NIPPON STEEL

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Titanium Products for Building Construction - Illustrated Brochure -
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NIPPON STEEL

Titanium Products for Building Construction

- Illustrated Brochure -

NIPPON STEEL CORPORATION

CONTENTS

National Centre for Performing Arts, China (View from Jingshan Park looking over the Forbidden City)

Overseas Projects

CHINA

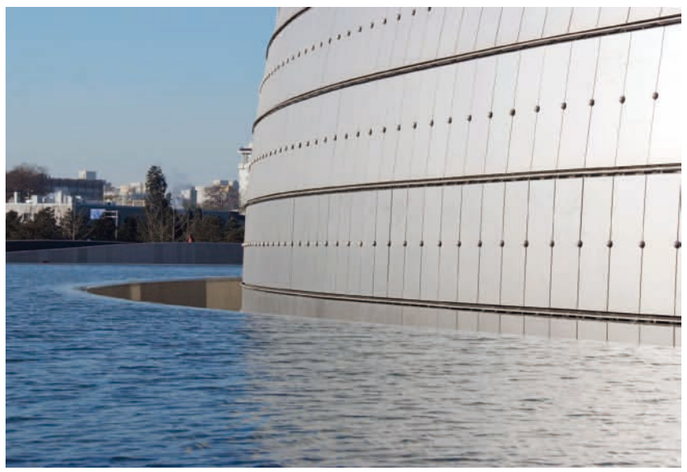
The Bilbao Guggenheim, which opened in 1997 and was designed by the American architect Frank O Gehry, opened the eyes of many architects around the world to the wonders of titanium. Each country is finding a way to make use of this metal.

The French architect Paul Andreu selected our titanium coil as used in the Titanium Composite Material (TCM) produced by Mitsubishi Chemical Corporation.

National Centre for Performing Arts

Roofing

Method – Panel (TCM manufactured by Mitsubishi Chemical Corporation.)
Surface – Roll Dull (ND20)
Thickness – 0.3mm
Area – 43,000m^2
Architect – Airport De Paris
Contractor – Hong Kong Construction and Others JV
Fabricator – K.G.E.
Date – 2007
China



CHINA

Carlos Ott, the Canadian architect, elected to use TCM on this project.

Hangzhou Grand Theatre

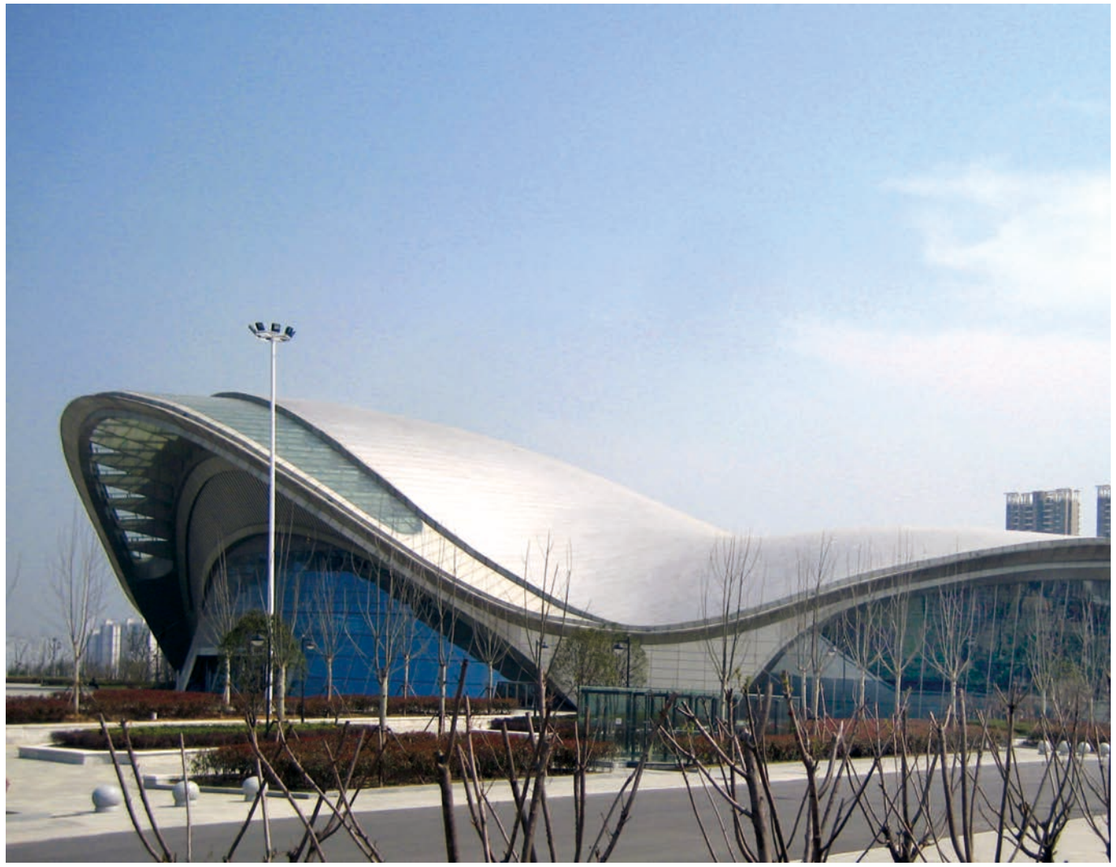
Method – Panel (TCM manufactured by Mitsubishi Chemical Corporation.)
Surface – Roll Dull (ND20)
Thickness – 0.3mm
Area – 10,000m^2
Architect – Carlos Ott
Contractor – Longyuan Construction Group
Fabricator – K.G.E.
Date – 2003
China

Roofing

Overseas Projects

CHINA

In China, the decision to make use of titanium with the National Centre for Performing Arts marked an opportunity for several other public buildings to choose titanium.



Hefei Lakeside International & Convention Center

Roofing

Method – Panel (TCM manufactured by Mitsubishi Chemical Corporation.)
Surface – Roll Dull (ND20)
Thickness – 0.3mm
Area – 13,000m^2
Architect – Shanghai Architectural Research Institute
Contractor – China Geological Engineering Group Company
Fabricator – Zhejiang Southeast Space Frame Shares Engineering
Date – 2011
China

TAIWAN

The Taiwanese architect Lo Hsing Hua chose titanium. It was the first structure in Taiwan to make full use of titanium for its roof.

Taipei Arena

Roofing

Method – Panel (TCM manufactured by Mitsubishi Chemical Corporation.)
Surface – Roll Dull (ND20)
Thickness – 0.3mm, 0.6mm, 1.5mm
Area – 20,000m^2
Architect – Archasia
Contractor – BES Engineering Corp.
Fabricator – Great Construction
Date – 2005
Taiwan

Overseas Projects

SPAIN

The hotel makes use of the same shade of light-rich brown titanium pioneered by Frank O Gehry. Mr. Gehry has used our brown titanium in four projects to date.

Hotel Marques de Riscal

Roofing

Method – Panel
Surface – Roll Dull (SD3); Colors: Pink, Gold
Thickness – 1.0mm
Area – 2,400m^2
Architect – Frank O Gehry & Associates
Contractor – Ferrovial
Fabricator – Umaran
Date – 2004
Spain

KOREA

Titanium products have been used in Korea since 2000.

Saemangeum Exhibition Center

Method – Panel
Surface – Roll Dull (ND20)
Thickness – 0.4mm
Area – 4,300m^2
Architect – KRC
Contractor – SHINSUNG Construction
Fabricator – MIJIE INDUSTRIAL
Date – 2011
Korea

Siding / Wall

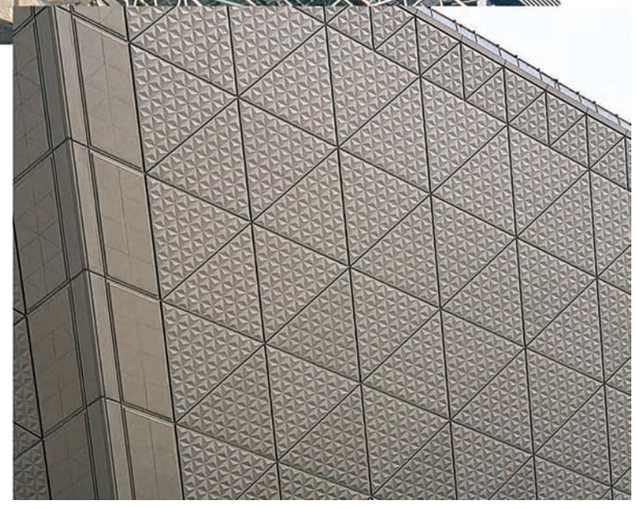
In a Highly Corrosive Environment

TOKYO

Our peerless corrosion-resistant titanium is able to resist a highly corrosive coastal sea-air environment that can corrode stainless steel and copper.

Our titanium has been put to use in Tokyo Bay, a highly corrosive environment.

Photo by Satoshi Mishima, Nikkei Business Publications, Inc



Tokyo Big Site

Siding / Wall

Method – Panel
Surface – Pickling
Thickness – 0.6, 1.5 mm
Area – 16,000m^2
Architect -AXS SATOW INC.
Contractor – Hazama Corporation and Others JV
Fabricator – Roof: Gantan Beauty Industry Co., Ltd.
Panel: Yamaki industry Co., Ltd.
Tajima Junzo Ltd.
Date – 1995
Tokyo

TOKYO

Ballous Observation Room of Fuji Television Headquarters

Method – Panel
Surface – Roll Dull (ND10)
Thickness – 0.8mm
Area – 2,800m^2
Architect – Kanzo Tange Associates Urbanist-architects
Contractor – Kajima Corporation
Fabricator – Kikukawa Kogyo Co., Ltd.
Date – 1996
Tokyo

Siding / Wall

In a Highly Corrosive Environment

SHIMANE

More titanium projects have been completed due to the severe corrosive environment alongside the Sea of Japan.

Shimane Prefectural Art Museum

Method – Flat Roof
Surface – Picking and roll Dull (PD25NX)
Thickness – 0.8, 1.2 mm
Area – 10,000m^2
Architect – Kikutake Architects
Contractor – Konoike Construction Co., Ltd and Others JV
Fabricator – Gantan Beauty Industry Co., Ltd.
Date – 1998
Shimane

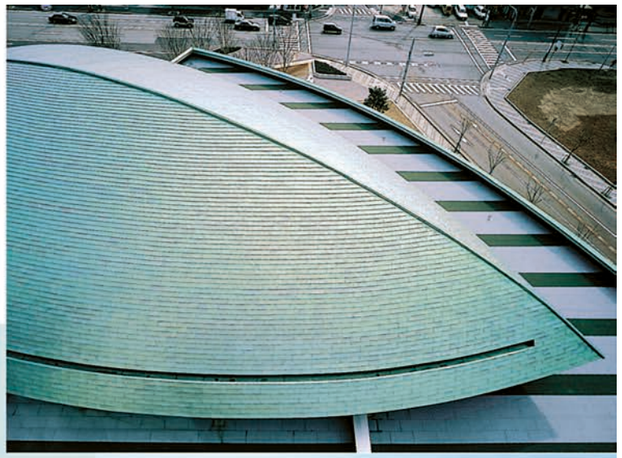
Roofing

ISHIKAWA

Uchinada Town Office

Roofing

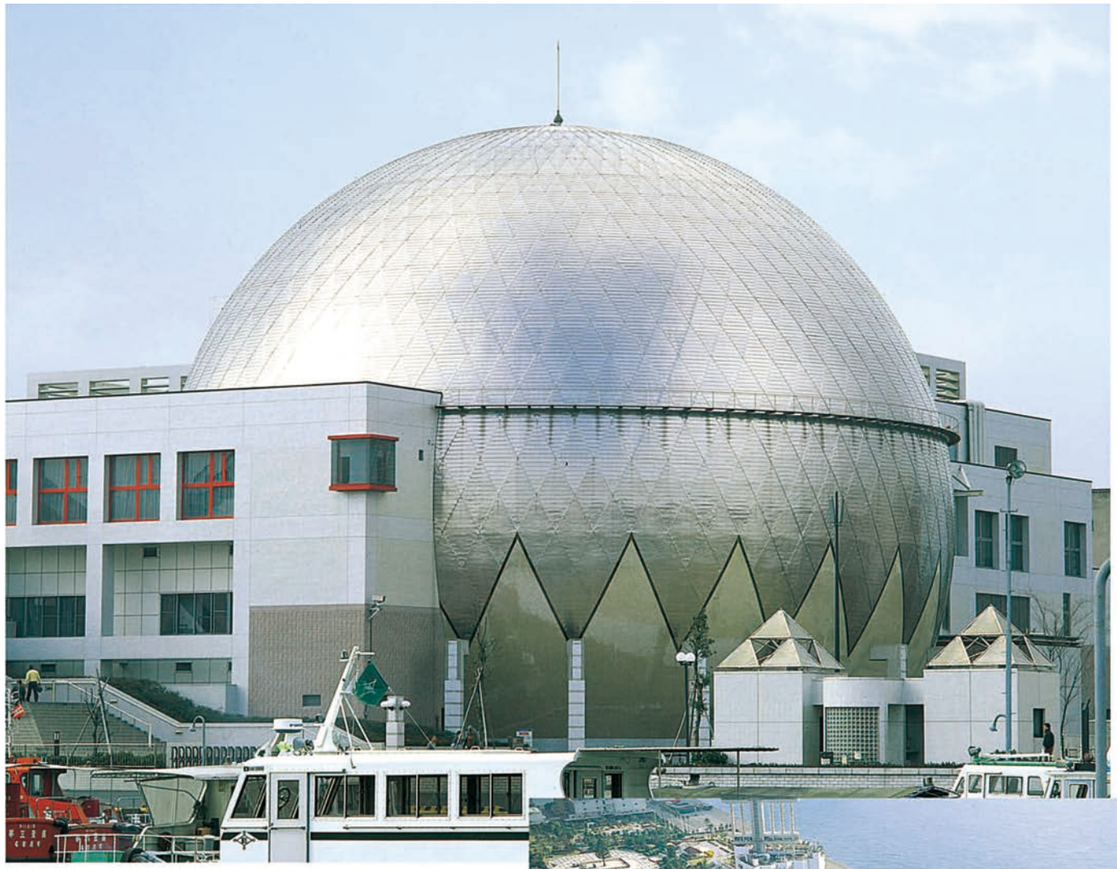
Method – Stepped Roofing
Surface – Roll Dull (ND20); Verdigris coloring
Thickness – 0.4mm
Area – 1,700m^2
Architect – Goi and Aiesu JV
Contractor – Shimizu Construction Co., Ltd.
Fabricator – Ooyu-kenchikubankin
Date – 1998
Ishikawa



In a Highly Corrosive Environment

AICHI

Titanium is used in the surface of the dome of the seafront-located Aquarium.



Aquarium Dome in Nagoya Port

Method – Dutch-lap Method
Surface – Roll Dull (ND15)
Thickness – 0.3mm
Area – 2,700m^2
Architect – Daiken Sekkei Inc.
Contractor – Kajima Corporation and Taisei Corporation and Others JV
Fabricator – Dohkin Ltd.
Date – 1991
Aichi

Roofing

HOKKAIDO

JR Hakodate station, located on the seafront, employs titanium for its sidings and walls

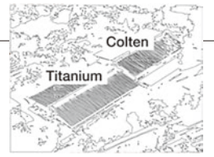
JR Hakodate Station

Siding / Wall

Method – Panel
Surface – Roll Dull (ND20)
Thickness – 1.0mm
Area – 1,000m^2
Architect – Hokkaido Nikken Architects
Contractor – Obayashi Corp.
Fabricator – Sanko Repair / NS Metals
Date – 2003
Hokkaido

Architecture for Centuries

FUKUOKA



NARA

The Kyushu National Museum and the new annexes of the Tokyo and Nara National Museums have been designed to last one hundred years.

Kyushu National Museum

Method – Welded Panel
Surface – Roll Dull (ND20); Blue/Coloring
Thickness – 0.4mm
Area – 17,000m^2
Architect – Kikutake – Kumei Collaboration
Contractor – Kajima – Hazama and Others JV,
Taisei – Nishimatsu and Others JV
Fabricator – Sanko Metal Industries
Date – 2004
Fukuoka

Roofing

Nara National Museum (No. 2 Annex)

Method – Standing Seam Roofing
Surface – Alumina Blasting (AD03); Brown/Coloring
Thickness – 0.3, 0.4, 1.5mm
Area – 6,000m^2
Architect – Junzo Yoshimura Architect
Contractor – Okumura Corporation
Fabricator – Sumitomo Metal Industries, Ltd.
Shinwa Industry
Date – 1998
Nara

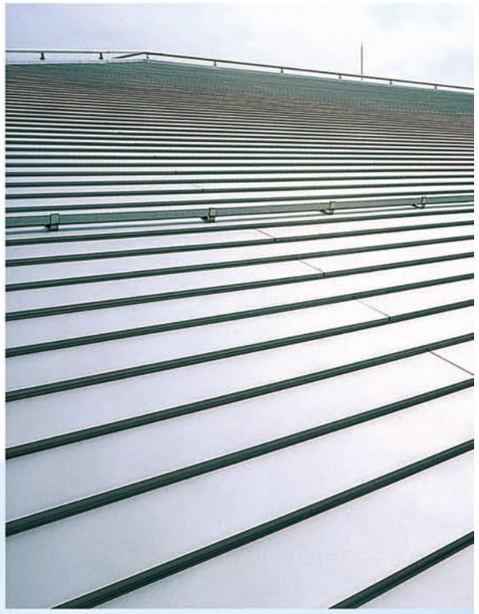
Roofing

Architecture for Centuries

Tokyo National Museum (Heisei Hall)

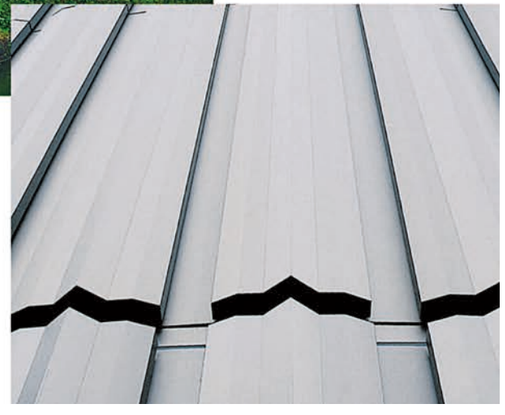
Roofing

Method – Stepped Roofing
Surface – Alumina Blasting (AD03)
Thickness – 0.4mm
Area – 6,000m^2
Architect – Yasui Architects and Engineers, Inc.
Contractor – Konoike Construction Co., Ltd. And Others JV
Fabricator – Kobe Steel, Ltd. / Sanko Metal Industrial Co., Ltd. / Gantan Beauty Industry Co., Ltd.
Date – 1998
Tokyo



The policy here determined that a shiny surface was not to be used for the metropolitan city center, so this was the first occasion to use an alumina blast finish.

Siding / Wall

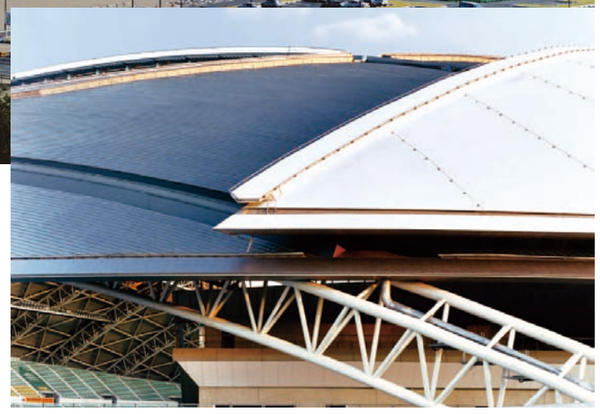


Showa Hall

Method – Panel
Surface – Alumina Blasting (AD09)
Thickness – 1.5mm
Area – 4,200m^2
Architect – Kikutake Architects
Contractor – Takenaka Corporation and Others JV
Fabricator – Kikukawa Kogyo Co., Ltd.
Tajima Junzo Ltd.
Nihon Kentetsu Co., Ltd.
Date – 1998
Tokyo

Architecture for Centuries

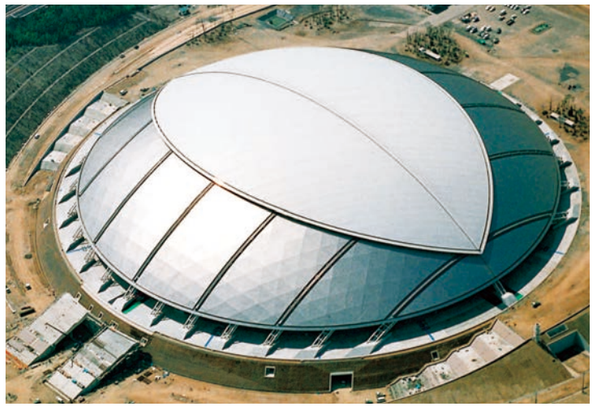
OITA



Roofing

Oita Sports Park Stadium

Method – Welded Panel
Surface – Roll Dull (ND20)
Thickness – 0.4mm
Area – 32,000m^2
Architect – KT Group
Contractor – KT Group
Fabricator – Shinwa Industries
Date – 2001
Oita



KYOTO

Kyoto University Funai Tetsuro Auditorium & Funai Center

Roofing

Method – Welded Panel, Light Panel
Surface – Roll Dull (ND20)
Thickness – 0.4mm, 1.0mm
Area – 4,000m^2
Architect – Nikken Architects
Contractor – Shimizu Corp.
Fabricator – Sanko Metal Industrial Co., Takada / Naito Metals
Date – 2007
Kyoto

Architecture for Centuries

HYOGO

Amagasaki Shinkin Bank Kaikan

Method – Step Roofing
Surface – Alumina Blasting (AD09)
Thickness – 0.4mm
Area – 800m^2
Architect – Kosumi Architects
Contractor – Kajima Construction
Fabricator – Okubo Metal Plate / Chugiken
Date – 2000
Hyogo

Roofing

TOCHIGI

Nasunogahara Museum

Method – Step Roofing
Surface – Alumina Blasting (AD09)
Thickness – 0.4mm
Area – 1,000m^2
Architect – Matsuda Hirata
Contractor – Nishimatsu Construction
Fabricator – Sanko Metal Industrial Co.,
Takada / Chugiken
Date – 2003
Tochigi

Roofing

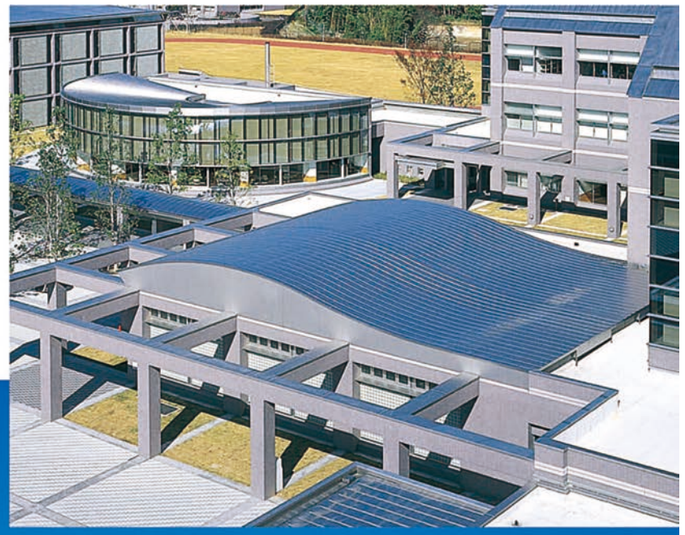
Architecture for Centuries

M I E

Mie Prefectural College of Nursing

Method – Standing Seam Roofing
Surface – Pickling and Roll Dull (PD25)
Thickness – 0.4, 0.6, 1.5mm
Area – 2,400m^2
Architect – Kume Sekkei Co., Ltd.
Contractor – Maeda Corporation and Others JV
Fabricator – Sanko Metal Industrial Co., Ltd.
Date – 1997
Mie

Roofing



SHIGA

Sagawa Art Museum Tea Arbor (Raku Kichizaemon Kan)

Method – Dutch-lap Method
Surface – Alumina Blasting (AD03)
Thickness – 0.3mm
Area – 400m^2
Architect – Takenaka Corp.
Contractor – Takenaka Corp.
Fabricator – Tahara Bankin
Date – 2007
Shiga

Roofing

New Age of Traditional Japanese Beauty

GOOD DESIGN AWARD 2003

KYOTO

TOKYO

On the recommendation of Sukiya Kenkyusho, alumina-blasted titanium tiles have been developed to replace the conventional copper, which has a short-lifetime in an acid-rain environment. These titanium tiles, with the appearance of traditional Japanese roof-tiles, are currently being used in many shrines and Buddhist temples.

Koetsuji Temple Main Hall

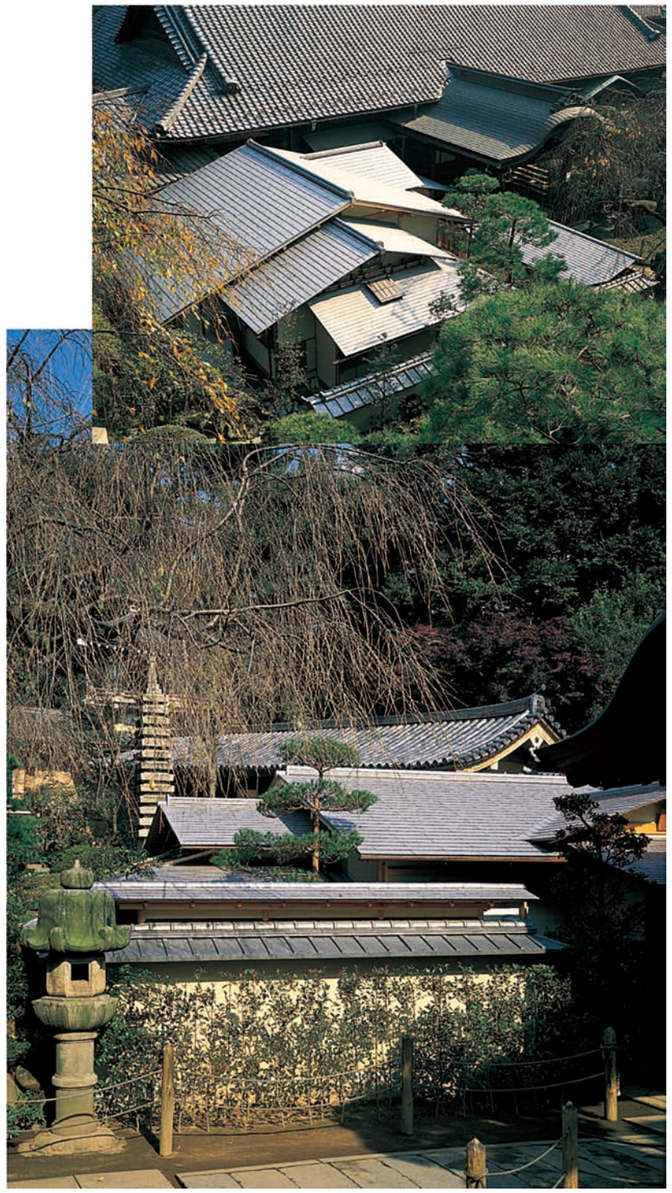
Method – Dutch-lap Method
Surface – Alumina Blasting (AD03)
Thickness – 0.3mm
Area – 700m^2
Architect – Sukiya Kenkyusho
Contractor – Sukiya Kenkyosho
Fabricator – Sukiya Kenkyusho
Date – 1997
Kyoto

Roofing

Yakuouin Temple Tea Arbor

Method – Dutch-lap Method
Surface – Alumina Blasting (AD03)
Thickness – 0.3mm
Area – 60m^2
Architect – Sukiya Kenkyusho
Contractor – Sukiya Kenkyosho
Fabricator – Sukiya Kenkyusho
Date – 1992
Tokyo

Roofing



New Age of Traditional Japanese Beauty

Kinkakuji Tea Arbor (Josokutei)

Method – Dutch-lap Method
Surface – Alumina Blasting (AD03)
Thickness – 0.3mm
Area – 100m^2
Architect – Sukiya Kenkyusho
Contractor – Sukiya Kenkyusho
Fabricator – Sukiya Kenkyusho
Date – 2003
Kyoto

Roofing

Daitokuji Oubai-in Temple (Jikyu-ken)

Method – Dutch-lap Method
Surface – Alumina Blasting (AD03); Brown/Coloring
Thickness – 0.3mm
Area – 155m^2
Architect – Yamamoto Kogyo
Contractor – Yamamoto Kogyo
Fabricator – Kubo Metal Plate
Date – 2011
Kyoto

Roofing

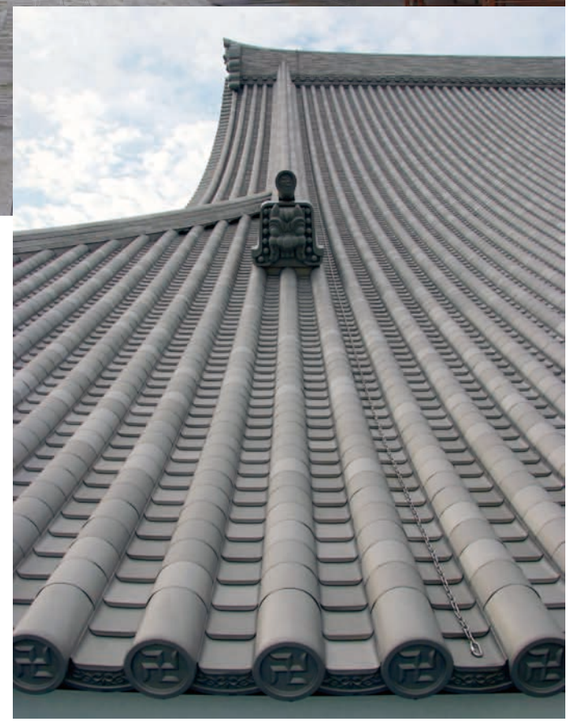
New Age of Traditional Japanese Beauty

Sensoji Temple Hozo-mon Gate

Method – Roof tiling, decorative roof tiles
Surface – Alumina Blasting (AD03, AD06)
Thickness – 0.3mm, 1.0mm
Area – 1,080m^2
Architect – Shimizu Corp.
Contractor – Shimizu Corp.
Fabricator – Kaname Inc.
Date – 2007
Tokyo

Roofing

- Otani Art Museum Foundation Award 2006
  “Titanium roof tilling and decorative roof tiles”



Sensoji Temple Main Hall

Method – Roof tiling
Surface – Alumina Blasting (AD03, AD06, etc.)
Thickness – 0.3mm
Area – 3,000m^2
Architect – Shimizu Corp.
Contractor – Shimizu Corp.
Fabricator – Kaname Inc.
Date – 2009
Tokyo

Roofing

New Age of Traditional Japanese Beauty

HYOGO

Hosenji Temple

Method – Flat roof tiling
Surface – Alumina Blasting (AD03)
Thickness – 0.4mm
Area – 334m^2
Architect – Kaname Inc.
Contractor – Kaname Inc.
Fabricator – Kaname Inc.
Date – 2009
Hyogo

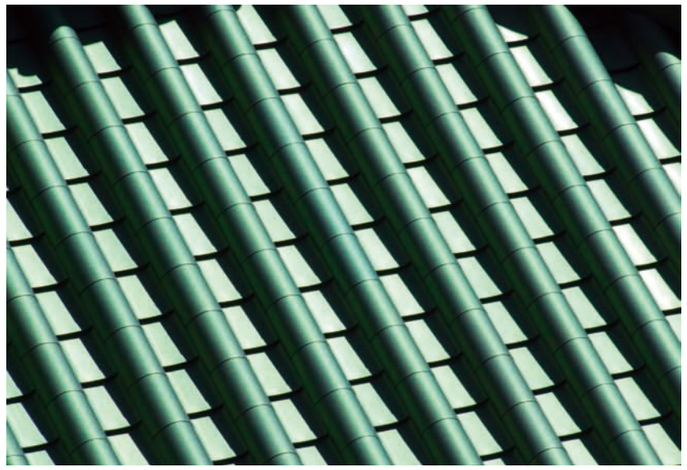
Roofing

SAGA

Roofing

Ryukotokuji Temple

Method – Roof tiling
Surface – Alumina Blasting (AD09); Verdigris coloring
Thickness – 0.3mm
Area – 2,500m^2
Architect – Kojima Kiyoshi Architects Office
Contractor – Teshima Komuten.
Fabricator – Ono Industries, Inc. / Toun Metals
Date – 2009
Saga



New Age of Traditional Japanese Beauty

KYOTO

FUKUOKA

A colored surface finish (green, blown) has been applied to alumina-blasted products.

Kitano-Tenmangu Shrine Treasury

Method – Dutch-lap Method
Surface – Alumina Blasting (AD09);
Verdigris coloring
Thickness – 0.4mm
Area – 1,000m^2
Architect – Kyoto Kenchiku Kenkyusho
Contractor – Okutani Construction Co., Ltd.
Fabricator – Ono Industry
Date – 1998
Kyoto

Roofing

Miyajidake Shrine

Method – Dutch-lap Method
Surface – Roll Dull (ND20);
Gold / Coloring
Thickness – 0.3mm
Area – 220m^2
Contractor – Kongo-Gumi
Fabricator – Ono Industries, Inc.
Date – 2010
Fukuoka

Roofing

New Age of Traditional Japanese Beauty

TOKYO

Ikegami Honmonji Temple

Method – Dutch-lap Method
Surface – Roll Dull (ND10)
Thickness – 0.3mm
Area – 400m^2
Contractor – Shimizu Kenkyusho
Fabricator – Hidaka Shoji / Kubo Bankin
Date – 2002
Tokyo

Roofing

SHIZUOKA

Daichuji Temple

Roofing

Method – Dutch-lap Method
Surface – Alumina Blasting (AD03)
Thickness – 0.3mm
Area – 661m^2
Architect – Katobiken
Contractor – Katobiken
Fabricator – Doryo Bankin
Date – 2006
Shizuoka

New Age of Traditional Japanese Beauty — FUKUOKA

Ashitaka Shrine

Roofing

Method – Dutch-lap Method
Surface – Alumina Blasting (AD09);
Verdigris coloring
Thickness – 0.3mm
Area – 122m^2
Architect – Otsuka Construction
Contractor – Otsuka Construction
Fabricator – Ide Bankin
Date – 2004
Fukuoka

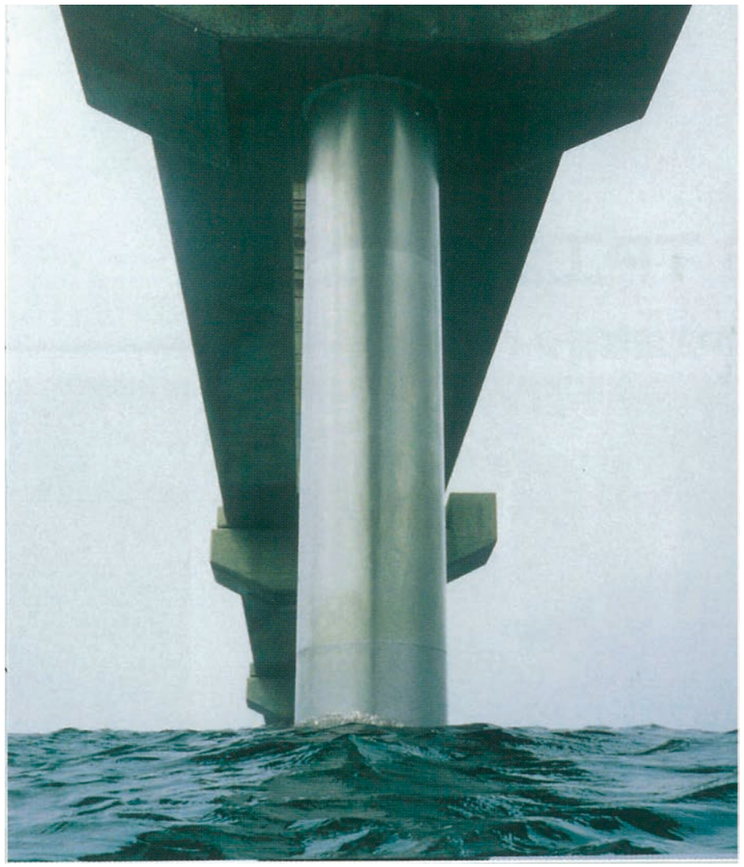
Civil Engineering (construction/structural)

NS Cover Plate is a new technology from NIPPON STEEL ENGINEERING, which together with the TP method (titanium cover petrolatum lining method) from NIPPON STEEL ANTI-CORROSION CO.,LTD. works to prevent bridges and piers from corrosion and contributes to their long working lives. This approach employs a cover coating of titanium with great corrosion resistance and durability.

Haneda Airport D Runway Pier

Method – NS Cover Plate
Surface – Anti-Corrosion Cover
Thickness – 0.35mm
Area – 570,000m^2
Architect – Kajima Corporation and NIPPON STEEL ENGINEERING and Others JV
Contractor – Kajima Corporation and NIPPON STEEL ENGINEERING and Others JV
Fabricator – Kajima Corporation and NIPPON STEEL ENGINEERING and Others JV
Date – 2011
Tokyo

Civil Engineering (construction/structural)



Port and Airport Research Institute / Hazaki Research Pier

Method – TP Method
Surface – Anti-Corrosion Cover
Thickness – 0.6mm
Architect – NIPPON STEEL ANTI-CORROSION
Fabricator – NIPPON STEEL ANTI-CORROSION
Date – 1997
Ibaraki

Chiba Prefecture / Naganuma Water Bridge

Method – TP Method
Surface – Anti-Corrosion Cover
Thickness – 0.6mm
Architect – Aoi Engineering
Date – 2012
Chiba

Monument

Flame Holder at the Nagano Winter Olympic Games

Surface – Mirror
Thickness – 2.0, 3.0mm
Architect – Kiyoyuki Kikutake
Sculptor of Interactive Scupltures
Fabricator – Tig
Date – 1998
Nagano

Sculpture Koka

Surface – Mirror
Thickness – 3.0mm
Architect – Minami Tada
Contractor – Sakamoto
Corporation and Others JV
Date – 1994
Hokkaido

Chigasaki Southern C

Surface – Shot Blast
Architect – Kotobuki
Fabricator – Toho Tech
Date – 2002
Kanagawa