Sand Screens

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Introduction

This International Standard has been developed by user/purchasers and supplier/manufacturers of sand screens intended for use in petroleum and natural gas wells. This International Standard provides requirements and information to both parties regarding the selection, manufacture, mechanical properties and testing of sand screens. Further, this International Standard addresses supplier/manufacturer requirements that set the minimum parameters with which it is necessary that supplier/manufacturers comply to claim conformity with this International Standard.

This International Standard is structured with grades of increased requirements for both design validation and quality control. Three design validation grades (V1, V2 and V3) and three quality grades (Q1, Q2 and Q3) provide the user/purchaser the choice of requirements to meet a specific preference or application. The three quality grades provide the user/purchaser with a choice of requirements to meet a specific preference or application. Quality grade Q3 is the minimum grade of quality offered by this product standard. Quality grade Q2 provides additional inspection and verification steps, and quality grade Q1 is the maximum grade offered by this product standard. The three validation grades provide the user/purchaser with a choice of requirements to meet a specific preference or application. Validation grade V3 is the minimum grade of validation offered by this product standard. Validation grade V2 provides collapse resistance validation, and validation grade V1 provides both collapse and burst resistance validation. Design validation grade V3 and quality grade Q3 represent equipment designed and manufactured to supplier/manufacturer's procedures.

Included within this International Standard are normative Annexes B and C specifying test methods for determining the burst and collapse strength of sand screens. Normative Annex D contains requirements for the determination of the maximum particle size that passes through metal-mesh sand screens. Informative Annexes E, F, G and H include measurement criteria for sand screen filter media and illustrations of the three types of sand screens. Additionally, informative Annexes I and J are included for alternative testing methods for sand screens.

It is necessary that users of this International Standard be aware that requirements above those outlined in this International Standard may be required for individual applications. This International Standard 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 any variations from this International Standard and provide details.

API Specification 19SS is a U.S. national adoption of the international standard ISO 17824:2009. A list of deviations from the ISO standard is provided in Annex K and is summarized as follows.

— Annex A for the API Monogram Program was added.

— Burst and Collapse Test Annexes: the FLC pill formulation was revised and a limit was specified for the variability in the pumping rate. The 12 ga slot opening requirement for wire-wrap burst and collapse testing was eliminated.

— Wire-wrap Sand Screens: Annex H, Increased slot inspection, was removed, but 95 % slot inspection was added for Q1 quality grade requirements, and testing for wrap-wire hardness was added in the quality section. Clarification was also added on sampling plans for wire-wrap, pre-pack and metal-mesh products.

— ISO 17824, Annex C, Sized-bead test method: changed to Annex D, Determination of maximum particle that passes through a metal mesh sand screen and changed from informative to normative.

— Annexes E, F, G and H: Minor changes in their illustrations and text.

— Annexes I and J: These informative test annexes were added.

Petroleum and natural gas industries — Downhole equipment — Sand screens

1 Scope

This International Standard provides the requirements and guidelines for sand screens for use in the petroleum and natural gas industry. Included are the requirements for design, design validation, manufacturing, quality, storage and transport. The requirements of this International Standard are applicable to wire-wrap screens, pre-pack screens, and metal-mesh screens as defined herein.

Annex A contains requirements for equipment to be provided with the API monogram.

The following items are outside the scope of this International Standard:

— expandable sand screens, compliant sand screens, slotted liners, or tubing and accessory items such as centralizers or bull plugs;

— shunt screen technology, inflow control devices, downhole sensors, and selective isolation devices, even where they can be an integral part of the sand screen;

— analysis for sand retention efficiency;

— end connections of the basepipe.

2 Normative References

The following referenced documents are indispensable for the application of this document. The way in which these referenced documents are cited in the body of this standard determines the extent (in whole or part) to which they apply. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

API Recommended Practice 13B-1, *Recommended Practice for Field Testing Water-based Drilling Fluids*

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

API Specification 5CT, *Specification for Casing and Tubing*

API Specification 5CRA, *Specification for Corrosion-resistant Alloy Seamless Tubes for Use as Casing, Tubing, and Coupling Stock*

ASME, *Boiler and Pressure Vessel Code (BPVC) — Section VIII: Div. 1, Appendix 8: Methods for Liquid Penetrant Examination (PT)*

ASME, *Boiler and Pressure Vessel Code (BPVC) — Section IX: Welding and Brazing Qualifications*

ASTM A370[1], *Test Methods and Definition for Mechanical Testing of Steel Products*

ASTM B822, *Standard Test Method for Particle Size Distribution for metal powders and related compounds by light scattering*

ASTM E165, *Standard Practice for Liquid Penetrant Examination for General Industry*

ASTM E190, *Standard test method for guided bend test for ductility of welds*

ASTM E384, *Standard Test Method for Microindentation Hardness of Materials*

ASQ H1331[2], *Zero Acceptance Number Sampling Plans*

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[1] ASTM International, 100 Barr Harbor Drive, West Conshohocken, Pennsylvania 19428, www.astm.org.