Kuantan Port Tank Farm
Track record 2017

Location of project
Malaysia

Products/system used
Interseal® 670HS, Interseal 670HS, Interthane® 990

Project owner
UPC Chemicals (Malaysia) Sdn. Bhd.
Gebeng Kuantan

Applicator
Bestrich Star Sdn. Bhd.

Fabricator

ISO12944 environment
C5-I

Project size
10,891m²
Sea-Tank 2205 inside

Track record 2017

Location of application
Sea Tank Terminal 510, Antwerpen

Products/system used
Enviroline® 376 F-30 LT Red/Brown @ 400μm

Owner
Sea Tank

Surface
Blasted Sa 2½
63-T-9105 Internal coating restoration
Track record 2016

Applied system
Interline® 975

Location of application
Republic of Kazakhstan, Tengiz

Project owner
Tengizchevroil

Applicator
Denholm Zholdas

ISO12944 environment
Im1

Project size
54m²

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Water Treatment Plant Project
Track record 2016

Applied system
PFP system: Intergard® 251, Chartek® 1709, Interthane® 990

Location of application
Republic of Kazakhstan, Tengiz

Project owner
Tengizchevroil

Applicator
BSL

ISO12944 environment
C5I

Project size
425m²
Pumphouse Building PH0208
Track record 2016

Applied system
PFP system: Intergard® 251, Chartek® 1709, Interthane® 990
Anticorrosive: Intergard 251, Intergard 475HS, Interthane 990

Location of application
Republic of Kazakhstan, Tengiz

Project owner
Tengizchevroil

Applicator
CCT

ISO12944 environment
C5I

Project size
1,080m² PFP
1,100m² Anticorrosive
The customer was looking for a system that would make cleaning their tank during maintenance easy. After 6 months use of the specified Interseal 670HS and Interfine 878 scheme, the customer uses only water for cleaning their tanks, greatly improving their maintenance processes.

Focus products: Interseal® 670HS and Interfine® 878
Type of project or asset: Maintenance of tanks
Surface preparation: High pressure washing and sanding
Location: Brazil
Project owner/applicator: Vopak
ISO12944 environment: C4
Project size: 1,800 litres
COMPERJ Fire Protection

Track record 2016

- **Location of project**: Brazil
- **Project owner**: Petrobras
- **Applicator/Fabricator**: Qualiman Mont. Inds. Ltda
- **ISO 12944 environment**: C5-I
- **Project size**: 4.8 tonnes of Chartek

Location of project

Products/system used
- Chartek® 1709 @ 7.85mm

ISO 12944 environment

Project size
- 4.8 tonnes of Chartek

Project owner

Applicator/Fabricator

Location of project

Products/system used

ISO 12944 environment

Project size

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### MLNG Passive Fire Protection Maintenance

**Track record 2009**

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<th>Location of project</th>
<th>Project owner</th>
<th>ISO12944 environment</th>
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<td>Malaysia</td>
<td>MLNG</td>
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<tr>
<td>Products/system used</td>
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<td></td>
</tr>
<tr>
<td>Chartek® 1709</td>
<td>KUMUS SDN BHD</td>
<td></td>
</tr>
</tbody>
</table>

- **Total area**: 50m² (538ft²)

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Miri Crude Oil Terminal (MCOT) Tank 78

Track record 2010

Location of project
Miri, Sarawak, Malaysia

Products/system used
External shell and tank roof
Interzone® 954, Interthane® 990

Project owner
Petronas Carigali Sdn Bhd

Applicator
Ropetech Sdn Bhd

ISO12944 environment
C5-I

Total area
4,500m² (48,438ft²)

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Area inspected 1: striker plates
The striker plates were coated using the Matcote system.

Area inspected 2: tank bottom
Tank bottom gel coat with Interline 985 over existing fiberglass and 1m (3ft) up the shell. Sweet blast to fiber glass reinforcement.

“Having seen the performance of AkzoNobel first hand, I am no longer skeptical about the quality of their products. AkzoNobel has partnered with Enterprise to supply superior coatings that range from tank linings to exterior systems that are simple to apply. They have made it easy for us to order protective coatings online or over the phone for our Terminal in Texas City”

Mike Horstman, Enterprise Contract Project Manager
Area inspected 1
After three years less than 10cm² of breakdown was found on this uninsulated tank - PCDHDS - Cold Separator with Carbon Steel. The product successfully used was Intertherm 751 CSA at 75-100μm DFT.

Area inspected 2
The insulated bullet tank also uses Intertherm 751 CSA at 75-100μm DFT with service temperatures at 48°C (119°F) to 114°C (238°F). On site application of Intertherm 751 CSA is specifically designed to provide a corrosion resistant barrier to steelwork in both atmospheric service and under insulation operating in thermal cyclical conditions between -50°C (-58°F) up to 400°C (752°F).
Background
Compagnia Italpetroli S.p.A is an Italian company specializing in the storage, handling, and distribution of finished petroleum products. The company has a facility in Civitavecchia with a storage capacity of approximately 12.3 million ft³ (350,000 m³) designed to store different types of petroleum products. Tankers offload their various petroleum cargos at an offshore terminal that is connected to the onshore storage facility through two 22-inch (55 cm) diameter pipelines. Due to the variety of petroleum products being run through the pipeline it had caused the two pipelines to degrade. This particular site and pipeline are very important as they provide jet fuel to the Leonardo da Vinci-Fiumicino Airport near Rome, Italy’s largest airport.

Focus product: Devchem® 257
Location: Civitavecchia, Italy
Project owner: Compagnia Italpetroli
Applicator: Intracoat Pipeline Services, Inc. (I.P.S.) located in Venus, Texas, USA
Project size: 3,700 gal (14,000 liters), 250,000ft² (23,225m²) two 22-inch diameter pipelines with a length of 4.25 miles each

“The solution
The ease of mixing Devchem 257 and long pot life are critical for long pipe runs. Resistance to a range of chemicals, fuels, and other potential future cargos is another vital factor. Devchem 257 has the ability to be applied by pipeline pig to mechanically and chemically clean and coat (insitu lining) the full length of the pipelines with unique corrosion-resistant epoxy coatings. The contractor Intracoat Pipeline Services have previous experience with Bar-Rust 236 which has been applied successfully to a number of projects in the past - primarily with gas, crude and brine lines. Confidence in the product comes from recommendations by the project owner Italpetroli and the contractor I.P.S. due to an excellent strong working relationship.
Texas City Refinery
Track record 2009

Location of project
Houston, USA

Products/system used
Interline® 921
Ceilcote® 662 Flakeline

Applicator
Mobley Industrial Coatings

ISO12944 environment
Immersion

Total area
Internal liner
1,580 m² (17,000 ft²)
Surface seam/rivet caulking
2,040 m² (22,000 ft²)

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Bintulu integrated facility maintenance

Track record 2010

Location of project
Malaysia

Products/system used
Interzone® 4954 (250μm)

Project owner
Shell SDN BHD

Applicator
Persafe Engineering SDN BHD

ISO12944 environment
C4

Total area
100m² (1,076ft²)
Petrobras RLAM Heaters

Track record 2010

Location of project
Landulpho Alves Refinery, Mercosul, Argentina

Products/system used
Area 1 - Heaters and stack
   Intergard® 235, Interlac® 84
Area 2 - Platforms and stairs
   Intergard 235, Intergard 653
Area 3 - Handrails
   Intergard 235, Interthane® 582

Project owner
Petrobras

Applicator
Anticorr S.A./Lupat ingeniería S.A.

Fabricator
A-Evangelista S.A. (AES)/ENG Group/TYCSA

Engineer
Flargent S.A./Tecna S.A.

ISO12944 environment
C4

Surface preparation
SSPC-SP10

Total volume
5,000 litres (1,320 gals)

Total area
19,993m² (215,200ft²)

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AkzoNobel
ExxonMobil Pipeline
Biodiesel Tank

Track record 2010

Location of project
USA

Products/system used
Area 1 - Interior lining (Biodiesel service)
Enviroline® 125LV @ 25-30 mils

Area 2 - Exterior coating (under insulation)
Intertherm® 228 @ 4-6 mils x 2 coats

Project owner
ExxonMobil Pipeline

Applicator
CL Coatings

Fabricator
Consolidated Tank

ISO12944 environment
C-4 and immersion conditions

Total area
586m² (6,300ft²)
Exxon Mobil Oil Refinery - Flare Knockout Drum

Track record 2010

Location of project
USA

Products/system used
ControTrace heating element - Intertherm® 898CSA @ 200μm (8 mils)

Project owner
ExxonMobil

Engineer
Valdes Engineering

Applicator
Shopwerks

ISO12944 environment
C5

Total area
511m² (5,500ft²)

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Exxon Mobil Oil Refinery - Flare Knockout Drum
Track record 2010

Location of project
USA

Products/system used
ControTrace heating element - Intertherm® 898CSA @ 200μm (8 mils)

Project owner
ExxonMobil

Engineer
Valdes Engineering

Applicator
Shopwerks

ISO12944 environment
C5

Total area
511m² (5,500ft²)

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Pro-Kleen Secondary Containment Pit

Track record 2010

Location of project
USA

Products/system used
Containment Floor
Ceilcote 680M @ 50-125μm (2-5 mils)
Ceilcote 800 Coroline @ 1500-2000μm (60-80 mils)
Ceilcote 2000 Flakeline @ 500-750μm (20-30 mils)

Applicator
Pro-Kleen Industries

ISO12944 environment
Immersion

Total area
929m² (10,000ft²)

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## Location of project
Ulsan, Korea

### Products/system used
- **Tank exterior**
  - Intergard® 400 roller @ 60μm (2 mils),
  - Intergard 400 @ 90μm (3 mils),
  - Interthane® 990 @ 80μm (3 mils)

### Project owner
Vopak Terminals Korea Ltd.

### Applicator
Keum Ho Painting Application Company

### ISO12944 environment
C5M

### Total volume
7,000 litres (1,540 gals)

---

Vopak Tank Terminal
maintenance and repair *(11 tanks)*

Track record 2011

[Photographs courtesy of Keum Ho Painting Application Company](#)
Ballast Pipeline

Track record 2007

Location of project
Long Island Point, Australia

Products/system used
Interline® 975

Project owner
Esso Australia Pty Ltd

Applicator
Eddy Batur Industrial Painting Pty Ltd

ISO12944 environment
Immersed conditions (tank lining)

Total volume
700 litres (100 gals)

Total area
1,200m² (12,900ft²)
Shell Nanhai CSPC Project
Case study 2003

Background
Developed in response to the rapidly growing demand in China for petrochemicals, this project has involved one of our largest ever start-ups. The processing complex covers 2.6km² with this huge area presenting tremendous challenges for the commissioning team. This project is made up of an integrated chemicals complex with steam and electricity generation, two storage, handling and shipping facilities, and an ethylene cracker.

The solution
Interzone 485 @ 1500μm was applied to buried cooling water pipes within this project. Interzone 485 has provided excellent performance and protection for the buried pipes, even though the CSPC project is near seawater. After completion the owners decided to change all buried FRP pipes to carbon steel pipes. Interzone 485 was again applied to all the new buried pipes for long term protection.

“Interzone 485 has provided excellent performance and protection for the buried pipes”

Focus products: Interzone 485 protecting buried pipes
Location: Zhuhai, China
Project owner: CNOOC / Shell
Applicator/fabricator: China Petroleum First and Sixth Construction Corporation; Sinopec Fourth and Tenth Construction Company; China Petroleum Jilin Chemical Engineering & Construction Co., Ltd; Japan Gasoline Company; France Technip Co.
ISO12944 environment: Im2
Guangzhou Nansha Titan
Case study 2011

Background
Titan Petrochemicals Group Ltd is a provider of oil provision and marine services in the Asia Pacific region, in particular China. The Titan Guangdong Nansha Petrochemical base mainly stores fuels oil, petrochemicals and oil products. High requirements are essential for any protective coating system considering the rigorous conditions and high operating temperatures the corrosive cargoes in tanks. Additionally the selected coating needs to resist a comprehensive range of cargoes. In summary, the Titan Nansha Project is a high quality large project, typical of the necessary storage solutions used in South China.

The solution
For chemical and oil product storage tanks, through repeated testing of the storage cargo and operating environment with the owners, AkzoNobel recommended Interline 850 epoxy phenolic tank lining. Interline 850 provides corrosion protection for the internals of steel storage tanks containing a range of products, including crude oil, unleaded gasoline blends, MTBE, jet fuels, caustic solutions, potable water and a selected range of aromatic and aliphatic solvents.

AkzoNobel provided the solutions for first phases of this project in 2002, and the customer was impressed with the performance and service received. The professional support given and high level of communication all contributed towards our involvement in the second phase starting in 2007 and the latest phases starting in 2010.

Focus product: Interline® 850
Year of project: 2002 - 2011
Location: China
Project owner: GZ Nansha Titan Petrochemical Co., Ltd
Applicator: Tianjin Petrochemical Company Limited, Shenzhen Liwei Anti-corrosion Company
ISO12944 environment: C5-M
Project size: 600,000 liters
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%).
Dow Corning
3rd Pillar Project
Case study 2010

Background
Covering an area of one million square meters, the US$1.8 billion Zhangjiagang site is China’s largest facility of its kind and among the world’s most advanced integrated production complexes for silicones. The site uses cutting-edge technologies to ensure high product quality and performance, which include advanced processes for raw material efficiency, a highly energy-efficient design, and environmental control technology. The plant provides a total capacity for siloxane and fumed silica products of approximately 200,000 metric tons per year which will support the vigorous growth in demand for silicone based materials in both the Chinese and Asian markets.

The solution
Flammable and highly corrosive, the use of trichlorosilane, based product in the production of silicon, provided a unique challenge for the plant owners. If the plants trichlorosilane production areas are not adequately protected with a protective coating system, detrimental damage can occur. That point provided a large opportunity for Chartek 1709 which is a lightweight intumescent fire protection coating and its low density properties reduce the overall applied weight, compared to cementitious fire protection products. Intertherm 751CSA provided the solution within the trichlorosilane production process, operating at temperatures as high as 400°C (752°F) long term, anti-corrosion protection. Using one system to cover at this temperature reduces application complexity at new construction and was one of the reasons the plant owners choose to use Intertherm 751CSA.

In addition, Ceilcote from AkzoNobel was applied to the lining of the hydrochloric acid waste water tanks. With a proven track record in protecting against extreme chemical attack, Ceilcote provides a long term solution, minimising the potential for early repair and is designed to protect against a wide range of chemicals, including inorganic and organic acids, chlorinated solvents, aliphatic solvents and aromatic solvents.

Focus products: Chartek® 1709, Intertherm® 751CSA, Ceilcote®
Year of project: 2006 through to 2010
Location: Zhangjiagang, Jiangsu Province, China
Project owner: Dow Corning
Applicator/fabricator: Peng Lai Young Hwa Heavy Duty Industry/YanTai, ShanDong province/ Shanghai Baoye Steel Structure Company
Surface preparation: Sa 2.5
ISO12944 environment: C4
Project size: 60,000L key products (300,000L total)
Chartek Track Record
Fornecimento para refinarias

Caraguatatuba | São Paulo

Projeto
Unidade de Tratamento de Gás de Caraguatatuba

Dono do projeto
Petrobras

Ano do projeto
2011

Área do projeto
4.250m²

Aplicação do projeto
Suportes de tubulações (pipe racks)

Mauá | São Paulo

Projeto
RECAP

Dono do projeto
Petrobras

Ano do projeto
2007

Área do projeto
2.000m²

Aplicação do projeto
Suportes de tubulações (pipe racks)

Neuquén | Argentina

Projeto
Skanska

Dono do projeto
Total Austral

Ano do projeto
2007

Área do projeto
600m²

Aplicação do projeto
Aguada pichana (low pressure unit)

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Chartek Track Record
Fornecimento para refinarias

**São José dos Campos | São Paulo**

- **Projeto**: REVAP - Refinaria Henrique Lage
- **Dono do projeto**: Petrobras
- **Ano do projeto**: 2008
- **Área do projeto**: 200m²
- **Aplicação do projeto**: Suportes de tubulações (pipe racks)

**São Francisco do Conde | Bahia**

- **Projeto**: RLAM
- **Dono do projeto**: Petrobras
- **Ano do projeto**: 2012
- **Área do projeto**: 1.911,5m²
- **Aplicação do projeto**: Suportes de tubulações (pipe racks)

**Cubatão | São Paulo**

- **Projeto**: Revamping Unidade de Reforma Catalítica
- **Dono do projeto**: Petrobras
- **Ano do projeto**: 2012
- **Área do projeto**: 6.250m²
- **Aplicação do projeto**: Carteira de gasolina

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<th>DONO</th>
<th>LOCAL</th>
<th>ANO</th>
<th>ÁREA</th>
<th>APLICAÇÃO</th>
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<td>Petrobras</td>
<td>São Paulo</td>
<td>2008</td>
<td>200m²</td>
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<td>REDUC</td>
<td>Petrobras</td>
<td>Rio de Janeiro</td>
<td>2008</td>
<td>90m²</td>
<td>Pernas de esferas</td>
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<td>RPBC</td>
<td>Petrobras</td>
<td>São Paulo</td>
<td>2010</td>
<td>641m²</td>
<td>Rotas de fuga</td>
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<tr>
<td>REDUC</td>
<td>Petrobras</td>
<td>Rio de Janeiro</td>
<td>2010</td>
<td>1.250m²</td>
<td>Suportes de tubulações (pipe racks)</td>
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</tbody>
</table>
Santos Port Bonython Hydrocarbon Processing Plant
Track record 2012

Location of project
South Australia

Products/system used
Intergard® 251, Chartek® 1709, Interthane® 870

Project owner
Santos

Applicator
MJM

Contractor
Transfield

ISO12944 environment
C4

Application method
Trowel

Passive fire protection
11 vessel skirts in total - 800m² (8,611ft²)
Terengganu Crude Oil Terminal, Tank 441

Track record 2009

Location of project
Malaysia

Project owner
Petronas

Products/system used
Ceilcote® 380 Primer,
Ceilcote® 252 MR Flakeline Basecoat,
Glass Mat Reinforcement,
Ceilcote® 252 Flakeline Topcoat

Applicator
AMS Engineering SDN BHD

Project size
4,068m² (43,788m²)

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Background
The owner of the facility was experiencing issues with the previous coating system including critical cracking and failures at expansion joints.
In the long term this could have lead to concrete degradation and loss of containment.

The solution
The Ceilcote 232MR Flakeline system was chosen to repair and seal the expansion joints as well as providing excellent abrasion and chemical resistance to the base of the tank.
Key to the success of the application was the technical support provided by the experienced AkzoNobel Technical Service Representative. This, along with the proven track record of the system, provided the owner with confidence that the project would be completed without any complications.
Location of project
Wisconsin, USA

Applicator
Porta Painting

ISO12944 environment
IM-1

Products/system used
Interline® 399 (Stripe Coat) @ 51μm (2 mils)
Interline 399 @ 92μm (4 mils)
Interline 399 @ 92μm (4 mils)
Interline 399 @ 92μm (4 mils)

Total volume
114 litres (30 gallons)

Total area
190m² (2,040ft²)
Acrylic Acid
Type Chemical
Tank Lining

Case study 1997

Background
The customer required a tank lining for a 3.7m diameter, 3.7m tall chemical storage tank, with proprietary contents similar to acrylic acid. Acrylic acid is a highly corrosive material to many metals as well as human tissue, making the risk of containment loss a concern.

The solution
The customer was therefore very careful in the selection of a high performance coating to protect the storage tank. Enviroline 376F-60 was chosen for the job due to its excellent chemical resistance. Enviroline 376F-60 is a polycyclamine cured epoxy novolac lining reinforced with both flake and fibre to provide outstanding long term performance against a wide range of chemicals.

Conforms to API 652 / 653
Enviroline 376F-60 conforms to API 652 / 653 guidelines, allowing inspection intervals up to 20 years, minimising downtime. At installation, the thick film reinforced lining is applied as a single coat without the need for specialist chopper guns.

Fast return to service
Fast cure provides extra efficiency gains, enabling you to return assets to immersion service within 14 hours and reduce overall installation costs.

Focus product: Enviroline® 376F-60 glass flake tank lining
Location: USA
Project owner: Callaway Chemical
Project size: 3.7m diameter x 3.7m tall storage tank
High Temp Water/Sweet Crude Tank Lining

Case study 2004

Background
The 2nd largest oil producing company in Canada, Canadian Natural Resources Ltd. (CNRL), needed a lining capable of resisting cargos of produced water and crude oil stored at high temperatures. Not only this but the cargos were to be stored at varying thermal gradients which creates a highly aggressive environment.

Once lined, CNRL hoped to avoid re-entering their tanks for at least 10 years.

The solution
To find the best coating for the job, Charter Coatings Services Ltd. was hired by CNRL to perform an evaluation of Enviroline 405HT Heat Resistant Coating in conjunction with other high temperature coatings, all reported to be capable of meeting CNRL’s needs.

Enviroline 405HT performed exceptionally well in the test. The test results, coupled with the coating's high solids, single coat, fast cure formulation, encouraged CNRL to select Enviroline 405HT for the project.

As a result, 3 CNRL tanks in Northern Alberta were immediately coated with Enviroline 405HT. The coating was used to entirely line the first 2 tanks (a 22.9m diameter tank and a 15.3m diameter tank that each holds produced water at a maximum operating temperature of 82°C (180°F)). The third tank, a 38.1m diameter tank that holds sweet crude at a maximum operating temperature of 32°C (90°F) was lined with Enviroline 405HT on the tank floor and 1.2m up the sides.

Focus product: Enviroline® 405HT heat resistant coating
Location: USA
Temperature: Up to 82°C (180°F)
Project owner: Canadian Natural Resources Ltd. (CNRL)
Project size: 3 tanks (38.1m, 22.9m & 15.3m diameter)

High temperature
Enviroline 405HT resists high temperatures in continuous immersion for a wide range of chemicals, including crude oil, hydrocarbon water mixtures and associated equipment up to 135°C (275°F).

Fast return to service
Enviroline 405HT is designed as a fast cure, single coat lining providing a DFT of 500-1000μm (20-40mils). It is possible to return your asset to service in 14 hours, reducing overall installation costs.
Bulk storage sour water tank

Case study 1996

Background
The existing coating on the interior surface of the tank failed, with the exception of the bottom side of the floating roof. The presence of a floating roof meant there was a requirement for abrasion resistance on the walls of the tank. Furthermore, a fast return to service was of great concern to the owner because of the high cost associated with a non-operational tank.

The solution
The bottom of the floating roof was blasted and lined first. The tank was then blasted and lined with a single coat of Enviroline 376F-60 at a thickness of 60 mil. Enviroline 376F-60 has excellent impact and abrasion resistance making it ideal for tanks with floating roofs. During a Taber Abrasion test Enviroline 376F-60 exhibits a loss of only 20mg compared to 150mg for conventional solvent free phenolic epoxies. Furthermore it is possible to return to immersion service within 14 hours of application, therefore the customer was able to minimise the time the tank was out of operation.

High temperature resistant
Solvent free Enviroline 376F-60 provides long term protection for a variety of cargoes including bio-diesel, crude oil and hydrocarbon water mixtures up to 90°C (194°F). Enviroline 376F-60 also offers good cathodic disbondment resistance, making it ideal for protecting buried pipelines and tank bottoms.

Conforms to API 652 / 653
Enviroline 376F-60 conforms to API 652 / 653 guidelines, allowing inspection intervals up to 20 years, minimising downtime. At installation, the thick film reinforced lining is applied as a single coat without the need for specialist chopper guns.
BP Tank LN3

Case history 2012

Area inspected: external steelwork
The tank was a complete refurbishment - old paint was ultra high blasted (minimum 30,000psi) back to bare metal and recoated as per system above.

Applicators were Contract Resources who are experienced in this type of work and do much of BP Largs Bay new and repaints.

“After briefly inspecting the tank late 2012 it was in excellent condition with no signs of deterioration or breakdown.”

Products/system used: Interplus® 356, Interseal® 670HS, Interthane® 990
Location: Australia
Project owner: BP
Applicator: Contract Resources
ISO12944 environment: C4 Industrial & Coastal
Project size: 3,000m² (32,292ft²)

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Shell Geelong Tank 1002
Internal Lining

Track record 2011

Location of project
Geelong Refinery, Australia

Products/system used
Tank internal floor and 500mm up walls
Interline® 982 @ 25μm (1 mils)
Interline® 984 @ 500μm (20 mils)

Project owner
Shell Refining (Australia) Pty. Ltd.

Applicator
McElligott Partners Pty. Ltd.

Total volume
900 litres (200 gallons)

Total area
1,600m² (17,200ft²)
Cepsa Kerosene Tank Y-T139

Track record 2009

**Location of project**
La Rabida Refinery (Huelva), Spain

**Products/system used**
Kerosene Tank Interior
Intergard® 269 (holding primer) @ 40μm (2 mils),
Interline® 984 @ 350μm (14 mils)

**Project owner**
Cepsa

**Applicator**
SEM

**Total volume**
11,700 litres (3,100 gallons)

**Total area**
26,100m² (281,400ft²)
Alliance Condensate Storage Tank

Track record 2006

Location of project
MapTaPhut, Thailand

Products/system used

Area 1 - Tank exterior
- Interzinc® 52 @ 75μm (3 mils)
- Intergard® 475HS @ 125μm (5 mils)
- Interthane® 990 @ 50μm (2 mils)

Area 2 - Tank interior
- Interline® 982 (holding primer) @ 40μm (2 mils)
- Interline 984 @ 500μm (20 mils)

Project owner
Alliance Refining Co., Ltd.

Applicator
Thai Rotary Engineering Ltd

Total volume
52,000 litres (13,700 gallons)

Total area
70,000m² (753,400ft²)

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MM&C Brine Tank Interior

Location of project
Labuan, Malaysia

Project owner
Malaysian Mud and Chemicals Sdn Bhd

Products/system used
Brine tank interior (shell plate, roof and tank bottom plate)
Interline® 399 @ 90μm (4 mils), Interline® 399 @ 90μm (4 mils), Interline® 399 @ 90μm (4 mils)

Total volume
800 litres (200 gallons)

Total area
2,000m² (21,500ft²)
**Location of project**  
China

**Products/system used**

<table>
<thead>
<tr>
<th>Product/Component</th>
<th>Details</th>
<th>Volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tank roof</td>
<td>Interline® 850 - 100μm (4 mils)</td>
<td>Total: 3,900 litres (1,000 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 850 - 100μm (4 mils)</td>
<td>Total: 3,900 litres (1,000 gallons)</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td>Total: 3,900 litres (1,000 gallons)</td>
</tr>
<tr>
<td>Tank externals and piping</td>
<td>Interzinc® 22 - 50μm (2 mils)</td>
<td>Total: 231,000 litres (60,900 gallons)</td>
</tr>
<tr>
<td></td>
<td>Intergard® 475HS - 100μm (4 mils)</td>
<td>Total: 231,000 litres (60,900 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interthane® 990 - 60μm (2 mils)</td>
<td>Total: 231,000 litres (60,900 gallons)</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td>Total: 231,000 litres (60,900 gallons)</td>
</tr>
<tr>
<td>Tank externals - Under insulation</td>
<td>Interseal® 670HS - 150μm (6 mils)</td>
<td>Total: 27,300 litres (7,200 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 399 - 80μm (3 mils)</td>
<td>Total: 27,300 litres (7,200 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 399 - 90μm (4 mils)</td>
<td>Total: 27,300 litres (7,200 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 399 - 80μm (3 mils)</td>
<td>Total: 27,300 litres (7,200 gallons)</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td>Total: 27,300 litres (7,200 gallons)</td>
</tr>
<tr>
<td>Tank internals - Fuel oil</td>
<td>Max. temp: 95°C (203°F)</td>
<td>Total: 33,400 litres (8,800 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 850 - 125μm (5 mils)</td>
<td>Total: 33,400 litres (8,800 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 850 - 125μm (5 mils)</td>
<td>Total: 33,400 litres (8,800 gallons)</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td>Total: 33,400 litres (8,800 gallons)</td>
</tr>
<tr>
<td>Tank internals - Chemical</td>
<td>Max. temp: 90°C (194°F)</td>
<td>Total: 65,700 litres (17,300 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 850 - 125μm (5 mils)</td>
<td>Total: 65,700 litres (17,300 gallons)</td>
</tr>
<tr>
<td></td>
<td>Interline® 850 - 125μm (5 mils)</td>
<td>Total: 65,700 litres (17,300 gallons)</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td>Total: 65,700 litres (17,300 gallons)</td>
</tr>
<tr>
<td>Piping - Under insulation</td>
<td>Interzinc® 22 - 50μm (2 mils)</td>
<td>Total: 3,000 litres (800 gallons)</td>
</tr>
<tr>
<td></td>
<td>Intertherm® 875 - 25μm (1 mil)</td>
<td>Total: 3,000 litres (800 gallons)</td>
</tr>
<tr>
<td></td>
<td>Intertherm® 875 - 25μm (1 mil)</td>
<td>Total: 3,000 litres (800 gallons)</td>
</tr>
<tr>
<td></td>
<td>Total:</td>
<td>Total: 3,000 litres (800 gallons)</td>
</tr>
</tbody>
</table>

**Total volume**  
364,500 litres (96,200 gallons)

**Total area**  
880,000m² (9,472,200ft²)

---

**Guangzhou Nansha Titan Petrochemical Project Phase II**

**Track record 2007**
## Chartek Track Record

**Supplied to PETROBRAS refineries**

<table>
<thead>
<tr>
<th>NO</th>
<th>TYPE</th>
<th>LOCATION</th>
<th>YEAR</th>
<th>SIZE</th>
<th>AREA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Monteiro Lobato Gas Treatment Unit (UTGCA)</td>
<td>Caraguatatuba, São Paulo</td>
<td>2011</td>
<td>4,250m²</td>
<td>Pipe Supports</td>
</tr>
<tr>
<td>2</td>
<td>Capuava Refinery (RECAP)</td>
<td>Mauá, São Paulo</td>
<td>2007</td>
<td>2,000m²</td>
<td>Pipe Supports</td>
</tr>
<tr>
<td>3</td>
<td>Henrique Lage Refinery (REVAP)</td>
<td>São José dos Campos, São Paulo</td>
<td>2008</td>
<td>200m²</td>
<td>Pipe Supports</td>
</tr>
<tr>
<td>4</td>
<td>Landulpho Alves Refinery (RLAM)</td>
<td>São Francisco do Conde, Bahia</td>
<td>2012</td>
<td>1,912m²</td>
<td>Pipe Supports</td>
</tr>
<tr>
<td>5</td>
<td>Cubatão Refinery Refurbishment of Catalytic Reforming Unit</td>
<td>Cubatão, São Paulo</td>
<td>2012</td>
<td>6,250m²</td>
<td>Pipe Supports</td>
</tr>
</tbody>
</table>

---

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Bagasse Fire Unit Addition
Track record 2013

Location of project
Guatemala

Products/system used
Interzinc® 22 @ 76μm (3 mils)
Intertherm® 50 @ 51μm (2 mils)

Project owner
Ingenio Palo Gordo

Applicator
Rivera Ingenieros

ISO12944 environment
C4

Project size
1,500m² (16,146ft²)

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pc.communication@akzonobel.com
Devmat 101
Frac Tank Application

Track record 2013

Location of project
USA

Market
Oil & Gas Upstream Shale

Products/system used
Devmat® 101 @ 20 mils (508μm)

Project owner/applicator/fabricator
Large OEM company

ISO12944 environment
Tank lining

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pc.communication@akzonobel.com
Australia Pacific
LNG Piling Onshore

Track record 2012

Location of project
Seomyun industry complex,
Suncheon-si, Chonlanam-do,
South Korea

Products/system used
Interzone® 505 @ 200~300μm (8~12 mils)
Interzone® 505 @ 200~300μm (8~12 mils)

Project owner
Orrcon Steel

Engineering
Bechtel OG&C, Inc.

Fabricator
Seah Steel

Applicator
Myungseong

Surface preparation
SSPC-Sa2.5

Total volume
13,335 litres (3,523 gals)

Total area
18,620m² (200,424ft²)

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pc.communication@akzonobel.com
Location of project
Yulchon industry complex,
Gwangyang-si, Chonnam-do,
South Korea

Products/system used
Interzone® 485 @ 1500μm (60 mils)

Project owner
John Holland - Leighton
Joint Venture
Engineering
Bechtel OG&C, Inc.

Fabricator
Steel Flower Co., Ltd.

Applicator
Samwoo Heavy
Industry Co., Ltd.

Surface preparation
SSPC-Sa2.5

Total volume
33,000 litres (8,718 gals)

Total area
8,814m² (94,873ft²)

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pc.communication@akzonobel.com
Santos Port Bonython Hydrocarbon Processing Plant - Naphtha Vessel

Track record 2014

Location of project
South Australia

Products/system used
Top 500mm of vessel skirt operating 120 - 360°C requires 2x75 mm = 150mm total Foamglas/Chartek® duplex layer

Area 1 - Naphtha Vessel (<120°C)
Intergard® 269, Chartek 1709, Interthane® 870

Area 2 - Naphtha Splitter (120 - 360°C)
Intertherm® 751CSA, Chartek 1709, Interthane 870

Application method
ISO12944 environment C4

Project owner
Santos

Engineer
Aurecon

Applicator
MJM

Contractor
Transfield

Application method
Trowel

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pc.communication@akzonobel.com
Sangachal Terminal Tank B
Track record 2013

Location of project
Azerbaijan

Products/system used
Interline® 982 @ 25µm (1 mil)
Interline® 925 @ 500µm (19.7 mils)

Project owner
BP

Applicator
Socar Cape

ISO12944 environment
Im2 Seawater immersion

Project size
2,300m² (24,757ft²)
Vessel Skirts - Russia
Track record 2014

Location of project
Germany

Products/system used
Interzinc® 22
Intergard® 269
Chartek® 1709

Specifier
IRB GmbH

Applicator
Xervon GmbH

ISO12944 environment
C5-I

Total weight
2,500kg (5,512 lbs)

Total area
250m² (2,691ft²)
BASF TDI Plant Ludwigshafen

Track record 2014

Location of project
Germany

Products/system used
Intergard® 269, Chartek® 1709

Project owner/Specifier
BASF AG

Applicator
S.K.I. GmbH

ISO12944 environment
C5-I

Total weight
5,000kg (11,023 lbs)

Total area
1,200m² (12,917ft²)
Annual Shutdown for M&R

Track record 2013

Location of project
Republic of Kazakhstan, Atyrau region, Tengiz field

Products/system used
Interbond® 1202UPC @ 2x100μm (3.9 mils)

Project owner
TCO TengizChevrOil

Applicator
Chemimontazh

ISO12944 environment
ISO 8504
Sa2½

Substrate
Carbon Steel

Operating conditions
Under insulation, operating temperature between 101°C (214°F) to 400°C (752°F)

Total area
1,300m² (13,993ft²)
Chartek 7 application was carried out at the Kencana Fabrication Yard, located in Lumut, Sitiawan, Perak Darul Ridzuan, Malaysia. Visual inspection of the vessel and vessel supports showed that the application was carried out in accordance with recommendation from AkzoNobel.

Furthermore, a chisel test (as described in Technical Note TN/F/CT/001) was conducted on a carbon steel plate and a stainless steel plate, with the results deemed acceptable and accepted by all parties.
**White Elephant Tank Farm**

**Track record 2013**

Location of project
Republic of Kazakhstan, Atyrau region, Tengiz field

Products/system used
External - Interzinc® 52, Intergard® 475 HS, Interthane® 990
Internal - Interline® 850

Project owner
TCO TengizChevrOil

Specifier
TengizChevrOil

Applicator
Chicago Bridge & Iron Company CB&I

ISO12944 environment
C5

Total volume
Tank external: 713lt (188 gals), Tank internal: 640lt (169 gals)

Total area
1,358m² (14,617ft²)

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pc.communication@akzonobel.com
Location of project
Republic of Kazakhstan,
Atyrau region, Tengiz field

Products/system used
External - Interzinc® 52,
Intergard® 475 HS,
Interthane® 990
Internal - Interline® 850

Project owner
TCO TengizChevrOil

Specifier
TengizChevrOil

Applicator
Chicago Bridge &
Iron Company CB&I

ISO12944 environment
C5I

Total volume
Tank external: 1,705lt (450 gals),
Tank internal: 1,374lt (363 gals)

Total area
2923m² (31,463ft²)

SGP critical tank sparing T-201
Track record 2013
Liquefied Petroleum Gas Farm
Track record 2014

Location of project
Republic of Kazakhstan, Atyrau region, Tengiz field

Products/system used
Structural Steelwork - Intergard® 251, Chartek® 1709, Interthane® 990 RAL (6011)

Project owner
TCO TengizChevrOil

Specifier
TengizChevrOil

Applicator
MultiCorr

ISO12944 environment
C5I

Total volume
20 tons of Chartek® 1709

Total area
Structural Bullits 2,105m² (22658ft²)

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pc.communication@akzonobel.com
Zhanakorgan Sulphuric Acid Plant

Track record 2011

Location of project
Kazakhstan

Products/system used
System 1
Interzinc® 22 @ 60μm (2.4 mils)
Intergard® 475HS @ 175μm (7 mils)
Interthane® 990 @ 75μm (3 mils)

System 2
Interzinc® 22 @ 60μm (2.4 mils)
Intertherm® 50 @ 25μm (1 mil)
Intertherm® 50 @ 25μm (1 mil)

Project owner
Zhanakorgan Sulphuric Acid Plant

Applicator/Fabricator
ZSMK

ISO12944 environment
C5-I

Project size
20,000L (5,283 gals) for System 1,
5,000L (1,320 gals) for System 2
Vitol O&G Terminal

Track record 2014

Location of project
Vassilikos, Cyprus

Products/system used
- Interline® 982 @ 40µm (1.6 mils)
- Interline® 984 @ 175µm (7 mils) stripe coat
- Interline® 984 @ 300µm (12 mils)

Project owner
Vitol Tank Terminals Vasiliko (VTTV)

Specifier
J&P Overseas-VTTV/VITOL

Applicator
SEM SA, Barondin Cyprus

ISO12944 environment
C5-M

Total volume
20,000L (5,283 gals)

Total area
40,000m² (430,556ft²)

Project size
250,000m² (2,690,978ft²)
In 2013 an extensive maintenance program was undertaken to replace failing cementitious passive fire protection on the recommendation of the site safety team. The excellent workability of Chartek® 1709 meant no delays on the maintenance program were recorded during the winter. During the winter months temperatures as low as -40°C have been recorded. In the summer the temperature swing can increase by 80°C from this low to +40°C. Chartek’s proven durability and excellent application properties were what lead the site team to select its use. The failing cementitious replacement program is still on-going.
## GLNG

### Track record 2014

<table>
<thead>
<tr>
<th>Location of project</th>
<th>Project owner</th>
<th>Project size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>Santos/Petronas</td>
<td>500m² (5,382ft²)</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Products/system used</th>
<th>Main contractor</th>
<th>Total volume</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ceilcote® Coroline 800 system (4mm fibreglass re-inforced screed)</td>
<td>Bechtel Australia</td>
<td>3,200 litres (845 gals)</td>
</tr>
</tbody>
</table>
Vessel Skirt C-5102
Shell Refinery Cologne
Track record 2014

Location of project
Germany

Products/system used
2,000kg (4,409lbs) of Chartek® 7

Project owner
Shell

Specifier
Shell AG

Applicator
Züblin Chimney & Refractory GmbH

ISO12944 environment
C5-I

Total area
250m² (2,691ft²)
Second Generation Project/ Water Handling Upgrade

Track record 2014

Location of project
Republic of Kazakhstan, Atyrau region, Tengiz field

Products/system used
Structural Steelwork Interzinc® 52, Chartek® 1709, Interthane® 990, Intergard® 475HS

Project owner
TCO TengizChevrOil

Specifi er
TengizChevrOil

Applicator
Denholm-Zholdas

ISO12944 environment
C5I industrial areas with high humidity and aggressive atmospheres

Total area covered
62-D-802 access tower module

Total volume
18,250kg (40,234lbs) of Chartek® 1709

Project size
1,400m² (15,070ft²)
Sulphur Handling Facility
Track record 2014

Location of project
Turkey

Project owner
Kuwait National Petroleum Company

Applicator
HDM Steel & Pipe Co.

Products/system used
Area 1 - System for Structural Steel - Internal System
Intershield® - 125µm (5 mils) dft
Interzone® 505 - 325µm (13 mils) dft
Interthane® 990 - 50µm (2 mils) dft

ISO12944 environment
C5-M High Durability

Project size
10,000m² (107,639 ft²)

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pc.communication@akzonobel.com
Tupraş Petroleum Refineries Co. Fireproofing Project

Track record 2012

Location of project
Turkey

Products/system used
System for Structural Steel - External System
Chartek® 7 - 7.5mm dft, Interthane® 990 - 70μm (2.8 mils)

Project owner
Tupraş Petroleum Refineries Co.

Applicator
Metel A.S.

Application type
Fireproofing

Project size
3,000m² (32,292ft²) – 23 tonnes

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As the applicator specialises in rope access application, it was essential to utilise a polyurethane that could achieve 75μm (3 mils) dft in one application.

After extensive in-house testing from the applicator it was established that Interthane 990SG surpassed the competitors products in its ability to achieve a wet film build of over 110μm (4 mils) with roller application without showing signs of sagging. The fact that the Interthane 990SG is semi-gloss polyurethane, it also had a more uniform finish than a higher gloss coating would give with stop-start roller application.

Focus products: Interseal® 670HS Aluminium (patch prime and stripe coat); Interseal 670HS (patch intermediate coat); Interthane® 990SG white and silver-grey (full final coat)

Location: Durban, KwaZulu Natal, South Africa

Project owner: Sapref - Shell and BP South African Petroleum Refineries (Pty) Ltd

Applicator: A.S.P Rope Access (Pty) Ltd

ISO12944 environment: C5I

Project size: 8,000m² (86,111ft²) completed so far
SGP PU-760 Caustic Carrover Elimination Settler and Bridge

Track record 2015

**Location of project**
Republic of Kazakhstan, Atyrau region

**Products/system used**
- Structural Steelwork - Intergard® 251, Chartek® 1709, Interthane® 990 (RAL 6011), Intergard 475HS

**Project owner**
TCO TengizChevrOil

**Specifier**
TengizChevrOil

**Applicator**
CCT

**ISO12944 environment**
C5i

**Total area**
1,390m² (14,962ft²) of passive fire protection
1,658m² (17,847ft²) of anti-corrosive

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RIG585 Reserve Tank

Track record 2015

Location of project
Republic of Kazakhstan, Atyrau region

Products/system used
- Internal (200m²) - Interline® 850
- External (520m²) - Interzinc® 52, Interseal® 670HS, Interthane® 990

Project owner
Nabors

Specifier/Applicator
Zhigermunaiservice

ISO12944 environment
C5i
**KTL 1.1  R-503**

Spare Vessel

Track record 2015

**Location of project**
Republic of Kazakhstan, Tengiz field

**Products/system used**
Interbond® 1202UPC

**Project owner/Specifier**
Tengizchervroil

**Applicator**
Denholm-Zholdas

**ISO12944 environment**
CSI Industrial areas with high humidity and aggressive atmospheres

**Total area**
272m² (2,928ft²)

www.international-pc.com
pc.communication@akzonobel.com
Dunga phase II,
Crude oil storage tanks

Track record 2015

Location of project
Republic of Kazakhstan, Aktau

Products/system used
Internal - Interline® 850
External - Intertherm® 228HS

Project owner
Maersk Oil Kazakhstan GmbH

Specifier/applicator
Chimzashita Group

ISO 12944 environment
C5I/Im2

Total area
Internal - 6,949m² (74,798ft²)
External - 5,316m² (57,221ft²)

www.international-pc.com
pc.communication@akzonobel.com
TPAO Fuel Storage Tank Lining

Track record 2015

<table>
<thead>
<tr>
<th>Location of project</th>
<th>Project owner</th>
<th>Project size</th>
</tr>
</thead>
<tbody>
<tr>
<td>Turkey</td>
<td>TPAO (Turkish Petroleum Corporation)</td>
<td>2,500m² (26,910ft²)</td>
</tr>
</tbody>
</table>

Products/system used
- Internal system: Envirolines® 376-F30 @ 400µm (16 mils)

ISO12944 environment
- C5
Old Boiler House Insulation

Track record 2015

Location of project
Republic of Kazakhstan,
Atyrau region, Tengiz field

Products/system used
Internal - Interzone® 1000;
External - Intertherm® 228, Interplus® 356

Project owner
TengizChevOil

Applicator
NSS (NEFTESTROYSERVICE)

ISO12944 environment
C5I

Total volume
Internal - 800 litres (211 gals)
External - 800 litres (211 gals)

Total area
2,000m² (21,528ft²)

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pc.communication@akzonobel.com
Diesel Storage Tank Lining

Track record 2015

Location of project
Turkey

Products/system used
Internal system for steel - Interline® 850 @ 2x125µm

Project owner
TP Petrol Dağıtım A.Ş.

Project size
7,000m² (75,347ft²)

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pc.communication@akzonobel.com
Total ROG LOT 2B
Track record 2016

Location of project
Arendonk, Belgium

Project owner
Total Raffinaderij Antwerpen

Applicator
Wet paint - Iemanst Steel construction, Chartek® 1709 - Cuijpers Services BV

<table>
<thead>
<tr>
<th>Applied system</th>
<th>Carbon steel</th>
<th>Galvanized steel</th>
</tr>
</thead>
<tbody>
<tr>
<td>1st coat</td>
<td>Intercure® 200 @ 60Mu</td>
<td>Intercure 200 @ 40-60Mu</td>
</tr>
<tr>
<td>2nd coat</td>
<td>Intercure 420HS @ 110Mu</td>
<td>Chartek 1709 @ UL1709</td>
</tr>
<tr>
<td>3rd coat</td>
<td>Interthane® 990 - RAL6005 @ 60Mu</td>
<td>Interthane 990 - RAL6005 @ 60Mu</td>
</tr>
</tbody>
</table>

Size
850m² Chartek 1709 / 4400m² Wet paint