<td>Spat 5% NaOH/10% KOH and under 24 hours</td>
<td>24hrs Good</td>
<td>24hrs Good</td>
</tr>
<tr>
<td>Resistance to solvent test</td>
<td>Racked by grain soaked in 96% Korn and the base model exposed</td>
<td>300hrs Good</td>
<td>300hrs Good</td>
</tr>
<tr>
<td>Resistance to boiling test</td>
<td>Dipped in boiling water for 1 hours</td>
<td>No change</td>
<td>No change</td>
</tr>
<tr>
<td>Ultraviolet ray test</td>
<td>Exposed at 100W/100W ultraviolet ray lamp from 100mm distance for 8 hours</td>
<td>No change</td>
<td>No change</td>
</tr>
</tbody>
</table>
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㎛ / Finish 10-15㎛ / Clear 5-10㎛ (option)
- Back side : Wash 5㎛

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% (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(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㎛ / Finish 10-15㎛ / Clear 5-10㎛ (option)
- Back side : Wash 5㎛

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% (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(24Hr with 5% NaOH and 5% HCl or H2SO4)

PRODUCTS:
PCM
**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㎛ / Finish 15-20 15㎛ / Clear 5-10㎛, (option)
- Back side : Wash 5㎛

**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 : 50-110%(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㎛ / Finish 20-25㎛
- Back side : Wash 5㎛

**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%(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)

**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㎛ / Finish(Polyester) 15-20 15㎛ / Print(ink) 1-3 ㎛ / Clear(Polyester or Acryl) 5-10 ㎛
- Back side : Wash 5㎛

**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%(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 METHODS & RESULTS - VCM**

<table>
<thead>
<tr>
<th>Test Item</th>
<th>Test Methods</th>
<th>Test Result</th>
<th>Related Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Erichsen Test</td>
<td>Cross-cutting 10mm interval, punching by 8mm in-depth in Erichsen tester</td>
<td>No Peeling</td>
<td>KS B 0812, KS M 3342</td>
</tr>
<tr>
<td>Impact Test</td>
<td>Drop 50g &amp; 1/2 inch Dupont diameter steel ball from 500mm</td>
<td>No Peeling, No Crack</td>
<td>KS D 3205</td>
</tr>
<tr>
<td></td>
<td>height three time</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bending Test</td>
<td>180°, 11 bending at 25°C (JIS G, 180°, 11 bending at 20°C (CR))</td>
<td>No Peeling, No Crack</td>
<td>KS D 3205, KS M 3342</td>
</tr>
<tr>
<td>Pencil Hardness Test</td>
<td>Using Mitsubishi Uni pencil checking pencil trace mark</td>
<td>Over H8 grade</td>
<td>KS D 3205</td>
</tr>
<tr>
<td></td>
<td>using mark down at 45° direction with 500g</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt spray test</td>
<td>Flat surface*</td>
<td>No change of surface</td>
<td>KS D 9003</td>
</tr>
<tr>
<td></td>
<td>(Flat surface*)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Salt spray test</td>
<td>Cross-cut 5mm interval, pushing by 8mm in-depth in Erichsen tester</td>
<td>No change of surface</td>
<td>KS D 9003</td>
</tr>
<tr>
<td></td>
<td>Cross-cut with razor blade 5 mm right touches base metal, and then test as</td>
<td>No change of surface</td>
<td>KS D 9003</td>
</tr>
<tr>
<td></td>
<td>same as above</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance to alkali test</td>
<td>20°C, 1.5% NaOH + 72 hrs</td>
<td>No change of surface</td>
<td>KS M 3343</td>
</tr>
<tr>
<td></td>
<td>20°C, 1.5% CH3COOH + 72 hrs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance to acid test</td>
<td>95°C, water + 5% and leave 3 hrs away from the no.</td>
<td>No change of surface</td>
<td>KS M 3343</td>
</tr>
<tr>
<td></td>
<td>95°C, water + 5% and leave 3 hrs away from the no.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resistance to boiling water</td>
<td>95°C, water + 15% and leave 3 hrs away from the no.</td>
<td>No change of surface</td>
<td></td>
</tr>
<tr>
<td></td>
<td>95°C, water + 15% and leave 3 hrs away from the no.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Pollution resistance test</td>
<td>Leave coffee, olive oil for 24 hrs, and then wipe with methyl alcohol</td>
<td>No change of surface</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Leave coffee, olive oil for 24 hrs, and then wipe with methyl alcohol</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Remarks:** 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 : 60±5㎛
- PET layer : 36±5㎛
- PVC layer : 100±10㎛
- Adhesive layer : 5~7㎛
- Service coating : 5~7㎛

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℃ x 2 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±5㎛
- PVF layer : 36±5㎛ / 104±5㎛
- Adhesive layer : 5~7㎛
- Service coating : 5~7㎛

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(EGI:1T.CR:0T)
4) Pencil hardness test : H~2H
5) Resistance of boiling water : No change of surface (Dropped coffee, Olive oil, Oil pen etc)

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±50㎛
- Adhesive layer : 5~7㎛
- Service coating : 5~7㎛

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℃ x 2 Hrs)
PACKING

Our products are packaged to best prevent damage from percussion, moisture and seawater.
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:
- Epoxy paint, wash primer, zinc-rich paint
- Plastic or steel cover

04 Washing
In order to remove dirt, use neutral detergent, soap, alcohol or benzene. Do not use ketene 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)

<table>
<thead>
<tr>
<th>Item</th>
<th>Standard</th>
<th>POSCO</th>
<th>KS</th>
<th>JIS</th>
<th>ASTM</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR</td>
<td>CSP 1</td>
<td>CSP(JIS 3513)</td>
<td>SCP(JIS 3513)</td>
<td>JIS 3131</td>
<td>A 366</td>
</tr>
<tr>
<td>EGI</td>
<td>EGS 1</td>
<td>EGC(JIS 3508)</td>
<td>SEGC(JIS 3513)</td>
<td>A911-CP</td>
<td></td>
</tr>
<tr>
<td>GI</td>
<td>C00C</td>
<td>SCP(JIS 3508)</td>
<td>SCP(JIS 3513)</td>
<td>A536</td>
<td></td>
</tr>
</tbody>
</table>

Standard

<table>
<thead>
<tr>
<th>Thickness</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>0.4-1.2</td>
<td>0.3-1.2</td>
<td>0.3-1.2</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Width</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>400-1350</td>
<td>500-1285</td>
<td>900-1500</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>300-5000</td>
<td>350-5000</td>
<td>400-6000</td>
<td></td>
</tr>
</tbody>
</table>

Tensility

<table>
<thead>
<tr>
<th>Yield Point(Kg/mm²)</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 36</td>
<td>28</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Tensile Strength(Kg/mm²)</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 28</td>
<td>30</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Elongation(%)</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over 30</td>
<td>50</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Dimensions

<table>
<thead>
<tr>
<th>Width</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Length</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Perpendicularity</th>
<th>VCM</th>
<th>ASAN PCM</th>
<th>NOKSAN PCM</th>
</tr>
</thead>
<tbody>
<tr>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
<td>±0.5</td>
</tr>
</tbody>
</table>
Our ambition is to make for a better tomorrow

Your imagination is our guide