



Exploration & Production

GENERAL SPECIFICATION

PIPELINES - RISERS

GS EP PLR 310

Pipeline Composite Repair Systems

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1. Scope

This General Specification is applicable to the design, material selection, qualification and installation of Pipeline Composite Repair Systems to be used for repair of pipelines during operations.

Further information on the scope is provided in section 4 hereof.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
ISO 4624	Paints and Varnishes - Pull off test for adhesion
NF A 49-711/Annex K	Resistance to cathodic disbonding under negative polarization

Professional Documents

Reference	Title
GESIP	Supervision, Maintenance and Repair of Transport Pipelines
ISO/TS 24817: Draft 2006	Petrochemicals and Natural Gas Industries - Composite Repair for Pipeworks
PDAM	Pipeline Defect Assessment Manual
PRCI R2269-01R	Pipeline Repair Manual

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
Not applicable	



Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 420	External field joint coatings of pipelines

3. Definitions and abbreviations

Definitions and abbreviations used in this General Specification are in accordance with the [ISO/TS 24817](#).

4. Applicability and limitations

This specification covers the minimum requirements, provides recommendations and guidelines, as well as selects the reference documents, for the design, material selection, qualification and installation of Pipeline Composite Repair Systems.

4.1 Applicability

This specification addresses static pipelines, flow and process lines, and risers in the following environment:

- Onshore aerial or buried
- Offshore aerial, in splash zone or underwater, swamp.

Activities addressed include design, material selection, qualification and installation, which are summarised as:

- Engineering the composite repair: qualifying components mechanical and chemical properties, assessing the loads applied on the pipe and defining the extent of the repair and quantity of reinforcement to be applied
- Selecting and qualifying materials used to fabricate the composite repair system
- Qualifying the repair system by an appropriate test campaign
- Preparing the pipeline surface, installing the composite repair and ensuring the quality of this application.

4.2 Basic principles

The design, material selection, qualification and installation of pipeline composite repair systems shall be performed according to the [ISO/TS 24817](#).

In addition, this General Specification amends, replaces, or supplements various sections of [ISO/TS 24817](#).

5. Design basis

5.1 Design data sheet

A design data sheet shall be filled in accordance with [ISO/TS 24817](#) annex A, to provide the repair system Supplier all the informations on pipeline design, operating conditions and defect assessment.

5.2 Defect assessment

An assessment shall be performed in accordance with the [PDAM](#) in order to identify the defect, measure the extent of the defect and define its acceptability. When the defect is not acceptable with respect to the [PDAM](#) criteria, the pipeline shall be repaired.

Various repair systems, including, composite repair systems, metal sleeve welding, mechanical clamps, mechanical connector, partial replacement, or other method may be appropriate. Guidance for the selection and use of repair systems can be found in the [PRCI R2269-01R](#).

The use of Composite Repairs Systems is strictly limited to the following type of defects:

- Non through wall defect. Through wall defects ([ISO/TS 24817](#) type B) repair with composite systems is not allowed
- Defect depth limited to 80% of the nominal wall thickness, with a remaining thickness greater than 2 mm
- External corrosion only. External repair of internal corrosion or erosion with composite systems is not allowed, unless the corrosion or erosion can be guaranteed to have been stopped
- General and local wall thinning
- External damages such as dents, pitting, gouges, blisters, lamination, fretting, etc.
- Cracks repair with composite systems is not allowed, as the crack will be impossible to monitor properly and is likely to propagate.

A particular attention shall be paid to the width (circumferential extent) of the defect. If the repair system has not been qualified for axial strength, the remaining steel cross sectional area shall be sufficient to withstand axial loads induced by pressure end cap effect, thermal expansion (when the pipeline is unrestrained in section 5.5) and other external axial loading.

