

SLOVENSKI STANDARD

SIST EN ISO 14692-2:2017

01-november-2017

Nadomešča:

SIST EN ISO 14692-2:2004

SIST EN ISO 14692-2:2004/AC:2007

Industrija za predelavo nafte in zemeljskega plina - S steklenimi vlakni ojačeni polimerni cevovodi (GRP) - 2. del: Kvalificiranje in proizvodnja (ISO 14692-2:2017)

Petroleum and natural gas industries - Glass-reinforced plastics (GRP) piping - Part 2: Qualification and manufacture (ISO 14692-2:2017)

iTeh STANDARD PREVIEW

Erdöl- und Erdgasindustrie - Glasfaserverstärkte Kunststoffrohrleitungen (GFK) - Teil 2: Zulassung und Herstellung (ISO 14692-2:2017)

[SIST EN ISO 14692-2:2017](https://standards.itih.ai/catalog/standards/sist/48409bc8-ffe8-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017)

Industries du pétrole et du gaz naturel - Canalisations en plastique renforcé de verre (PRV) - Partie 2: Conformité aux exigences de performance et fabrication (ISO 14692-2:2017)

Ta slovenski standard je istoveten z: EN ISO 14692-2:2017

ICS:

75.200	Oprema za skladiščenje nafte, naftnih proizvodov in zemeljskega plina	Petroleum products and natural gas handling equipment
83.140.30	Polimerne cevi in fittingi za snovi, ki niso tekočine	Plastics pipes and fittings for non fluid use

SIST EN ISO 14692-2:2017

en

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 14692-2:2017](#)

<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>

EUROPEAN STANDARD

EN ISO 14692-2

NORME EUROPÉENNE

EUROPÄISCHE NORM

September 2017

ICS 75.200; 83.140.30

Supersedes EN ISO 14692-2:2002

English Version

Petroleum and natural gas industries - Glass-reinforced plastics (GRP) piping - Part 2: Qualification and manufacture (ISO 14692-2:2017)

Industries du pétrole et du gaz naturel - Canalisations en plastique renforcé de verre (PRV) - Partie 2: Conformité aux exigences de performance et fabrication (ISO 14692-2:2017)

Erdöl- und Erdgasindustrie - Glasfaserverstärkte Kunststoffrohrleitungen (GFK) - Teil 2: Zulassung und Herstellung (ISO 14692-2:2017)

This European Standard was approved by CEN on 22 June 2017.

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.

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: Avenue Marnix 17, B-1000 Brussels

Contents	Page
European foreword.....	3

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 14692-2:2017](https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017)
<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>

European foreword

This document (EN ISO 14692-2:2017) 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 March 2018 and conflicting national standards shall be withdrawn at the latest by March 2018.

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.

This document supersedes EN ISO 14692-2:2002.

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.

Full STANDARD PREVIEW
(standards.iteh.ai)

Endorsement notice

The text of ISO 14692-2:2017 has been approved by CEN as EN ISO 14692-2:2017 without any modification.

<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>

iTeh STANDARD PREVIEW
(standards.iteh.ai)

[SIST EN ISO 14692-2:2017](#)

<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>

INTERNATIONAL
STANDARD

ISO
14692-2

Second edition
2017-08

**Petroleum and natural gas
industries — Glass-reinforced plastics
(GRP) piping —**

**Part 2:
Qualification and manufacture**

iTeh STANDARD PREVIEW
*Industries du pétrole et du gaz naturel — Canalisations en plastique
renforcé de verre (PRV) —
(standards.iteh.ai)
Partie 2: Qualification et fabrication*

SIST EN ISO 14692-2:2017

<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffee-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>



Reference number
ISO 14692-2:2017(E)

© ISO 2017

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 14692-2:2017](https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffee-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017)

<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffee-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2017, Published in Switzerland

All rights reserved. Unless otherwise specified, 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
Ch. de Blandonnet 8 • CP 401
CH-1214 Vernier, Geneva, Switzerland
Tel. +41 22 749 01 11
Fax +41 22 749 09 47
copyright@iso.org
www.iso.org

Contents

Page

Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms, definitions, symbols and abbreviated terms	2
4 Manufacturer's declarations	2
4.1 Procedure.....	2
4.2 Long term regression testing.....	4
4.3 Gradient, G_{xx}	5
4.4 MPR_{xx}	5
4.5 Partial factors.....	5
4.5.1 Partial factor for design lifetime, A_0	5
4.5.2 Partial factor for chemical degradation, A_2	5
4.5.3 Partial factor for cyclic loading, A_3	6
4.6 Long term envelope data points.....	6
4.7 Dimensions.....	6
4.8 Baseline values.....	6
4.9 Flexibility factors and SIFs.....	7
4.10 Production processes and jointing instructions.....	7
5 Qualification programme	7
5.1 General.....	7
5.2 Scaling rules.....	9
5.3 Product qualification.....	10
5.3.1 Validation of long term envelopes.....	10
5.3.2 Density.....	10
5.3.3 Thermal expansion coefficient.....	10
5.3.4 Qualification procedure for external pressure.....	10
5.4 Elastic properties.....	10
5.4.1 General.....	10
5.4.2 Axial tensile modulus, E_a	12
5.4.3 Hoop tensile modulus, E_h , and minor Poisson's ratio, ν_{ah}	12
5.4.4 Major Poisson's ratio, ν_{ha}	12
5.4.5 Circumferential bending modulus, E_{hb}	13
5.5 Optional qualification requirements.....	13
5.5.1 Electrical conductivity.....	13
5.5.2 Potable water certification.....	13
5.5.3 Impact resistance.....	13
5.5.4 Qualification procedure for fire performance.....	13
5.5.5 Low temperature performance.....	13
6 Requalification	14
7 Quality programme for manufacture	15
7.1 General requirements.....	15
7.2 Quality control tests.....	16
7.2.1 General.....	16
7.2.2 Mill hydrostatic test for pipes.....	16
7.2.3 Mill hydrostatic test for spoolpieces.....	17
7.2.4 Degree of cure.....	17
7.2.5 Barcol hardness.....	17
7.2.6 Glass content.....	18
7.2.7 Visual inspection.....	18
7.2.8 Key component dimensions.....	18
7.2.9 Retest.....	19

ISO 14692-2:2017(E)

7.2.9	7.2.9.....	19
	Retest.....	19
7.3	Optional quality control tests.....	20
7.3.1	Electrical conductivity per length.....	20
7.3.2	Fire performance.....	21
7.3.3	Residual styrene monomer content.....	21
7.3.4	Additional quality control tests.....	21
8	Component marking.....	22
9	Handling, storage and transportation.....	22
10	Documentation.....	22
10.1	General.....	22
10.2	Enquiry and purchase order documentation.....	22
10.3	Qualification documentation.....	22
10.3.1	General.....	22
10.3.2	Qualification reports.....	22
10.3.3	Potable water approval certificates.....	23
10.4	Production quality control documentation.....	23
10.4.1	General.....	23
10.4.2	Manufacturing procedure.....	23
10.4.3	Raw material certificates.....	23
10.4.4	Production quality control reports.....	23
10.5	Installation documentation.....	23
Annex A (normative)	Gradients and temperature limits.....	24
Annex B (normative)	Long term envelope data points.....	29
Annex C (normative)	Survival tests.....	34
Annex D (normative)	Scaling rules.....	39
Annex E (normative)	Representative products.....	50
Annex F (normative)	Flange qualification.....	53
Annex G (normative)	Major Poisson's ratio.....	56
Annex H (normative)	Fire endurance testing.....	59
Annex I (normative)	Alternate material qualification.....	68
Annex J (normative)	Visual inspection.....	74
Annex K (informative)	Example of qualification summary form.....	78
Bibliography	80

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).

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).

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

For an explanation on 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 the following URL: 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*, Subcommittee SC 6, *Processing equipment and systems*.

This second edition cancels and replaces the first edition (ISO 14692-2:2002), which has been technically revised. It also incorporates the Technical Corrigendum ISO 14692-2:2002/Cor 1:2005.

A list of all the parts of ISO 14692 can be found on the ISO website.

ISO 14692-2:2017(E)**Introduction**

The objective of this document is to enable the purchase of GRP components with known and consistent properties from any source. Main users of this document will be the principal and the manufacturer, certifying authorities and government agencies.

The qualification programme and the quality programme are the most significant clauses in this document.

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

[SIST EN ISO 14692-2:2017](https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017)

<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>

Petroleum and natural gas industries — Glass-reinforced plastics (GRP) piping —

Part 2: Qualification and manufacture

1 Scope

This document gives requirements for the qualification and manufacture of GRP piping and fittings in order to enable the purchase of GRP components with known and consistent properties from any source.

It is applicable to qualification procedures, preferred dimensions, quality programmes, component marking and documentation.

This document is intended to be read in conjunction with ISO 14692-1.

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 834-1, *Fire-resistance tests — Elements of building construction — Part 1: General requirements*

ISO 1172, *Textile-glass-reinforced plastics — Prepregs, moulding compounds and laminates — Determination of the textile-glass and mineral-filler content — Calcination methods*

ISO 4901, *Reinforced plastics based on unsaturated-polyester resins — Determination of the residual styrene monomer content, as well as the content of other volatile aromatic hydrocarbons, by gas chromatography*

ISO 11357-2, *Plastics — Differential scanning calorimetry (DSC) — Part 2: Determination of glass transition temperature and glass transition step height*

ISO 11359-2, *Plastics — Thermomechanical analysis (TMA) — Part 2: Determination of coefficient of linear thermal expansion and glass transition temperature*

ISO 14130, *Fibre-reinforced plastic composites — Determination of apparent interlaminar shear strength by short-beam method*

ISO 14692-1:2017, *Petroleum and natural gas industries — Glass-reinforced plastics (GRP) piping — Part 1: Vocabulary, symbols, applications and materials*

ISO 14692-3:2017, *Petroleum and natural gas industries — Glass-reinforced plastics (GRP) piping — Part 3: System design*

ISO 14692-4:2017, *Petroleum and natural gas industries — Glass-reinforced plastics (GRP) piping — Part 4: Fabrication, installation, inspection and maintenance*

API 15HR, *Specification for high pressure fiberglass line pipe, Fourth Edition*

ASME RTP-1-2007, *Reinforced thermoset plastic corrosion-resistant equipment*

ASTM D638, *Standard test method for tensile properties of plastics*

ISO 14692-2:2017(E)

ASTM D696, *Standard test method for coefficient of linear thermal expansion of plastics between –30 °C and 30 °C with a vitreous silica dilatometer*

ASTM D1598, *Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure*

ASTM D2105, *Standard test method for longitudinal tensile properties of “fiberglass” (glass-fiber-reinforced thermosetting-resin) pipe and tube*

ASTM D2412, *Standard test method for determination of external loading characteristics of plastic pipe by parallel-plate loading*

ASTM D2583, *Standard test method for indentation hardness of rigid plastics by means of a barcol impressor*

ASTM D2992, *Standard practice for obtaining hydrostatic or pressure design basis for “fiberglass” (glass-fiber-reinforced thermosetting-resin) pipe and fittings*

ASTM D3567, *Standard practice for determining dimensions of “fiberglass” (glass-fiber-reinforced thermosetting resin) pipe and fittings*

ASTM E1529, *Standard test methods for determining effects of large hydrocarbon pool fires on structural members and assemblies*

IMO MSC.61(67), *Adoption of the International Code for application of fire test procedures*

IMO Resolution A.653(16), *Fire test procedures for surface flammability of bulkhead, ceiling and deck finish materials as amended by Resolution IMO MSC.61(67): Annex 1 Part 5*

ITC STANDARD PREVIEW

(standards.iteh.ai)

3 Terms, definitions, symbols and abbreviated terms

For the purposes of this document, the terms, definitions, symbols and abbreviated terms given in ISO 14692-1 apply.

SIST EN ISO 14692-2:2017
<https://standards.iteh.ai/catalog/standards/sist/48409bc8-ffe-4322-a05f-2ad84910fd7d/sist-en-iso-14692-2-2017>

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

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

4 Manufacturer's declarations

4.1 Procedure

Prior to the start of the qualification programme, the manufacturer shall declare:

- a) G_{xx} ;
- b) MPR_{xx} ;
- c) the long term envelope data points;
- d) the threshold envelope data points;
- e) dimensional data;
- f) baseline values for degree of cure, barcol hardness (GRUP and GRVE only) and glass content, where applicable.

The data shall be based on a standard design life of 20 years. [Figure 1](#) provides a flowchart of the procedure for declaring the manufacturer's data.

