

GENERAL SPECIFICATION

Drilling & Wells

GS EP FP 332

Specification for Wellhead & X-mas Tree Manufacturing
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05	10/2019	General revision - Covers all topics raised during Maersk Oil Gap Analysis
04	05/2015	Organization change – January 2015
03	10/2013	Name change + update of requirements + link with GS for subsea equipment
02	01/2012	Revision of the referential following E&P reorganization – March 2011
01	09/2009	Update of reference documents
00	11/2008	First issue (replacement of SP-DRL-010 Rev-03)
Rev.	Date	Purpose of the revision

Owning entity: DSO/FP	Managing entity: DSO/FP
Other Approving entity(ies):	

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1. Scope

This document defines the requirements for Quality Assurance and Quality Control with respect to design, material, manufacturing, testing and final supply of Wellhead & Xmas Tree equipment for the use within Company.

The minimum applied standard for design, manufacture, inspection and testing shall be [API SPEC 6A](#) PSL 3 PR2 for oil producer and water injector wells and PSL 3G PR2 for gas producer and gas injector wells, unless otherwise specified within this General Specification or the Company Purchase Order or Contract.

This General Specification applies to the following but not limited list of equipment:

Wellhead equipment:

casing head housings
casing head spools
tubing head spools
cross-over spools
multi-stage head housings and spools

Connectors and fittings:

cross-over connectors
tubing head adapters
top connectors
tees and crosses
fluid-sampling devices
adapter and spacer spools

Casing and tubing hangers:

mandrel hangers
Slip hangers

Valves and chokes:

single valves
multiple valves
actuated valves
valves prepared for actuators
check valves
chokes
surface and underwater safety valves and actuators
complete Xmas Tree assembly

back-pressure valves

Loose connectors (flanged, threaded, other end connectors (OEC), and welded):

weld neck connectors
blind connectors
threaded connectors
adapter and spacer connectors
bull plugs
valve-removal plugs
hydraulic connectors

Subsea trees:

tree connectors and tubing hangers
valves, valve blocks, and valve actuators
chokes and choke actuators
bleed, test and isolation valves
TFL wye spool
re-entry interface
tree cap
tree piping
tree guide frames
tree running tools
tree cap running tools
tree mounted flowline/umbilical connector
tubing heads and tubing head connectors
flowline bases and running/retrieval tools

tree mounted control interfaces
(instrumentation, sensors, hydraulic
tubing/piping and fittings, electrical control
cable and fittings)

Subsea wellheads:

conductor housings

wellhead housings

casing hangers

seal assemblies

guide bases

bore protectors and wear bushings

corrosion caps

Mudline suspension systems:

wellheads

running tools

casing hangers

casing hanger running tool

tieback tools for subsea completion

subsea completion adaptors for mudline
wellheads

tubing heads

corrosion caps

**Drill-Through mudline suspension
systems:**

conductor housings

surface casing hangers

wellhead housings

casing hangers

annulus seal assemblies

bore protectors and wear bushings

abandonment caps

Tubing hanger systems:

tubing hangers

running tools

Miscellaneous equipment:

flanged end and outlet connections

clamp hub-type connections

threaded end and outlet connections

other end connections

studs and nuts

ring joint gaskets

guideline establishment equipment

Other equipment:

actuators

hubs

pressure boundary penetrations

ring gaskets

running and testing tools

wear bushings

2. Reference documents

The reference documents listed below form an integral part of this General Specification.

External Documents

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the effective date of this document.

Reference	Title
API RP 6AR	Recommended Practice for Repair and Remanufacture of Wellhead and Christmas Tree Equipment
API SPEC 5CRA	Specification for Corrosion Resistant Alloy Seamless Tubes for Use as Casing, Tubing and Coupling Stock
API SPEC 5CT	Specification for Casing and Tubing
API SPEC 6A	Specification for Wellhead and Xmas Tree Equipment
API SPEC 16A	Specification for Drill-Through Equipment
API SPEC 17D	Specification for Subsea Wellhead and Christmas Tree Equipment
API SPEC 20 Series	Supply chain management for critical materials and processes used in oil and natural gas exploration and production
API SPEC Q1	Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas
API STD 6ACRA	Age-hardened Nickel-based Alloys for Oil and Gas Drilling and Production Equipment
ASME-BPVC-2015 Section IX	Boiler and Pressure Vessel Code - Welding, Brazing, and Fusing Qualifications
ASNT SNT-TC-1A	Personnel Qualification and Certification in Nondestructive Testing
ISO 9712	Non-destructive testing - Qualification and certification of personnel
ISO 10005	Quality management - Guidelines for quality plans
ISO 11960	Petroleum and natural gas industries - Steel pipes for use as casing or tubing for wells
ISO 13678	Petroleum and natural gas industries — Evaluation and testing of thread compounds for use with casing, tubing, line pipe and drill stem elements
ISO 14001	Environmental management systems
NACE MR0175/ISO 15156	Materials for use in H ₂ S-containing environments in oil and gas production

Total General Specifications

Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published in the applicable yearly collection.

Reference	Title
GS EP COR 350	External protection of offshore and coastal structures and equipment by painting
GS EP COR 355	External protection of piping and equipment by thermal spray coating
GS EP FP 330	Manufacturing and Qualification Specification for new seamless OCTG carbon & low alloy material
GS EP FP 331	Seamless Carbon and low alloy OCTG pipes purchased from stock
GS EP FP 410	Subsea Wellhead and Guidance Systems
GS EP FP 411	Subsea Horizontal Xmas Tree System
GS EP FP 413	Subsea vertical Dual Bore Xmas Tree
GS EP SPS 004	Subsea Valves
GS EP SPS 016	Subsea Choke Valves
GS EP SPS 024	Subsea Valve Manual Actuators
GS EP SPS 025	Subsea Valve Actuators
GS EP SPS 029	Metallic Materials for Subsea Production Facilities

3. Application

Any Wellhead or Xmas Tree equipment supplied to Company under this specification shall be manufactured by a Company-approved Manufacturer. Approval is granted by the QAQC entity in D&W in HQ.

3.1 Waiver / Derogation

Any significant deviation from the requirements stipulated in this document shall be approved by the relevant HQ DSO Product line, upon recommendation of the QAQC entity in DSO/FP, following the submission by the D&W entity of the subsidiary of a formal derogation request.

Should the equipment delivered by the Manufacturer not fulfill the requirements of this General Specification, and should the Manufacturer not be granted the derogation by the purchaser, then the Third-Party inspection representative will not accept the materials.

4. Glossary

D&W	Drilling and Wells
FAT	Factory Acceptance Test
FTA	Fault Tree Analysis

FMECA	Failure Mode, Effects and Criticality Analysis
GRAL	General Rolling Action List: Continuous improvement process tracking system
HPHT	High-Pressure High-Temperature
HAZ	Heat Affected Zone
IQ-ALL	Integrity & Quality for ALL: Inspection and Vendor Management web application
MDB	Manufacturing Data Book
MPI	Magnetic Particle Inspection
NDE	Non-Destructive Examination
PO	Purchase Order
PR	Performance Requirement
PWHT	Post Welding Heat Treatment
QAQC	Quality Assurance Quality Control
QCP	Quality Control Plan (also known as QP or ITP in some organizations)
QTC	Qualification Test Coupon
T&C	Threaded and Coupled
TPI	Third-Party Inspection

5. Purchase Requirements

The Purchaser should consult **the relevant Company standard** before selecting the manufacturer.

The Manufacturer of the Wellhead or Xmas Tree equipment shall be licensed to [API SPEC 6A](#) and [API SPEC Q1](#). In case of equipment for Subsea application, the Manufacturer shall also be licensed to [API SPEC 17D](#) and [API SPEC Q1](#).

When enquiring or placing orders for equipment to be manufactured in accordance with this Company specification, the Purchaser shall specify the following details as described in 5.1.

5.1 Requirements to be specified on PO / enquiry

The purchaser may use Appendix A (informative) Purchasing guidelines in [API SPEC 6A](#) as an aid for describing the equipment.

The following information, as a minimum, shall be described in the Purchase Order:

- I. Nominal Size (Bore)
- II. Rated Working pressure
- III. PSL
- IV. Temperature rating
- V. Material Class
- VI. Connection type (studded, bolted, weld neck, thread, etc.) with relevant details

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- VII. Reference to [API SPEC 6A](#), and GS EP FP 332 and relevant Company-approved quality plan with the given supplier. For Subsea equipment, [API SPEC 17D](#) and GS EP FP 332 + relevant subsea GS and relevant Company-approved quality plan with the given vendor.
- VIII. Any already granted deviation from these general-specification requirements
- IX. Expected manufacturing plant (informative only)
- X. Quantity
- XI. Delivery date and shipping instructions
- XII. Quality assurance requirements including contact details for inspection
- XIII. Contact details (name + email of vendor contact)

Depending on the type and planned operational use, the information below will be required:

- I. PR
- II. Sour service [NACE MR0175/ISO 15156](#), if applicable
- III. Electrical or, hydraulic or air feed-through connection
- IV. Outlets
- V. External Coating (paint)
- VI. Drift (special if required)
- VII. Certification requirements

A copy of the Purchase Order shall be provided to Company QAQC entity in D&W at HQs and/or to Company affiliate QAQC entity (if any) for technical and quality review and TPI allocation.

5.2 Vendor acknowledgement of the Purchase Order

Prior to the acknowledgement of the Purchase Order, the Vendor shall:

- Ensure that the requirements from above chapter 5.1 are fulfilled,
- Confirm that the manufacturing plant is qualified by Company for the ordered equipment.

If either of the above conditions cannot be fulfilled, the vendor shall not acknowledge the Purchase Order and shall instead call for an amendment to the Company Purchaser.

Once the Purchase Order is acknowledged, the allocated Third Party Inspection Agency(ies) name(s) has(ve) to be communicated to the Vendor. If not done, the Vendor shall contact the Company QAQC entity in D&W in HQ and/or Company affiliate QAQC entity (if any), for clarification.

6. Quality Management requirements

6.1 Quality Assurance

The selected contractor/supplier/manufacture and/or its Subcontractor(s)/Sub-Supplier(s) shall be:

- able to demonstrate conformity and be auditable to [API SPEC Q1](#), [API SPEC 20 Series](#) and [ISO 14001](#).

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- able to provide proof of license/certification to [API SPEC 6A](#) and/or [API SPEC 17D](#).
- auditable to ISO/API standards related to materials to be delivered.

The requirements from this general specification shall be followed as if it was an integral part of the PO. The PO shall specify the obligation to comply with this General Specification requirements.

6.1.1 Supplier qualification

The selected contractor/supplier/manufacturer, as well as the manufacturing plant shall be qualified by Company for the related equipment. If the manufacturing facility to which the Purchase Order is awarded is not qualified by Company, a qualification process has to be launched by Company's QAQC entity in D&W in HQ. Manufacturing shall not start prior positive completion of the above qualification process or without specific mitigations duly approved by Company's QAQC in HQ. The Company QAQC entity in D&W in HQ and/or Company affiliate QAQC department (if any) reserves the right to conduct audits of suppliers in order to ensure the quality of the activity performed.

Should the manufacturing plant be deemed not suitable for Company production after the qualification process, the selected contractor/supplier/manufacturer shall either:

1. Close all corrective actions stemming from qualification audits and/or technical assessments in a timely manner before manufacturing commences in order to guarantee equipment integrity and adequate delivery time, OR
2. Propose an already Company-qualified alternative manufacturing route to insure delivery of equipment.

6.1.2 Sub-supplier qualification

All subcontractors/sub-suppliers involved in:

- **Material supply (forging and heat treatment facilities) of pressure containing parts**
- **Pipe for pup joints (manufactured as per [GS EP FP 330](#) or [GS EP FP 331](#))**
- **Actuators supply**
- **Needle valve at or above 10 Ksi**
- **Welding**
- **Assembly and sub-assembly, pressure testing and functional / Stack up test**
- **Painting**

shall be communicated to and accepted by the Company QAQC entity in D&W in HQ.

The Company QAQC entity in D&W in HQ reserves the right to audit any sub-contractor/supplier/manufacturer facility and/or inspect any equipment at any sub-contractor/supplier/manufacturer facility.

6.1.3 Sub-supplier management

Any manufacturing subcontracted shall be the responsibility of the contractor/supplier/manufacturer who was awarded the contract/purchase order by Company. All