DESIGNED STAINLESS STEEL
LAMINATED SHEET

Titanium Color Laminated Sheet
Nano Color Laminated Sheet
Embo-Pattern Laminated Sheet
TITANIUM COLOR LAMINATED SHEET

SPECIFICATION

1. Titanium Color STS
2. High-strength resin adhesive
3. Back material (STS/EGI, ZAM)
**Colors**

- Champagne Gold
- Gold
- Bronze
- Blonde
- Caramel
- Coffee Brown
- Sepia
- Diamond Black
- Black

**Surface**

- No. 4
- Hard Bead Blast

**Specification**

<table>
<thead>
<tr>
<th></th>
<th>Steel Grade</th>
<th>304, 316, 316L</th>
</tr>
</thead>
<tbody>
<tr>
<td>Surface</td>
<td>No. 4</td>
<td>Hard Bead Blast</td>
</tr>
<tr>
<td>Surface Thickness</td>
<td>0.2</td>
<td>0.3</td>
</tr>
<tr>
<td>Width / Length</td>
<td>600 ~ 1000 / from 2400</td>
<td></td>
</tr>
<tr>
<td>Back material thickness</td>
<td>STS (Steel Grade 400) (0.6, 0.8, 1.0, 1.2, 1.5)</td>
<td>EGI, ZAM (0.6, 0.8, 1.0, 1.2, 1.6)</td>
</tr>
</tbody>
</table>
What is Ti-Color Coating

Physical Vapor Deposition (PVD) is a method used to deposit layers of coating by using the condensation from the vaporized form of a material and applying it to a desired target material. PVD is achieved by taking titanium Alkoxide (titanium mass) and applying a positive voltage to it while it is inside a high temperature vacuum. This releases positively charged titanium molecules. Inside the vacuum is a material, such as stainless steel, that has a negative voltage applied to it. The negative voltage attracts the positively charge titanium molecules and results in the material being coated.

Plasma cleaning and ion impact processing of materials is needed to improve the adhesion of the coating. This results in the coating having a longer lifespan.

PVD technology has significantly contributed in a variety of fields including car manufacturing, electronics, and other industries. PVD is a state of the art process that is rapidly progressing the field of surface treatment.
Features of Ti-Color Coating

Thin film hardness
The hardness of the product film itself was measured by the Vickers hardness test and was found to be about 10 times harder than stainless steel.

Adhesion of the coating
The strength of the adhesion was tested by creating a 2mm wide scratch with a knife and attempting to peel of layers of the coating with cellophane tape. There was no peeling of the film.

Impact Resistance
A 1kg steel ball was dropped from a height of 50cm onto the product using a DuPont impact tester. There was no abnormalities such as discoloration or damage visually observation.

<table>
<thead>
<tr>
<th>Abrasion resistance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using a SUGA abrasion tester 500g of pressure from an eraser was applied to 0.5 microns of ion plating. The applied pressure was repeated 200 times. The ion plating film was not peeled.</td>
</tr>
</tbody>
</table>

Scratch Hardness
Load of cracking point, as seen below, was tested by scratching 150mm per minute with Kuremence Scratch Tester. The result showed ion coating was 3 times harder than chemical coating on scratch resistant hardness.

<table>
<thead>
<tr>
<th>Scratch Hardness</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ion coating</td>
</tr>
<tr>
<td>Chemical coating</td>
</tr>
</tbody>
</table>

Artificial Sweat Test
The Ion-Coated frame was presoaked in artificial sweat of PH 4.5, JISLO 848 for 8 hours and left on room temperature for 16 hours.

<table>
<thead>
<tr>
<th>Resistance to the perspiration</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ion coating Gold</td>
<td>No change</td>
</tr>
<tr>
<td>Brass</td>
<td>partial pitting corrosion has been found</td>
</tr>
<tr>
<td></td>
<td>multiple corrosion has been found</td>
</tr>
</tbody>
</table>

Wet Corrosion
No damage or no color change was found on ion coating by putting it on 50°C, 98% of humidity for the duration of 500 hours.
Interior
Exterior
Exterior
DESIGNED STAINLESS STEEL NANO COLOR LAMINATED SHEET

Titanium Color Laminated Sheet

Nano Color Laminated Sheet

Embo-Pattern Laminated Sheet
NANO COLOR LAMINATED SHEET

SPECIFICATION

1. Nano Color STS
2. High-strength resin adhesive
3. Back material (STS/EGI, ZAM)
## NANO COLOR LAMINATED SHEET

### Specification

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<td>STS (Steel Grade 400) (0.6, 0.8, 1.0, 1.2, 1.5)</td>
<td>( EGI, ZAM \ (0.6, 0.8, 1.0, 1.2, 1.6) )</td>
</tr>
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NANO COLOR LAMINATED SHEET

ADVANTAGE

N.C.C

Through a special electro-chemical coating process, a hybrid coating of organic-inorganic layer is put on the surface that enhances anti-bacterial, anti-pollution and anti-fingerprint properties for minimal maintenance and cleaning. N.C.C even makes stainless steel stronger against rust than normal stainless steel while creating aesthetically pleasing and elegant colors.

N.C.C I

1. Anti-finger print
2. Diffused reflection control (Dull finished effect)
3. Anti-bacterial (99.9% inhibition of colon bacillus and etc.)
4. Minimal maintenance and cleaning
5. Stronger against rust than normal STS
6. Beautiful and elegant color

N.C.C II

1. Easy cleaning
2. Strengthening of surface (Pencil hardness test 9H and over)
3. Nice glossy finish like glass.
4. Anti-bacterial (99.9% inhibition of colon bacillus and etc.)
5. Minimal maintenance and cleaning
6. Stronger against rust than normal STS
7. Beautiful and elegant color
NANO COLOR LAMINATED SHEET

ADVANTAGE

N.C.C I

Matt

N.C.C II

Gloss
Easy cleaning

No Finger Print

Anti fingerprint effect

Non Coated

NCC Coated

Gold

Bronze

Black
Anti bacterial test result

NCC Laboratory test of Anti-bacteria

**E. Coli**

- **Initial**
- **After 24 hours**

<table>
<thead>
<tr>
<th>Test sample</th>
<th>Number of bacteria</th>
<th>After 24 hours</th>
<th>Restraint ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS</td>
<td>$3.9 \times 10^5$</td>
<td>$1.5 \times 10^5$</td>
<td>-</td>
</tr>
<tr>
<td>NCC STS</td>
<td>$&lt; 10$</td>
<td>99.99 %</td>
<td></td>
</tr>
</tbody>
</table>

**S. aureus**

- **Initial**
- **After 24 hours**

<table>
<thead>
<tr>
<th>Test sample</th>
<th>Number of bacteria</th>
<th>After 24 hours</th>
<th>Restraint ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>STS</td>
<td>$2.0 \times 10^5$</td>
<td>$9.3 \times 10^5$</td>
<td>-</td>
</tr>
<tr>
<td>NCC STS</td>
<td>$&lt; 10$</td>
<td>99.99 %</td>
<td></td>
</tr>
</tbody>
</table>
A hybrid coating that forms a hybrid organic-inorganic layer on the surface of the coated material through an electro-chemical coating process. The coating is always clean because of the self-cleaning ability and organic matter decomposition effect.

**Photocatalyst Superhydrophilicity Experiment**

- **Before Photocatalytic coating**
  - $t = 0$ sec
  - $56^\circ$

- **After Photocatalytic coating**
  - $t = 60$ sec
  - $26.8^\circ$

- **After sunlight-irradiated**
  - $t = 300$ sec
  - $7^\circ$

**Multi Functional Coating System**

- OH radical, activated oxygen disintegration (oxidation-reduction reaction)

- Process of pollutant disintegration

- Superhydrophilic
NANO COLOR LAMINATED SHEET

ADVANTAGE

NCC Technology

NCC Technology

Ti-Color & NCC Coating

NCC Coating

* After the organic matter gets through the process of a heat treatment. The pure inorganic matter remains on the coated surface.
NCC - EX Activation Evaluation (Fingerprints decomposition analysis)

Test Conditions
- NCC-EX coated and uncoated samples tested on Ti-coated Stainless steel sheet (Black, Bronze, Gold)
- Hands were stained with the lubricant WD-40 then fingerprints were applied to demonstrate the effect of fingerprint decomposition.
- UV intensity was set at 1.43 mW/cm and after 24, 48, 72, and 100 hours pictures were taken to check the fingerprint's decomposition.
**NCC - EX Activation Evaluation (Organic matter decomposition analysis)**

**Test Conditions**
- Evaluation performed by using 1,000 ppm of Methylene Blue aqueous solution. (UV intensity at 1.43 mW/cm).

![Graph showing decomposition over time](image)

Decomposition (%) vs. Time (min)

- **NCC EX**
- **NO NCC**

**Images**
- Images showing NO-NCC and NCC-EX samples at different stages of decomposition.
NANO COLOR LAMINATED SHEET

Advantages:

Hydrophilic

Self-Cleaning

NCC-EX  NO-NCC

NCC-EX  NO-NCC
N.C.C. Test Report
NANO COLOR LAMINATED SHEET

Image
DESIGNED STAINLESS STEEL

EMBO-PATTERN LAMINATED SHEET

Titanium Color Laminated Sheet

Nano Color Laminated Sheet

Embo-Pattern Laminated Sheet
EMBO-PATTERN LAMINATED SHEET
SPECIFICATION

1. Ultra-thin Embossed Pattern STS
   It is made of 0.06 / 0.09T patterned stainless steel and is available in various colors and patterns.

2. High-strength resin adhesive

3. Back material (STS/EGI, ZAM)
# EMBO-PATTERN LAMINATED SHEET SPECIFICATION

## Colors
- Champagne Gold
- Gold
- Bronze
- Black

## Patterns
- Brush
- Fan
- Micro Chess
- Snow Flower
- Check
- Mesh
- Shine Delta
- Cube

## Specification

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Steel Grade</td>
<td>304, 316, 316L</td>
</tr>
<tr>
<td>Surface</td>
<td>Ultra-thin Embossed Pattern STS (VERNOX)</td>
</tr>
<tr>
<td>Surface Thickness</td>
<td>0.06 / 0.09</td>
</tr>
<tr>
<td>Width / Length</td>
<td>600 / From 2400</td>
</tr>
</tbody>
</table>
| Back material thickness        | **STS** (Steel Grade 400) [0.6, 0.8, 1.0, 1.2, 1.5]  
|                               | **EGI, ZAM** [0.6, 0.8, 1.0, 1.2, 1.6]                                |
Ultra-thin Embossed Pattern STS (VERNOX)

Ultra-thin Stainless Steel that comes in a variety of Ti-Colors with three-dimensional patterns to reach beyond the limits of stainless steel. It can be applied to different spaces such as walls and interior ceilings. Since it can be laminated to wood or steel it is versatile and available for kitchen furniture and interior accessories.

In addition, multi-functional coating is available making it suitable for public areas or spaces that require special functionality such as kindergartens, schools, hospitals and more.

Roll to Roll
The Roll to Roll (R2R) process efficiently uncoils the batch of stainless steel, applies the pattern, and recoils the steel.

The advantages of this are a streamlined process and less initial capital investment costs. This system is very suitable for mass production and can be produced in any length a customer demands.

Various Use
Ceiling  Art Wall  Covering
Pattern Details

Mesh

Shine Delta

The actual size of the pattern.
Pattern Details

Snow Flower

Fan

*The actual size of the pattern.*
Pattern Details

Micro Chess

Brush

※ The actual size of the pattern.
EMBO-PATTERN LAMINATED SHEET
SPECIFICATION

Pattern Details

Cube

Check

The actual size of the pattern.