SLOVENSKI STANDARD
SIST EN ISO 14692-4:2017

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Nadomešča:
SIST EN ISO 14692-4:2004
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Industrija za predelavo nafte in zemeljskega plina - S steklenimi vlakni ojačeni polimerni cevovodi (GRP) - 4. del: Izdelava, vgradnja in delovanje (ISO 14692-4:2017)

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

Erdöl- und Erdgasindustrie - Glasfaserverstärkte Kunststoffrohrleitungen (GFK) - Teil 4: Fertigung, Installation und Betrieb (ISO 14692-4:2017)

Industries du pétrole et du gaz naturel - Canalisations en plastique renforcé de verre (PRV) - Partie 4: Construction, installation et mise en œuvre (ISO 14692-4:2017)

Ta slovenski standard je istoveten z: **EN ISO 14692-4:2017**

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 fitingi za snovi, ki niso tekočine	Plastics pipes and fittings for non fluid use

SIST EN ISO 14692-4:2017 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 14692-4

September 2017

ICS 75.200; 83.140.30

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English Version

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

Industries du pétrole et du gaz naturel - Canalisations en plastique renforcé de verre (PRV) - Partie 4: Construction, installation, inspection et maintenance (ISO 14692-4:2017)

Erdöl- und Erdgasindustrie - Glasfaserverstärkte Kunststoffrohrleitungen (GFK) - Teil 4: Fertigung, Installation und Betrieb (ISO 14692-4:2017)

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

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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.

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COMITÉ EUROPÉEN DE NORMALISATION
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Contents

Page

European foreword

This document (EN ISO 14692-4:2017) 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 14692-4:2002.

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.

Endorsement notice

The text of ISO 14692-4:2017 has been approved by CEN as EN ISO 14692-4:2017 without any modification.

INTERNATIONAL STANDARD

ISO 14692-4

Second edition
2017-08

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

Part 4: Fabrication, installation and operation

Industries du pétrole et du gaz naturel — Canalisations en plastique renforcé de verre (PRV) —
Partie 4: Construction, installation et mise en œuvre

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Contents

Page

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 14692-4:2002), which has been technically revised. It also incorporates the Technical Corrigendum ISO 14692-4:2002/Cor 1:2006.

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

Introduction

The objective of this document is to ensure that installed GRP piping systems will meet the specified performance requirements throughout their service life. Main users of the document are envisaged to be the principal, fabrication/installation contractors, repair and maintenance contractors, certifying authorities and government agencies.

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

Part 4: Fabrication, installation and operation

1 Scope

This document gives requirements and recommendations for the fabrication, installation, inspection and maintenance of GRP piping systems for use in oil and natural gas industry processing and utility service applications. The recommendations apply to delivery, inspection, handling, storage, installation, system pressure testing, maintenance and repair.

It 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 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

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

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

ASTM D1599, *Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings*

ASTM D2583, *Standard Test Method for Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor*

API Spec 5B, 2008, *Specification for Threading, Gauging and Thread inspection of Casing, Tubing, and Line Pipe Threads*

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.

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 Fabrication and installation

4.1 Delivery, inspection and documentation of GRP piping

The quantity, MSP, nominal dimensions and relevant special requirements of all piping components and prefabricated spools shall be verified for compliance with the purchase order. Shipments of piping components that do not comply with the purchase order shall be reported to the responsible personnel and to the pipe producer for corrective actions.

All piping components shall be visually inspected in accordance with Table A.1 for damage that can have occurred during storage and shipment. Rejected components shall be replaced. If doubts concerning the extent of defects occur during inspection, a specialist approved by the principal shall perform a second inspection of the delivered items.

Adhesive bonding kits shall be inspected to ensure that the kits:

— contain all necessary materials;

— are not leaking or visibly damaged; and

— have at least six months remaining lifetime before the expiration of shelf-life.

All fire protection material shall be inspected to ensure that the original packaging is not damaged.

4.2 Handling and storage

The handling of the GRP components shall follow the requirements given in Annex B and the requirements of the pipe manufacturer.

4.3 System design documentation

The principal shall provide the installer at least with the following information:

a) operating and design parameters:

   1) design pressure;

   2) design temperature (maximum and minimum);

   3) T_g of the resin used in component manufacture;

   4) T_g of the adhesive used in component manufacture, if appropriate;

   5) MSP of each component and MSOP of each piping system;

   6) mean and maximum velocity conditions in each piping system;

   7) chemical resistance limitations, if applicable;

   8) procedures to eliminate or control water hammer and cavitation, if applicable;

   9) fire classification and location of fire-rated pipe, if applicable;

   10) conductivity classification, location of conductive pipe, earth linkage/grounding requirements and location of earthing points;

   11) criticality rating;

b) system drawings and support requirements for heavy equipment;

c) preferred locations for connection of final joint in pipe loops, if appropriate;

d) system criticality and minimum requirements for inspection during installation.

4.4 Installer requirements

4.4.1 Personnel qualification

All pipe, fittings and related items shall be installed by qualified GRP pipe fitters, bonders or spool-builders and thereafter approved by a qualified GRP piping inspector. GRP pipe fitters and GRP piping inspectors shall be qualified according to the minimum requirements detailed in Annex C.

4.4.2 Health and safety

In general, all safety precautions set forth by the manufacturer of pipes and fittings, chemicals, etc. shall be adopted. Materials safety data sheets should always be read before commencing work.

4.5 Installation

4.5.1 General requirements

All piping components shall be installed so that they are ideally stress-free and at least not over-stressed, meaning that:

a) bending of pipes to achieve changes in direction, or forcing misaligned flanges together by over-torquing bolts is not permitted;

b) the manufacturer's recommendations for bolt-torquing sequence, torque increments and maximum bolt torque shall be followed;

c) all supports shall be installed (location and function) as per system design.

Prefabricated pipework shall be fabricated in accordance with fully dimensioned piping isometrics. Overall spool dimensions shall be sized, taking the following into consideration:

— site transport and handling equipment limitations;

— installation and erection limitations;

— limitations caused by the necessity to allow a fitting tolerance for installation ("cut-to-fit" requirements).

If shown on isometric drawings, the fabrication shall include "cut-to-fit" lengths and field joints on fabricated pieces to allow for the setting up of pipework accurately on-site between fixed points. "Cut-to-fit" lengths shall be left square and plain.

The installer shall take the following considerations into account.

a) The need to avoid overstressing of GRP components by the forced pulling of GRP pipework to facilitate alignment at joints, and particularly at flanged joints.

b) The need to prevent damage to joints when handling small-diameter thick-walled pipe, e.g. due to fire protection.

NOTE This is because the high rigidity of the pipe concentrates loading at the thinner sections of pipe wall adjacent to the joint.

c) The preferred location of the last site joint in a piping loop to ensure that necessary access is available, since this joint is often the most difficult to complete.

d) Delays caused by the time required for adhesive or laminated joints to cure without being disturbed. The scheduling of surrounding construction activities shall take into account the risk of possible disturbances to such joints.