



# SLOVENSKI STANDARD SIST EN ISO 17782:2019

01-februar-2019

---

**Petrokemična industrija ter industrija za predelavo nafte in zemeljskega plina -  
Shema za ugotavljanje skladnosti proizvajalcev posebnih materialov (ISO  
17782:2018)**

Petroleum, petrochemical and natural gas industries - Scheme for conformity  
assessment of manufacturers of special materials (ISO 17782:2018)

Erdöl-, petrochemische und Erdgasindustrie - Herstellerqualifizierung von  
Sonderwerkstoffen (ISO 17782:2018)

Industries du pétrole, de la pétrochimie et du gaz naturel - Système d'évaluation de la  
conformité des fabricants de matériaux spéciaux (ISO 17782:2018)

**Ta slovenski standard je istoveten z: EN ISO 17782:2018**

---

**ICS:**

75.180.01 Oprema za industrijo nafte in zemeljskega plina na splošno  
Equipment for petroleum and natural gas industries in general

**SIST EN ISO 17782:2019**

**en**

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 17782:2019](#)

<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>

EUROPEAN STANDARD

EN ISO 17782

NORME EUROPÉENNE

EUROPÄISCHE NORM

November 2018

ICS 75.020

English Version

## Petroleum, petrochemical and natural gas industries - Scheme for conformity assessment of manufacturers of special materials (ISO 17782:2018)

Industries du pétrole, de la pétrochimie et du gaz  
naturel - Système d'évaluation de la conformité des  
fabricants de matériaux spéciaux (ISO 17782:2018)

Erdöl-, petrochemische und Erdgasindustrie -  
Herstellerqualifizierung von Sonderwerkstoffen (ISO  
17782:2018)

This European Standard was approved by CEN on 27 September 2018.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

**iTeh STANDARD PREVIEW**

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the CEN-CENELEC Management Centre has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

**CEN-CENELEC Management Centre: Rue de la Science 23, B-1040 Brussels**

Contents	Page
European foreword.....	3

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 17782:2019](https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019)  
<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>

## European foreword

This document (EN ISO 17782:2018) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2019, and conflicting national standards shall be withdrawn at the latest by May 2019.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN shall not be held responsible for identifying any or all such patent rights.

According to the CEN-CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, Former Yugoslav Republic of Macedonia, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

## iTeh STANDARD PREVIEW Endorsement notice (standards.iteh.ai)

The text of ISO 17782:2018 has been approved by CEN as EN ISO 17782:2018 without any modification.

[SIST EN ISO 17782:2019](https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019)

<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

SIST EN ISO 17782:2019

<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>

INTERNATIONAL  
STANDARD

ISO  
17782

First edition  
2018-10

---

---

**Petroleum, petrochemical and  
natural gas industries — Scheme  
for conformity assessment of  
manufacturers of special materials**

*Industries du pétrole, de la pétrochimie et du gaz naturel — Système  
d'évaluation de la conformité des fabricants de matériaux spéciaux*

**iTeh STANDARD PREVIEW**  
**(standards.iteh.ai)**

[SIST EN ISO 17782:2019](https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019)

<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>



Reference number  
ISO 17782:2018(E)

© ISO 2018

## iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 17782:2019

<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>



### **COPYRIGHT PROTECTED DOCUMENT**

© ISO 2018

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office  
CP 401 • Ch. de Blandonnet 8  
CH-1214 Vernier, Geneva  
Phone: +41 22 749 01 11  
Fax: +41 22 749 09 47  
Email: [copyright@iso.org](mailto:copyright@iso.org)  
Website: [www.iso.org](http://www.iso.org)

Published in Switzerland



# Contents

	Page
<b>Foreword</b> .....	<b>v</b>
<b>Introduction</b> .....	<b>vi</b>
<b>1 Scope</b> .....	<b>1</b>
<b>2 Normative references</b> .....	<b>1</b>
<b>3 Terms, definitions and abbreviated terms</b> .....	<b>2</b>
3.1 Terms and definitions.....	2
3.2 Abbreviated terms.....	4
<b>4 Responsibilities</b> .....	<b>5</b>
4.1 Purchaser's responsibilities.....	5
4.2 Manufacturer's responsibilities.....	5
4.3 Qualifying Company's responsibilities.....	5
<b>5 Conformity assessment of manufacturers</b> .....	<b>6</b>
5.1 Conformity assessment.....	6
5.2 Basis for assessment of manufacturers.....	6
5.3 Evaluation for conformity.....	7
5.4 Review of manufacturing procedure conformity record (MPCR).....	7
5.5 Statement of conformity.....	7
<b>6 Validity of the manufacturer procedure conformity record (MPCR)</b> .....	<b>7</b>
6.1 Term of validity.....	7
6.2 Renewal of the MPCR.....	7
6.3 Transitional requirements.....	8
<b>7 General requirements</b> .....	<b>8</b>
7.1 Knowledge and relevant experience.....	8
7.1.1 Knowledge.....	8
7.1.2 Relevant experience.....	8
7.2 Manufacturing facilities and equipment.....	8
7.3 Subcontractors and suppliers.....	8
7.4 Quality requirements for test laboratories and manufacturers of welded products.....	9
7.4.1 Test laboratories.....	9
7.4.2 Manufacturers of welded products.....	9
<b>8 Manufacturing procedure summary (MPS)</b> .....	<b>9</b>
8.1 General.....	9
8.2 Content of the manufacturing procedure summary (MPS).....	9
8.2.1 Scope of the manufacturing procedure summary.....	9
8.2.2 Manufacturing procedure summary requirements.....	10
<b>9 Heat treatment</b> .....	<b>12</b>
9.1 Facilities and equipment.....	12
9.1.1 General.....	12
9.1.2 Foundries.....	12
9.1.3 Heat treatment furnaces.....	12
9.1.4 Thermocouples and pyrometers.....	13
9.1.5 Quenching baths.....	13
9.1.6 Loading of components.....	13
9.1.7 Transfer time between furnace and quenching bath.....	13
9.1.8 Continuous, semi-continuous and induction furnaces.....	13
9.2 Heat treatment procedure.....	14
9.2.1 General.....	14
9.2.2 Heat treatment facilities and equipment.....	14
9.2.3 Loading and unloading of components and transfer between furnace and quenching bath.....	14
9.2.4 Description of heat treatment cycle.....	14

## ISO 17782:2018(E)

9.2.5	Production testing and traceability.....	15
9.2.6	Documentation of heat treatments.....	15
9.3	Verification of heat treatment procedures.....	15
9.3.1	General.....	15
9.3.2	Objective.....	16
9.3.3	Extent of verification.....	16
9.3.4	Procedure for verification.....	16
9.3.5	Reporting.....	17
9.3.6	Witnessing.....	18
<b>10</b>	<b>Verification of the manufacturing process.....</b>	<b>18</b>
10.1	Objective of verification testing.....	18
10.2	Essential variables.....	18
10.2.1	General.....	18
10.2.2	Castings.....	18
10.2.3	Fittings.....	18
10.2.4	Forgings.....	18
10.2.5	Heat treatment.....	18
10.2.6	Hot forming.....	19
10.2.7	Hot isostatic pressed (HIP) products.....	20
10.2.8	Induction bending.....	20
10.2.9	Manufacture at different plants and/or locations.....	20
10.2.10	Manufacturing equipment.....	20
10.2.11	Material grade.....	20
10.2.12	Melting and refining process.....	20
10.2.13	Start materials.....	21
10.2.14	Strain hardening.....	21
10.2.15	Thickness and mass limitations.....	22
10.2.16	Welded products.....	23
10.3	Qualification testing.....	23
10.3.1	Selection of components for testing.....	23
10.3.2	Testing.....	24
10.3.3	Additional testing.....	25
10.4	Welding procedure qualifications.....	29
<b>11</b>	<b>Manufacturing procedure conformity record (MPCR).....</b>	<b>29</b>
11.1	General.....	29
11.2	Content of manufacturing procedure conformity record (MPCR).....	29
11.3	Required copies and distribution of manufacturing procedure conformity record.....	31
<b>Annex A (informative) Manufacturing Procedure Summary front page and examples.....</b>		<b>32</b>
<b>Annex B (normative) Temperature Uniformity Survey — Additional requirements to Annex M of ISO 10423:2009 and ASTM A991-10.....</b>		<b>38</b>
<b>Annex C (informative) Verification of the heat treatment procedure — Example.....</b>		<b>40</b>
<b>Annex D (normative) Fasteners.....</b>		<b>41</b>
<b>Annex E (normative) Induction bending — Testing for qualification of bends without post-bend heat treatment.....</b>		<b>47</b>
<b>Annex F (normative) Assessment of testing laboratories.....</b>		<b>48</b>
<b>Annex G (normative) Manufacturing Procedure Conformity Record (MPCR) front page.....</b>		<b>52</b>
<b>Bibliography.....</b>		<b>53</b>

## 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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

## ISO 17782:2018(E)

### Introduction

This document is based on NORSOK M-650, 4<sup>th</sup> edition, which was developed by the Norwegian petroleum industry to ensure adequate safety, value added and cost effectiveness for petroleum industry developments and operations.

The conformity assessment requirements provide a Scheme for manufacturers to demonstrate their competence and experience to manufacture the relevant material grades and product forms. The intention is that a manufacturing procedure conformity record (MPCR) accepted by one customer should also be acceptable for other customers, within the essential variables of this document.

This document includes the following annexes that are either normative or informative:

- [Annex A](#) provides the Manufacturing Procedure Summary front page and examples (informative);
- [Annex B](#) contains the Temperature Uniformity Survey with additional requirements to Annex M of ISO 10423:2009 and ASTM A991-10 (normative);
- [Annex C](#) provides an example of verification of the heat treatment procedure (informative);
- [Annex D](#) contains requirements related to fasteners (normative);
- [Annex E](#) contains requirements related to induction bending in the case of testing for qualification of bends without post-bend heat treatment (normative);
- [Annex F](#) contains requirements for the assessment of testing laboratories (normative);
- [Annex G](#) provides the Manufacturing Procedure Conformity Record front page (normative).

SIST EN ISO 17782:2019  
<https://standards.iteh.ai/catalog/standards/sist/404643d0-53e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>

# Petroleum, petrochemical and natural gas industries — Scheme for conformity assessment of manufacturers of special materials

## 1 Scope

This document establishes a procedure for verifying that the manufacturer of special materials for the petroleum, petrochemical and natural gas industries has sufficient competence and experience of the relevant material grades of metal, and the necessary facilities and equipment, to manufacture these materials in the required shapes and sizes with acceptable properties according to the applicable standard, material specification and/or material data sheet specified by the purchaser.

This document is applicable to manufacturers of various materials, product forms and manufacturing processes when specified by the purchaser. This document has been established considering especially, but not exclusively:

- a) duplex stainless steel;
- b) high alloyed austenitic stainless steel;
- c) nickel-based alloys;
- d) titanium and its alloys.

This document is also applicable to the processes of induction bending and strain-hardened products.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their 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 any amendments) applies.

ISO 3834-2, *Quality requirements for fusion welding of metallic materials — Part 2: Comprehensive quality requirements*

ISO 9000, *Quality management systems — Fundamentals and vocabulary*

ISO 10423:2009, *Petroleum and natural gas industries — Drilling and production equipment — Wellhead and christmas tree equipment*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 14343, *Welding consumables — Wire electrodes, strip electrodes, wires and rods for arc welding of stainless and heat resisting steels — Classification*

ISO 15590-1, *Petroleum and natural gas industries — Induction bends, fittings and flanges for pipeline transportation systems — Part 1: Induction bends*

ISO 15614-1, *Specification and qualification of welding procedures for metallic materials — Welding procedure test — Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys*

ISO/IEC 17000:2004, *Conformity assessment — Vocabulary and general principles*

ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*

**ISO 17782:2018(E)**

ASME Boiler and Pressure Vessel Code, Section II, Materials, Part C, *Specifications for welding rods, electrodes, and filler metals* (also referred to ASME II Part C)

ASME Boiler and Pressure Vessel Code, Section IX: *Welding and Brazing Qualifications* (also referred to ASME IX)

ASTM A370-14, *Standard Test Methods and Definitions for Mechanical Testing of Steel Products*

ASTM A991-10, *Standard Test Method for Conducting Temperature Uniformity Surveys of Furnaces Used to Heat Treat Steel Products*

ASTM E407, *Standard Practice for Microetching Metals and Alloys*

EN 10204, *Metallic products — Types of inspection documents*

**3 Terms, definitions and abbreviated terms**

For the purposes of this document, the terms and definitions given in ISO 9000, ISO/IEC 17000 and the following apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- ISO Online browsing platform: available at <https://www.iso.org/obp>
- IEC Electropedia: available at <http://www.electropedia.org/>

**3.1 Terms and definitions****3.1.1****conformity assessment**

demonstration that specified requirements relating to a product, process, system, person or body are fulfilled

[SOURCE: ISO/IEC 17000:2004, 2.1]

**3.1.2****continuous furnace**

furnace in which the item/product to be heat treated is loaded and heat treated in a continuous cycle

**3.1.3****company**

owner or organization that is responsible for development of and/or operation of an installation/facility

Note 1 to entry: For the purposes of this document, the company is normally an oil company.

**3.1.4****equalization time**

time used to ensure a uniform pre-set temperature throughout a heat treatment load and/or throughout all section thicknesses of a component

**3.1.5****heat sink**

separate block used to monitor temperature during heat treatment and made from the same generic type of material as the parts being heat treated

**3.1.6****high alloyed austenitic stainless steel (SS)**

austenitic stainless steel typically having  $PREN \geq 40$  or  $[\%Ni + 2(\%Mo)] > 30$  where  $\%Mo > 2$ , all mass fractions expressed as percent

EXAMPLE UNS S31254, UNS N08367, UNS N08926, UNS S31266, UNS S32654, UNS S34565, J93254.

**3.1.7****holding time**

time from when the controlling thermocouple(s) [normally the furnace thermocouple(s)] has reached set temperature until the specified soaking time is completed

Note 1 to entry: See also [Annex C](#).

Note 2 to entry: Holding time consists of equalization time + soaking time. Holding time is not applicable to continuous and semi-continuous furnaces.

**3.1.8****main contractor**

party which carries out all or part of the design, engineering, procurement, construction, commissioning or management of a project, or operation or maintenance of a facility, on a contract awarded by the company

**3.1.9****manufacturer**

party, including subcontractors, which carries out operations that affect the material properties of the finished product

Note 1 to entry: A manufacturer should have minimum one operation, which affects material properties in-house.

Note 2 to entry: These operations can include forming, heat treatment, etc.

**3.1.10****pitting resistance equivalent number  
PREN**

number indicating the resistance of stainless steel to pitting corrosion and related to chemical composition

Note 1 to entry: PREN is calculated from one of the following equations:  
<https://standards.iteh.ai/catalog/standards/sist/4e4045d0-55e7-4a10-98e7-38395f9a9b53/sist-en-iso-17782-2019>

a)  $PREN = \%Cr + 3,3 \%Mo + 16 \%N$

b)  $PREN = \%Cr + 3,3 \% (Mo + 0,5 W) + 16 \%N$

where all mass fractions are expressed as a percentage.

Note 2 to entry: The requirement for the minimum PREN value applies to the applicable material specification, MDS and/or material standard as specified by purchaser.

**3.1.11****purchaser**

party which purchases a product from a manufacturer

Note 1 to entry: Company (end user), main contractor and buyer are purchasers in the context used in this document.

**3.1.12****Qualifying Company**

body or person that performs *conformity assessment activity* ([3.1.13](#))

**3.1.13****second-party conformity assessment activity**

conformity assessment activity that is performed by a person or organization that has a user interest in the object

Note 1 to entry: Persons or organizations performing second-party conformity assessment activities include, for example, purchasers or users of products, or potential customers seeking to rely on a supplier's management system, or organizations representing those interests.

[SOURCE: ISO/IEC 17000:2004, 2.3]