Downhole Chemical Injection Devices and Related Equipment

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Introduction

This specification has been developed by users/purchasers and suppliers/manufacturers of downhole chemical injection devices/products that are used in side-pocket mandrels and tubing retrievable mandrels/carriers in the worldwide petroleum and natural gas industry. This specification is intended to provide requirements and information to parties who are involved in the specification, selection, manufacture, testing and use of chemical injection devices. Further, this specification contains the minimum supplier/manufacturer requirements to claim conformity to this specification.

This specification has been structured to support a range of requirements in design verification, design validation, functional testing, and quality. These variations allow the user/purchaser to select the grades and levels for a specific application.

There are four design validation grades for chemical injection devices and four for products that provide the user/purchaser with a range of technical requirements and ratings. This ensures that the devices/products supplied according to this specification meet the requirements and that the user/purchaser can compare these requirements with its preference or application and determine whether additional requirements are placed on the supplier/manufacturer.

It is important that users of this specification are aware that requirements in addition to those outlined herein may be needed for individual applications. This specification is not intended to inhibit a supplier/manufacturer from offering, or the user/purchaser from accepting, alternative equipment or engineering solutions. This can be particularly applicable where there is innovative or developing technology. Where an alternative is offered, it is the responsibility of the supplier/manufacturer to identify variations from this specification and provide details.

Two quality levels are provided that the user/purchaser may choose to meet specific preferences or applications. Additional quality requirements can be specified by the user/purchaser as supplemental requirements.

In addition to the requirements of this document, related requirements are included in the following:

— API 19G1 provides requirements for side-pocket mandrels;

— API 19G3 provides requirements for running, pulling, kick-over tools and latches used in conjunction with side-pocket mandrel chemical injection devices/products;

— API 19G4 provides requirements for side-pocket mandrels and related equipment;

— API 19AC provides requirements for mandrels or carriers that are used with chemical injection devices/products when installed in a well.

Downhole Chemical Injection Devices and Related Equipment

1 Scope

This specification provides requirements for chemical injection devices intended for use in the worldwide petroleum and natural gas industry. This includes requirements for specifying, selecting, design verification, validation testing, manufacturing, quality-control, testing, and preparation for shipping of chemical injection devices as defined herein. These requirements include in-line debris screen systems, single-use shearable/frangible devices, and performance testing and calibration procedures.

The installation and retrieval of chemical Injection devices and systems is outside the scope of this document (see API 19G2 and API 19G3).

This document does not include requirements for mandrels, carriers, running, pulling, and kick-over tools, handling tools and latches, injection lines, fittings, control line connectors, clamps, chemicals and chemical delivery systems. Service, repair or redress of used chemical Injection devices is outside of the scope of this document.

Validation and functional testing within this specification is performed using water as the testing medium. Design validation in conformance with this specification may not provide assurance that a chemical injection device/product will perform in a specific well, due to the variety and potential contamination of the injected chemicals.

Included in this specification are Annex B through Annex G (normative) and Annex A and Annex H (informative). If a product is supplied bearing the API Monogram and manufactured at a facility licensed by API, the provisions of Annex A apply.

2 Normative References

The following referenced documents are referred to in the text in such a way that some or all the content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including amendments) applies.

API Specification 5B, *Specification for Threading, Gauging and Thread Inspection of Casing, Tubing, and Line Pipe Threads*

API Specification 7-2, *Specification for Threading and Gauging of Rotary Shouldered Thread Connections, Second Edition*

API Specification 19G1, *Side-pocket Mandrels*

API Specification 19G2, *Flow-control Devices for Side Pocket Mandrels*

API Specification 19G3, *Running Tools, Pulling Tools, and Kick-over Tools and Latches for Side-Pocket Mandrels*

API Recommended Practice 19G4, *Practices for Side-pocket Mandrels and Related Equipment*

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

ASME [1] Boiler and Pressure Vessel Code (BPVC), Section V, *Nondestructive Examination*

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