

VOLTA COATINGS

Superior Products International

Corrosion and Insulation Specialists



Global Clients

Chevron

Berkshire Hathaway Energy

Linde

Milaha

ADNOC

OXY

Eni Saipem

Sunoco

Nakilat

Drydocks World

GP Georgia-Pacific

Halliburton

Petrobras

Vela

Sasol

Hess

Covanta Energy

Engie

Pemex

U.S. Army

Default Paint Method

Unchanged for the past 50 years

1. Sandblasting

2. Zinc Rich Primer

3. Top Coats





Limited Success

Limited success in humid climates? Why?

- Blast is often made in humid conditions.
- Coating application is often delayed.
- Microscopic flash rust develops before application (bloom)
- The rest is history…delaminating, blistering, etc.

Solution

RUST GRIP®

Direct to Metal - Moisture Cure - Polyurethane



Rust Grip Advantages

Rust Grip:

Single Component – No mixing part A & B

Fast Cure – Humidity accelerates curing

Surface Tolerant – Minimal surface preparation

Easy to Apply - Brush, spray or roll

Strength – Non leafing aluminum metallics

Self Priming – “Three coats in one” system

Summer – Apply on surfaces up to 140F (60C)

Long Shelf Life – 3 years if unopened





Chemistry – Polyurethane

SECTION 3: Composition/information on ingredients				
3.2	Ingredient compositions	%	CAS/PIN	TLV
	Aromatic 100	8.3%	64742-95-6	50.00
	Aromatic 150	20.0%	64742-94-5	25.00
	Mineral spirits	8.12%	64742-47-8	100.00
	4,4 Methylene Bis (Phenyl Iso) Diphenylmethane	0.64%	26447-40-5	Not established
	4,4 MDI, Bis (4-isocyanatopheny methane) Polyiso	34.97%	Proprietary	Not established
	4,4 Diphenylmethane Diiso	10.12%	101-68-8	.002-ceiling (.051 mg/m3)
	Metallic paste	17.85%	7429-90-5	Not established



How it Works

Top Coat

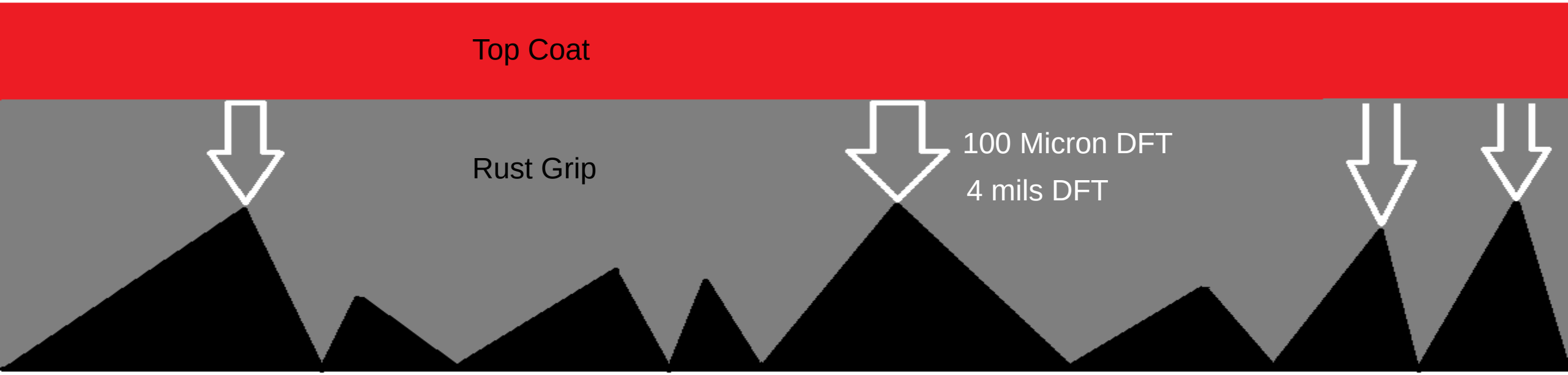
Rust Grip

Rust Grip fills the pores and establishes a stronger anchor profile.

RUST GRIP uses special low molecular weight solvents which penetrate deep into the pores, anchoring, swelling and encapsulating the surface. RUST GRIP slows the electro-chemical reaction by sealing the pores of the metal, reducing water vapor transmission. The heavier aluminum metallic's and micaceous oxide add strength to the weakened steel

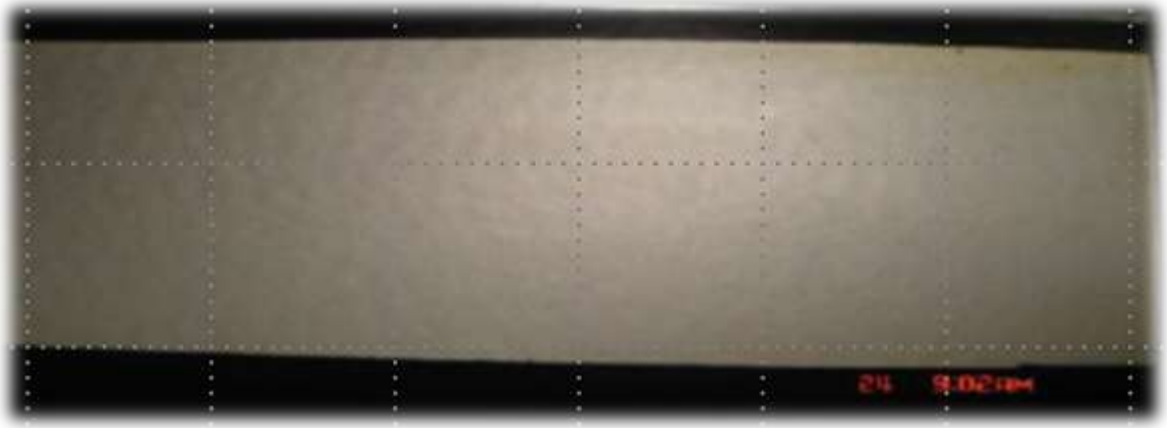


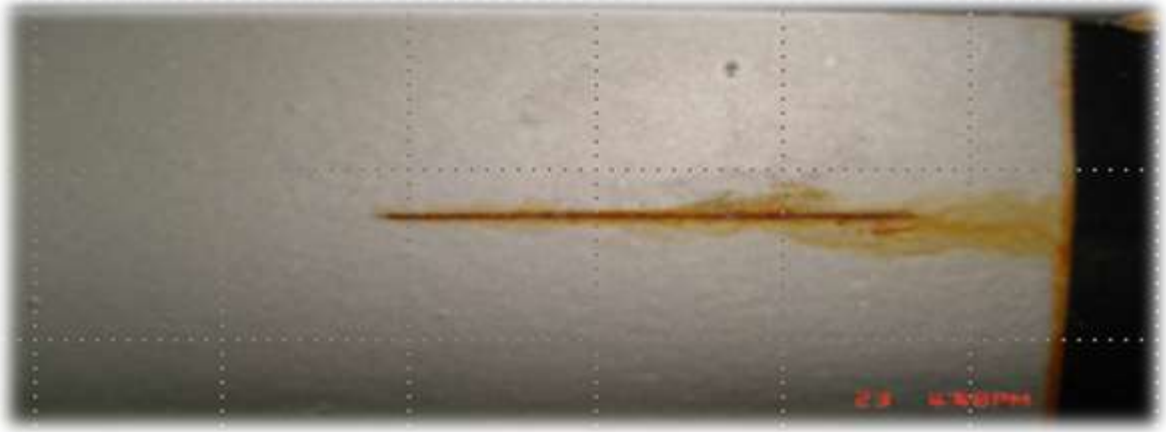
Peaks & Valleys



To ensure proper encapsulation, Rust Grip coating must fill the peaks and valleys of the metal profile obtaining a minumum thickness of 100 micron DFT above the heightist peak.

ASTM B117





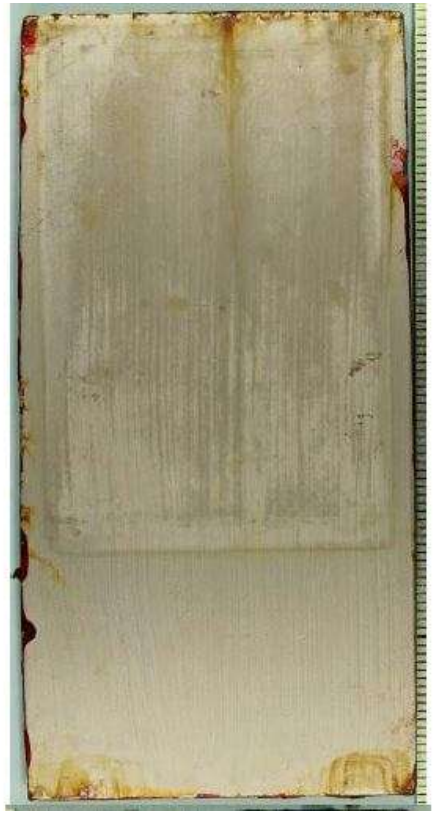
- 15000+ Hour Salt Fog Spray Test
- Equivalent to **30 years**
- 32 C Temperature
- 500 Hour w/ Scribe
- No bubbles or undercutting along the scribe

ASTM D 5894

Perfect Score 10 out of 10



(a) 1000 Hours



(b) 5000 Hours



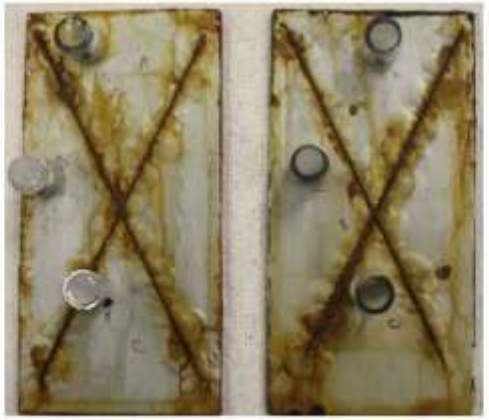
(c) 10000 Hours

Aged Pull Off Testing



(a) First Coupon (b) Second Coupon

Figure 3. Images of the Two RUST GRIP Scribed Coupons After Placement of the Dollies. The Right Most Dolly on Each Coupon Is Just a Dummy.



(a) First Coupon (b) Second Coupon

Figure 4. Images of the Two RUST GRIP Scribed Coupons After the Pull Test. The Three Locations (A, B, and C) on Each Coupons Corresponds to the Locations Where Pull Test Was Recorded.

Results

•4368 hours, then bake the RUST GRIP coupon at 163 °C for 24 hours, then perform pull off test.

• “The coating does not fail in the pull-off adhesion test. Only adhesive failure was observed at the average pull force of more than 1000 psi. This is indicative of good performance of the coating considering the thin application of the coating on the coupon.”

References

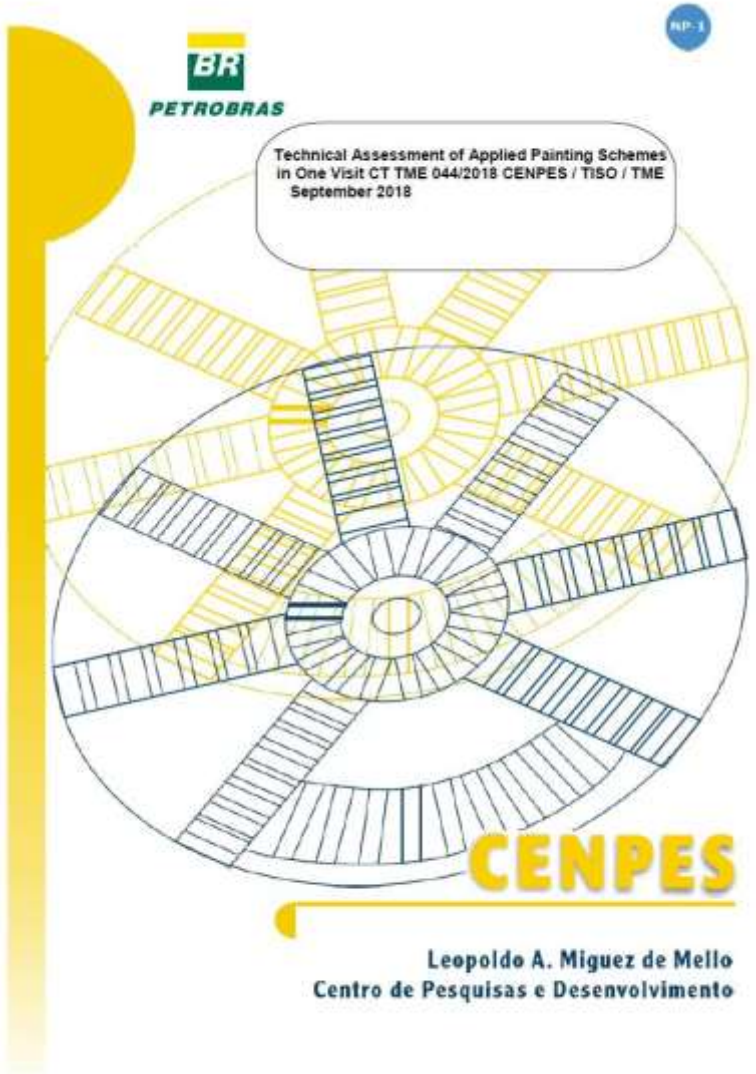
ASTM D5894–10, Corrosion
ASTM D4541–02, Pull Off

US Army Corps of Engineers



- Most Consistent Performer
- Exceeded Adhesion Requirements
- No other coating performed at the same level
- Only ‘3 in 1’ coating solution to pass rust evaluation requirement

Petrobras – Brazil – ISO 12944-9



"Among the 3 tested zinc-free mono component paint schemes, the **Rust Grip showed the best performance**. This product was distinguished by adherence to the substrate prepared to the St3 standard, low corrosion advance from the incision and absence of corrosion points at the end of the tests"

"Among the zinc-free coatings, it is worth mentioning the performance of the Rust Grip product, with no red corrosion and little corrosion advance from the incision at the end of 12 cycles. In the case of a coating that acts only by the barrier mechanism, **we consider an excellent result."**

Initial Pull 12.5 Mpa, (1,813 PSI)

After 12 cycles 11.3 Mpa, (1,638 PSI)

ADNOC - ADCO

RUST GRIP COATING – "NEB – Field Trial"





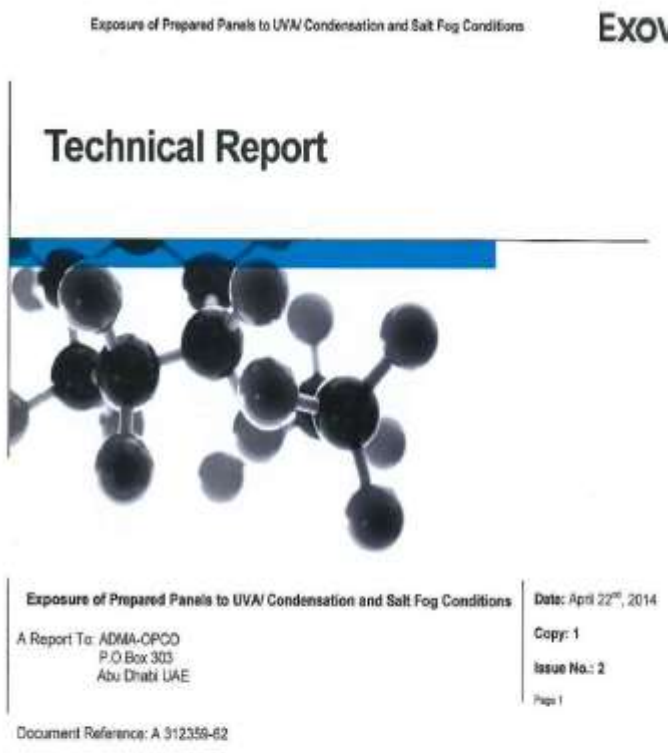
ADNOC - ADCO

RISK AND COST – Blasting And Painting Process

Application	Pressure Washing	Blasting	Coating (Primer)	Coating (1st or 2nd)	Final Coat
Conventional Application	Required (10 hrs)	Required (25 hrs)	Required (10 hrs)	Required (10 hrs)	Required (10 hrs)
Rust Grip Application	Required (10 hrs)		Required (10 hrs)	Required (5 hrs)	Required (10 hrs)
Risk Assessment	Same for both	No Hot PTW No blasting Equipment No dust or noise No isolation or SD	Fast curing under high humidity for Rust Grip	short over coating time for Rust Grip	Same for both
Cost Comparison (Conventional/Rust Grip)	Same for both	No cost for Rust Grip	Same for both	Less time, less manpower for Rust Grip	Same for both

NO HOT PERMIT NEEDED FOR MAINTENANCE

ADNOC - ADMA



JOTUN System – Sa 2.5 4 coats

SPI System – Pressure Wash 3 coats

Rust Grip outperforms conventional zinc rich primers even with no sandblasting (5000 hours)

SPI (Cold Permit)



JOTUN (Hot Permit)





Chevron Case Study

Society of Petroleum Engineers

No Pipe Body Downgrades - Improved Corrosion Mitigation Coating System Provides Significant Operator Savings

Buck Johnson, Chevron North America; Timothy Cappel, Superior Products International II, Inc.; Greg Elliott, Leianne Sanclemente, Greg Moore, Noah Tritz, and James Brock, Workstrings International; Chuck Sewell, Superior Inspection Services

Copyright 2020, Society of Petroleum Engineers.

The paper was prepared for presentation at the SPE Subsea Well Intervention Symposium originally scheduled for 11-13 August 2020, but the event was cancelled. The paper is included in the SPE 2020 Symposium Compilation, published 18 January 2021.

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Abstract

Objectives/Scope: Tubulars used in completion and intervention riser applications are exposed to both the marine environment and corrosive oilfield chemicals, including salt-based completion brines. Eight years of field history from one company shows a loss of $24.3 million from pipe body downgrades due to corrosion and pitting in these salt-based environments.

Methods, Procedures, Process: This paper documents an extensive development effort spanning over eight years including: research of completion parameters and environments, evaluation of 18 potential external coating/salt neutralization products, multiple lab tests, field trials, as well as testing surface preparation methods, coating application, dry time and adhesion tests. The development of application procedures and construction of an external coating facility are discussed as are rig pipe washing systems and corrosion mitigation procedures.

Results, Observations, Conclusions: The result is an improved corrosion mitigation coating system. A modified epoxy phenolic internal coating combined with a metallic-based, moisture-cure polyurethane encapsulating external coating. Since 2015, over 1,700,000 feet, 44,000 joints, of completion and intervention tubulars utilizing this system have been deployed with zero pipe body downgrades due to corrosion or pitting, and zero operational issues. In addition to reducing replacement cost and loss of capital, this system provides the ability for longer deployment of the pipe on a multiple well program reducing logistics costs.

8 Year Study by Chevron:

18+ Coatings Tested

Lab & Field Testing

RUST GRIP selected as best overall coating

Drill Pipes

“Since 2015, over 1,700,000 feet (44,000 Joints) with zero tube corrosion downgrades”





Gulf of Mexico - Deepwater

Picture LEFT – RUST GRIP coated pipe returned after 3 back to back completions over an 8 month period.

Picture RIGHT – UNCOATED returned after a single deep-water completion.



LNG Carriers – Abu Dhabi











N. G. S. C.

NGSCO (Abu Dhabi) – Multiple LNG Tankers

LNG Carriers – Abu Dhabi

NO BLAST, NO SHUTDOWN, NO DRYDOCKING, APPLICATION AT SEA



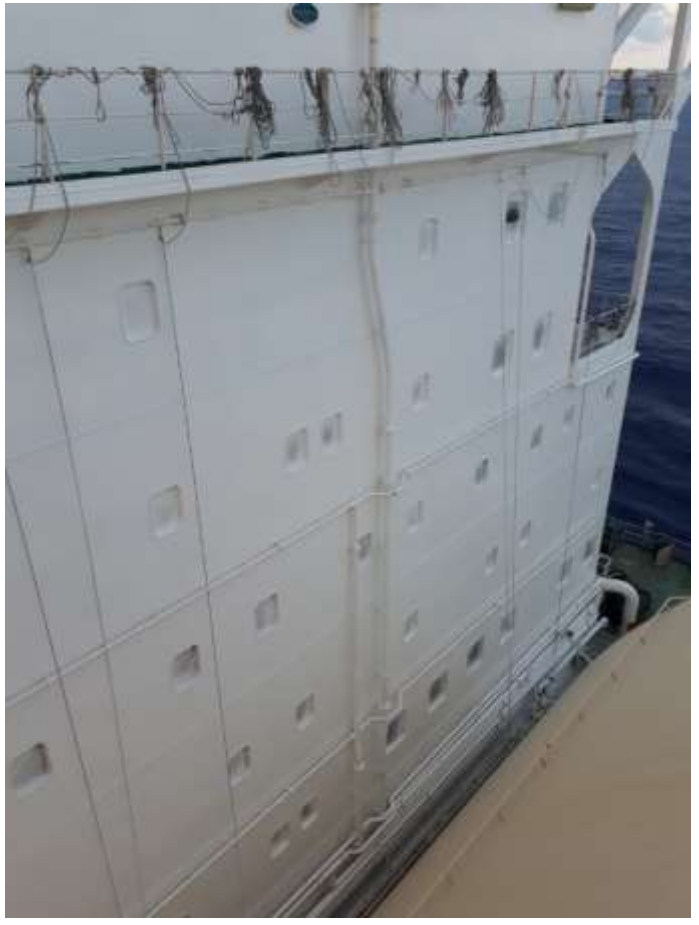


LNG Carriers – Abu Dhabi

NO BLAST, NO SHUTDOWN, NO DRYDOCKING, APPLICATION AT SEA







Blue Chip Casino Boat

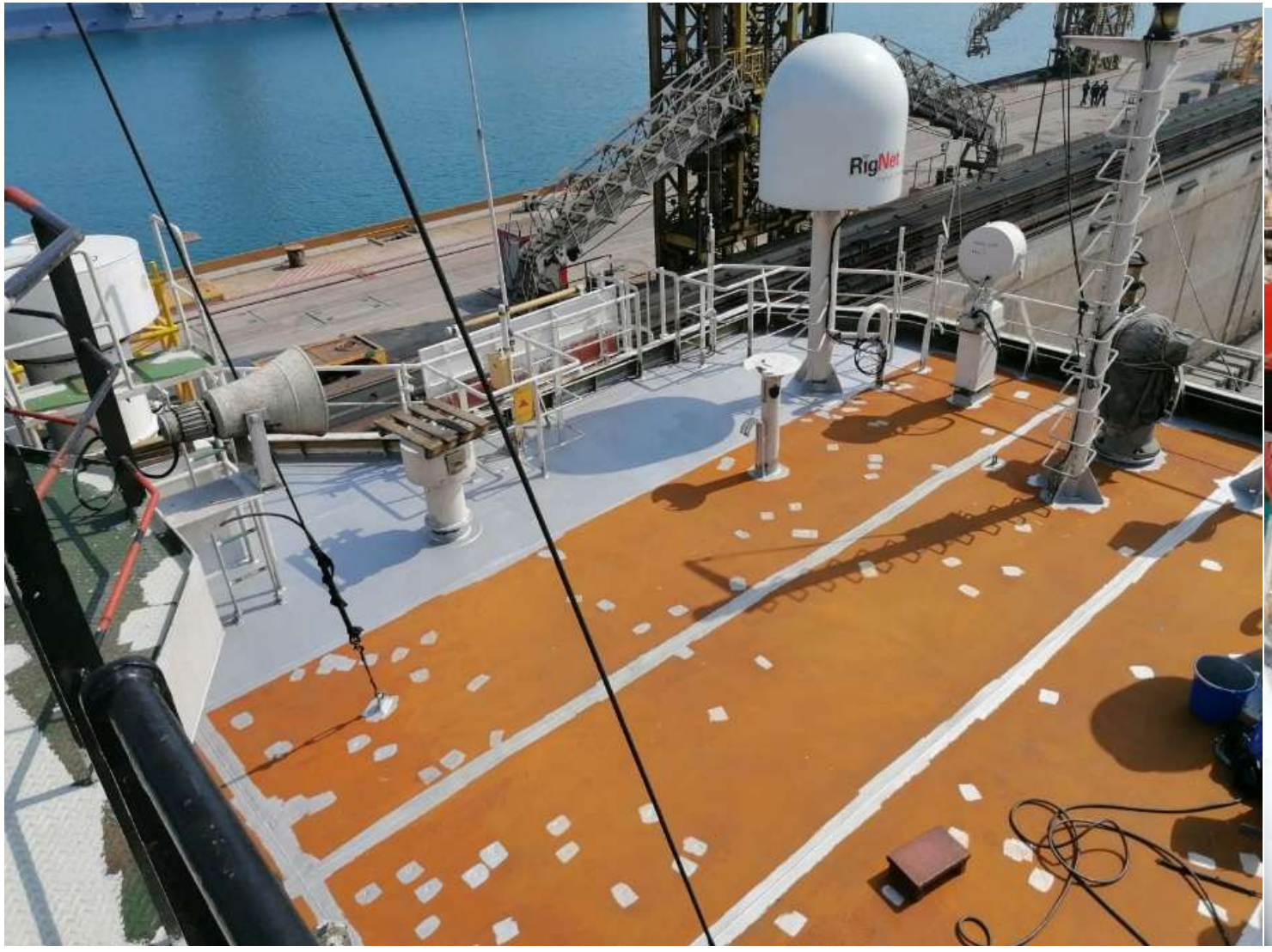






$ 2,000,000 Saved on Surface Preparation

Milaha - Qatar









Offshore



Cantarell Complex, Gulf of Mexico

Rapid Curing

3 coats in a single day saving time & money



Offshore



Cantarell Complex, Gulf of Mexico

Rapid Curing

3 coats in a single day saving time & money



Offshore

OFFSHORE PERFORMANCE

In a Non Zinc Formulation



Ease of Application





BRUSH

ROLL

SPRAY

Offshore CUI







Surface Tolerant

Offshore CUI Protection

Fast Cure

325 F (163 C) Max Operation Temperature

LNG Pipeline



NO BLAST

BEFORE



AFTER

LNG Pipeline





Color Top Coat

ENAMO GRIP

Aliphatic Polyurethane

LNG Tank



Encapsulation of Old Paint

No Costly Containment

Surface Prep 4,000 psi Power Wash

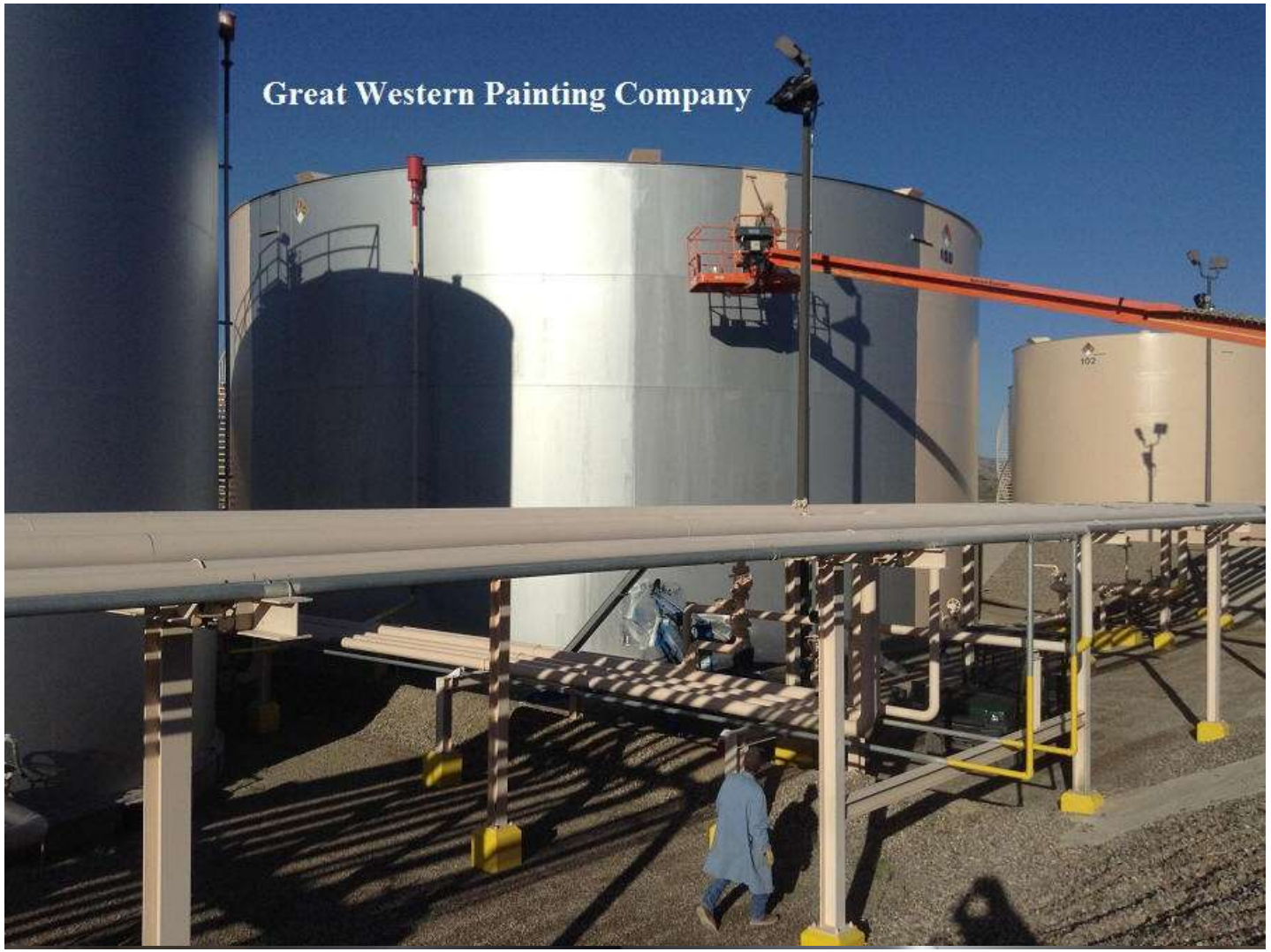
Vessels



Shop Application

3 Coats in a single day in humid climates.

Tanks



Field Application

Cures in as little as one hour.

Tan color topcoat is Enamo Grip.

Spot Rust Repair







Packing Sizes

Quart

1 Gallon

5 Gallon

ADNOC - LINDE



شركة أدنوك ليندي للغازات الصناعية المحدودة
ADNOC Linde Industrial Gases Company Ltd.

08th Dec 2014,

Abu Dhabi.

From,
Sujith Pillai,
Mechanical Maintenance Manager,
ADNOC Linde Industrial Gases Company Ltd,
Abu Dhabi, UAE.

To,
Tunb Oil & Gas Equipment Trading LLC,
P.O. Box 133497
Abu Dhabi, UAE.

Sub: Product Appreciation Letter

On behalf of ADNOC Linde Industrial Gases Company, I am writing to express our appreciation on the Rust Grip protection coatings delivered by you. We have been using the coating for the corrosion prevention in our plant since one and half years. The coating offers better resistance especially in the vicinity of Cooling Tower which is operated with sea water.

We'll be sure to keep your company in mind for any future applications.

Thanks & Regards,

Sujith Pillai

Rust Grip Structural Steel









Baku Metro – Azerbaijan



Cast Iron

Rapid Cure

Surface Tolerant

Bridges - USA





5,000 PSI

SSPC SP 3 to remove pack rust

Dept. of Transportation USA



DEPARTMENT OF TRANSPORTATION

1890 County Services Parkway
Marietta, Georgia 30008-4014
Phone: (770) 528-1600 Fax: (770) 528-1601

Mr. Harry Williams
6498 Lynndale Lane
Morrow, Georgia 30260

December 17, 2002

To Whom It May Concern,

Environmental Industrial Applied Coatings, Inc. (New Tech Coatings, Inc.) Morrow, Georgia, introduced and provided us with a new, top-quality product for the repairs and encapsulation of rust on a bridge in our County. This product has performed beyond our expectations and the ease of application enabled to save about 80 man hours on one bridge, over the traditional methods of repair. Normally, we would have to sand blast the substructure of the bridge in order to repaint and repair them. This product, Rust Grip, enabled us to do the work with little or no preparation.

Our test bridge was downgraded from a 10 ton bridge to a 3 ton, due to the rust and deterioration of the substructure. Using the Rust Grip, the State's re-certification process upgraded the bridge to a 21 ton, with our cover plating and re-enforced concrete covering. We think this is remarkable and have scheduled 17 more bridges to be covered with this product in the next seventeen months.

We would like to thank Environmental Industrial Applied Coatings for introducing this product to our County.

Sincerely,

Roger Henry
Bridge Superintendent
Cobb DOT

Bridges - AL

Inspection of structure conducted March 2017 Project Completed 2009 (8) Years in Service







Bridges - SC

Inspection of structure conducted in 2018 Project Completed 2010 (8) Years in Service









Save Time & Money

	Conventional Systems	RUST GRIP
Surface Preparation	Sand Blasting Sa.2.5, NACE2, SSPC10	Cost is reduced due to high surface tolerance of Rust Grip • SSPC1+SSPC2+SSPC3, St.2+St.3 OR • NACE4, SSPC7, **Grit/Garnet cost eliminated or reduced by up to 75%**
Application	Epoxy 3-Coat Systems 4-Coat Systems	Polyurethane moisture-cure metallic, that cures faster. The higher the humidity the faster the curing. **Total application time is reduced by 75%**
Performance	Limited Performance Cannot match Rust Grip's laboratory or field performance	Perfect Score: • ASTM B117 Salt Spray Fog Test; 15,000 hours • ASTM D5894 Standard Practice for Cyclic Salt Fog/UV Exposure of Painted Metal; 10,000 hours • ASTM E1795 Standard Specification for Non-Reinforced Liquid Coating Encapsulation Products for Leaded Paint in Buildings
Configuration	Multi-Component System with various mixing ratios	Self priming, Single-component system consist of only Rust Grip

SSPC Award for Innovation

SSPC
The Society For Protective Coatings

E. Crone Knoy Award

for a single, recent, outstanding achievement in industrial or commercial coatings work that demonstrates innovation

Hoover Dam Bypass Bridge - Colorado River Bridge

Spans between Nevada and Arizona



Structure Owner: Federal Highway Administration
Contractor/Applicator: United/Anco Services - A Member of The Brock Group
Coating Material Suppliers: PPG Marine and Protective Coatings, and
Superior Products International (SPI)

January 31, 2011
Las Vegas, NV

President

Executive Director

U.S. Patent



The United States of America

The Commissioner of Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

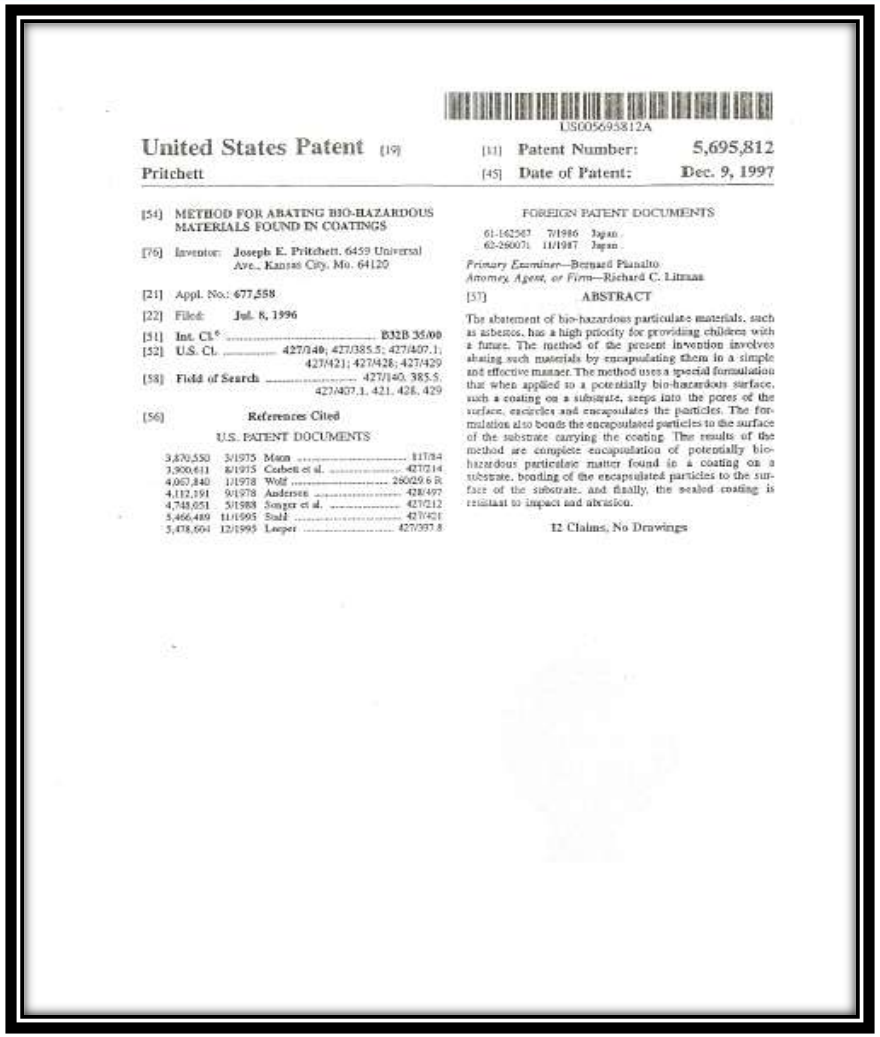
Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the U.S. filing date, subject to any statutory extension. If the application contains a specific reference to an earlier filed application or applications under 35 U.S.C. 120, 121 or 365(c), the term of the patent is twenty years from the date on which the earliest application was filed, subject to any statutory extension.

Bruce Lehman
Commissioner of Patents and Trademarks

Marjorie v. Turner
Attest



US005695812A

United States Patent [19]
Pritchett

[11] Patent Number: 5,695,812
[45] Date of Patent: Dec. 9, 1997

[54] METHOD FOR ABATING BIO-HAZARDOUS MATERIALS FOUND IN COATINGS

[76] Inventor: Joseph E. Pritchett, 6459 Universal Ave., Kansas City, Mo. 64120

[21] Appl. No.: 677,558

[22] Filed: Jul. 8, 1996

[51] Int. Cl.[6] B32B 35/00
[52] U.S. Cl. 427/140; 427/385.5; 427/407.1; 427/421; 427/428; 427/429
[58] Field of Search 427/140, 385.5, 427/407.1, 421, 428, 429

[56] References Cited

U.S. PATENT DOCUMENTS

3,870,550	3/1975	Mann	117/34
3,900,611	8/1975	Corbett et al.	427/214
4,067,840	1/1978	Wolf	260/29.6 R
4,112,191	9/1978	Anderson	428/497
4,748,051	5/1988	Songer et al.	427/212
5,466,489	11/1995	Stahl	427/421
5,478,604	12/1995	Leeper	427/397.8

FOREIGN PATENT DOCUMENTS

61-162587	7/1986	Japan .
62-260071	11/1987	Japan .

Primary Examiner—Bernard Pianalto
Attorney, Agent, or Firm—Richard C. Litman

[57] ABSTRACT

The abatement of bio-hazardous particulate materials, such as asbestos, has a high priority for providing children with a future. The method of the present invention involves abating such materials by encapsulating them in a simple and effective manner. The method uses a special formulation that when applied to a potentially bio-hazardous surface, such a coating on a substrate, seeps into the pores of the surface, encircles and encapsulates the particles. The formulation also bonds the encapsulated particles to the surface of the substrate carrying the coating. The results of the method are complete encapsulation of potentially bio-hazardous particulate matter found in a coating on a substrate, bonding of the encapsulated particles to the surface of the substrate, and finally, the sealed coating is resistant to impact and abrasion.

12 Claims, No Drawings

Letter of Recommendation



Eni GROUP **Saipem**

Statuto Service S.r.l.
ADVACOTE division
Via S. d'Orsenigo 5
20135 Milano
Attn. Claudio Pollio

Subject: product application

Dear Mr. Pollio,

During the month of November 2004, Saipem's personnel responsible for the operation and maintenance of S10000 drillship were involved in the application of two coating systems, with the technical support of your field supervisors.

The first job, concerning the thermal insulation of a series of steam piping manifolds on board the ship, was carried out by means of the products named HPC and Super Therm. The job was performed by Saipem's crewmen, after a few hours of training by your supervisor. I am glad to report that the people on board are very satisfied with the result, that has been achieved in a very short time, compared with the conventional systems based on rockwool and aluminum sheets.

The second job, performed by a local application team at Saipem's Port Harcourt base, involved the application of a corrosion prevention system on drilling riser pipe. As you may know, offshore oil drilling is one of the most exacting environments on machinery and equipment. The three coat system, composed of Rust Grip, Moist Metal Grip, and pigmented Enamo Grip products, had been advised by Advacote technicians to meet our requirements for a long-lasting coating system suitable for use underwater and periodically subject to weathering on deck.

In both cases, our application teams were impressed with the quality of the coatings and the level of service and attention provided by your field personnel.

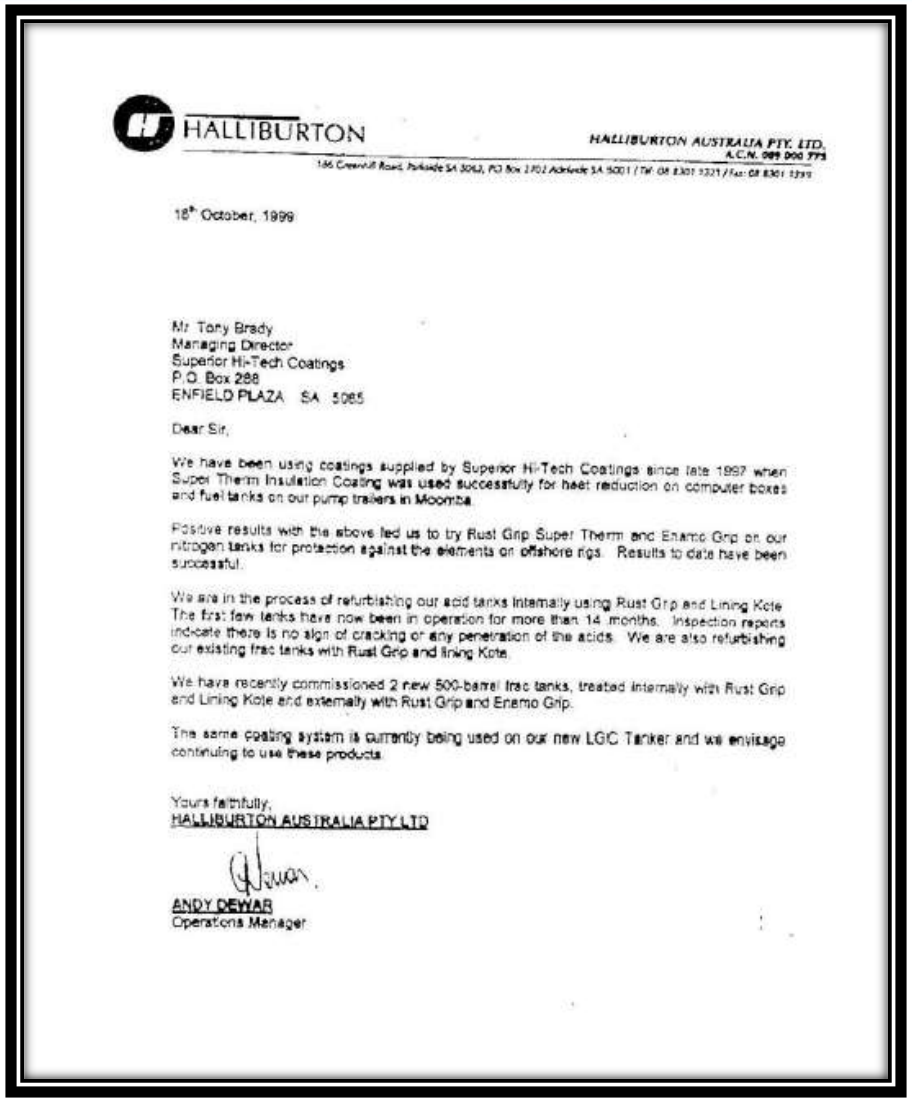
We are currently ordering from your company additional products to apply the above mentioned corrosion prevention system on the remainder of the subsea pipes that are scheduled for re-coating by the end of the year.

We look forward to make further use of your products and services in the near future.

In the meantime, we remain

Yours Sincerely

Marcello Vairetti
Assets Management and Maintenance Department
Drilling Assets and Equipment Manager
Phone: +39 02 520 34424
Mobile: +39 349 8907941
Fax: +39 02 520 34709



HALLIBURTON

HALLIBURTON AUSTRALIA PTY. LTD.
A.C.N. 009 000 775
166 Greenhill Road, Parkside SA 5063, PO Box 2702 Adelaide SA 5001 / TW: 08 8301 9221 / Fax: 08 8301 9399

18th October, 1999

Mr Tony Brady
Managing Director
Superior Hi-Tech Coatings
P.O. Box 288
ENFIELD PLAZA SA 5085

Dear Sir,

We have been using coatings supplied by Superior Hi-Tech Coatings since late 1997 when Super Therm Insulation Coating was used successfully for heat reduction on computer boxes and fuel tanks on our pump trailers in Moomba.

Positive results with the above led us to try Rust Grip Super Therm and Enamo Grip on our nitrogen tanks for protection against the elements on offshore rigs. Results to date have been successful.

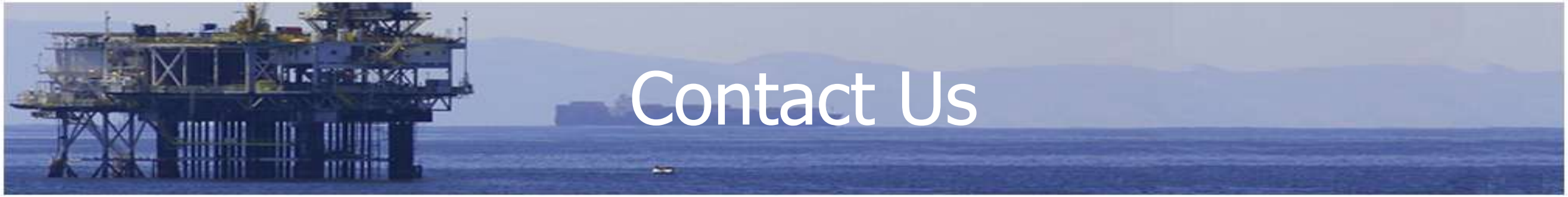
We are in the process of refurbishing our acid tanks internally using Rust Grip and Lining Kote. The first few tanks have now been in operation for more than 14 months. Inspection reports indicate there is no sign of cracking or any penetration of the acids. We are also refurbishing our existing frac tanks with Rust Grip and lining Kote.

We have recently commissioned 2 new 500-barrel frac tanks, treated internally with Rust Grip and Lining Kote and externally with Rust Grip and Enamo Grip.

The same coating system is currently being used on our new LGC Tanker and we envisage continuing to use these products.

Yours faithfully,
HALLIBURTON AUSTRALIA PTY LTD

ANDY DEWAR
Operations Manager



Contact Us

Arin Shahmoradian
Sales Manager
Volta Coatings
Mobile: 00 1 818 696 3786
arin@voltacoatings.com
voltacoatings.com