

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

Dialog Construction Sdn. Bhd.

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

Project owner

Tengizchevroil

ISO12944 environment

Im1

Location of application

Republic of Kazakhstan, Tengiz

Applicator

Denholm Zholdas

Project size

54m²



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



Vopak Tanks Alemoa

Case study 2012

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



The customer was looking for 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.



COMPERJ Fire Protection

Track record 2016

Location of project
Brazil

Products/system used
Chartek® 1709 @ 7.85mm

Project owner
Petrobras

Applicator/Fabricator
Qualiman Mont. Inds. Ltda

ISO12944 environment
C5-I

Project size
4.8 tonnes of Chartek



MLNG Passive Fire Protection Maintenance

Track record 2009

Location of project
Malaysia

Products/system used
Chartek[®] 1709

Project owner
MLNG

Applicator
KUMUS SDN BHD

ISO12944 environment
C4

Total area
50m² (538ft²)



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)



EPCO Tank 4

Case history 2010

Focus products: Interline® 983 (stripe coat), Interline 985 with chopped strand fiberglass, and Interline 985 top coat. This system is known as the Matcote System

Year of project: 1979

Location: Texas City, USA

Type of project: Enterprise products terminal TEPCO. 16x91m (52x300ft) crude oil external floating roof tank

Project owner: Enterprise

Project size: 7,570L (2,000 gals),
6,633 m² (71,400 ft²)

The Matcote system originally installed in 1979 was once again selected for its proven track record and consistent tried and true formula. Previous expected service life extended for another 30 years and will not see downtime for another 20 years.

Due to the proactive M&R program at Enterprise, it was decided that they would extend the life of the tank floor and replace 280 striker plates.

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

Motiva Convent

Case history 2009

Focus product: Intertherm® 751 CSA
@ 75-100µm (2-4 mils) DFT

Year of project: 2006

Location: Los Angeles, USA

Type of project: Refining

Project owner: Motiva

Applicator: Basic Industries

Project size: 4.6m (15ft) diameter x 14.6m (48ft)
length bullet tanks

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).



“Specifically designed to provide a corrosion resistant barrier to steelwork in both atmospheric service and under insulation”.

Italpetroli internal pipeline

Case study 2010

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

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.



**“Another testament to our
renowned customer service
and technology leadership worldwide”.**



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 (17,000ft²)

Surface seam/rivet caulking

2,040 m² (22,000ft²)



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. (AESAs)/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)



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

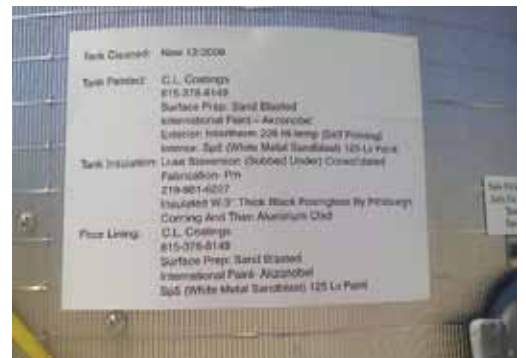
Consolidated Tank

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)



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 Caroline @ 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)



Vopak Tank Terminal maintenance and repair (11 tanks) Track record 2011

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)



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

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

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”

Guangzhou Nansha Titan

Case study 2011

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

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.



Buckle Initiator Foundation Structures

Track record 2011

Location of project

Australia

Project owner

Chevron Australia

Fabricator

Pacific Industries

Project size

400 tons

Products/system used

Interzone® 954

Applicator

Kaefer Novacoat Cape PLC

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%).

Dow Corning 3rd Pillar Project

Case study 2010

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)

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.



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)

Projeto

RECAP

Dono do projeto

Petrobras

Ano do projeto

2007

Área do projeto

2.000m²

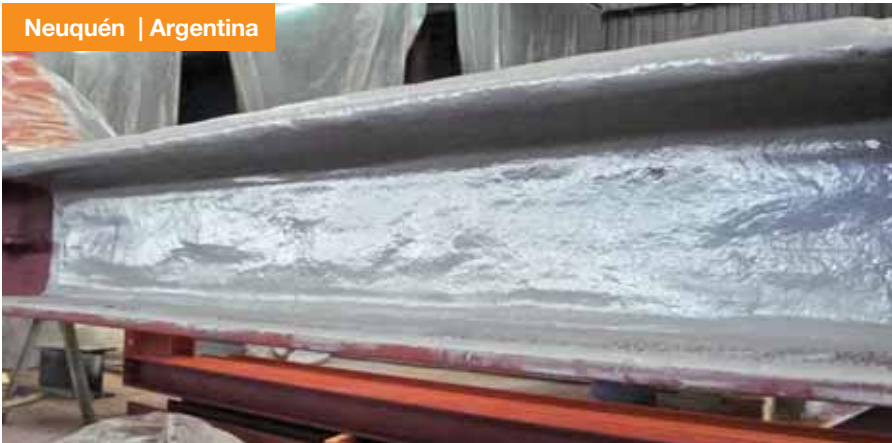
Aplicação do projeto

Suportes de tubulações (pipe racks)



Mauá | São Paulo

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)

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)

Projeto

RLAM

Dono do projeto

Petrobras

Ano do projeto

2012

Área do projeto

1.911,5m²

Aplicação do projeto

Suportes de tubulações (pipe racks)



São Francisco do Conde | Bahia

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

PROJETO	DONO	LOCAL	ANO	ÁREA	APLICAÇÃO
REVAP	Petrobras	São Paulo	2008	200m ²	Estruturas metálicas ou skids
REDUC	Petrobras	Rio de Janeiro	2008	90m ²	Pernas de esferas
RPBC	Petrobras	São Paulo	2010	641m ²	Rotas de fuga
REDUC	Petrobras	Rio de Janeiro	2010	1.250m ²	Suportes de tubulações (pipe racks)

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)



Bio Reactor Clarifier Tank Bottom

Case study 2011

Focus product: Ceilcote® 232MR Flakeline

Location: Thailand

Project owner: Star Petroleum Refinery Corp

Applicator: CBI (Thailand) Ltd.

ISO12944 environment: Immersion service

Project size: 835m² (8,988m²)

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 led 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.



Lube Oil Tank Lining

Track record 2012

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 galls)

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.

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



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.

High Temp Water/ Sweet Crude Tank Lining

Case study 2004

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)

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 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.



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

Focus product: Enviroline® 376F-60 glass flake lining

Location: USA

Temperature: Ambient to 71 - 83°C (160 - 180°F)

Project owner: Chevron

Project size: 42.7m diameter by 17.1m tall

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

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)

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.



Images of tank prior being stripped clean



Finished tank



Paint removal process using UH water pressure (min. 30,000psi)

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

Shell Geelong Tank 1002 Internal Lining

Track record 2011

Location of project

Geelong Refinery, Australia

Project owner

Shell Refining (Australia) Pty. Ltd.

Total volume

900 litres (200 gallons)

Products/system used

Tank internal floor and 500mm up walls
Interline[®] 982 @ 25µm (1 mils)
Interline[®] 984 @ 500µm (20 mils)

Applicator

McElligott Partners Pty. Ltd.

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)



MM&C Brine Tank Interior

Track record 2005

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)



Guangzhou Nansha Titan Petrochemical Project Phase II

Track record 2007

Location of project

China

Products/system used

Tank roof

Interline® 850 - 100µm (4 mils)

Interline® 850 - 100µm (4 mils)

Total: 3,900 litres (1,000 gallons)

Tank externals and piping

Interzinc® 22 - 50µm (2 mils)

Intergard® 475HS - 100µm (4 mils)

Interthane® 990 - 60µm (2 mils)

Total: 231,000 litres (60,900 gallons)

Tank externals - Under insulation

Interseal® 670HS - 150µm (6 mils)

Total: 27,300 litres (7,200 gallons)

Tank internals - Fuel oil

Max. temp: 95°C (203°F)

Interline® 399 - 80µm (3 mils)

Interline® 399 - 90µm (4 mils)

Interline® 399 - 80µm (3 mils)

Total: 33,400 litres (8,800 gallons)

Tank internals - Chemical

Max. temp: 90°C (194°F)

Interline® 850 - 125µm (5 mils)

Interline® 850 - 125µm (5 mils)

Total: 65,700 litres (17,300 gallons)

Piping - Under insulation

Max. temp: 230°C (446°F)

Interzinc® 22 - 50µm (2 mils)

Intertherm® 875 - 25µm (1 mil)

Intertherm® 875 - 25µm (1 mil)

Total: 3,000 litres (800 gallons)

Total volume

364,500 litres (96,200 gallons)

Total area

880,000m² (9,472,200ft²)



Chartek Track Record

Supplied to **PETROBRAS** refineries

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



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)



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



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

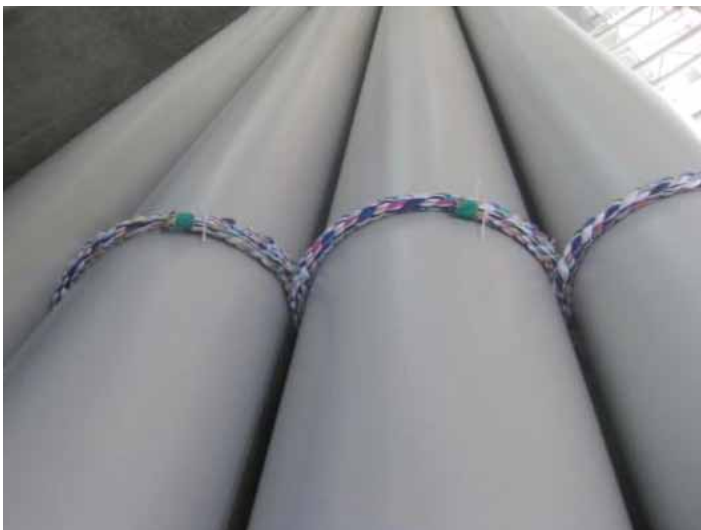
SSPC-Sa2.5

Total volume

13,335 litres (3,523 gals)

Total area

18,620m² (200,424ft²)



Australia Pacific LNG Piling Immersed

Track record 2013

Location of project

Yulchon industry complex,
Gwangyang-si, Chonlanam-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)



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

Project owner

Santos

Engineer

Aurecon

Applicator

MJM

Contractor

Transfield

ISO12944 environment

C4

Application method

Trowel



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)



ISBL module fabrication for Wheatstone project LNG Plant

Focus products: 7,650kg (16,865lbs) of Chartek® 7

Project size: 4 vessels (2 stainless steel & 2 carbon steel),
700m² (7,535ft²) of steel coated

Location: Sapura Kencana Petroleum Lumut Perak,
Malaysia

General contractor: Sapura Kencana Petroleum Lumut

Client's Inspector: Bechtel

Applicator: RM Leopad Sdn Bhd

Case study 2014

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.



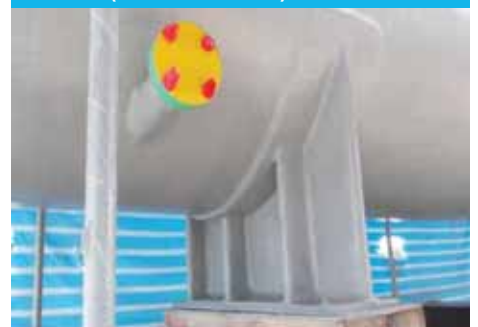
Preparation work



Chartek 7 - 1st coat and HK 1 mesh
application at mid thickness



Chartek 7 application – final thickness
achieved (smooth roll finish)



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

C5I

Total volume

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

Total area

1,358m² (14,617ft²)



SGP critical tank sparing T-201

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

C5I

Total volume

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

Total area

2923m² (31,463ft²)



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)



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)



Tengiz refinery

Case study 2013

Focus products: Intergard® 251 (75 µm)
Chartek® 1709
Interthane® 990 (75 µm)

Location: Kazakhstan

Project owner: Chevron

General contractor: MultiCorr

ISO12944 environment: C5-I

Project size: >2,100m²



Existing cementitious fire protection



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

Location of project

Australia

Products/system used

Ceilmate® Coroline 800 system
(4mm fibreglass re-inforced screed)

Project owner

Santos/Petronas

Main contractor

Bechtel Australia

ISO12944 environment

Chemical exposure

Project size

500m² (5,382ft²)

Total volume

3,200 litres (845 gals)



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

Specifier

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 (107,639ft²)



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



Sapref External Tank Rejuvenation Case study 2014

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

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.



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



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

ISO12944 environment

C5I

Specifier/Applicator

Zhigermunaiservice



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

Tengizchervoil

Applicator

Denholm-Zholdas

ISO12944 environment

C5I Industrial areas with high humidity and aggressive atmospheres

Total area

272m² (2,928ft²)



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

ISO12944 environment

C5I/Im2

Total area

Internal - 6,949m² (74,798ft²)

External - 5,316m² (57,221ft²)



TPAO Fuel Storage Tank Lining

Track record 2015

Location of project

Turkey

Products/system used

Internal system:

Enviroline® 376-F30 @ 400µm (16 mils)

Project owner

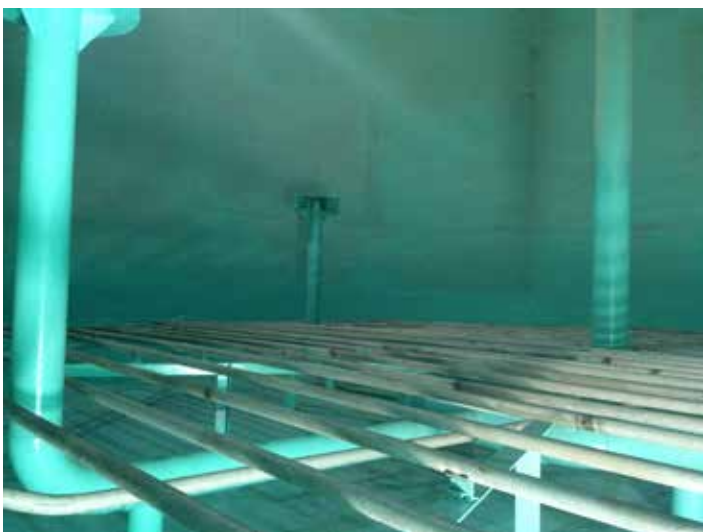
TPAO (Turkish Petroleum Corporation)

ISO12944 environment

C5

Project size

2,500m² (26,910ft²)



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

TengizChevrOil

Applicator

NSS (NEFTESTROYSERVICE)

ISO12944 environment

C5I

Total volume

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

Total area

2,000m² (21,528ft²)



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)



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

Applied system	Carbon steel	Galvanized steel
1st coat	Intercure® 200 @ 60Mu	Intercure 200 @ 40-60Mu
2nd coat	Intercure 420HS @ 110Mu	Chartek 1709 @ UL1709
3rd coat	Interthane® 990 - RAL6005 @ 60Mu	Interthane 990 - RAL6005 @ 60Mu

Size
850m² Chartek 1709 / 4400m² Wet paint

