**ColdShield™** : The only Cold Reinforcement Class-Approved for hull girder strength

Coldshield offers hull structural repairs through COLD WORK techniques allowing to:

- **Reduce exposure to HSE risks for offshore personnel**
  (>140 saved mandays/10m² for COT)

- **Minimize production disruption** (no HOT WORKS)

- and Better manage POB (short offshore cycle time yielding to lower risk)

### APPLICATION AREAS

Repair & Reinforcement of FPSO hull structures:

- Deck
- Side shell
- Longitudinal or transverse frames
- Crude Oil Tanks
- Sea Water Ballast Tanks

### BENEFITS

- No welding or grinding : safe installation with no downtime
- Class approved alternative to Crop & Renew
- Permanent status - Restores initial structural strength
- Extreme durability even under harsh environment
- Fast & qualified installation procedure for all weather conditions
- Very light footprint onto existing structure (virtually no stress concentration, no residual stress)

The present information is indicative and may be subject to change without prior notice.
ColdShield™ Standard Process

1- A prerequisite Site Survey is performed.  
2- Then, Engineering is carried out.  
3- Pads Prefabrication is performed as per Aerospace standards.  
4- Then, the two-step Offshore Installation Process is carried out: A qualified Surface Preparation is performed prior to the Vacuum-Assisted Injection of the structural polymer (epoxy resin).  
5- Finally, specific NDT are used for Structural Monitoring.

ColdShield™ features

ColdShield™ is designed to permanently restore weakened/corroded structures to their initial capacity and to protect durably the damaged area against further corrosion.

ColdShield™ is a unique and patented technology leveraging vacuum-assisted resin injection in a fully controlled manner even in harsh conditions like an Offshore environment.

This technology is based on the proven techniques of bonded composite reinforcement already used in demanding industries such as aerospace, military and civil engineering.

ColdShield™ has been developed in a partnership with TOTAL and COLD PAD ®

COLD PAD provides innovative solutions designed to enhance the reliability of structural bonding for the Offshore industry and especially FPSOs (maintenance and life extension). This includes corrosion-induced issues like plate thinning, fastening and fatigue life extension.

Certified by

Bureau Veritas Rules for the Classification of Steel Ships
Bureau Veritas Rules for the Classification of Offshore Units
Bureau Veritas Rules on Materials and welding for the Classification of Marine Units

Certificate N°: 43515/A0 BV

ABS Rules for Conditions of Classification, Part I

Certificate N°: 16-HS1514812-PDA

1st prize winner at Innovation Award 2015
Prix PME-PMI de l’Innovation

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Safe, Reliable & Durable

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