

DEP SPECIFICATION

FLEXIBLE COMPOSITE PIPE SYSTEMS

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DESIGN AND ENGINEERING PRACTICE



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TABLE OF CONTENTS

1.	INTRODUCTION	5
1.1	SCOPE	5
1.2	DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS	5
1.3	DEFINITIONS	5
1.4	CROSS-REFERENCES	8
1.5	SUMMARY OF MAIN CHANGES.....	8
1.6	COMMENTS ON THIS DEP	8
1.7	DUAL UNITS.....	8
1.8	NON NORMATIVE TEXT (COMMENTARY).....	8
2.	MATERIALS	9
2.1	GENERAL	9
2.2	THERMOSET MATERIALS	9
2.3	THERMOPLASTIC MATERIALS	9
2.4	REINFORCEMENT MATERIALS	10
2.5	EXTERNAL LAYER	10
2.6	CHEMICAL RESISTANCE	11
3.	DESIGN ASPECTS	11
3.1	GENERAL	11
3.2	PRESSURE RATING	11
3.3	CYCLIC/STATIC SERVICE	12
3.4	TENSILE LOAD RATING	12
3.5	OCCASIONAL LOAD	12
3.6	EXTERNAL PRESSURE/VACUUM RESISTANCE	13
3.7	LINER THICKNESS.....	13
3.8	JOINTS	13
4.	QUALIFICATION.....	13
4.1	GENERAL.....	13
4.2	PRODUCT FAMILY	14
4.3	PRODUCT SECTOR	14
4.4	SHORT-TERM BURST TESTS	15
4.5	1000 HOURS QUALIFICATION TESTS.....	15
4.6	TENSILE STRENGTH TESTS	15
4.7	VACUUM TESTS.....	16
4.8	PERMEATION TESTS	16
4.9	END FITTING TEST	16
4.10	SEAWATER RESISTANCE FOR OFFSHORE APPLICATIONS	17
4.11	COLLAPSE TEST (EXTERNAL PRESSURE RESISTANCE)	17
4.12	REQUALIFICATION	18
5.	QUALITY ASSURANCE AND CONTROL	18
5.1	GENERAL	18
5.2	QUALITY CONTROL EQUIPMENT	18
5.3	MILL HYDROSTATIC TEST	19
5.4	ONGOING PRESSURE TESTS	19
5.5	FIBRE CONTENT	19
5.6	DIMENSIONS	19
5.7	QUALITY CONTROL RECORDS.....	19
6.	COMPONENT MARKING	20
6.1	GENERAL.....	20
7.	HANDLING, STORAGE AND TRANSPORTATION	20
7.1	HANDLING	20
7.2	STORAGE	20
7.3	TRANSPORTATION.....	20

8. **INSTALLATION AND TESTING 20**
8.1 GENERAL.....20
8.2 FLUSHING.....21
8.3 HYDROTEST 21
9. **REFERENCES 22**

1. INTRODUCTION

1.1 SCOPE

This DEP specifies requirements and gives recommendations for the use of flexible composite pipe systems, for onshore and static offshore use. This DEP addresses thermoplastic pipe reinforced using thermoplastic composites, thermoset composites, steel wires, steel cords and steel strips. Operating pressures are typically up to 300 bar (4350 psi), temperatures between -30 °C (-22 °F) and 90 °C (194 °F), diameters between 25 mm (1 in) and 203 mm (8 in), and continuous length up to 10 km (6.2 miles), depending on reel capacity.

This is a revision of the DEP of the same number dated February 2017; see (1.5) regarding the changes.

1.2 DISTRIBUTION, INTENDED USE AND REGULATORY CONSIDERATIONS

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This DEP is intended for use in facilities related to oil and gas production, gas handling, oil refining, chemical processing, gasification, distribution and supply/marketing. This DEP may also be applied in other similar facilities.

When DEPs are applied, a Management of Change (MOC) process shall be implemented; this is of particular importance when existing facilities are to be modified.

If national and/or local regulations exist in which some of the requirements could be more stringent than in this DEP, the Contractor shall determine by careful scrutiny which of the requirements are the more stringent and which combination of requirements will be acceptable with regards to the safety, environmental, economic and legal aspects. In all cases, the Contractor shall inform the Principal of any deviation from the requirements of this DEP which is considered to be necessary in order to comply with national and/or local regulations. The Principal may then negotiate with the Authorities concerned, the objective being to obtain agreement to follow this DEP as closely as possible.

1.3 DEFINITIONS

1.3.1 General definitions

The **Contractor** is the party that carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project or operation of a facility. The Principal may undertake all or part of the duties of the Contractor.

The **Manufacturer/Supplier** is the party that manufactures or supplies equipment and services to perform the duties specified by the Contractor.

The **Principal** is the party that initiates the project and ultimately pays for it. The Principal may also include an agent or consultant authorised to act for, and on behalf of, the Principal.

The word **shall** indicates a requirement.

The word **should** indicates a recommendation.

The word **may** indicates a permitted option.

1.3.2 Specific definitions

Term	Definition
Design Pressure	The highest gauge pressure that, according to mechanical design codes, a system or piece of equipment can be continually subjected to at or below the Upper Design Temperature, and above the Lower Design Temperature.
Design Temperature	The highest temperature to which equipment is designed at the design pressure.
Mill Hydrostatic Test	Short-term hydrotest at the mill, or factory, used as a quality control check, which is carried out at a pressure above the rated pressure.
Occasional Load	Maximum short-term duration load intended to be experienced during the component's service life.
Operating Pressure	The OP is the gauge pressure which prevails inside equipment and piping during any intended operation.
Pressure Rating	Maximum allowable continuous pressure, relating to its long-term resistance to failure when subjected to either static or cyclic internal pressure loading.
Product Family	Component type all of whose variants have the same function.
Product Family Representative	Component that is taken to be representative of a particular product family.
Product Sector	A product sector is a sub-division of a product family, e.g., 25 mm (1 in) to 250 mm (10 in) diameter spoolable fibre reinforced polymer pipe/joint less than 100 bar (1500 psi), that groups spoolable pipes into specific diameter and pressure ranges.
Product Sector Representative	The product sector representative is the component e.g., 250 mm (10 in), 150 bar (2200 psi) spoolable pipe) that has the largest nominal diameter and highest pressure rating in a specific sector.
Qualification	Process of demonstrating that a component is in accordance with the requirements of this DEP.
Rated Temperature	Maximum allowable continuous temperature at the rated pressure.
Short Term Hydraulic Burst Strength	Burst pressure measured during a short-term test.
Standard Laboratory Temperature	23°C ± 5°C (73.5°F ± 9°F)
Tensile Load Rating	Maximum allowable continuous tensile load.

Term	Definition
1000 Hour Test	Medium survival test to demonstrate long-term strength performance.

1.3.3 Abbreviations

Term	Definition
GRE	Glass-fibre reinforced epoxy
GRP	Glass reinforced plastic
LCL	Lower Confidence Limit
NPRs	Nominal pressure rating, static pressure service
NPRc	Nominal pressure rating, cyclic pressure service
Pmin	Minimum pressure during pressure cycle
Pmax	Maximum pressure during pressure cycle
PA	Polyamide
PE	Polyethylene
PEX	Cross-linked polyethylene
PP	Polypropylene
PVC	Poly Vinyl Chloride
PVDF	Polyvinylidene fluoride
R	Minimum/maximum pressure ratio during cyclic service
S-FRP	Spoolable fibre-reinforced plastic
S-GRP	Spoolable glass-fibre-reinforced plastic
S-RTP	Spoolable reinforced thermoplastic
SLT	Standard laboratory temperature
STHP	Short-term hydrostatic pressure strength
Tg	Glass transition temperature
TLR	Tensile load rating
TP1000hrs	Test pressure to be used in 1000-hour qualification test
TS	Tensile strength pipe
UV	Ultraviolet