



# REINFORCEKIT® 4D

## COMPOSITE REPAIR FOR PIPE REINFORCEMENT

According to ISO 24.817 & ASME PCC-2



All diameters



-50°C to +150°C



Oil



Gas



Water



Onshore/Offshore/  
Subsea



Elbow repair

**EXTERNAL DAMAGE**

Sabotage repair

Leak repair

**INTERNAL DAMAGE**

Dent repair

Pinhole repair

Weld repair

Tee repair



PIPE REPAIR & REINFORCEMENT



COMPOSITE WRAPPING



ONSHORE-OFFSHORE-SUBSEA



INNOVATIVE REPAIR SOLUTIONS FOR YOUR INSTALLATIONS



**REINFORCEKIT® 4D (R4D)** is a wet lay-up system, wrapped helicoidally around the pipe in order to bring the mechanical resistance to the damaged pipe section. This composite technology, made of Kevlar® tape and specific bi-component epoxy resin, is the solution for a long-term pipe reinforcement.

3X ENGINEERING has developed its own software called R.E.A to design the composite repair and define the material requirements in accordance with ISO 24.817 & ASME PCC-2.

**REINFORCEKIT® 4D RANGE**



**ONSHORE / OFFSHORE ON AIR**

**EXTERNAL CORROSION**

**INTERNAL CORROSION**

**UP TO 150°C**

**THROUGH WALL DEFECT, LEAK, HOLE**

**DENT, CRACK, MECHANICAL DAMAGE**

...

**OFFSHORE SUBSEA**

**EXTERNAL CORROSION**

**INTERNAL CORROSION**

**UP TO 65°C**

**THROUGH WALL DEFECT, LEAK, HOLE**

**DENT, CRACK, MECHANICAL DAMAGE**

...

**Range of 6 epoxy resins**

according to the characteristics of the defect

**Specific resin for subsea application**

that polymerizes underwater



**USES**

- Reinforce pipe suffering from:
  - internal and external corrosion
  - pinhole, leakage, crack
  - mechanical damage, dent
  - severe abrasion, erosion
  - sabotage ...
- Restore pipe integrity



**APPLICATIONS**

- Onshore, Offshore and Subsea
- All pipe geometries including welds, elbows and tees
- All pipe sizes (no limitation)
- High pressure pipeline
- Pipe operating from negative up to high temperature
- Pipe transporting most common fluid and gas



**BENEFITS**

- Online repair (no shutdown required except in case of leakage)
- No loss of production
- Non-conductive repair
- No hot work
- Long-term performance

**REINFORCEKIT® 4D IMPLEMENTATION STEPS**

**1** Designed as per ISO 24.817 & ASME PCC-2

**2** Surface preparation Sa2½ / St3 and roughness Rz > 60µm

**3** Filler application

**4** Bi-component epoxy resin preparation

**5** R4D wrapping

**6** Coating protection & traceability tag



**IMPLEMENTATION BY TRAINED AND CERTIFIED APPLICATORS ONLY**

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