

# Specification for Subsea Umbilicals

## Upstream Segment

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# Contents

Page

API Foreword .....	iii
Foreword .....	ix
Introduction.....	x
1 Scope .....	1
2 Normative references .....	1
3 Terms, abbreviated terms and definitions .....	3
3.1 Terms and definitions .....	3
3.2 Abbreviated terms .....	9
4 Functional requirements.....	10
4.1 General requirements .....	10
4.2 Project-specific requirements .....	11
5 Safety, design and testing philosophy.....	11
5.1 Application .....	11
5.2 Safety objective .....	11
5.3 Systematic review .....	11
5.4 Fundamental requirements .....	12
5.5 Design philosophy .....	12
5.6 Testing .....	14
6 Design requirements .....	15
6.1 General .....	15
6.2 Loads .....	15
6.3 Load effect analysis .....	19
6.4 Installation analysis .....	25
6.5 Fatigue life.....	26
7 Component design, manufacture and test .....	26
7.1 General .....	26
7.2 Electric cables.....	27
7.3 Hoses .....	37
7.4 Optical-fibre cable .....	48
7.5 Metallic tubes .....	52
8 Terminations and ancillary equipment design .....	68
8.1 Design principles.....	68
8.2 Design process .....	69
8.3 Armour terminations .....	69
8.4 Tube and hose terminations.....	69
8.5 Cable terminations .....	69
8.6 Pull-in head .....	70
8.7 Topside hang-off.....	71
8.8 Subsea termination interface .....	71
8.9 Subsea umbilical termination.....	71
8.10 Bend restrictors .....	71
8.11 Bend stiffeners.....	72
8.12 Ancillary equipment .....	73
9 Umbilical design .....	75
9.1 Temperature range .....	75
9.2 Maximum tensile load .....	75
9.3 Ultimate tensile load.....	75
9.4 Minimum bend radius .....	75
9.5 Cross-sectional arrangement.....	76

9.6	Lay-up .....	76
9.7	Sub-bundles .....	76
9.8	Inner sheath.....	76
9.9	Armouring.....	77
9.10	Outer sheath .....	77
9.11	Length marking .....	77
10	Umbilical manufacture and test .....	78
10.1	Umbilical manufacture .....	78
10.2	Qualification and verification tests .....	80
11	Factory acceptance tests .....	81
11.1	General.....	81
11.2	Visual and dimensional inspection.....	81
11.3	Electrical continuity at the termination .....	81
11.4	Trial termination fit-up.....	81
11.5	Electric cable.....	81
11.6	Optical fibre cables.....	82
11.7	Hoses .....	82
11.8	Tubes.....	83
11.9	Terminations .....	83
11.10	Continuity check.....	83
12	Storage.....	83
12.1	General.....	83
12.2	Protection of unterminated umbilical components.....	83
12.3	Spare length .....	84
12.4	Repair kits.....	84
12.5	Handling for integration tests.....	84
13	Pre-installation activity.....	84
13.1	Umbilical information .....	84
13.2	Route information .....	85
13.3	Terminations and ancillary equipment information .....	85
13.4	Host facility information .....	86
13.5	Subsea structure information.....	86
13.6	Host facility visit .....	86
14	Load-out.....	87
14.1	General.....	87
14.2	Technical audit of load-out facilities.....	87
14.3	Load-out procedure .....	88
14.4	Pre-load-out meetings .....	88
14.5	Pre-load-out tests .....	88
14.6	Load-out operation .....	89
14.7	Stopping and starting the load-out .....	90
14.8	Handling of the umbilical .....	90
14.9	Load-out monitoring.....	91
14.10	Load-out on a reel or carousel .....	91
14.11	Post-load-out tests .....	92
15	Installation operations.....	92
15.1	General.....	92
15.2	Requirements for installation vessel and equipment .....	92
15.3	Pre-installation survey .....	93
15.4	I-tube or J-tube pull-in operations .....	94
15.5	Lay-down of subsea termination (first end).....	97
15.6	Lay route.....	97
15.7	Handling requirements for the main lay .....	97
15.8	Vessel positioning to achieve required touch-down .....	98
15.9	Control and monitoring of length laid .....	98
15.10	Integrity monitoring during lay.....	99
15.11	Burial operations .....	100
15.12	Approach to subsea termination position (second end).....	101
15.13	Lay-down of subsea termination.....	101

15.14	Pull-in of subsea termination .....	102
15.15	Pipeline crossings .....	102
15.16	Buoyancy attachments .....	102
15.17	Arming of the weak link .....	103
15.18	Post-lay survey .....	103
15.19	Post-burial survey .....	103
15.20	Post-pull-in test.....	103
15.21	Post-hook-up test .....	104
15.22	Retrieval of installation aids.....	104
15.23	Contingencies .....	104
15.24	Repairs.....	105
15.25	Post-installation survey .....	105
<b>Annex A (informative) Information that should be provided in a purchaser's functional specification</b>		<b>106</b>
<b>Annex B (informative) Umbilical testing .....</b>		<b>113</b>
<b>Annex C (informative) Hose and tube preferred sizes .....</b>		<b>117</b>
<b>Annex D (normative) Characterization tests for hoses and umbilicals.....</b>		<b>118</b>
<b>Annex E (informative) Fatigue testing.....</b>		<b>122</b>
<b>Annex F (informative) Load-effect analysis.....</b>		<b>124</b>
<b>Annex G (informative) Umbilical full-scale tests.....</b>		<b>135</b>
<b>Annex H (informative) Tube material matrix.....</b>		<b>141</b>
<b>Annex I (informative) Tube-wall thickness example calculation.....</b>		<b>153</b>
<b>Annex J (informative) Buckling of metallic tubes.....</b>		<b>160</b>
<b>Annex K (informative) Use of the API Monogram Program by Licensees .....</b>		<b>163</b>
<b>Bibliography.....</b>		<b>166</b>



## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO 13628-5 was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 4, *Drilling and production equipment*.

This second edition cancels and replaces the first edition (ISO 13628-5:2002), which has been technically revised.

ISO 13628

*pipe systems for subsea and marine applications* consists of the following parts, under the general title *Petroleum and natural gas industries — Design and operation of subsea production systems*:

- *Part 1: General requirements and recommendations*
- *Part 2: Unbonded flexible pipe systems for subsea and marine applications*
- *Part 3: Through flowline (TFL) systems*
- *Part 4: Subsea wellhead and tree equipment*
- *Part 5: Subsea umbilicals*
- *Part 6: Subsea production control systems*
- *Part 7: Completion/workover riser systems*
- *Part 8: Remotely Operated Vehicle (ROV) interfaces on subsea production systems*
- *Part 9: Remotely Operated Tool (ROT) intervention systems*
- *Part 10: Specification for bonded flexible pipe*
- *Part 11: Flexible*

A Part 12, dealing with dynamic production risers, a Part 13, dealing with remotely operated tool and interfaces on subsea production systems, a Part 15, dealing with subsea structures and manifolds, a Part 16, dealing with specification for flexible pipe ancillary equipment, and a Part 17, dealing with recommended practice for flexible pipe ancillary equipment, are under development.

## Introduction

This part of ISO 13628 is based on the first edition of ISO 13628-5, which was based on API Spec 17E, second edition and API RP 17I, first edition. The first edition of ISO 13628-5 was adopted by API as API Spec 17E, third edition. It is intended that API Spec 17E, fourth edition, will be identical to this International Standard.

It is important that users of this part of ISO 13628 be aware that further or differing requirements can be needed for individual applications. This part of ISO 13628 is not intended to inhibit a vendor from offering, or the purchaser from accepting, alternative equipment engineering solutions for the individual application. This can be particularly applicable if there is innovative or developing technology. If an alternative is offered, it is the responsibility of the vendor to identify any variations from this part of ISO 13628 and provide details.

In this part of ISO 13628, where practical, US Customary (USC) and other units are included in parentheses for information.

# Petroleum and natural gas industries — Design and operation of subsea production systems —

## Part 5: Subsea umbilicals

### 1 Scope

This part of ISO 13628 specifies requirements and gives recommendations for the design, material selection, manufacture, design verification, testing, installation and operation of umbilicals and associated ancillary equipment for the petroleum and natural gas industries. Ancillary equipment does not include topside hardware. Topside hardware refers to any hardware that is not permanently attached to the umbilical, above the topside hang-off termination.

This part of ISO 13628 applies to umbilicals containing components, such as electrical cables, optical fibres, thermoplastic hoses and metallic tubes, either alone or in combination.

This part of ISO 13628 applies to umbilicals for static or dynamic service, with surface-surface, surface-subsea and subsea-subsea routings.

This part of ISO 13628 does not apply to the associated component connectors, unless they affect the performance of the umbilical or that of its ancillary equipment.

This part of ISO 13628 applies only to tubes with the following dimensions: wall thickness,  $t < 6$  mm, internal diameter, ID  $< 50,8$  mm (2 in). Tubular products greater than these dimensions can be regarded as pipe/linepipe and it is expected that they be designed and manufactured according to a recognised pipeline/linepipe standard.

This part of ISO 13628 does not apply to a tube or hose rated lower than 7 MPa (1 015 psi).

This part of ISO 13628 does not apply to electric cable voltage ratings above standard rated voltages  $U_0/U(U_m) = 3,6/6(7,2)$  kV rms, where  $U_0$ ,  $U$  and  $U_m$  are as defined in IEC 60502-1 and IEC 60502-2.

### 2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 527 (all parts), *Plastics — Determination of tensile properties*

ISO 1402, *Rubber and plastics hoses and hose assemblies — Hydrostatic testing*

ISO 4080, *Rubber and plastics hoses and hose assemblies — Determination of permeability to gas*

ISO 4406, *Hydraulic fluid power — Fluids — Method for coding the level of contamination by solid particles*

ISO 4672:1997, *Rubber and plastics hoses — Sub-ambient temperature flexibility tests*