

18" CA MAU Riser at Bunga Raya

Track record 2017

Location of application

Malaysia

Products/system used

Intergard® 269, Chartek® 7, Interthane® 990

Project owner

Petro Vietnam Gas CA MAU Company

Applicator

ANZ Engineering Sdn. Bhd.

Fabricator

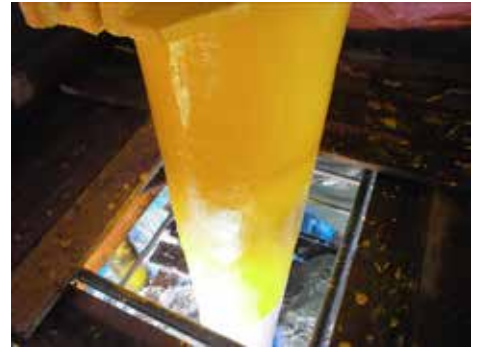
Repsol Oil & Gas Malaysia Limited

ISO12944 environment

C5M

Project size

10m²



Baronia BNCP-B bridge platform

Track record 2017

Location

Pasir Gudang, Johor, Malaysia

Products/system used

Bridge structure: Interzinc® 52, Intergard® 475HS, Interthane® 990

Piping: Interzinc 22, Intertherm® 50, Intertherm 875

Applicator/fabricator

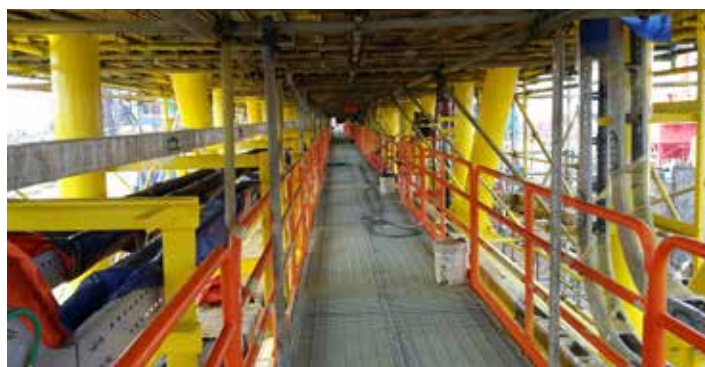
Malaysia Marine Heavy and Engineering Sdn Bhd

ISO12944 environment

C5-M

Project size

4,200m²



Besar A Wellhead Platform

Track record 2017

Products/system used

1A	Interzinc 52, Intergard 475HS, Interthane 990	Carbon Steel Design Temperature < 110°C Non Insulated in the Atmospheric Zone - Initial Painting
1C	Interseal 670HS, Interseal 670HS, Interthane 990	Carbon Steel Design Temperature < 110°C Non Insulated in the Atmospheric Zone - Maintenance Painting for Power Tool Cleaned Surface
2A	Interzinc 52, Intergard 475HS	Carbon Steel Design Temperature < 110°C Insulated in Atmospheric Zone - Initial Painting
3B	Interzone 505, Interzone 505	Offshore Platform Decks (including primary and secondary structures) - Initial Painting and Maintenance Painting (Alternative)
4B	Interzone 505, Interzone 505	Splash Zone and Spray Zone - Initial Painting and Maintenance Painting (Alternative)
5A (1)	Interzinc 22, Intertherm 875, Intertherm 875	Carbon Steel Design Temperature > 110°C (Insulated and Non-Insulated) in Atmospheric Zone - Facilities with surface temperature 110 - 250°C
5A (2)	Intertherm 50, Intertherm 50	Carbon Steel Design Temperature > 110°C (Insulated and Non-Insulated) in Atmospheric Zone - Facilities with surface temperature 250 - 450°C
6A	Interseal 670HS, Interthane 990	Galvanised Steel - Initial Painting
7A (1)	Interseal 670HS, Interthane 990	Stainless Steel - Non insulated facilities operating < 110°C
7A (3)	Intertherm 50, Intertherm 50	Stainless Steel - Insulated and non-insulated facilities operating 110 - 600°C
16A	Interline 850, Interline 850	Diesel - Roof and Shell plate Up to 60°C
16B	Interline 850, Interline 850, Interline 850	Diesel - Bottom plate Up to 60°C

Location

Pasir Gudang, Johor, Malaysia

Applicator/fabricator

Malaysia Marine Heavy
and Engineering Sdn Bhd



ISO12944 environment
C5-M

Project size
16,000m²

EPCC F12 Topside

Track record 2017

Location

Pasir Gudang, Johor, Malaysia

Products/system used

Chartek® 7

Applicator/fabricator

Malaysia Marine Heavy
and Engineering Sdn Bhd

ISO12944 environment

C5-M

Project size

350m²



Statoil Oseberg UWHP

Track record 2017

Location of application

The Netherlands

Owner

Statoil

Applicator

DCS

Products/system used**Carbon steel topside structure -
TSZ metallized (25,000m²)**

Intergard® 269 @ 40µm (2 mils)

Interplus® 356 @ 125µm (5 mils)

Interfine® 1080 @ 60µm (3 mils)

Carbon steel jackets (1,281m²)

Interzone® 3507 @ 200µm (8 mils)

Interzone 3507 @ 150µm (6 mils)

Carbon steel jackets (1,394m²)

Interzone 1000 @ 750µm (30 mils)

Interzone 3507 @ 750µm (30 mils)



STB 1 Barge

Track record 2016

Location of project

Floating Dry Dock, Bibiheybat,
Baku, Azerbaijan

Products/system used

Topsides areas, above waterline
to main deck, open deck - 4,237m²
Primer - Intershield® 300 @ 175µm
Mid coat - Intergard® 263 @ 100µm
Top coat - Interthane® 990 @ 50µm

Underwater area below waterline including
flat bottom and sea chests, dielectric shields
areas around ICCP - 10,888 m²

Epoxy filler - Intergard 821 @ 6,000µm
Primer - Intershield 300 @ 175µm
Second coat - Intergard 263 @ 100µm
Third coat - Intersmooth® 360SPC @ 125µm
Top coat - Intersmooth 360SPC @ 125µm

Ballast tank and compartments (repair) - 1,057m²

First coat - Intershield 300 @ 160µm
Second coat - Intershield 300 @ 160µm

Project owner

BP

Applicator

Caspian Shipyard Company
and SOCAR Cape

ISO12944 environment

C5M

Project size

16,182m²



P74 Topsides Fire Protection

Track record 2016

Location of project

Brazil

Products/system used

Chartek® 7

Project owner

Petrobras

Applicator/Fabricator

Estaleiros do Brasil (EBR)

ISO12944 environment

C5-M

Project size

17.5 tonnes



Wild Well Inc Blow Out Preventer (BOP)

Track record 2010

Location of project

Angola

Products/system used

Interseal[®] 670HS x 3 coats
@ 4-8 mils (100-200µm) DFT

Project owner

Wild Well Control Inc.

Applicator

Quality Product Finishing, Inc

Fabricator

National Oilwell - Texas Oil Tools

ISO12944 environment

C5-M

Project size

Blow Out Preventer 6m tall by 2.5m
wide (20'x 8') for use in sub sea wells



Precision Drilling Rig 41

Track record 2010

Location of project

Alice, Texas, USA

Products/system used

Area 1 - Entire rig coated with 2 coats of Intercure® 200HS @ 4-6 mils per coat
Topcoat Interthane® 990 @ 2-3 mils

Area 2 - Interior of mud tanks Interzone® 505 abrasion resistance

Plant type

Land based drilling rig

Project owner

Precision Drilling



Yemen LNG Terminal

Track record 2008

Location of project

Balhaf, Malaysia

Products/system used

Interzinc® 52, Chartek® 1709,
Interthane® 990, Intergard® 269,
Interzone® 954

Applicator

Muhibbah Engineering (M) Bhd

ISO12944 environment

Fire Protection

Surface preparation

SSPC-SP5

Total volume

130,100 litres (34,300 gals)

Total area

21,000m² (226,000ft²)



Cobra Castor Fixed Platform

Track record 2010

Location of project
Spain

Products/system used
Area 1 - 3 level decks
Interzone® 485
Interthane® 990HS

Area 2 - Main structure
Interzinc® 52
Intergard® 345UHS
Interthane 990HS

Area 3 - Fire wall
Interzinc 52
Chartek® 7

Area 4 - High heat pipes
Intertherm® 751 CSA

Project owner
Cobra Instalaciones y
Servicios and Noble Denton

Applicator/Engineer
Kiewit Offshore Services
Limited, OSD Engineering
and local contractors

ISO12944 environment
C5-M

Surface preparation
SSPC-SP10

Total volume
6,056 litres (1,600 gals)

Total area
8,589m² (92,460ft²)



Akpo FPSO

Track record 2007

Products/system used

Decks (58,000m²)
Intershield® 300 (200µm)
Intershield 300 (200µm)
International® GMA non-skid aggregate
Intergard® 740 (75µm)

Structural steel (175,000 m²)
Interzinc® 52 (75µm)
Intergard 475HS (200µm)
Interthane® 990 (75µm)

Passive fire protection (23,000 m²)
Intergard 269 (50µm)
Chartek® 7
Intergard 263 (50µm)
Interthane 990 (75µm)

Heavy duty decking (27,000 m²)
Interzinc 52 (75µm)
Interzone® 1000 (500µm)
International® GMA non-skid aggregate
Interthane 990 (75µm)

High temperature valves
Intertherm® 751CSA (175µm)

Passive fire protection for vessels
Intertherm 7050
Chartek 7

Project owner

Total

Fabricator

HHI, Korea

ISO12944 environment

C5-M

Total area

300,880m² (3,238,645ft²)



Falcon FPSO

Case history 2007

Focus product: Intershield® 300

Year of project: 2000

Location: Keppel Tuas Shipyard, Singapore

Type of project: FPSO Conversion

Project owner/lessor: SBM Offshore

Operator: ExxonMobil

Intershield 300 was used to protect over 145,000m² (1,560,767ft²) of steel including the water ballast, cargo, slop tanks, heli-deck and mooring area. Intershield 300 was applied onto pitted steel in the tanks after abrasive blasting to Sa 2.5.

On inspection after seven years in service less than 1.5% corrosion was seen in the slop, cargo and water ballast tanks. The Falcon FPSO has operated in the Yoho field off Nigeria with a 99.6% uptime record.



Heli-deck

Coatings performing well



Pitted steel

Heavy pitting in good condition



Water ballast tanks

Transverse frame in excellent condition with no breakdown or defects



Cargo oil tanks

Excellent edge condition on longitudinal stiffeners



Slop port tank

Deckhead with no corrosion

Nexen Buzzard

Track record 2004 - 2010

Location of project

North Sea, UK

Products/system used

Decks (16,000m²)
Interzone® 954 (500µm)
Interzone 954 (500µm)
International® non-skid aggregate
Intergard® 740 (75µm)

Structural steel >120°C (2,000m²)
Intertherm® 50 (40µm)

Structural steel (112,000 m²)
Interzinc® 52HS (75µm)
Intergard 475HS (200µm)
Interfine® 629HS (60µm)

Passive Fire Protection (24,000m²)
Chartek® 7

Project owner

Nexen

Fabricator

Heerema, Hartlepool, UK
BiFab, Fife, UK
Dragados Offshore, Cadiz, Spain

ISO12944 environment

C5M (all systems meeting NORSOK M-501)



Petrobras P-57 FPSO

Track record 2010

Location of project

Singapore and Brazil

Products/system used

Area 1 - Outer hull, water ballast tanks and cargo oil tanks (216,000m²)

Intershield® 300 (160µm)

Intershield 300 (160µm)

Area 2 - Sea chests (850 m²)

Intershield 300 (160µm)

Intershield 300 (160µm)

Intersleek® 737 (175µm)

Intersleek 970 (200µm)

Area 3 - High temperature valve repair (190 m²)

Intertherm® 751 CSA (175µm)

Project owner

SBM Offshore

Applicator

Keppel Singapore and Brasfels Brazil

ISO12944 environment

C5-M



Hutton TLP after 30 years

Case history 2011

Focus product: Interzone® 1000 (3x500µm)

Year of project: 1982

Location: North Sea, UK

Type of project: Tension Leg Platform (TLP)

Project owner: Conoco

Applicator/fabricator: Highland Fabricators, UK

Project size: 40,000 litres
12,600m², over Sa 2.5

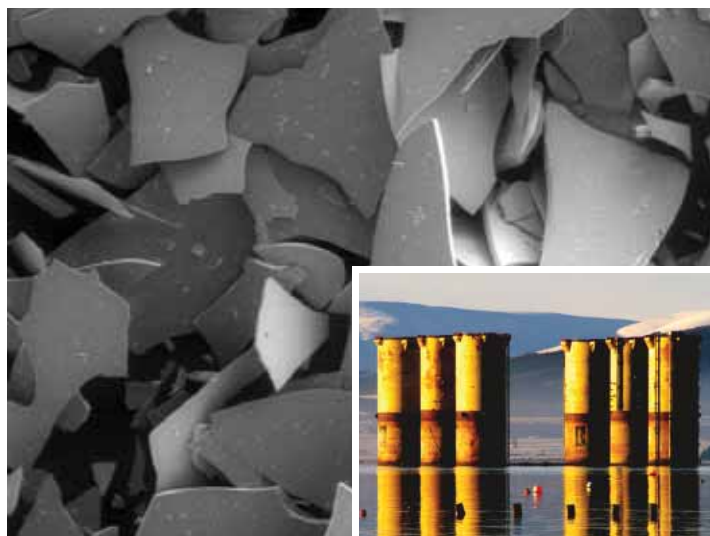
The Hutton was the first ever tension leg platform in the world. It was operated by Conoco for nearly 20 years on the Hutton oil field in the North Sea. At its peak it produced more than 110,000 barrels of oil a day. A coating system was required for the splashzone that would provide a minimum of 20 years anti-corrosion protection in the harsh North Sea.

Area inspected after 29 years: less than 1% corrosion on painted tubular sections

After decommissioning a visual inspection was carried out in August 2011. The original yellow [Interzone 1000](#) in the splashzone is in excellent condition after almost 30 years in a C5-M environment. The bottom section of the Hutton TLP was coated with a holding primer and relied on an impressed current protection system for the submerged section and pontoon. Having 33% non-micronised glass flake in the dry film is what makes [Interzone 1000](#) unique and helps provide the outstanding barrier protection seen on the Hutton TLP.



Excellent corrosion protection provided by Interzone 1000 after almost 30 years



Non-micronised glass flake is critical to achieving outstanding corrosion protection

"It is clear that after nearly 30 years in service the high loaded glass flake epoxy is still performing very well on the painted tubular splashzone sections of the Hutton TLP hull. Estimated corrosion is less than 1% over the coated splashzone. Even areas subjected to abrasion from topside equipment such as pumps, ropes and chains are in excellent condition. For the Hutton we chose the high loaded non-micronised glass flake epoxy over polyester glass flake technology for a number of reasons. One of those was that the glass flake epoxy was much easier to apply."

"After almost 40 years of offshore surveying in the North Sea, I would consider a glass flake epoxy, as used on the Hutton TLP, to offer the best corrosion protection for the splashzone of offshore assets."

Chris Jordan, Coatings Specialist for Conoco during construction of the Hutton TLP

Baronia Living Quarters

Track record 2008

Location of project

Malaysia, Sarawak Offshore

Products/system used

Area 1 - Topside
(Atmospheric Zone)
Interzone® 954 (350µm)
Interthane® 990 (50µm)

Area 2 - Splash Zone
and Jacket Legs

Interzone 954 (500µm)
Interzone 954 (500µm)

Project owner

Petronas Carigali

Applicator

Ropetech

ISO12944 environment

C5-M

Application method

Abseiling and airless spray

Total area

30,000m² (322,917ft²)



DF1-1 Gas Field Development

Track record 2005

Location of project

China

Products/system used

Structural steel
Interzinc® 52 (75µm)
Intergard® 475HS (200µm)
Interthane® 990 (75µm)

Under insulation up to 230°C

Interzone® 228 (120µm)
Intertherm® 228 (120µm)

Splashzones
Interzone 954 (350µm)
Interzone 954 (350µm)

Deck and Helideck

Interzinc 52 (75µm)
Interzone 505 (500µm)

Project owner

CNOOC

Applicator/Fabricator

COOEC/CSE

ISO12944 environment

C5-M

Total area

150,000m² (1,614,586ft²)



Helang Fixed Platform

Track record 2006

Location of project

Pasir Gudang, Malaysia

Products/system used

Structural Steel

Interzinc® 52 (75µm)

Intergard® 475HS (200µm)

Interthane® 990 (75µm)

Decks

Interzone® 2000 (500µm)

Interzone 2000 (500µm)

Project owner

Nippon Oil

Applicator/Fabricator

Mse Pasir Gudang

ISO12944 environment

C5-M

Total area

40,000m² (430,556ft²)



Maari WHP

Track record 2008

Location of project

New Zealand

Products/system used

Jacket immersed steel (500m²)

Interzone® 485 (2,000µm)

Splashzone and non-skid deck (3500m²)

Interzone 1000 (1,000µm)

Passive Fire Protection for Wellbay (380m²)

Interzinc® 22 (50µm)

Intergard® 269 (40µm)

Chartek® 7

Interthane® 990 (75 µm)

Project owner

OMV

Applicator

Kencana, Malaysia

ISO12944 environment

C5-M



Marathon Alba Living Quarters shelter

Track record 2009

Location of project

USA and Equatorial Guinea

Products/system used

Intergard[®] 251 (75µm)
Chartek[®] 7
Interseal[®] 670HS (100µm)
Interthane[®] 990 (75µm)

Project owner

Marathon Oil Corporation

Applicator

Atlantic Scaffolding

ISO12944 environment

C5-M

Total volume

13,860 litres (3,661 gals)

Total area

3,200m² (34,445ft²)



Montara WHP Offshore Platform

Track record 2008

Location of project

Thailand and Australia

Products/system used

Decks (12,000 m²)

Intergard® 251 (50µm)

Interzone® 485 (750µm)

Interfine® 629 (75µm)

Galvanised (1,000 m²)

Interprime® 160 (pretreatment)

Interseal® 670HS (125µm)

Interfine 629 (75µm)

Project owner

PTT Exploration & Production

Public Company Limited

Applicator

Deborah Services, Australia
& Clough, Thailand

ISO12944 environment

C5-M

Total volume

35,000 litres (9,246 gals)

Total area

12,000m² (129,167ft²)



Perdido Spar

Track record 2009

Location of project

Gulf of Mexico, USA

Products/system used

Structural steel

Interzinc® 52 (75 µm)

Intergard® 475HS (200 µm)

Interthane® 990HS (75 µm)

Passive fire protection

Chartek® 7

Project owner

Shell

Applicator

Kiewit, USA

ISO12944 environment

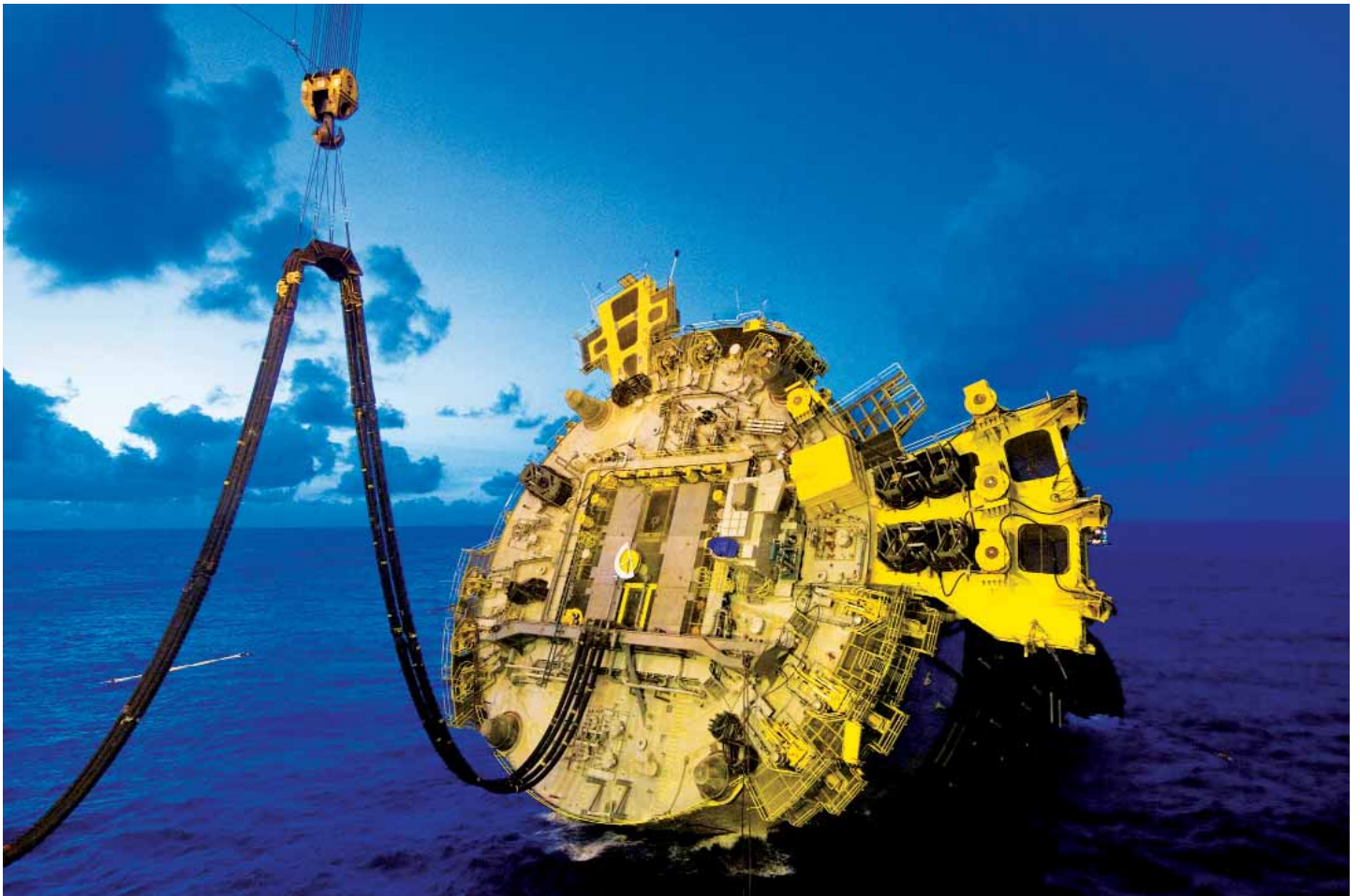
C5-M

Total volume

82,520 litres (21,799 gals)

Total area

5,400m² (58,125ft²)



Piltun B, Sakhalin Platform

Track record 2007

Location of project

Korea

Products/system used

Weather Protection steel:

Interzinc® 52 (75µm)

Intergard® 475HS (200µm)

Interthane® 990 (75µm)

Light duty decks:

Intergard 269 (80µm)

Interzone® 505 (400µm)

Heavy duty decks:

Intergard 269 (80µm)

Interzone 1000 (1,000µm)

Passive Fire Protection:

Intergard 269 (80µm)

Chartek® 7

Intergard 475HS (100µm)

Interthane 990 (75µm)

Stainless steel:

Intergard 400 (150µm)

Intergard 475HS (200µm)

Interthane 990 (75µm)

Project owner

Sakhalin Energy Investment Company (SEIC)

Applicator

SHI, Korea

ISO12944 environment

C5-M

Total area

150,200m² (1,616,739ft²)



© Sakhalin Energy



Peng Lai 19 Offshore Platforms

Track record 2009

Location of project

China

Products/system used

Splashzone (5,400 m²):

Interzone® 485 (3,000µm)

Interzone 485 (1,500µm)

Riser supports (1,500 m²):

Interzone 505 (500µm)

Interthane® 990 (75µm)

Decks and Walkways (3,700 m²):

Interzone 505 (600µm)

Galvanised steel (900 m²):

Interseal® 670HS (150µm)

Interthane 990 (75µm)

Passive Fire Protection (10,800m²):

Chartek® 7

Project owner

CNOOC/ConocoPhillips

Fabricator

COOEC/BOMSEC

ISO12944 environment

C5-M

Total area

33,100m² (356,285ft²)



PB-KU-A fixed platform

Track record 2006

Location of project

Spain

Products/system used

Structural steel (3,030m²)
Interzinc® 52HS @ 75µm
Intergard® 475HS @ 175µm
Interfine® 878 @ 75µm

Risers (100m²)
Interzone® 485 @ 3,000µm

Project owner

PEMEX

Fabricator

Dragdos, Spain

ISO12944 environment

C5-M

Total area

32,100m² (345,522ft²)



FSRU Toscana

Track record 2011

Location of project

Dubai, India

Products/system used

Hull below the waterline

(25,090 m²)

Intershield® 300 @ 150µm

Intershield 300 @ 150µm

Intershield 300 @ 150µm

Hull above the waterline

(17,432 m²)

Intershield 300 @ 150µm

Intershield 300 @ 150µm

Intershield 300 @ 150µm

Interthane® 990 @ 75µm

Fenders (742 m²)

Interzone® 1000 @ 750µm

Interzone 1000 @ 750µm

LNG Domes and topside

modules (4,330 m²)

Interseal® 670HS @ 100µm

Chartek® 7

Interthane 990 @ 75µm

Project owner

OLT Offshore

Yard/Fabricator

Drydocks World-Dubai

ISO12944 environment

C5M

Total area

80,508m² (866,581ft²)



Pazflor FPSO

Track record 2010

Products/system used

Water Ballast Tanks and
Crude Oil Tanks (350,000 m²)
Intershiel[®] 300 (160µm)
Intershiel 300 (160µm)

Decks (58,000 m²)
Intershiel 300 (200µm)
Intershiel 300 (200µm)
International[®] GMA132
Intergard[®] 740 (60µm)

Passive Fire Protection living quarters
and deck modules (23,000 m²)
Intergard 269 (50µm)
Chartek[®]
Intergard 263 (50µm)
Interthane[®] 990 (75µm)

Helideck and heavy duty decking
(27,000 m²)
Interzinc[®] 52 (75µm)
Interzone[®] 1000 (500µm)
International[®] GMA132
Interthane 990 (75µm)

Project owner

Total

Fabricator

DSME, Korea

ISO12944 environment

C5-M

Project size

300,880m² (3,238,645ft²)



CCI Borco Piping

Track record 2011

Location of project

Bahamas

Project owner

CCI Borco

Applicator/Fabricator

Acadian Contractors

Products/system used

Interzinc® 52 @ 50-75µm (2-3 mils)

Intercure® 200HS @ 125-175µm (5-7 mils)

Interthane® 990 @ 50-75µm (2-3 mils)

Engineer

Paloma Energy Consultants

ISO12944 environment

C5M



Chevron Jack St. Malo

Track record 2011

Location of project

USA

Products/system used

Area 1 - Valve skid

Interzinc® 22 @ 50-75µm (2-3 mils)

Intergard® 475HS @ 100-150µm (4-6 mils)

Interthane® 990 @ 50-75µm (2-3 mils)

Area 2 - Skid valves

Intertherm® 751CSA @ 100-150µm (4-6 mils)

Intertherm 751CSA @ 100-150µm (4-6 mils)

Project owner

Chevron

Engineer

Mustang

Fabricator/Applicator

Omega Natchiq

ISO12944 environment

C5-M



Subsea Pipe Bends

Track record 2011

Location of project

Australia

Project operator

Chevron Australia

Fabricator

Wasco Piping Systems

Area coated

4,500 litres (1,189 gals)

Products/system used

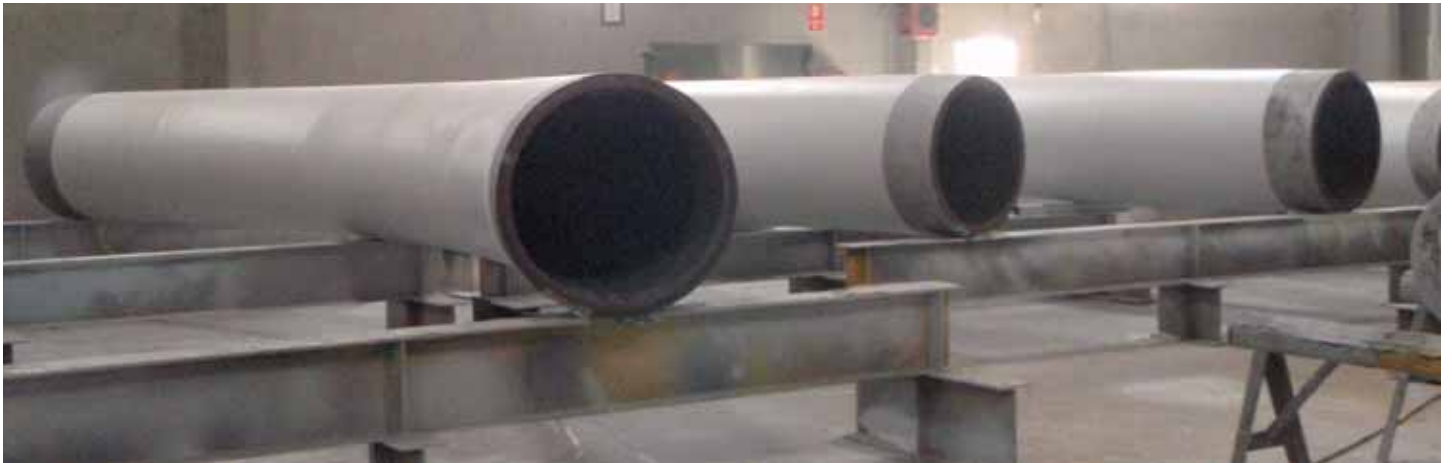
Interzone[®] 485

Applicator

Orontide Industrial Services

ISO12944 environment

C5-M



The Gorgon Project is operated by an Australian subsidiary of Chevron and is a joint venture of the Australian subsidiaries of Chevron (47.3%), ExxonMobil (25%), Shell (25%), Osaka Gas (1.25%), Tokyo Gas (1%) and Chubu Electric Power (0.417%).

Tarpon Project

Track record 2012

Location of project

Malaysia

Products/system used

Area 1: Topside structural steelwork
in atmospheric condition
Interzinc® 22, Intergard® 475HS,
Interthane® 990

Area 2: Splashzone area

Intergard® 269, Interzone® 505

Project owner

BC Petroleum

Applicator

Vantage Steel Sdn. Bhd.

Fabricator

Dialog Fabricator Sdn. Bhd.

ISO12944 environment

C5-M

Project size

4 units x 250 tonnes



Prirazlomnaya Offshore Ice-resistant Platform

Track record 2011

Location of project

Russia

Project owner

Gazprom

General contractor

Sevmash shipyard

Products/system used

Area 1 - Pitted steel repair

Interplus® 356 @ 125µm (5 mils)

Interzone® 954 @ 300µm (12 mils)

Area 2 - Fire protection for bulkheads,
piperacks and structural steel
Chartek® 7

ISO12944 environment

C5-M

Project size

300,000m² (3,229,173ft²)



Stena DrillMAX ICE

Case study 2010

Focus product: Intershield® 163 Inerta 160 (500µm)

Location: Korea

Project owner: Stena Drilling

Applicator: SHI, Korea

Surface preparation: Sa 2.5

ISO12944 environment: C5-M

Project size: 9,800m² (105,486ft²)

The solution

Intershield 163 Inerta 160 was selected by Stena Drilling to provide ice abrasion resistance for the hull of their ice strengthened Arctic drill ship Stena DrillMAX ICE. Stena Drilling specifically requested Intershield 163 Inerta 160 because of its track record spanning over 30 years in the protection of ice breakers and other polar class marine vessels.

The hull of the DrillMAX ICE has been given the polar class identification of PC-4. This means it can operate year-round in first year thick ice which may include old ice inclusions. The application of Intershield 163 Inerta 160 was performed in conjunction with Korean block stage painting processes at SHI, Korea, with full TSR support from AkzoNobel. The Stena DrillMAX ICE hull was tested in models to ensure operation through ice at 2.2m thickness. The drill ship will be expected to operate for many years to come and Intershield 163 Inerta 160 will provide protection in Arctic waters thanks to its excellent ice slip properties due to its low coefficient of friction in ice.

Intershield 163 Inerta 160 was the first ice abrasion resistant coating to get class society Type Approval and has over 1,300 applications world wide to date including drill ships and other offshore structures. Intershield 163 Inerta 160 was specifically designed to reduce friction caused by ice abrasion and to minimise the corrosion of hulls operating in ice conditions.



Intershield 163 Inerta 160 was successfully applied following the Korean new build block stage erection process

PEMEX Chemul Semi-submersible Platform, Maintenance and Repair

Track record 2010

Location of project

Halifax, Nova Scotia, Canada

Products/system used

Intershield® 300, Interthane® 990

Project owner

PEMEX, Mexico

Applicator

MacKinnon & Olding,
Smith & McCarthy Painting

Fabricator

Woodside Industries
(a division of Halifax Shipyard)

ISO12944 environment

C5M - marine environment

Area coated

Approximately 18,580m² (200,000ft²)



Jette Subsea Manifold

Case study 2012

Focus products: Hot pipe work - Intertherm® 3070 (125µm [4.9mils]), Intertherm 3070 (125µm [4.9mils]), Intertherm 3070 (125µm [4.9mils])

Steel protection frame - Intergard® 269 (40µm [1.6mils]), Interzone® 954 (200µm [7.9mils]), Interzone 954 (200µm [7.9mils])

Location: UK

Project owner: Det Norske

General contractor: BiFab

ISO12944 environment: C5-M Im2

Background

The manifold used in the Jette oil and gas field is a key part of the subsea infrastructure for Det Norske. It will help gather oil and gas from the neighbouring wells and transfer the hydrocarbon fluids to the production pipeline.

The solution

Det Norske's first ever subsea project on the Norwegian oil and gas shelf was recently completed using Intertherm 3070 from AkzoNobel's International® range, to protect the manifold's hot pipes. Intertherm 3070 has excellent temperature resistance under seawater immersion and good compatibility with cathodic protection. In addition Interzone 954 was used to provide an abrasion resistant coating to protect the manifold's outer frame.



Noble Alen Platform

Track record 2012

Location of project

USA

Project owner

Noble Energy

Engineer

Mustang Engineering

Fabricator/Applicator

McDermott INC

Products/system used

Area 1 - High Impact Deck Coating

Interzone® 485 @ 1250 - 1500µm (50-60 mils)

Interthane® 990HS @ 50 - 75µm (2-3 mils)

Area 2 - Structural Steel

Interzinc® 52 @ 75µm (2-3 mils)

Intergard® 475HS @ 125 - 175µm (5-7 mils)

Interthane® 990HS @ 50 - 75µm (2-3 mils)

Area 3 - Piping

Intertherm® 751CSA @ 150 - 175µm (6-7 mils)

Intertherm® 751CSA @ 150 - 175µm (6-7 mils)

Area 4 - LQ Package

Interzinc® 52 @ 50 - 75µm (2-3 mils)

Chartek® 7 @ 10-12mm (½")

ISO12944 environment

C-5

Surface preparation

SSPC SP 10 Near White

Total volume

>113,570 liters (30,000 gallons)

Total area

69,680m² (750,000 ft²)

Tonnage coated

10,000 tons



Stone Energy E.W. 305A Deck Project

Track record 2012

Location of project

USA

Project owner

Stone Energy Corporation

Engineer

Tahanie Thibodeaux

Applicator

Nachor Corporation

Products/system used

Interzone® 485 @ 1250 - 1500µm (50 - 60 mils)
Interthane® 990HS @ 50 - 75µm (2 - 3 mils)

ISO12944 environment

C5-M

Surface preparation

UHP- Hb2.5M or Hb2.5L

Total volume

1,520 liters (400 gallons)

Total area

750m² (8,000ft²)



Apache PL 11F Heliport Deck Project

Track record 2012

Location of project

Gulf Of Mexico

Applicator

BIS Salamis

ISO12944 environment

C5-M

Total volume

910 liters (240 gallons)

Project owner

Apache Corporation

Products/system used

Interzone® 485 @ 1250 - 1500µm (50 - 60 mils)
Interthane® 990HS @ 50 - 75µm (2 - 3 mils)

Surface preparation

SSPC-SP-10 Near White

Total area

465 m² (5,000 ft²)

Engineer

Tim Morgan



Apache E.C. 278 B Waterline Project

Track record 2012

Location of project

Gulf Of Mexico

Applicator

BIS Salamis

ISO12944 environment

C5-M

Total volume

2,275 liters (600 gallons)

Project owner

Apache Corporation

Products/system used

Interseal[®] 670HS @ 100 - 125µm (4-5 mils)

Interzone[®] 505 @ 375 - 500µm (15-20 mils)

Interthane[®] 990HS @ 50 - 75µm (2-3 mils)

Surface preparation

SSPC-SP-10 Near White

Total area

1,395 m² (15,000 ft²)

Engineer

Tim Morgan



Apache G.I. 47AP Deck Project

Track record 2012

Location of project

Gulf Of Mexico

Applicator

BIS Salamis

Project owner

Apache Corporation

Products/system used

Interzone[®] 485 @ 1250 - 1500µm (50 - 60 mils)

Interthane[®] 990HS @ 50 - 75µm (2 - 3 mils)

ISO12944 environment

C5-M

Surface preparation

SSPC-SP-10 Near White

Total volume

3,785 liters (1,000 gallons)

Total area

1,860 m² (20,000 ft²)

Engineer

Tim Morgan



Petrobras P55 Living Quarters

Track record 2010

Location of project

USA

Project owner

Petrobras

Fabricator/Applicator

Signal International

Engineer

SBM Gusto

Products/system used

Passive epoxy fireproofing system

Interzinc® 52 @ 75µm (3 mils)

Chartek® 7

Interthane® 990 @ 50µm (2 mils)

ISO12944 environment

C5-M

Surface preparation

SSPC-SP10 Near White Metal

Total area

280 m² (3,000 ft²)



Noble Max Smith

Major Refurbishment

Track record 2012

Location of project

USA

Project owner

Noble Drilling

Fabricator

Signal Shipyard

Applicator

Signal and Cypress Bayou (sub-contractor)

ISO12944 environment

C5-M

Products/system used

Area 1 - Hull above 24m (79') waterline
& underside main deck

Intershield® 300V @ 150 - 200µm (6 - 8 mils)

Intershield® 300V @ S/C - B/S

Intershield® 300V @ 150 - 200µm (6 - 8 mils)

Interfine® 878 @ 50 - 75µm (2 - 3 mils)

Area 2 - Hull below 24m (79') waterline

Interzone® 954 @ S/C sprayed

Interzone® 954 @ 250 - 300µm (10-12 mils)

Interzone® 954 @ 250 - 300µm (10-12 mils)

Area 3 - Heliport deck

Intergard® 251 @ 50 - 100µm (2-4 mils)

Interzone® 505 with 7754D non-slip

aggregate @ 250 - 300µm (10-12 mils)

Interfine® 878 @ 50 - 100µm (2-4 mils)

Surface preparation

SSPC-S10 and UHP

Total area

37,220 m² (400,600 ft²) total job



Marlin A Platform

Track record 2012

Location of project

Victoria, Australia

Project owner

Eso Australia Resources
BHP Billiton Petroleum
(Bass Strait)

Applicator

WGPSN

Products/system used

Chartek® 7

ISO12944 environment

C5-M

Application method

Plural Spray and hand application
(offsite) and hand trowel all site work

Project size

10,000kg (22,046lb)



Agbami FPSO

Case history 2012

Focus product: Intershield® 300

Year of project: 2007

Location: Agbami Field, Nigeria

Type of project: Floating Production, Storage & Offloading (FPSO) unit

Project owner: Chevron

Applicator/fabricator: Daewoo Shipyard, South Korea

Project size: 140,000m² (1,506,947ft²) topsides & decks

At the time of its discovery the Agbami oil and gas field, situated 70 miles off the Nigeria coast, was the biggest of its day. Chevron recognised the only way to develop the field was via an FPSO, moored in 1,463m (4,800ft) of sea water.

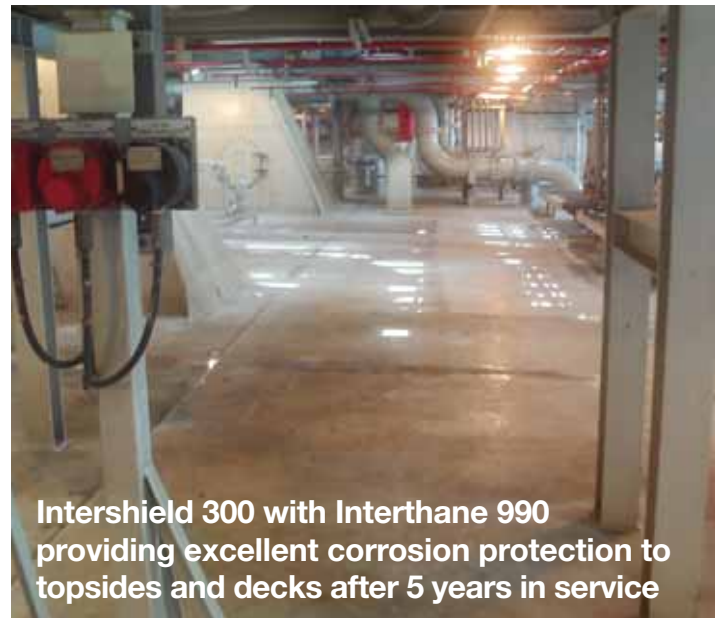
Chevron needed 20 year corrosion protection for the mammoth FPSO which would be capable of processing 250,000 barrels of oil a day and storing 2,200,000 million barrels of oil.

During the design, Chevron worked closely with AkzoNobel to select a suitable coating to provide corrosion protection for the outer hull, tanks and topsides. **Intershield 300** was selected as a universal primer for all of these areas. This allowed the yard (DSME, Korea) to simplify the coatings procedure and keep up a high level of productivity. The abrasion resistance of **Intershield 300** meant it protected the hull top plate whilst the modules and supports were installed.

After 5 years in service **Intershield 300** is performing extremely well. Areas of high risk such as edges and welds are still in excellent condition. This can be seen, in particular, on the hull top plate and helideck supports.

“Intershield 300 is performing as expected”

Brent W. Griffin, Coatings and Linings Engineer Chevron



Intershield 300 was extensively applied to the outer hull, tanks and topsides of the Agbami FPSO

BOP Actuators

Track record 2013

Location of project

USA

Project owner

NOV - TOT/ FMC Brazil

Fabricator

NOV

Project size

24 sets - 161m² (1,730ft²)

Products/system used

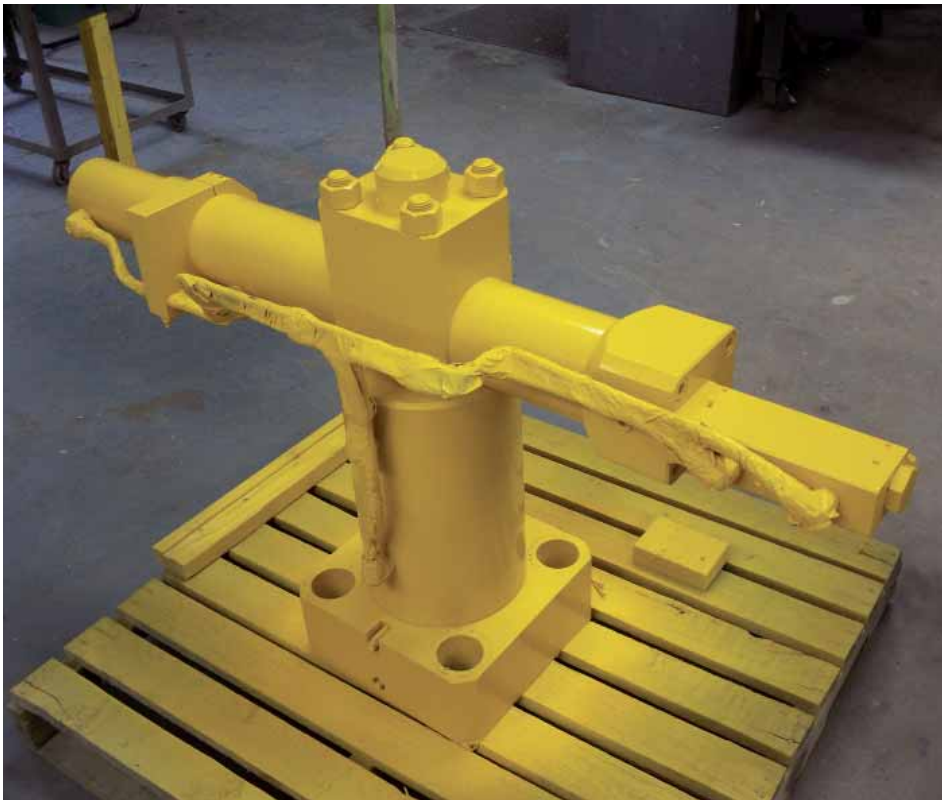
2 coats Interseal[®] 670HS
@ 203-254µm (8-10 mils) each

Applicator

Quality Product Finishing

ISO12944 environment

Subsea



COP WEST Chirag PDQ Jacket Project

Track record 2012

Location of project

Azerbaijan

Project owner

BP

Applicator

Hertel

Products/system used

System 1 - Intergard® 269 @ 75µm (3 mils),
Interzone® 505 @ 750µm (29.5 mils)

System 2 - Interzone® 505 @ 350µm (13.8 mils)

System 3 - Interline® 955 @ 500µm (19.7 mils)

Fabricator

Bos Shelf

ISO12944 environment

Im2 Seawater immersion

Project size

72,705m² (782,590ft²)



Process, compression, water utility (PCWU) platform

Track record 2007

Location of project

Azerbaijan

Products/system used

Area 1 - Topsides Insulated/
Uninsulated

Intercure® 202 @ 75µm (3 mils)
Intercure® 420 @ 175µm (6.9 mils)
Intercure® 420 @ 175µm (6.9 mils)
Interfine® 629 HS @ 50µm (2 mils)

Area 2 - Atmospheric Exposure
Carbon/Stainless Insulated/
Uninsulated

Intertherm® 228 @ 125µm (4.9 mils)
Intertherm® 228 @ 125µm (4.9 mils)

Area 3 - Light Duty Non Skid Deck
System

Intercure® 202 @ 75µm (3 mils)
Interseal® 670HS @ 400µm
(15.7 mils)

Area 4 - Heavy Duty Non Skid

Intercure® 202 @ 75µm (3 mils)
Interzone® 485 @ 3000µm
(118 mils)
Intergard® 740 @ 50µm (2 mils)

Area 5 - Duplex stainless steel external
surfaces, insulated and uninsulated

Intercure® 202 @ 75µm (3 mils)
Interzone® 505 @ 375µm (14.8 mils)
Interzone® 505 @ 375µm (14.8 mils)

Area 6 - All structural steelwork

Interseal® 670HS @ 125µm
(4.9 mils)
Interzone® 505 @ 375µm (14.8 mils)
Interzone® 505 @ 375µm (14.8 mils)

Project owner

AIOC, Azerbaijan International
Operating Company

Applicator

Azfen

Fabricator

ATA Consortium
(Amec - Tekfen - Azfen)

ISO12944 environment

C5-M

Total area

100,000m² (1,076,391ft²)



Tapis EOR and rejuvenation project

Track record 2013

Location of project

Malaysia

Product/system used

Chartek[®] 7

Project owner

Exxonmobil Exploration and
Production Inc, Malaysia

Applicator

Nomad Engineering

Fabricator

MMHE

ISO12944 environment

C5M

Project size

5,000m² (53,820ft²)



Second Generation Enhancement, TCO: Phase II expansion of Tengiz Oil Field site

Track record 2014

Location of project

Republic of Kazakhstan,
Atyrau region, Tengiz field

Products/system used

Interbond[®] 1202UPC @ 200µm (8 mils)

Project owner

TCO TengizChevrOil

Applicator

Senimdi Kurylys

ISO12944 environment

ISO 8504 Sa2½

Operating conditions

Under insulation,
operating temp: 156°C (313°F)

Substrate

Carbon steel

Project size

1,000m² (10,764ft²)



Martin Linge Jacket

Track record 2014

Location of project

Kværner Verdal, Norway

Products/system used

Interzone® 954, Interzone® 762

Project owner

TOTAL E&P

Total area

10,000m² (107,639ft²)



Shell Draugen Subsea Installation

Track record 2014

Location of project

Norway

Project owner

Shell

Products/system used

Interzone® 954 @ 2x200µm (8 mils)

Compliant with

Norsok M-501 edt.6 System 7B



Butendiek Offshore Wind Farm Substation

Track record 2014

Location of project

German North Sea

Products/system used

Interzinc® 52, Intergard® 475HS,
Interthane® 990, Interzone® 954,
Intershield® 300, Interseal® 670HS,
Interdeck® 500 aggregate,
Interlac® 789, Intergard® 269

Wind farm capacity

288MW

Asset/areas coated

Substation deck, topsides,
foundation substructure

Location of application

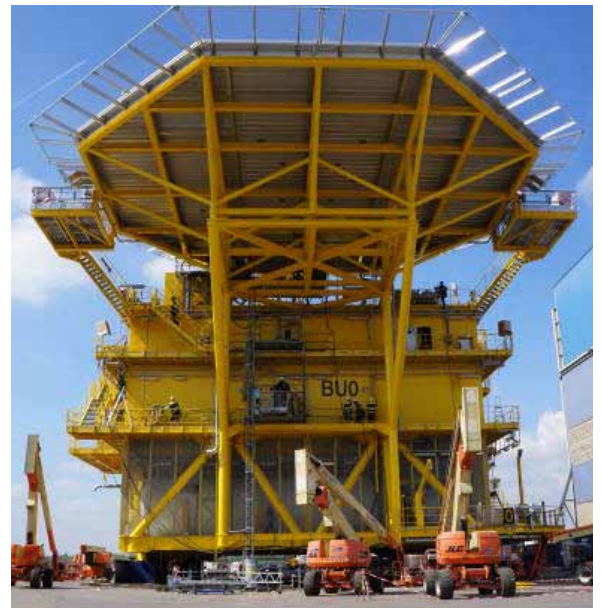
Belgium

Fabricator

lemants

ISO 12944 environment

C5-M



Shah Deniz II Subsea Pipeline Crossing Support

Track record 2014

Location of project

Azerbaijan

Products/system used

Crossing support concrete surface
Intercrete™ 4840, Interseal® 670HS

Steel frame of crossing support
Interzone® 954, Interseal® 670HS

Project owner

BP Exploration

Applicator

Hertel

Fabricator

Bos Shelf

ISO12944 environment

IM2

Project size

35,430 kg of Intercrete™ 4840



Crane Barge - Pelicano

Track record 2013

Location of project

Brazil

Products/system used

Intershield® 300, Interthane® 990

Project owner

SBM

Applicator/Fabricator

BSL

ISO12944 environment

C5M/Im2

Project size

6,000m² (64,583ft²)



FPSO Cdl Modules

Track record 2013

Location of project

Brazil

Products/system used

Interzinc® 52, Interseal® 670HS, Interthane® 990

Project owner

SBM

Applicator

Estaleiro Brasa, Metasa, Brafer, Ebse

Fabricator

Estaleiro Brasa, Ebse

ISO12944 environment

C5M

Project size

4.500 Ton - 300 KLt



SSV Victoria M&R

Track record 2014

Location of project

Brazil

Project owner

Ventura Petroleo

ISO12944 environment

C5M

Products/system used

Interzone® 954 @ 500µm (20 mils)

Interthane® 990 @ 50µm (2 mils)

Applicator

J. Costa

Project size

2,000m² (21,528ft²)



Onshore Mobile Drilling Rig Discovery 612

Track record 2015

Location of project

Republic of Kazakhstan, Atyrau region

Products/system used

Internal (1,100m²) - Interzone® 954

External (21,444m²) - Interseal® 670HS, Interthane® 990

Project owner

KMG Drilling & Services

ISO12944 environment

C5I

Specifier/Applicator

Zhigermunaiservice



TCO TurnAround 2015

Track record 2015

Location of project

Republic of Kazakhstan, Atyrau region, Tengiz field

Products/system used

Pipe spools. Controtrace installation DR.

Insulation and uninsulation pipes. Interbond® 1202UPC

Project owner

TCO TengizChevrOil

Specifier

TengizChevrOil

Applicator

SICIM SpA

ISO12944 environment

C5I

Total volume

15,000 litres (3,962 gals)



Drill Cutting Pad

Track record 2015

Location of project

Republic of Kazakhstan,
Atyrau region, Tengiz, Korolev field

Products/system used

External - Interplus® 356
Internal - Interline® 850

Project owner

TCO TengizChevrOil

Applicator

ACG (Access Coating Group)

ISO12944 environment

C5I

Total area

External - 450m² (4,844ft²)
Internal - 434m² (4,672ft²)



Woodside FPSO OKHA

Hull - Vertical sides and flat bottom rudder

Location of project

Singapore

Products/system used

Intersleek® 7180 @ 100µm (4 mils)

Intersleek 731 @ 100µm (4 mils)

Intersleek 1100SR @ 150µm (6 mils)

Surface preparation

Water wash 3,000 psi, Hard scrap,
Hydro jetting 20,000 psi

Project owner

Woodside Energy

Applicator

Sembcorp Marine

ISO12944 environment

C5 High Durability Marine

Project size

22,900m² (105,486ft²)

Background

The Okha was refitted in 2010 for the Cossack Wanaea Lambert and Hermes Field 135km north-west of Karratha Western Australian coast.

Original coating on the below water area was Intersmooth® 360 the client wish was to move from a copper base antifoul to an Intersleek® material.

AkzoNobel was requested to offer a system which met the client's requirements and was environmentally suitable to Australian regulators.

**The solution**

Intersleek 1100SR Fluoropolymer was chosen due to its ability for reduce slime and growth build up while the OKHA FPSO was on station.

The Intersleek system was applied first using Intershield® 300 touch up, Intersleek 7180 tie coat @ 100µm, Intersleek 731 link coat @ 100µm, Intersleek 100SR finish coat @ 150µm.



Woodside FPSO OKHA

Helideck

Products/system used

Interzone® 954, Non Skid Additive GMA131, Interthane® 990

Project size

450m² (4,844ft²)



ACG oil field project

Case study 2016

Product: Intertherm® 3070, 2 coats at 175µm each

Location: Azerbaijan

Type of asset: Subsea in-line valve and equipment, uninsulated

Surface preparation: Abrasive blast cleaning to Sa 2.5 or SSPC SP 10/NACE 2

Project owner: BP

Applicator/Fabricator: MQS

ISO12944 environment: IM2

Project size: 400m², 800 liters of Intertherm 3070

Oil Major BP was keen to further develop the Azeri-Chirag-Deepwater Guneshli (ACG) oil field which is the largest in the Azerbaijan sector of the Caspian Sea, spanning over 400km². Lying beneath 120m of seawater with its individual “reservoir horizons” located 3km beneath the seabed, the ACG field produces over 600,000 barrels of oil per day. Aside from the offshore production platform, drilling platform and living quarters, the field development also comprises 230km of subsea pipeline.

BP needed to enhance the oil recovery through water and gas injection to balance field pressure, which required additional subsea equipment and connections to the pipelines.

Due to the critical nature and importance of the subsea equipment, BP required a high performance coating solution which would be compliant with NORSOK M-501 System 7C to temperatures above 90°C (194°F). Using a coating system that would not require maintenance was important while, as the project progressed, using a solution that could save project time became vital. Taking these factors into account, the choice was made to use Intertherm 3070, a high performance **temperature resistant**, phenolic epoxy novolac coating, applied as a **two coat system**. Designed specifically for the subsea market, Intertherm 3070 meets the challenges of protecting subsea equipment operating at temperatures of up to 185°C (365°F) and acts as the primary corrosion barrier for equipment and piping.

With an excellent and increasing track record, Intertherm 3070 is already approved by large subsea equipment manufacturers. Aside from its outstanding temperature resistance, projects also benefit from productivity benefits, as Intertherm 3070 is applied as a two coat system, moving away from the slower applied industry standard three coat system.

Significant time and cost savings can be made when using Intertherm 3070 for subsea equipment corrosion protection.



Intertherm 3070 has an excellent track record with subsea equipment suppliers who require high temperature resistant coating solutions for oil and gas projects.

