

PETRONAS



- Global oil & gas corporation
- Leader in petroleum technologies
- Includes IP for pipeline protection
- Fortune Global 500 company

The Offering

- Patents and patent applications
- PROASSURE™ Trademark
- Prototypes [isn't it product?] & design
- Comprehensive documentation
- Technology transfer
- Knowhow includes proprietary resins

PROASSURE™ Features

- Allows UNDER WATER pipeline repair and cure in wet, sub-sea conditions
- Can be applied to LIVE PIPELINES without the need to shutdown
- Certified by DNV in compliance with ISO/TS 24817
- Performs in accordance with ASME PCC-2 & PTS 31.409.60.12
- Adaptable to various size and shape of structures
- Transverse adhesion strength is over 12 MPa, 3 times the requirement
- Consists of E-Glass fiber impregnated with proprietary epoxy resin

PROASSURE™ Benefits

- PROASSURE™ offers cost effective pipe corrosion protection
- Offers better safety for repairs with no hot work needed
- Effective and proven corrosion protection properties
- Offers effective, efficient and cost effective solution
- Bonds to steel pipelines even when applied under water
- Proven commercialization value with geographically limited licensee

The Opportunity

Blackhawk Technologies, LLC is exclusively representing PETRONAS, a global leader in petroleum technologies, to find a monetization partner for its PROASSURE™ technology. PROASSURE™ is an adhesive composite wrap that allows UNDERWATER pipeline repair and CURE in wet, sub-sea conditions on LIVE PIPELINES which result in minimum interruption to production.



Therefore it significantly reduces cost and safety issues associated with repair of aging sub-sea assets and serves as a novel composite pipeline repair solution for onshore and offshore applications. The technology was jointly developed with Australia's Commonwealth Scientific and Industrial Research Organization (CSIRO) and is proven in real applications.

PETRONAS seeks a strategic partner, with global brand and distribution channels, that will enable its platform technology to be fully commercialized globally.

The Technology

Corroding, ageing and damaged pipelines cause major issues for the oil and gas industry. The downtime to repair offshore pipelines can be particularly costly. Hydrocarbon production must be suspended while new sections of pipe are ordered, delivered and installed using complex and dangerous sub-sea welding procedures. Each repair represents tens of millions of dollars in lost profits.



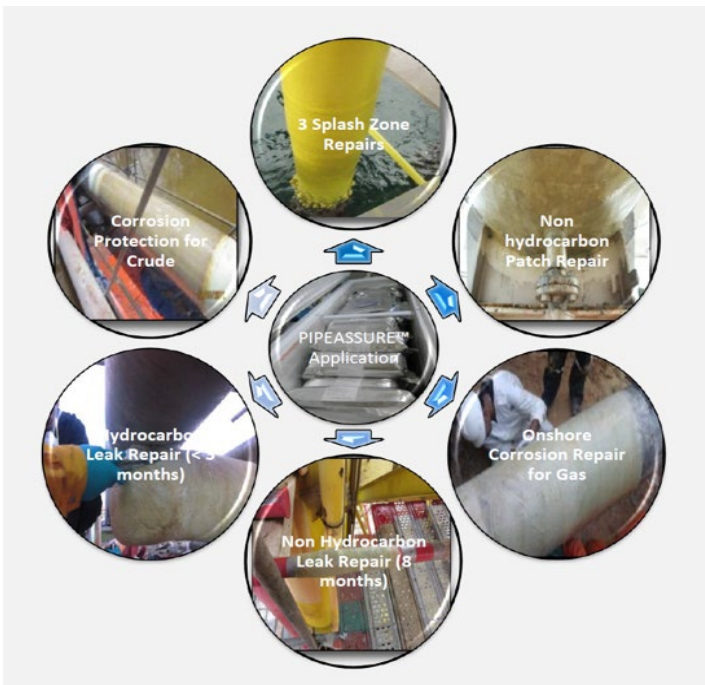
The PROASSURE™ consists of E-Glass fiber pre-impregnated with a proprietary epoxy resin formulation. It is curable in dry and wet conditions and effectively protects pipes against corrosion while providing structural reinforcement.

PROASSURE™ Properties

Material System	Epoxy impregnated glass fabric
Tensile Strength	235 MPa
Tensile Modulus	17.5 GPa
Transverse Adhesion	18.5 (MPa)
Lap Shear Adhesion Strength	14.4 (MPa)
Max Glass Transition Temp Tg.	Up to 130 C
Pot life of primer at 30C	60 (minutes)
Cure Time at 30C	4 (days)
Hardness (Shore D)	80 (Shore D)
Unscribed Salt Spray test	Passed 4,500 hours



PROASSURE™ – Proven Technology



		Riser 1	
B e f o r e			
	A f t e r		
		<p>Damage size: Dia – 10"; Length – 35" Repair length: 40"</p>	

