








3X ENGINEERING

SUBSEA COMPOSITE REPAIR SOLUTION FOR PIPE REINFORCEMENT



 Any pipe diameters	 Any pipe geometries	 High pressure	 +5°C to +65°C	 Oil	 Gas	 Water
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REINFORCEKIT® 4D SUBSEA

**ISO 24.817
and
ASME PCC-2
compliant**

COMPOSITE WRAPPING

SUBSEA

OFFSHORE SPLASH-ZONE

ONLINE REPAIR

NEVLAR TAPE

SUBSEA EPOXY RESIN



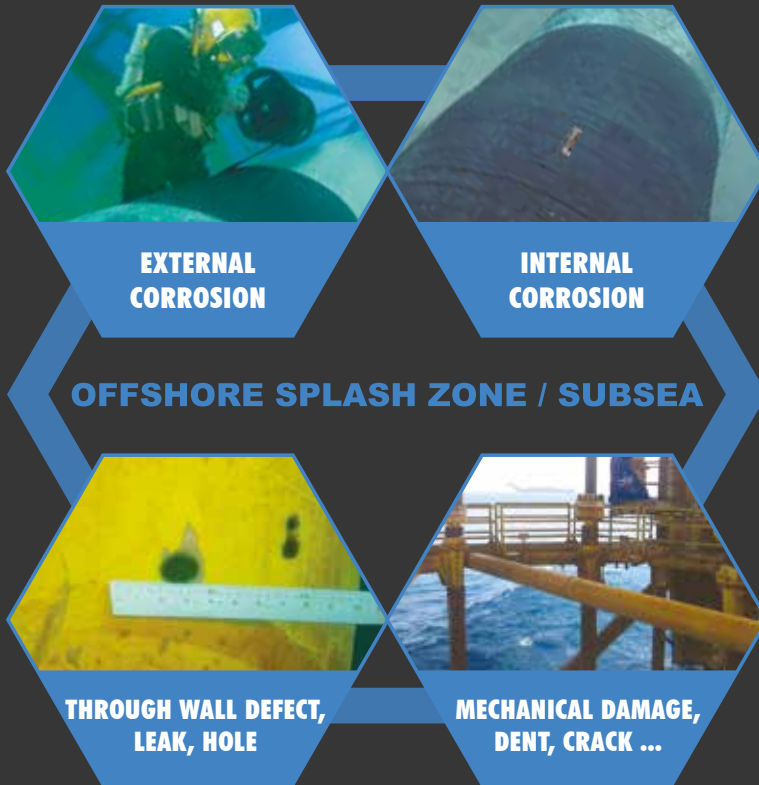
**OIL & GAS
SUBSEA**

INNOVATIVE REPAIR SOLUTIONS FOR YOUR INSTALLATIONS


REINFORCEKIT® 4D SUBSEA (R4D-S), specifically dedicated to subsea environment, is a wet lay-up repair system wrapped around the pipe to reinforce the damaged area, restore original pipe integrity and prevent further deterioration.

This composite technology, made of Kevlar® tape and subsea curing epoxy resin, is a great alternative to metal clamp, welded sleeve and pipe replacement. **3X ENGINEERING (3X)** developed its own software to design the repair and define the material requirements according to ISO 24.817 and ASME PCC-2 standards.

REINFORCEKIT® 4D SUBSEA RANGE



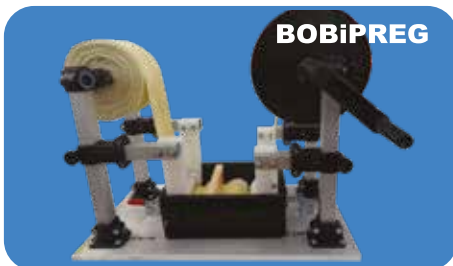
REINFORCEKIT® 4D SUBSEA MAIN FEATURES & BENEFITS

- Emergency Pipeline Repair System (EPRS)
- Online repair (no loss of production)
- Long-term performance (up to 20-year lifetime)
- Designed according to the standards (ISO 24.817 and ASME PCC-2 compliant)
- Versatile product with a large range of applications (subsea pipes, subsea caissons, risers, casings, conductor pipes, umbilicals ...)
- Suitable for any pipe geometries (straight, elbow ...) including irregularities (welds...), without pipe size limitation
- User-friendly (no hot work, non conductive repair, light product)
- Specific subsea implementation by trained and certified divers only
- Traceability using smart tag 
- Leader in subsea repairs with a large track record worldwide (approved by major O&G companies)

REINFORCEKIT® 4D SUBSEA IMPLEMENTATION

REINFORCEKIT® 4D SUBSEA installation is very specific and technically challenging. All the installation steps need to be performed with highly qualified staff and using tools specially designed for this application.

3X ENGINEERING developed a range of subsea tools to apply **R4D-S** in controlled conditions and guarantee the good implementation and the product sustainability.



- Field-impregnation machine
- Guarantees the good impregnation resin-fiber before immersion



- Quick and easy wrapping device
- Ensures proper tensile strength during application underwater



- Divers training and supervision by 3X
- 3X supervisors check the product implementation remotely (control room)

