

Pipe Coating Solutions

Volume I, 2009



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BREDERO SHAW

A SHAWCOR COMPANY

the GLOBAL LEADER in pipe coating solutions.

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Upcoming Events

March

NACE
March 22 - 26, 2009
Atlanta, Georgia

OMC
March 25 - 27, 2009
Ravenna, Italy

April

Arctic Oil and Gas Conference
April 22 - 23, 2009
Oslo, Norway

May

Offshore Technology Conference (OTC)
May 4 - 7, 2009
Houston, Texas

Peace Region Show
May 13 - 14, 2009
Peace Region, Alberta

June

Saskatchewan Oil Show
June 3 - 4, 2009
Weyburn, Saskatchewan

OGA
June 10 - 11, 2009
Kuala Lumpur, Malaysia

September

Offshore Europe
September 8 - 11, 2009
Aberdeen, Scotland

Rio Pipeline
September 22 - 24, 2009
Rio de Janeiro, Brazil

October

APIA
October 17 - 20
Cairns, Australia



On the cover:

The cover photograph features one of Bredero Shaw's mobile facilities that will be set up in La Brea, Trinidad to coat Trinidad & Tobago Ltd's North East Offshore (NEO) and Tobago Pipeline Projects. For more information on this project please refer to page 3.

NEWS UPDATE

Bredero Shaw's Kuantan Facility Exemplifies Excellent HSE Performance

In 2008, Bredero Shaw's Asia Pacific region lead globally with HSE performance for its second year in a row while the Kuantan, Malaysia facility led regionally. The Kuantan facility was able to achieve their best ever HSE performance while simultaneously recording over three

million man hours, the largest number of working hours in the plant's history. Normally the two achievements are counterintuitive which illustrates not only the plant management's focus on HSE but also the exceptionally strong commitment from all employees. The facility was recognized within Bredero Shaw by being awarded its 2008 Safety Master Award in recognition for Outstanding Safety Leadership. The award was presented by John Tikkanen, President



Bredero Shaw. The Kuantan facility was also recognized by one of its largest clients, PETRONAS Carigali, with three HSE awards and also acquired EMS-ISO 14001: 2004 & BS OHSAS 18001: 2007 certification from BSI in 2008. HSE is a core value and is integral to Kuantan and all of Bredero Shaw's facilities worldwide.

The Kuantan site management is strongly committed to ShawCor's vision of an Incident and Injury Free Workplace, with no harm to people and no damage to the environment. Incident & Injury Free programs, engineering improvement and HSE awareness initiatives were key contributors to Kuantan's achievement and will continue to be promoted and implemented to manage HSE risk. The Management Site Leadership Team's methodology is to reach out to employees by utilizing a positive behavioral approach to ensure that employees embrace HSE. Whilst they do so, they work on setting clear HSE standards and practices which will create a safe working culture practiced by all employees. This is the IIF journey...

Bredero Shaw Awarded Contract to Coat Two Projects in Trinidad

Bredero Shaw received a contract with a value in excess of \$80 million to provide concrete weight coatings and anode installation for the National Gas Company of Trinidad & Tobago Ltd's North East Offshore (NEO) and Tobago Pipeline Projects. Bredero Shaw will mobilize two Compression Coat Technology (CCT) concrete weight coating plants in Trinidad and will commence coating for these projects in the second quarter of 2009.

The North East Offshore Pipeline Project will consist of approximately 94 km of 36" pipe that will transport natural gas from the Angostura Gas Export Platform to Mayaro Bay and then to Beachfield on the east coast of Trinidad. The Tobago Pipeline Project will consist of approximately 54 km of 12" pipe that will transport natural gas from BHP Billiton's Gas Export platform to Cove Industrial Estate at Columbus Point on the south coast of Tobago.

Bredero Shaw will provide concrete weight coating using Compression Coat mobile coating technology. Compression Coat is the pipeline industry's leading coating system for projects requiring rapid mobilization or coating near the right-of-way. This concrete coating system is designed to provide negative buoyancy and mechanical protection for pipelines in offshore and onshore wet environments. Compression Coat uses a side-wrap application process making it ideal for both small and large diameter pipelines.

NEW PRODUCTS

SureFlo® SF – A Solvent Free Solution for Flow Efficiency

During Q4 of 2008, Bredero Shaw's facility in Leith, Scotland, completed the pipe coating project for the 130 km, 28" Gjøa gas pipeline. The Leith Facility has developed an excellent reputation for producing quality pipe coatings, and for delivering on time and within budget. The coating of the Gjøa pipeline project was completed successfully and heralded the introduction of a new internal coating for flow efficiency, the SureFlo® SF product.

The SureFlo® SF product is a new addition to Bredero Shaw's SureFlo® product line, which consists of several internal pipe coating solutions developed by Bredero Shaw's world class R&D team. An internal coating is important to enhance the flow efficiency performance of a gas transmission pipeline. It also helps to protect the pipes from corrosion during storage prior to installation. The coating replaces the internal rough surface of a steel pipe with a smooth surface finish, which results in a reduction in friction and turbulence which increases flow efficiency. This may allow for the use of a smaller diameter pipe or lower compression requirements resulting in reduced capital and operating costs respectively. The internal coating also allows for easier visual inspection and an improved ability to 'pig' or check the pipe interior. Traditionally, the most commonly used internal coating used for the gas flow efficiency application is a solvent based one called SureFlo® FEC and its solids content is as low as 48%. In 2007, Bredero Shaw introduced a higher solids content (75%) product, called SureFlo® HS. SureFlo® SF is the latest product in the line.

SureFlo® SF is a solvent-free formulation. The benefits of using SureFlo® SF are far more than just meeting the obligation to use non or less polluting materials in all operations and to meet the strictest HSE standards. Compared with the bare steel and the solvent based SureFlo® FEC coating, SureFlo® SF provides a pipe surface of up to 50% smoother (surface roughness can be 4 µm or less) which reduces turbulence and allows natural gas to flow more efficiently. As a result, significant operating cost savings can be achieved through the use of SureFlo® SF.



According to recent research conducted by IFP (Institut Français du Pétrole), the use of conventional solvent based internal coatings can produce cost savings of 7 - 14% over 30 years in pipelines operating at 150 bar/ 2175 psi, compared to bare pipe with little corrosion. With SureFlo® SF, these cost savings jump to 10 - 20% over bare pipe with little corrosion and 15 - 25% over bare pipe with heavy corrosion.

Other additional benefits include:

- reduced incidence of coating defects due to solvent related application and cure problems;
- a glossy appearance which helps visual inspection;
- allowing extra thickness and producing a tighter polymeric matrix in the cured coating for improved corrosion protection.

The SureFlo® product line can be manufactured in a single plant or in multiple coating plants to improve project logistics. High capacity within the Bredero Shaw plant network allows the client to benefit from single source advantages, ultimately providing more cost effective management of pipe coating needs. In addition to SureFlo® FEC, SureFlo® HS and SureFlo® SF, Bredero Shaw's SureFlo® product line also includes SureFlo® FBE: Internal FBE Lining and SureFlo® CML: Centrifugally Applied Cement Mortar Lining.

▼ Pipes protected with SureFlo® SF which will be installed for the Gjøa gas pipeline



NEW PRODUCTS

WaterGuard® – 100% Solids Lining Solutions for Water Pipelines

To meet the continuously increased project demand for water transmission pipeline coatings, Bredero Shaw has started to globally launch its new internal pipe coating product line called WaterGuard®.

Recently a plural component, solvent free, liquid epoxy lining product was successfully applied by Bredero Shaw's coating facility located in Ras Al Khaimah in the United Arab Emirates for the Water Transmission pipeline from the mainland in Umm Al Nar (UAN) at Sas Al Nakheel Junction to Sadiyat Island in Abu Dhabi. The pipeline will cross all islands through submarine crossings. The water pipeline market segment in the Middle East has been traditionally dominated by cast / ductile iron pipes with an internal cement mortar lining and not coated externally. However, the owner of this 48" potable water transmission pipeline, the Abu Dhabi Transmission and Despatch Company (Transco), subsidiary of Abu Dhabi Water and Electricity Authority (Adwea), decided to construct a carbon steel pipeline and awarded the EPIC Contract to Lindenberg Water and Drainage. Lindenberg in turn awarded the contract to supply coated pipes to Trouvay Cauvin Gulf, a major stockist & project package specialist for the distribution of steel pipes & tubes and related components used in the fluid and gas transmission. Trouvay Cauvin Gulf in turn procured the LSAW pipes from Sumitomo & awarded Bredero Shaw to coat the pipes internally with solvent free liquid epoxy and externally

with 3 LPE. The owner's decision of the coating choice and application contract was not made at discretion. During the project, Bredero Shaw had closely worked with the owner (Transco), the Engineering consultant (Tebodin), lay contractor (Lindenberg) and client (TC Gulf).

Bredero Shaw's world class R&D team conducted extensive research to identify ten liquid coating candidates that would be suitable for steel potable water services and to compare the findings with Transco specifications. Bredero Shaw then helped the pipeline project team to determine the impact of field construction requirements such as flexibility and bending on pipe coating performance properties, coating thickness, and coating application. Bredero Shaw's strong technical assistance and its industry leading quality of coating application had certainly made the client's job much easier in this pipeline project.

The liquid epoxy lining used by the Abu Dhabi water pipeline project is named WaterGuard® LE. In addition to this liquid product, the WaterGuard® product line includes WaterGuard® PU (a plural component, rigid polyurethane product) and WaterGuard® FBE (a Fusion Bonded Epoxy product). WaterGuard® LE, PU, and FBE are all 100% solids, solvent free coating products which meet the strictest HSE standards. The products also meet the requirements of industrial standards for drinking water application (such as NSF 61, BS 6920 and AS 4020), and comply with the requirements of AWWA steel water pipe standards (such as AWWA C210, C222, and C213).

Compared with conventional cement-mortar materials, Bredero Shaw's WaterGuard® products provide better adhesion and resistance to corrosion, chemicals, and abrasion, lighter weight, improved flow efficiency, as well as higher flexibility and cold bending ability. They are suitable for many different water applications including raw water, drinking water, wastewater, process water, injection water and seawater.

The WaterGuard® products are available through Bredero Shaw's global plants, strategically located worldwide. Bredero Shaw also mobilizes portable or temporary facilities to address the specific needs of remote projects.

▼ Pipes protected with WaterGuard® LE



CURRENT PROJECTS

Talisman Energy's Bull Moose Pipeline Project

Shaw Pipe, a part of Bredero Shaw has recently completed the coating on Talisman Energy's Bull Moose Pipeline project. The project consisted of protecting approximately 8.5 km of NPS 12" pipe with 2" of Insul-8[®] 85 Tape/Primer undercoat and with 1" of Rock Jacket[®] for mechanical protection of the pipeline. The pipe was coated at Shaw Pipe's 21st Street facility, located in Edmonton, Alberta, Canada.

Talisman Energy's Bull Moose Pipeline project is located between the Tumbler Ridge region and Chetwynd B.C. It will encompass approximately 19 km of pipeline with 2 major water crossings.



Shaw Pipe Supplies Coatings for TCPL's North Central Corridor

TransCanada's (TCPL) wholly owned subsidiary, NOVA Gas Transmission Ltd (NGTL), is constructing a 300 km, 42" natural gas pipeline on the northern section of the Alberta System. The pipeline which will transport sweet natural gas will connect the northwest portion of the Alberta System at the existing Meikle River Compressor Station to the northeast portion of the system at the existing Woodenhouse Compressor Station.

Shaw Pipe has been contracted to coat approximately 150 km of the pipeline with Fusion Bond Epoxy (FBE) and Low Application Temperature FBE at its Coating Solutions Centre in Camrose, Alberta, Canada. LAT/FBE is a plant applied powder coating for strain based pipeline designs that require a low application temperature. It is spray applied to hot rotating pipe by

electrostatic charge. The pipe will also be coated with Bredero Shaw's SureFlo[®] Flow Efficiency Coating, a thin film epoxy coating applied in natural gas pipelines to smooth the internal pipe surface for improved flow.

The North Central Corridor pipeline project is an expansion of the integrated Alberta System. It will provide capacity needed to address increasing gas supply in northwest Alberta, declining gas supply in northeast Alberta, growing intra-Alberta markets resulting largely from increased oil sands development and reduced delivery capability to interconnecting pipelines at the Alberta-Saskatchewan border. This expansion will allow NGTL to meet increased customer requirements for the 2009/2010 Gas Year and beyond.

▼ Pipes Protected at Shaw Pipe's Coating Solutions Centre in Camrose, Alberta for the North Central Corridor Project



PLANT CAPABILITIES

Plant Expansion in Pearland, TX

Bredero Shaw has been investing considerably in the past two years to expand its coating facility in Pearland, TX. Located 24 km (15 miles) South-East of Houston, Pearland has served the North American market for over 40 years. This expansion is part of a program to increase Bredero Shaw's coating capacity for projects in the US and Gulf of Mexico. The facility has added new coating lines and has increased its capacity for large diameter pipe used in the transmission market.

Pearland's new expansion offers:

- New 3-Layer Polyethylene and 3-Layer Polypropylene coatings.
- Stream lined shipping and receiving area and processes to compliment the additions of staff and forklifts, resulting in more than 50,000 trucks handled in the past two years.
- An additional rail spur construction for more efficient handling of rail car volumes, effectively doubling current capacity.
- Improved automated pipe handling equipment for greater safety of employees and visitors.
- New state-of-the-art office building facility accommodating spacious management, engineering, operations offices as well as conference and meeting rooms.

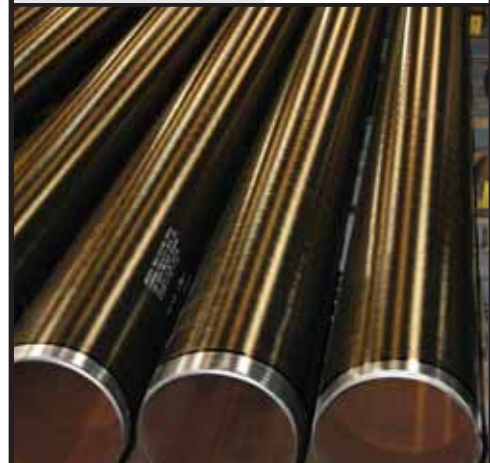
In addition to the plant expansion, Bredero Shaw has leased and is developing 20 additional acres of land with the intention to increase pipe storage capacity and also accommodate future expansion of the Pearland plant. These investments will allow Bredero Shaw to meet the growing demand for insulated pipelines in the US and Gulf of Mexico, increase efficiency and reduce lead time.



MANUFACTURED PRODUCTS AT PEARLAND

3LPP: Three Layer Polypropylene Coating
3LPE: Three Layer Polyethylene Coating
FBE: Fusion Bonded Epoxy Powder Coating
Dual Layer FBE: Dual Layer Fusion Bonded Epoxy Powder Coating
En Tec®: High Density Two Layer Polyethylene Coating
Zap-Tec®: FBE and ARO
ThermoFlo®: Polyurethane Insulation Systems
Custom Coating and Field Joint Protection

LOCATION



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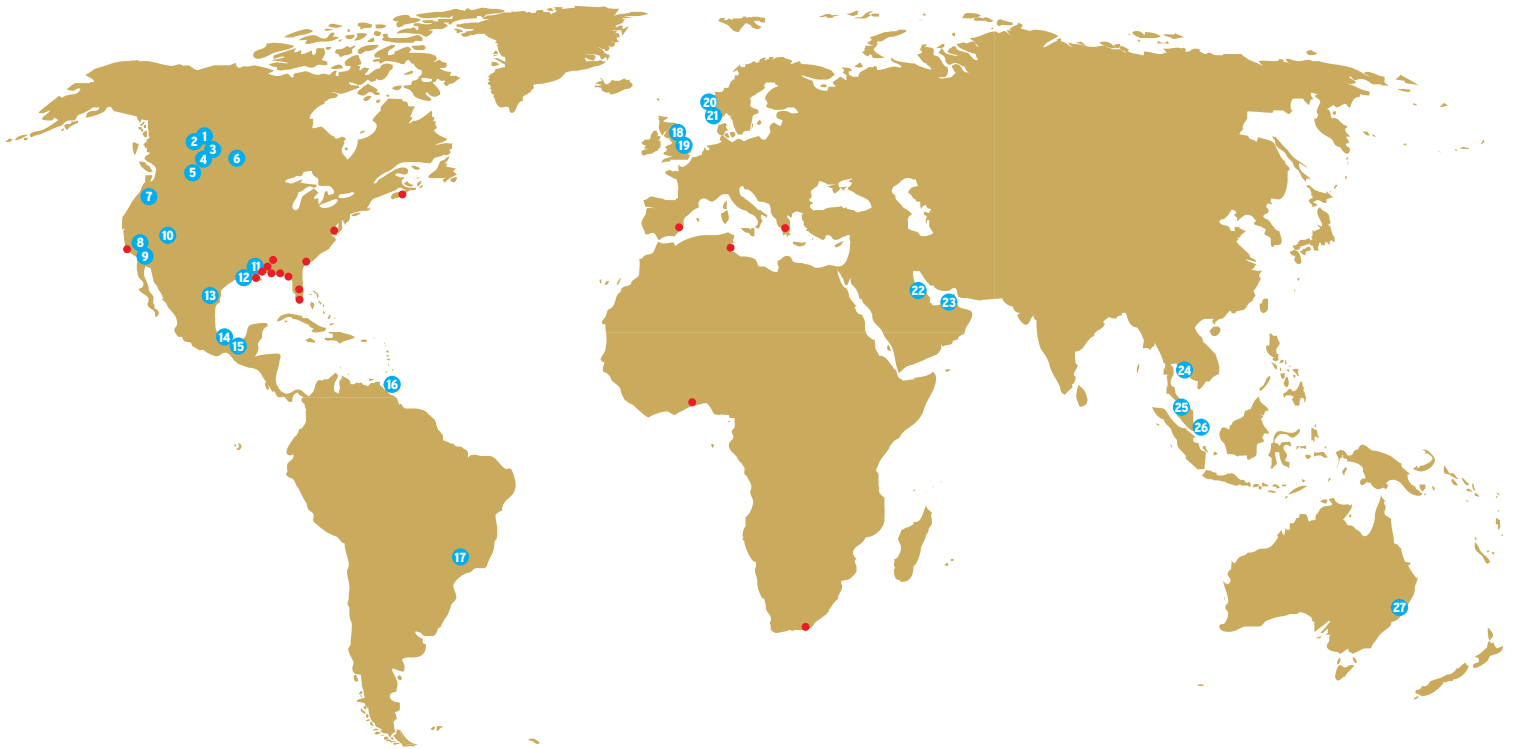
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The World's Leading Pipe Coating Facilities



● **PAST MOBILE FACILITIES**

● **PLANTS**

AMERICAS

1. 34th Street, Edmonton, Alberta
2. 21st Street, Edmonton, Alberta
3. Camrose I, Camrose, Alberta
4. Camrose II, Camrose, Alberta
5. Calgary, Alberta
6. Regina, Saskatchewan
7. Portland, Oregon
8. Adelanto, California
9. Fontana, California
10. Vineyard, Utah
11. Beaumont, Texas
12. Pearland, Texas

13. Monterrey, Mexico
14. Veracruz, Mexico
15. Coatzacoalcos, Mexico
16. La Brea, Trinidad
17. Belo Horizonte, Brazil

EUROPE, AFRICA AND RUSSIA

18. Ellon, Scotland
19. Leith, Scotland
20. Orkanger, Norway
21. Farsund, Norway

MIDDLE EAST

22. Jubail, Saudi Arabia
23. Ras Al Khaimah, UAE

ASIA PACIFIC

24. Rayong, Thailand
25. Kuantan, Malaysia
26. Kabil, Batam Island, Indonesia
27. Kembla Grange, Australia

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