INTERNATIONAL STANDARD

ISO 10432

First edition
1993-12-15

Petroleum and natural gas industries — Subsurface safety valve equipment — Specification

Industries du pétrole et du gaz naturel — Vannes de protection de fond de puits — Spécifications

Reference number
ISO 10432:1993(E)

Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

International Standard ISO 10432 was prepared by the American Petroleum Institute (API) (as Spec 14A, 8th edition) and was adopted, under a special "fast-track procedure", by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum and natural gas industries*, in parallel with its approval by the ISO member bodies.

International Organization for Standardization
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Introduction

International Standard ISO 10432:1993 reproduces the content of API Spec 14A, 8th edition, 1994. ISO, in endorsing this API document, recognizes that in certain respects the latter does not comply with all current ISO rules on the presentation and content of an International Standard. Therefore, the relevant technical body, within ISO/TC 67, will review ISO 10432:1993 and reissue it, when practicable, in a form complying with these rules.

This standard is not intended to obviate the need for sound engineering judgement as to when and where this standard should be utilized and users of this standard should be aware that additional or differing requirements may be needed to meet the needs for the particular service intended.

Standards referenced herein may be replaced by other international or national standards that can be shown to meet or exceed the requirements of the referenced standards.

Appendices A, B and C form an integral part of this standard.

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Petroleum and natural gas industries — Subsurface safety valve equipment — Specification

1 Scope

This International Standard provides the minimum acceptable requirements for subsurface safety valve equipment, and all components that establish tolerances and/or clearances which may affect performance or interchangeability of such equipment.

2 Requirements

Requirements are specified in:

"API Specification 14A (Spec 14A), Eighth Edition, January 1, 1994 — *Specification for Subsurface Safety Valve Equipment*",

which is adopted as ISO 10432.

For the purposes of international standardization, however, modifications shall apply to specific clauses and paragraphs of publication API Spec 14A. These modifications are outlined below.

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Information given in the POLICY is relevant to the API publication only.

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Subclause 1.4, Referenced standards

API standards referenced in table 1.1 and listed hereafter are available under the following ISO references:

API RP 14B as ISO 10417
API Spec 5CT as ISO 11960 (at present under study)
API Std 5B as ISO 10422

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Appendix A – Metric conversion

Throughout publication API Spec 14A, the conversion of English units shall be made in accordance with ISO 31. The content of Appendix A shall read as given below.

LENGTH	1 inch (in)	= 25,4 mm (exactly)
	1 foot (ft)	= 304,8 mm or 0,304 8 m (exactly)

PRESSURE	1 pound-force per square inch (lbf/in^2) or psi NOTE 1 bar = 10^5 Pa	= 6,894 757 Pa
STRENGTH OR STRESS	1 pound-force per square inch (lbf/in^2)	= 6,894 757 Pa
IMPACT ENERGY	1 foot-pound force (ft·lbf)	= 1,355 818 J
TORQUE	1 foot-pound force (ft·lbf)	= 1,355 818 N·m
TEMPERATURE	The following formula was used to convert degrees Fahrenheit (°F) to degrees Celsius (°C): $°C = 5/9 (°F - 32)$	
MASS	1 pound (lb)	= 0,453 592 37 kg (exactly)
VOLUME	1 cubic foot (ft^3)	= 0,028 316 85 m^3 or 28,316 85 dm^3
FLOW RATE	1 cubic foot per minute (ft^3/min)	= 0,028 316 85 m^3/min or 40,776 192 m^3/day

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Appendix D – Test agency license criteria

Information given in Appendix D is relevant to the API publication only.

Specification for Subsurface Safety Valve Equipment

API SPECIFICATION 14A (SPEC 14A)
EIGHTH EDITION, JANUARY 1, 1994

STEP
Strategies for Today's Environmental Partnership

American Petroleum Institute
1220 L Street, Northwest
Washington, DC 20005

Issued by
AMERICAN PETROLEUM INSTITUTE
Exploration & Production Department

FOR INFORMATION CONCERNING TECHNICAL CONTENTS OF THIS PUBLICATION CONTACT THE API EXPLORATION & PRODUCTION DEPARTMENT, 1201 MAIN STREET, SUITE 2535, DALLAS, TX 75202-3994 — (214) 748-3841. SEE BACK COVER FOR INFORMATION CONCERNING HOW TO OBTAIN ADDITIONAL COPIES OF THIS PUBLICATION.

Users of this publication should become familiar with its scope and content. This publication is intended to supplement rather than replace individual engineering judgment.

OFFICIAL PUBLICATION

REG. U.S. PATENT OFFICE

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POLICY

API PUBLICATIONS NECESSARILY ADDRESS PROBLEMS OF A GENERAL NATURE. WITH RESPECT TO PARTICULAR CIRCUMSTANCES, LOCAL, STATE AND FEDERAL LAWS AND REGULATIONS SHOULD BE REVIEWED.

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American Petroleum Institute (API) Specifications are published as aids to the procurement of standardized equipment and materials as well as instructions to manufacturers of equipment or materials covered by an API Specification. These Specifications are not intended to obviate the need for sound engineering, nor to inhibit in any way anyone from purchasing or producing products to other specifications.

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FOREWORD

This standard was developed as an API specification under the jurisdiction of the API Exploration & Production Department Committee on Standardization of Offshore Safety and Anti-Pollution Equipment (OSAPE), and was prepared with the guidance of the API, the Offshore Operators Committee (OOC) and the Western States Petroleum Association (WSPA).

The API OSAPE Committee has the following scope:

API specifications and recommended practices for safety and anti-pollution equipment and systems used in offshore oil and gas production, giving emphasis when appropriate in such standards to manufacturing, equipment testing and systems analysis methods.

Other publications formulated by this committee are:

RP 14B, *Recommended Practice for Design, Installation, Repair and Operation of Subsurface Safety Valve Systems.*

RP 14C, *Recommended Practice for Analysis, Design, Installation and Testing of Basic Surface Safety Systems on Offshore Production Platforms.*

Spec. 14D, *Specification for Wellhead Surface Safety Valves and Underwater Safety Valves for Offshore Service.*

RP 14E, *Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems.*

RP 14F, *Recommended Practice for Design and Installation of Electrical Systems for Offshore Production Platforms.*

RP 14G, *Recommended Practice for fire Prevention and Control on Open Type Offshore Production Platforms.*

RP 14H, *Recommended Practice for Use of Surface Safety Valves and Underwater Safety Valves Offshore.*

RP 14J, Recommended Practice for Design and Hazards Analysis for Offshore Production Facilities.

This is the Eighth Edition of this publication and supersedes all previous editions. It includes changes to the Seventh Edition approved by letter Ballot.

Request for interpretations of this specification, proposed revisions, or requests for permission to reproduce or translate all or any part of the material herein should be addressed to the Director, Exploration & Production Department, 1201 Main Street, Suite 2525, Dallas, TX 75202-3994.

This Standard shall become effective on the date printed on the cover but may be used voluntarily from the date of distribution.

API specifications usually include bar notations in the margins to indicate items that have been changed from the previous edition. These bar notations have not been included in this document due to the extensiveness of the changes made. Every section of this document includes changes from the previous edition.

SECTION 1
SCOPE

1.1 PURPOSE

1.1.1 This specification was formulated to provide the minimum acceptable requirements for Subsurface Safety Valve (SSSV) Equipment.

1.1.2 To be qualified in accordance with this specification, SSSV Equipment shall meet all the applicable requirements of this specification.

1.2 COVERAGE. This specification covers Subsurface Safety Valves, Safety Valve Locks, Safety Valve Landing Nipples, and all components that establish tolerances and/or clearances which may affect performance or interchangeability of the SSSV Equipment. Safety Valve Locks, Safety Valve Landing Nipples and SSSVs manufactured by different facilities or Manufacturers may be supplied as separate items.

1.3 CLASS OF SERVICE. SSSV Equipment manufactured in accordance with this specification shall conform to one or more of the following classes of service:

Class 1. Standard Service. This class of SSSV Equipment is intended for use in wells which do not exhibit the detrimental effects caused by sand or corrosive agents.

Class 2. Sandy Service. This class of SSSV Equipment is intended for use in wells where a substance such as sand could be expected to cause SSSV Equipment failure. Class 2 SSSV Equipment must also meet the requirements for Class 1 service.

Class 3. Stress Corrosion Cracking Service. This class of SSSV Equipment is intended for use in wells where corrosive agents could be expected to cause stress corrosion cracking. Class 3 equipment must meet the requirements for Class 1 or Class 2 and be manufactured from materials which are resistant to stress corrosion cracking. Within this service class there are two divisions, 3S for sulfide stress cracking service and 3C for chloride stress cracking service. Metallic materials, suitable for a 3S environment, shall be in accordance with NACE MR0175.

Class 4. Weight Loss Corrosion Service. This class of SSSV Equipment is intended for use in wells where corrosive agents could be expected to cause weight loss corrosion. Class 4 equipment must meet the requirements for Class 1 or Class 2 and be manufactured from materials which are resistant to weight loss corrosion.

1.4 REFERENCED STANDARDS. This specification includes by reference, either in total or in part, other API, industry and government standards listed in Table 1.1. Where cited these requirements are mandatory. Referenced standards used by the Manufacturer may be either the applicable revision shown in Table 1.1 or the latest revision.

1.5 APPENDICES. Appendices are for information only.

1.6 ABBREVIATIONS AND DEFINITIONS. The following abbreviations and definitions are used in this specification:

AISI — American Iron & Steel Institute

ANSI — American National Standards Institute

API — American Petroleum Institute

AQL — Acceptance Quality Level

ASME — American Society of Mechanical Engineers

ASTM — American Society for Testing and Materials

BEAN — The orifice or designed restriction causing the pressure drop in velocity type SSCSVs.

BS — British Standards

CHLORIDE STRESS CORROSION CRACKING — Cracking under the combined action of tensile stress and corrosion in the presence of chlorides and water.

END CONNECTION — SSSV Equipment/Tubular connecting interface.

FAILURE — Any condition of SSSV Equipment that prevents it from performing the design function.

FUNCTIONAL TEST — Testing performed to confirm proper operation of SSSV Equipment.

MANUFACTURER — The principal agent in the design, fabrication and furnishing of SSSV Equipment who chooses to comply with this specification.

MIL-STD — Military Standard

MODEL — SSSV Equipment with unique internal part(s) and operating characteristics which differentiate it from other SSSV Equipment of the same type. It may have any of a variety of end connections.

NACE — National Association of Corrosion Engineers

NDE — Nondestructive Examination

OPERATING MANUAL — The publication issued by the Manufacturer which contains detailed data and instructions related to the design, installation, operation and maintenance of SSSV Equipment.

OPERATOR — The user of SSSV Equipment.

SAE-AS — Society of Automotive Engineers, Inc. - Aerospace Standard

SCSSV — A Surface Controlled Subsurface Safety Valve is an SSSV controlled from the surface.

SNT — Society for Nondestructive Testing

SSCSV — A Subsurface Controlled Subsurface Safety Valve is an SSSV actuated by the characteristics of the well.

SSSV — A Subsurface Safety Valve is a device whose design function is to prevent uncontrolled well flow when closed. These devices may be installed and retrieved by wireline or pump down methods (Wireline Retrievable) or be an integral part of the tubing string (Tubing Retrievable).

SSSV EQUIPMENT — The Subsurface Safety Valve, Safety Valve Lock, Safety Valve Landing Nipple, and all components that establish tolerances and/or clearances which may affect performance or interchangeability of the SSSV Equipment.

STRESS CORROSION CRACKING — Cracking which results from a combination of corrosion and stress when susceptible materials are exposed to specific corrosive media.

SULFIDE STRESS CRACKING — Cracking under the combined action of tensile stress and corrosion in the presence of water and hydrogen sulfide.

SV LOCK — A Safety Valve Lock is a device attached to or a part of the SSSV that holds the SSSV in place.

SVLN — A Safety Valve Landing Nipple is a receptacle with internal sealing surfaces in which an SSSV may be installed. It may include recesses for locking devices to hold the SSSV in place and may be ported for communication to an outside source for SSSV operation.

TEST AGENCY — Any independent third party which provides a test facility and administers a testing program that meets the Verification Test requirements of this specification.

TYPE — SSSV Equipment with unique characteristics which differentiate it from other SSSV Equipment. The SCSSV, the Velocity Type SSCSV and the Low Tubing Pressure Type SSCSV are examples of SSSV types.

VERIFICATION TEST — Testing performed to qualify a particular size, type and model of SSSV Equipment for a specific Class of Service.

WEIGHT LOSS CORROSION — Loss of metal in areas exposed to fluids which contain water or brine and carbon dioxide (CO_2), or hydrogen sulfide (H_2S), oxygen (O_2) or other corrosive agents.