

API Specification

17J

Third Edition, January 2008
Specification for Unbonded Flexible Pipe

National Adoption of ISO 13628:2006(Identical)—
Petroleum and natural gas industries—Design and
operation of subsea production systems—Part 2:
Unbonded flexible pipe systems for subsea and
marine applications

Annex A Purchasing Guidelines

API Monogram® Required ☐ Yes ☐ No

Annex A (informative)

Purchasing guidelines

- A.1** Table A.1 in this annex gives purchasing guidelines for flexible pipes.
- A.2** A separate form should be completed for each length of flexible pipe.
- A.3** The manufacturer should specify in the design premise the values assumed for all parameters in Table A.1 not specified by the purchaser.

Table A.1 — Flexible pipe purchasing guidelines

General information	
Client:	Client reference:
	Project:
Phone:	Location:
Fax:	
Purchaser's technical contact:	Enquiry date:
Conformance to ISO 13628-2 required? ☐ Yes ☐ No	Required response date:
General design parameters	
Internal diameter (m):	Maximum axial load (kN):
Length required (m):	Maximum effective tension (kN):
Tolerance required on length (m ± m):	Torsional balance requirement (°C/m or °F/m):
Pipe structural requirements (MBR, bend stiffness):	Compression strength requirement (kN):
	Design Load Case Probabilities (1 year, 100 Years)
Linear mass requirements (kg/m) in air empty:	Installation:
External protection requirements (external carcass):	Normal operation:
	Abnormal operation:
Service life (years):	Specification of normal and abnormal load cases, including accidental loads, and definition of load combinations to be used in the design:
°C = degree Centigrade; °F = degree Fahrenheit; g = gram; K = Kelvin; kg = kilogram; kJ = kilojoule; kN = kilonewton; KOH = potassium hydroxide; kPa = kilopascal; l = litre; m = metre; MBR = minimum bend radius; mg = milligram; MPa = megapascal; ppm = parts per million; TAN = titrated acid number; TF = through flowline; W = Watt NOTE "ppm" is a deprecated unit.	

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Table A.1 (continued)

Internal fluid parameters	
General	TAN (mg KOH/g):
Fluid description (oil, gas, water):	Flow rate and thermal calculations
Flow regime description (single, phase, slug):	Flow rate (m ³ /day):
Flow direction:	Fluid density (kg/m ³):
Pressures	Viscosity (Pa • s):
Design pressure [MPa (psi)]:	Minimum inlet pressure (MPa):
Max./Min. operating pressure and/or profile during the service life (MPa (psi)):	Required outlet pressure (MPa):
Vacuum conditions [MPa (psi)]:	Fluid heat capacity (kJ/kg/°C):
Differential internal pressure [MPa (psi)]:	Fluid compositional data
Number and range of pressure cycles expected during the specified service life:	NaCl content (weight percent of water):
Temperatures	Maximum operational depressurisation and pressurization rates:
Design minimum temperature (°C):	Chlorides content [mg/l (ppm) ^a]:
Design maximum temperature (°C):	Gas-oil ratio (m ³ /m ³):
Operating inlet temperature (°C):	Water cut (volume percent):
Number and range of temperature cycles expected during the specified service life:	Alcohols? ☐ Yes ☐ No
Upset temperature and cycles (°C):	Aromatic components? ☐ Yes ☐ No
Service Definition	Corrosive agents? ☐ Yes ☐ No
Description (sweet/sour):	Inhibitors (scale, paraffin)? ☐ Yes ☐ No
ISO 15156 (all parts) to apply? ☐ Yes ☐ No	Injected chemicals? ☐ Yes ☐ No
H ₂ S partial pressure (bar):	Solids, Precipitates, etc.? ☐ Yes ☐ No
CO ₂ partial pressure (bar):	If available, attach details of full fluid compositional data and expected variation over the service life. Also, attach details of any aromatic components, corrosive agents, inhibitors, alcohols, solids, or injected chemicals in the fluid composition.
pH of aqueous phase:	
°C = degree Centigrade; °F = degree Fahrenheit; g = gram; K = Kelvin; kg = kilogram; kJ = kilojoule; kN = kilonewton; KOH = potassium hydroxide; kPa = kilopascal; l = litre; m = metre; MBR = minimum bend radius; mg = milligram; MPa = megapascal; ppm = parts per million; TAN = titrated acid number; TF = through flowline; W = Watt	
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Table A.1 (continued)

External Environment—Static Loads	
Water Depths	Soil Data
Design water depth (m):	Soil description (clay, sand):
Minimum tidal variation (m):	Soil shear strength (kPa):
Maximum tidal variation (m):	Angle of internal friction (degrees):
Attach details of water depth variation over flexible pipe route.	Lateral friction coefficient:
Air Temperatures	Longitudinal friction coefficient:
Minimum temperature (°C):	Seabed scour/sand waves occur? ☐ Yes ☐ No
Maximum temperature (°C):	If available, attach seabed profile.
Minimum storage/transport/installation temperature (°C):	Other
Maximum storage/transport/installation temperature (°C):	Marine growth to be considered? ☐ Yes ☐ No
Seawater Data	If yes, attach details.
Density:	Ice effects to be considered? ☐ Yes ☐ No
pH value:	If yes, attach details.
Minimum surface temperature (°C):	Sunlight exposure? ☐ Yes ☐ No
Maximum surface temperature (°C):	Current data attached? ☐ Yes ☐ No
Minimum seabed temperature (°C):	Attached current data should be given as a function of water depth, direction, and return period.
Maximum seabed temperature (°C):	
External environment — Dynamic loads	
Wave data attached? ☐ Yes ☐ No	Wind data attached? ☐ Yes ☐ No
Attached wave data should be given in terms of significant wave, maximum wave, equivalent periods, spreading functions, scatter diagrams, as a function of direction and return period. For irregular seas, the wave spectrum data should be specified.	Attached wind data should be given in terms of maximum 3-s, 1-min, 10-min, and 1-h wind speeds, as a function of direction, height above water level, and return period.
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Table A.1 (*continued*)

General system requirements	
General	Gas venting
System description (flowline, riser, jumper, subsea, topsides):	Gas-venting required? ☐ Yes ☐ No
Application definition (static, dynamic):	System components (valves, burst disks):
Pipe bore description (rough, smooth):	Allowable gas permeation rate (l/m/day):
Corrosion protection requirements	Venting-location restrictions?
Corrosion protection required? ☐ Yes ☐ No	Gas-monitoring system?
Cathodic protection system required? ☐ Yes ☐ No	Other
Electrical continuity required? ☐ Yes ☐ No	Fire resistance required? ☐ Yes ☐ No Specify (Lloyds/DNV/API Spec 16C):
End-fitting coatings required? ☐ Yes ☐ No	Pigging, TFL, workover, etc. required? ☐ Yes ☐ No
External coating description:	Piggyback required? ☐ Yes ☐ No
Internal coating description:	If yes, attach details.
If available, allowable electrical resistance, protection voltage, current source, and current density should be specified.	Pressure and tensile armour weld location restrictions? ☐ Yes ☐ No
Thermal insulation	Interface definitions/specifications (refer to 5.6.1.10):
Thermal insulation required? ☐ Yes ☐ No	
Required outlet temperature (°C):	
Required insulation U-value (W/m ² K):	Exothermal chemical reaction cleaning required? ☐ Yes ☐ No
Insulation U-value should be based on pipe ID and be for the pipe alone. Specify any allowances that can be made for external effects such as soil.	Inspection condition monitoring required? ☐ Yes ☐ No
Connector	If yes, give details of requirements.
Lower connector type (flange, pipe):	
Upper connector type (flange, pipe):	
Attach welding specification seal type and sizes, and responsibility for supply and mounting of components.	
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Flowline parameters	
Flowline routing description attached? ☐ Yes ☐ No	Upheaval buckling
Guides and supports (I-tubes, J-tubes):	Upheaval buckling to be checked? ☐ Yes ☐ No
Protection requirements	Required minimum soil coverage (m):
Impact resistance to accidental loads? ☐ Yes ☐ No	Allowable bend radius (m):
Trenching? ☐ Yes ☐ No	Load cases attached? ☐ Yes ☐ No
Rock dumping? ☐ Yes ☐ No	Other
Mattresses? ☐ Yes ☐ No	On-bottom stability to be checked? ☐ Yes ☐ No
Other? ☐ Yes ☐ No	Crossover requirements? ☐ Yes ☐ No
Attach details of specified protection system(s), including GA drawings, possible accidental occurrences (trawl boards, dropped objects, anchors, and so on), design impact loads.	Required pipe attachments (bend restrictors, clamps): Attach drawings of all items.
Riser parameters	
General	Interference
Riser configuration (lazy-S, steep wave):	Interference/clashing check required? ☐ Yes ☐ No
Attach description of riser configuration and GA drawing(s) of all relevant details.	Attach details of all possible interface areas, including other risers, mooring lines, platform columns, vessel pontoons, tanker heel, and so forth, and specify allowable interferences/clashing.
Riser upper connection description (platform, tanker):	Vessel motion data
Riser lower connection description (seabed, vessel):	Vessel motion data attached? ☐ Yes ☐ No
Required pipe attachments (bend stiffeners, buoys): Attach drawings of all items.	Attached vessel motion data should be specified in terms of the following for the relevant loading conditions. Attached data should include a general layout drawing, showing vessel heading, North point, riser(s) in plan, and mooring lines — vessel static and dynamic offsets for all conditions. — vessel data, dimensions, drafts, etc. — vessel first- and second-order motions, in terms of heave, surge, sway, yaw, roll and pitch. — vessel motion phase data and specification. — reference point for motions. — mooring system design, including line properties and anchor locations. — position tolerances.

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Additional requirements		
Materials required in addition to ISO 13628-2? If yes, specify details.	☐ Yes	☐ No
Manufacturing required in addition to ISO 13628-2? If yes, specify details.	☐ Yes	☐ No
Selection of PSL category for 8.9.6 (default is PSL 2-3)? If yes, specify details.	☐ Yes	☐ No
FAT required in addition to ISO 13628-2? If yes, specify details.	☐ Yes	☐ No
Markings required in addition to ISO 13628-2? If yes, specify details.	☐ Yes	☐ No
Prototype tests required? If yes, specify details.	☐ Yes	☐ No
Additional national authority/government regulations? If yes, specify details.	☐ Yes	☐ No
Purchaser inspection required? If yes, specify details.	☐ Yes	☐ No
General requirements in addition to ISO 13628-2? If yes, specify details.	☐ Yes	☐ No
°C = degree Centigrade; °F = degree Fahrenheit; g = gram; K = Kelvin; kg = kilogram; kJ = kilojoule; kN = kilonewton; KOH = potassium hydroxide; kPa = kilopascal; l = litre; m = metre; MBR = minimum bend radius; mg = milligram; MPa = megapascal; ppm = parts per million; TAN = titrated acid number; TF = through flowline; W = Watt NOTE "ppm" is a deprecated unit.		

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Delivery, installation and maintenance requirements	
Delivery Requirements:	
Shipping, packing, and storage requirements:	
Documentation requirements:	
Purchaser should specify if a separate installation manual is required.	
Installation requirements	Maintenance
Method:	Maintenance required? ☐ Yes ☐ No
Vessel:	If yes, specify details.
General:	
Where relevant, the purchaser should specify any requirements for season, environment, vessel limitations, restrictions due to conflicting activities, and installation scope (including trenching, burial, testing, inspection, surveying, and documentation).	
Installation design criteria	
Equipment bend radius (m):	
Tensioner crush loads (kN):	
Installation/lifting device requirements:	
Transport reel used for installation? ☐ Yes ☐ No	
Pipe internal fluid at delivery (empty, water filled):	
Seawater flooding requirements (exposure time)? ☐ Yes ☐ No	
Where relevant, the purchaser should specify details such as length of tensioners, shape of tensioner shoes, number of belts, diameter of wheels, reels, ramp angles and surface shape.	
Installation test requirements:	
Installation vessel motions and offsets attached? ☐ Yes ☐ No	
Attached details should, in general, reflect data requirements in vessel motion data requirements listed under riser parameters (above).	
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