

# Rock Jacket®

## PRODUCT EXPERIENCE SHEET

Over the past 25 years Bredero Shaw has completed over 250 Rock Jacket® projects for over 50 customers. Once they have used Rock Jacket® on a project, many pipeline owners or pipeline construction companies are specifying this system for all their onshore mechanical protection needs.

### THE FIRST PROJECTS

The first Rock Jacket® projects dealt with the uncertainties of a new product and the complexities of tough terrain configurations, rough trench materials and extreme climate conditions from tropical jungles in Papua New Guinea to the frozen areas in the Northern hemisphere. Below is a select list of challenging projects completed in the early years.

PROJECT	CUSTOMER	COUNTRY	PIPE DIAMETER	LENGTH	YEAR
Shawinigan - Lac St. Jean Gas Pipeline	Gaz Inter-Cite Quebec	Canada	16"	170 km	1984
TPA Pipeline	State of Victoria	Australia	4", 6"	48 km	1987
Queensland State Gas Pipeline	Queensland Dept of Mines	Australia	12"	200 km	1989-1990
Vancouver Island Pipeline	Westcoast Energy	Canada	12"	125 km	1990
E-Z Pipeline	Phillips Pipeline Co	USA	10"	103 km	1991
IGTS Pipeline	Iroquois Gas Transmission System	USA	24", 30"	121 km	1991
Kutubu Oil Pipeline	Chevron Niugini	Papua New Guinea	20"	171 km	1991-1992

### RECENT SUCCESS STORIES

Rock Jacket® has been proven to be the best mechanical protection system in the market. Recently coated projects were focused in two active onshore pipeline construction regions Canada and Australia both with significant mechanical protection needs. Below is a select this of projects completed between 1993 - 2007.

PROJECT	CUSTOMER	PIPE DIAMETER	LENGTH	YEAR
Talisman Projects	CE Franklin	4", 6", 8", 10", 12"	124 km	1999-2007
Bullmoose & Tay River Developments	Shell Canada Resources	6", 8", 10"	14 km	2006
Grand Cache	ATCO Pipelines	8", 10"	55 km	2005
Goodrich Project	Camrose Pipe / Duke Energy	6"	10 km	2004
Moose Mountain Pipeline Loop	Shell Canada Resources	4", 6", 8"	37 km	2003-2004
Moose Mountain Project	Husky Energy	3", 4", 6"	32 km	2002-2003
Chungo Southport	Talisman Energy	4", 6", 8"	14 km	2001
Southern Crossing	IPSCO / BC Gas	24"	18 km	2000
Sukunka Project	CNRL	3", 6", 8"	32 km	1996
Burnt/Brazion Project	Shell Canada Resources	8"	24 km	1995
Brazion Pipeline	Westcoast Energy	20"	17 km	1994
Napierville Pipeline	TransCanada PipeLines	12"	25 km	1993



Protective & Weight Coatings





## Rock Jacket® Experience



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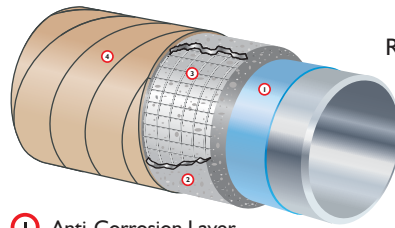
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## ROCK JACKET®



- ① Anti-Corrosion Layer
- ② Concrete
- ③ Reinforcing Wire Mesh
- ④ Outer Wrap

Rock Jacket® is a coating system that was developed to offer excellent mechanical protection to the anti-corrosion coating and the steel pipe of onshore pipelines with the lowest total installed cost, installation time and environmental impact in the industry. Rock Jacket® is a plant applied reinforced concrete pipe coating developed for rocky terrain, rough terrain configurations such as steep slopes and for road and river crossings. It has been designed to be buried directly in blasted out rock trenches without the use of other costly protective products and is ideal for both small and large diameter pipelines.

## GLOBAL AVAILABILITY

Rock Jacket® is now available globally in Bredero Shaw's unique mobile facilities. The plants can be mobilized quickly to meet specific project requirements and to significantly reduce pipe transportation and handling costs. Plant mobilization near the pipeline right-of-way can improve the overall economics of the project and qualify for in-country content requirements.

## TESTIMONIALS

*"Rock Jacket® allowed us to greatly reduce and even eliminate the need for sand padding on our line. It also had a favorable effect on the cost of handling pipe in transport and at the work site...the economies attributable to the use of Rock Jacket®... were certainly significant and they greatly helped to complete the construction ahead of schedule and much below budget. It is also foreseen that Rock Jacket® will help significantly reduce the cost of line maintenance..."*

Serge G. Morin, Transmission Project Director, Gaz Inter-Cite Quebec Inc

*"Ed Karpel, the Iroquois Gas Transmission System supervising engineer for the land portion of the pipeline stated that sections of the pipeline route on spread 4 in southern New York, and all of Spread 5 in Connecticut, encountered areas of rock trench, extremely hilly and rocky terrain with 30% grades, densely populated areas, limited right of way access and narrow right of way easements. Faced with the challenge of constructing the pipeline under these difficult pipe laying conditions and extremely tight deadlines, IGTS chose Rock Jacket® to protect a substantial portion of the pipeline and its coating."*

Pipeline Digest, April 1992

*"Rock Jacket® served positively in two areas: cost and integrity of pipe. Cost savings:*

- *during construction, particularly in areas of hauling, stringing, bending and pipe line-up, Rock Jacket® enabled the pipe to be handled efficiently and rapidly as special provisions to protect the coating were eliminated*
- *eliminated the need to provide passing areas for the equipment hauling padding material thus reducing clearing, grading and clean-up operations*
- *Rock Jacket® eliminated coating inspection and patching during lower-in thereby increasing the productivity of that operation*
- *The cost of Rock Jacket® in place was...less than padding*
- *Eliminated ditch breakers on slopes which would have been required to retain padding material when used"*

Henry M Yamauchi, Senior Supervisor Engineering, Westcoast Energy Inc

*"[Kutubu Oil Pipeline] was one of the world's most rugged pipeline jobs. It was laid in a country [Papua New Guinea] with a 4.5 to 6 meters mean annual rainfall with no road access and river access at only two points. The Kutubu project was both exciting and dangerous. The terrain was 75 per cent swamp with numerous fast flowing rivers and 25 per cent mountains. The climate was hot and humid"*

1991-1992: Building the Kutubu Oil Pipeline in PNG in The Australian Pipeliner, Sep 2007

*"[With Rock Jacket®] we do not have to do anything as far as select backfill. We do not have to truck in sand or any kind of padding in the ditch. We can take the material that we dig out of the trench and put it on top of the pipe without any changes to give us the needed protection"*

Robert Worthingham, Senior Corrosion Engineer, TransCanada PipeLines

## BREDERO SHAW: THE GLOBAL LEADER IN PIPE COATING SOLUTIONS

Bredero Shaw is the world leader in pipe coating solutions, with more than 75 years of experience, over 27 pipe coating facilities on 6 continents and the largest team of technical and service specialists in the business. Bredero Shaw offers technologically advanced solutions for anti-corrosion coatings, protective and weight coatings, thermal flow assurance coatings, internal coatings, custom coatings and field joints for both onshore and offshore applications. This broad range of products and services provides Bredero Shaw with the unique capability to service the full spectrum of pipeline protection and flow assurance requirements. Consult your Bredero Shaw representative for your unique project requirements.

The information contained herein is indicative of the types of coatings provided by Bredero Shaw, and is not intended to be a guarantee that a particular coating will be suitable for a given application. Since many unique environmental, operating, and design conditions must be considered, the user shall determine the suitability of the coating for the intended use and assume all the risks and liabilities in connection therewith. Bredero Shaw's liability is stated in our standard conditions of sale.