

SLOVENSKI STANDARD

SIST EN ISO 19901-5:2022

01-februar-2022

Nadomešča:

SIST EN ISO 19901-5:2016

Industrija za predelavo nafte in zemeljskega plina - Posebne zahteve za naftne ploščadi - 5. del: Upravljanje teže (ISO 19901-5:2021)

Petroleum and natural gas industries - Specific requirements for offshore structures - Part 5: Weight management (ISO 19901-5:2021)

Erdöl- und Erdgasindustrie - Besondere Anforderungen an Offshore-Bauwerke - Teil 5: Gewichtskontrolle (ISO 19901-5:2021)

Industries du pétrole et du gaz naturel - Exigences spécifiques relatives aux structures en mer - Partie 5: Gestion des poids (ISO 19901-5:2021)

<https://standards.iteh.ai/catalog/standards/sist/5adb757b-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

Ta slovenski standard je istoveten z: EN ISO 19901-5:2021

ICS:

75.180.10

Oprema za raziskovanje,
vrtanje in odkopavanje

Exploratory, drilling and
extraction equipment

SIST EN ISO 19901-5:2022

en,fr,de

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

SIST EN ISO 19901-5:2022

<https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN ISO 19901-5

December 2021

ICS 75.180.10

Supersedes EN ISO 19901-5:2016

English Version

Petroleum and natural gas industries - Specific requirements for offshore structures - Part 5: Weight management (ISO 19901-5:2021)

Industries du pétrole et du gaz naturel - Exigences spécifiques relatives aux structures en mer - Partie 5: Gestion des poids (ISO 19901-5:2021)

Erdöl- und Erdgasindustrie - Besondere Anforderungen an Offshore-Bauwerke - Teil 5: Gewichtskontrolle (ISO 19901-5:2021)

This European Standard was approved by CEN on 11 September 2021.

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
(standards.itih.eu)

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, 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 19901-5:2022](https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022)

<https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

European foreword

This document (EN ISO 19901-5:2021) 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 June 2022, and conflicting national standards shall be withdrawn at the latest by June 2022.

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 19901-5:2016.

Any feedback and questions on this document should be directed to the users' national standards body/national committee. A complete listing of these bodies can be found on the CEN website.

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, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Republic of North Macedonia, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey and the United Kingdom.

SIST EN ISO 19901-5:2022

<https://standards.iteh.ai/en/standards/iso/19901-5/2021-06-01/4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

Endorsement notice

The text of ISO 19901-5:2021 has been approved by CEN as EN ISO 19901-5:2021 without any modification.

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

SIST EN ISO 19901-5:2022

<https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

INTERNATIONAL STANDARD

ISO
19901-5

Third edition
2021-11

Petroleum and natural gas industries — Specific requirements for offshore structures —

Part 5: Weight management

iTeh STANDARD PREVIEW
*Industries du pétrole et du gaz naturel — Exigences spécifiques
relatives aux structures en mer —
(standards.iteh.ai) Partie 5: Gestion des poids*

SIST EN ISO 19901-5:2022

<https://standards.iteh.ai/catalog/standards/sist/3ad193cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>



Reference number
ISO 19901-5:2021(E)

© ISO 2021

iTeh STANDARD PREVIEW (standards.iteh.ai)

SIST EN ISO 19901-5:2022

<https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>



COPYRIGHT PROTECTED DOCUMENT

© ISO 2021

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
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

Contents

Page

Foreword	vi
Introduction	viii
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Abbreviations	6
5 Principles of weight management	7
5.1 General	7
5.2 Weight management during project lifecycle phases	7
5.3 Weight management objectives	7
5.3.1 Objectives during conceptual design phase	7
5.3.2 Objectives during FEED, detail engineering and construction phases	8
5.3.3 Objectives during operations and decommissioning phases	8
5.4 Illustration of weight versus time	8
5.5 Loading conditions	9
5.5.1 General	9
5.5.2 Typical loading conditions	9
6 Control Weights	10
6.1 General	10
6.2 Purpose	11
6.3 Budget weights and NTE weights	11
6.3.1 Budget Weights	11
6.3.2 Reserves	11
6.3.3 NTE weights	12
6.4 Loading conditions and parameters	12
6.5 Control weights during operations phase	12
7 Weight management during project execution phases	12
7.1 Conceptual design	12
7.1.1 General	12
7.1.2 Predicted weight	13
7.1.3 Conceptual design weight	13
7.1.4 Upper bound weight constraint	13
7.1.5 Weight estimating	14
7.1.6 Key documentation	14
7.1.7 Estimating principles	15
7.1.8 Deliverables	17
7.2 FEED	18
7.2.1 General	18
7.2.2 Weight management plan	18
7.2.3 Weight management procedure	19
7.2.4 Weight reporting	19
7.2.5 Weight checking and verification	20
7.3 Detail engineering	21
7.3.1 General	21
7.3.2 Weight management plan	21
7.3.3 Weight management procedure	21
7.3.4 Weight reporting	21
7.3.5 Weight checking and verification	23
7.4 Construction	23
7.4.1 General	23
7.4.2 Weight database	23
7.4.3 Weight reporting	24

ISO 19901-5:2021(E)

7.4.4	Weighing of assemblies	24
7.5	Installation and HUC	24
7.6	Operations	24
7.6.1	General	24
7.6.2	Weight management procedure	24
7.6.3	Weight database	25
7.6.4	Legacy weight databases	25
7.6.5	Laydown and storage drawings	25
7.6.6	Decommissioning	26
8	Requirements for suppliers' weight data and weighing of tagged equipment and assembled discipline bulks	26
8.1	General	26
8.2	Submission of weight data	26
8.3	Weighing requirements	27
8.3.1	Equipment	27
8.3.2	Discipline bulks	27
8.4	Weighing procedure	27
8.5	Weighing devices	28
8.5.1	Type of weighing device	28
8.5.2	Calibration of weighing devices	28
8.5.3	Maximum relative uncertainty for weighing devices	28
8.5.4	Capacity of weighing device	29
8.5.5	Spare weighing devices and ancillaries	29
8.6	Witnessing of weighing	29
8.7	Scheduling of weighings	29
8.8	Environmental conditions during a weighing	29
8.9	Weighing operation	29
8.10	Temporary items present during a weighing	30
8.11	Permanent items not installed during a weighing	30
8.12	Weighing certificate	30
9	Requirements for weighing of major assemblies	31
9.1	General	31
9.2	Weighing procedure	31
9.3	Weighing system	32
9.3.1	Load cells	32
9.3.2	Read-out devices	32
9.3.3	Uncertainty of weighing system	32
9.3.4	Calibration of load cells	33
9.3.5	Capacity of weighing system components	33
9.3.6	Spare load cells and ancillaries	33
9.3.7	Hydraulic jacking system	33
9.3.8	Levelness of the assembly during the weighing	34
9.4	Preparations prior to the weighing	34
9.4.1	Notification and witnessing of weighings	34
9.4.2	Environmental conditions during a weighing	34
9.4.3	Weighing prediction report	34
9.4.4	Temporary items during the weighing	35
9.5	Weighing operation	35
9.5.1	Number of results recorded	35
9.5.2	Readings of load cells and level criteria	36
9.5.3	Consistency of results	36
9.5.4	CoG calculations	36
9.5.5	Weighing report	36
9.5.6	Weighing certificate	37
	Annex A (informative) Commentary	38
	Annex B (informative) Weighing certificates	42

Annex C (informative) Example control weight summary	46
Annex D (informative) Variable weight	47
Annex E (informative) Example decision-making RAPID matrix	51
Annex F (informative) Weighing result uncertainty	53
Annex G (informative) Weight database structure	56
Annex H (informative) Weight management guidelines for concrete structures	57
Annex I (informative) Coordinate systems	60
Annex J (informative) Weight allowances and reserves	62
Annex K (informative) Weight management competencies	64
Bibliography	65

iTeh STANDARD PREVIEW (standards.iteh.ai)

[SIST EN ISO 19901-5:2022](https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022)

<https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

ISO 19901-5:2021(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.

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 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.

This document was prepared by Technical Committee ISO/TC 67, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, Subcommittee SC 7, *Offshore structures*, in collaboration with the European Committee for Standardization (CEN) Technical Committee CEN/TC 12, *Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries*, in accordance with the Agreement on technical cooperation between ISO and CEN (Vienna Agreement).

This third edition cancels and replaces the second edition (ISO 19901-5:2016), which has been technically revised.

The main changes are as follows:

- part title changed to "Weight Management";
- document restructured and columnization removed;
- weight control classes removed;
- requirements for weight management for all project phases implemented;
- annexes deleted or relocated to body of document:
 - previous Annex A "Weight data sheets – tagged equipment" combined with previous Annex B "Weighing certificates" to create new joined into a new [Annex B](#) "Weighing certificates";
 - previous Annex C "Weight and load budget (WLB) formats and levels" replaced with new [Annex C](#) "Control weights";
 - deleted previous Annex D "Major elements of the weight displacement";
 - information in previous Annex E "Supplier weighing procedure" relocated to [Clause 8](#);
 - deleted previous Annex F "Guidelines for displacement measurement of floating facilities";

- information in previous Annex G “Requirements for weight control during operations” relocated to [Clause 7](#);
- information in previous Annex H “Requirements for topsides weight estimation — New builds/ green field” relocated to [Clause 7](#);
- information in previous Annex I “Executive summary description” relocated to [Clause 7](#);
- replaced previous Annex J “Weighing result uncertainty” with [Annex F](#) “Weighing result uncertainty”;
- previous Annex K “Weight control database structure” replaced with new [Annex G](#) “Weight database structure”.
- Annexes added:
 - [Annex A](#) “Commentary”;
 - [Annex D](#) “Variable weight”;
 - [Annex E](#) “Example decision-making RAPID matrix”;
 - [Annex H](#) “Weight of concrete structures”;
 - [Annex I](#) “Coordinate systems”;
 - [Annex J](#) “Weight allowances and reserves”;
 - [Annex K](#) “Weight management competencies”.

A list of all parts in the ISO 19901 series can be found on the ISO website.

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.

ISO 19901-5:2021(E)**Introduction**

The International Standards on offshore structures prepared by TC 67/SC 7 (ISO 19900, the ISO 19901 series, ISO 19902, ISO 19903, ISO 19904-1, the ISO 19905 series, and ISO 19906) constitute a common basis covering those aspects that address design requirements and assessments of all offshore facilities used by the petroleum and natural gas industries worldwide. Through their application the intention is to achieve reliability levels appropriate for manned and unmanned offshore facilities, whatever the type of structure and the nature of the materials used.

It is important to recognize that structural integrity is an overall concept comprising models for describing actions, structural analyses, design rules, safety elements, workmanship, quality control procedures and national requirements, all of which are mutually dependent. The modification of one aspect of design in isolation can disturb the balance of reliability inherent in the overall concept or structural system. The implications involved in modifications, therefore, need to be considered in relation to the overall reliability of all offshore structural systems.

The International Standards on offshore structures prepared by TC 67/SC 7 are intended to provide a wide latitude in the choice of structural configurations, materials and techniques without hindering innovation. Sound engineering judgement is therefore necessary in the use of these International Standards.

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

[SIST EN ISO 19901-5:2022](https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022)

<https://standards.iteh.ai/catalog/standards/sist/3adf93cb-cd4d-467c-a39e-916682db4b67/sist-en-iso-19901-5-2022>

Petroleum and natural gas industries — Specific requirements for offshore structures —

Part 5: Weight management

1 Scope

This document specifies requirements for managing and controlling the weight and centre of gravity (CoG) of offshore facilities by means of mass management during all lifecycle phases including; conceptual design, front end engineering design (FEED), detail engineering, construction and operations. These can be new facilities (greenfield) or modifications to existing facilities (brownfield).

Weight management is necessary throughout operations, decommissioning and removal to facilitate structural integrity management (SIM). The provisions of this document are applicable to fixed and floating facilities of all types.

Weight management only includes items with static mass.

Snow and ice loads are excluded as they are not considered to be part of the facility. Dynamic loads are addressed in ISO 19904-1, ISO 19901-6 and ISO 19901-7.

This document specifies:

- a) requirements for managing and controlling weights and CoGs of assemblies and entire facilities;
- b) requirements for managing weight and CoG interfaces;
- c) standardized terminology for weight and CoG estimating and reporting;
- d) requirements for determining not-to-exceed (NTE) weights and budget weights;
- e) requirements for weighing and determination of weight and centre of gravity (CoG) of tagged equipment, assemblies, modules and facilities;

This document can be used:

- f) as a basis for costing, scheduling or determining suitable construction method(s) or location(s) and installation strategy;
- g) as a basis for planning, evaluating and preparing a weight management plan and reporting system;
- h) as a contract reference;
- i) as a means of refining the structural analysis or model.

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/IEC Guide 98-3, *Uncertainty of measurement — Part 3: Guide to the expression of uncertainty in measurement (GUM:1995)*