Side-pocket Mandrels

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Introduction

This specification has been developed by users/purchasers and suppliers/manufacturers of side-pocket mandrel products intended for use in the worldwide petroleum and natural gas industry. This specification is intended to provide requirements and information to all parties who are involved in the specification, selection, manufacture, testing and use of side-pocket mandrel products. Further, this specification addresses supplier/manufacturer requirements that set the minimum parameters with which each supplier/manufacturer shall comply, to be able to claim conformity with this specification.

This has been structured to allow different quality control grades to support quality control, design validation, design verification, and product functional testing. These variations allow the user/purchaser to select the grades that are required for a specific application. If the user/purchaser does not specify a specific grade for the following categories, the supplier/manufacturer will meet the requirements of grade 3.

This specification is not intended to inhibit a supplier/manufacturer from offering, or the user/purchaser from accepting, alternative equipment or engineering solutions. Where an alternative is offered, the supplier/manufacturer should identify any variations from this specification and provide details.

Design validation grades. There are four design validation grades for side-pocket mandrel products that provide the user/purchaser with a range of technical and performance requirements. Users of this specification should be aware that requirements in addition to those outlined herein might be needed for individual applications.

Product functional testing grades. There are four product functional testing grades for side-pocket mandrel products that provide the user/purchaser with a range of choices for validating that individual products manufactured under this specification meet the design specifications.

Quality control grades. There are four quality control grades that provide the user/purchaser with varying grades of quality control requirements to meet specific preferences or applications. Additional quality upgrades can be specified by the user/purchaser as supplemental requirements.

Annexes B, C, and D of this specification are normative requirements; Annexes E and F are informative.

Side-pocket Mandrels

1 Scope

This specification provides requirements for side-pocket mandrels used in the petroleum and natural gas industry. This specification includes specifying, selecting, designing, manufacturing, quality control, testing, and preparation for shipping of side-pocket mandrels.

This specification addresses standard side-pocket mandrel designs as well as high pressure and/or high temperature (HPHT) equipment rated greater than 103.43 MPa (15,000 psi) and/or greater than 177 °C (350 °F) wellbore conditions as proffered by API 1PER15K-1.

This specification does not address nor include requirements for end connections between the side-pocket mandrels and the well conduit. The installation and retrieval of side-pocket mandrels is outside the scope of this specification. Additionally, this specification does not include specifications for center-set mandrels, mandrels that employ or support tubing-retrievable flow control devices or side-pocket mandrels that incorporate non-metallic materials for pressure containment.

This specification does not include gas-lift or any other flow-control valves or devices, latches, and/or associated wire line equipment that can or cannot be covered in other API specifications.

The side-pocket mandrels to which this specification refers are independent devices that can accept installation of flow control or other devices down-hole.

2 Normative References

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

API Q1, *Specification for Quality Management System Requirements for Manufacturing Organizations for the Petroleum and Natural Gas Industry*

API 20A, *Carbon Steel, Alloy Steel, Stainless Steel, and Nickel Based Alloy Castings for Use in the Petroleum and Natural Gas Industry*

API 20H, *Heat Treatment Services—Batch Type for Equipment used in the Petroleum and Natural Gas Industry*

ANSI/NCSL Z540-1, *Calibration Laboratories and Measuring and Test Equipment General Requirements*[1]

ASME Boiler and Pressure Vessel Code, Section V, *Non-destructive Examination*[2]

ASME Boiler and Pressure Vessel Code, Section VIII, *Pressure Vessels*, Division 1, *Rules for Construction of Pressure Vessels*

ASME Boiler and Pressure Vessel Code, Section VIII, *Rules for Construction* of *Pressure Vessels*, Division 2, *Alternative Rule*ASME Boiler and Pressure Vessel Code, Section VIII, *Rules for Construction* of *Pressure Vessels*, Division 3, *Alternative Rules for Construction of High Pressure Vessels*

ASME Boiler and Pressure Vessel Code, Section IX, *Welding and Brazing Qualifications*

[1] NCSL International, 2995 Wilderness Place, Suite 107, Boulder, Colorado 80301-5404, USA.

[2] American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990, USA.