
Naftna in plinska industrija, vključno z nizkoogljično energijo - Razsuti material za priobalne projekte - Enotirna nosilna gred in dvizno uho (ISO 24202:2023)

Oil and gas industries including lower carbon energy - Bulk material for offshore projects - Monorail beam and padeye (ISO 24202:2023)

Öl- und Gasindustrie einschließlich kohlenstoffarmer Energieträger - Schüttgut für Offshore-Projekte - Einschienenbahnträger und Anschlagauge (ISO 24202:2023)

Industries du pétrole et du gaz, y compris les énergies à faible teneur en carbone - Petits matériels pour projets Offshore - Poutres et oeilletons des monorails (ISO 24202:2023)

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ICS:

75.180.10	Oprema za raziskovanje, vrtanje in odkopavanje	Exploratory, drilling and extraction equipment
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EUROPEAN STANDARD

EN ISO 24202

NORME EUROPÉENNE

EUROPÄISCHE NORM

February 2026

ICS 75.180.10

English Version

Oil and gas industries including lower carbon energy - Bulk material for offshore projects - Monorail beam and padeye (ISO 24202:2023)

Industries du pétrole et du gaz, y compris les énergies
à faible teneur en carbone - Petits matériels pour
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Öl- und Gasindustrie einschließlich kohlenstoffarmer
Energieträger - Schüttgut für Offshore-Projekte -
Einschienenbahnträger und Anschlagauge (ISO
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Contents	Page
European foreword.....	3

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European foreword

The text of ISO 24202:2023 has been prepared by Technical Committee ISO/TC 67 "Oil and gas industries including lower carbon energy" of the International Organization for Standardization (ISO) and has been taken over as EN ISO 24202:2026 by Technical Committee CEN/TC 12 "Oil and gas industries including lower carbon energy" the secretariat of which is held by NEN.

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INTERNATIONAL
STANDARD

ISO
24202

First edition
2023-10

**Oil and gas industries including lower
carbon energy — Bulk material for
offshore projects — Monorail beam
and padeye**

*Industries du pétrole et du gaz, y compris les énergies à faible teneur
en carbone — Petits matériels pour projets Offshore — Poutres et
oilletons des monorails*

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Contents

	Page
Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms, definitions and abbreviated terms	1
3.1 Terms and definitions.....	2
3.2 Abbreviated terms.....	2
4 Requirements and specifications for monorail beams	3
4.1 General.....	3
4.2 Design loads.....	3
4.3 Deflection.....	3
4.4 End stoppers.....	4
4.5 Fabrication.....	4
4.6 Painting and marking.....	4
4.7 Material grade and design temperature.....	4
4.8 Strength assessment.....	5
4.9 Fatigue assessment.....	5
4.10 Specification of beam size and span.....	5
4.11 Curved monorail beams.....	8
4.12 Arrangement for installation of hoists and trolley.....	9
4.13 Load test requirements.....	9
5 Requirements and specifications for padeyes	10
5.1 General.....	10
5.2 Design loads.....	11
5.3 Fabrication.....	11
5.4 Painting and marking.....	11
5.5 Material grade and design temperature.....	12
5.6 Specification of shapes and dimensions.....	12
5.7 Load test requirements.....	15
6 Testing and inspection	15
6.1 General.....	15
6.2 Sampling test.....	15
6.3 Sampling test for monorail beams.....	15
6.4 Sampling test for padeyes.....	16
6.5 Prerequisite for testing.....	16
6.6 Test result evaluation.....	17
6.7 Inspection.....	18
Annex A (normative) Material requirements for monorail beams and padeyes	19
Annex B (normative) Detail shackle data for padeye design	30
Annex C (informative) Quality control plan	31
Annex D (informative) Detail test methods	34
Bibliography	38

ISO 24202:2023(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).

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This document was prepared by Technical Committee ISO/TC 67, *Oil and gas industries including lower carbon energy*, in collaboration with Technical Committee ISO/TC 8, *Ships and marine technology*, SC 8, *Ship design*.

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.

Introduction

This document aims to reduce the number and variations in requirements to the minimum necessary to reflect a common and global best practice based upon existing standards and regulations.

The main benefit of standard shapes and dimensions for monorail beams and padeyes is to gain a reduced delivery time, more streamlined and efficient engineering and construction as well as improved cross use of standardized monorail beams and padeyes between projects. The specified test methods are provided to verify by proof load test that the monorail beams and padeyes including foundation structures have the required load carrying capacity. The detailed test methods provided in this document aim to reduce overall testing time by early stage test and inspection, and to provide a consistent and proven approach to ensure structural strength of monorail beams and padeyes.

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Oil and gas industries including lower carbon energy — Bulk material for offshore projects — Monorail beam and padeye

1 Scope

The purpose of this document is to provide a uniform standard for monorail beams and padeyes when these structures are designed and constructed in offshore projects.

This document specifies the design and material requirements for mechanical handling including monorail beams and padeyes during operations of offshore facilities. This document specifies the standard shapes and dimensions of monorail beams and padeyes and provides material requirements for these bulk materials.

This document is applicable to the structures of monorail beams and padeyes for topside systems for fixed or floating offshore projects.

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 2566-1, *Steel — Conversion of elongation values — Part 1: Carbon and low-alloy steels*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

ISO 7452, *Hot-rolled steel plates — Tolerances on dimensions and shape*

ISO 7500-1, *Metallic materials — Calibration and verification of static uniaxial testing machines — Part 1: Tension/compression testing machines — Calibration and verification of the force-measuring system*

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

ISO 19902, *Petroleum and natural gas industries — Fixed steel offshore structures*

ANSI/AISC 360-10, *Specification for Structural Steel Buildings*

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

EN 10163-2, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections — Part 2: Plate and wide flats*

EN 10163-3, *Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections — Part 3: Sections*

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

3 Terms, definitions and abbreviated terms

For the purposes of this document, the following terms and definitions apply.

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

— ISO Online browsing platform: available at <https://www.iso.org/obp>

ISO 24202:2023(E)

— IEC Electropedia: available at <https://www.electropedia.org/>

3.1 Terms and definitions

3.1.1

monorail beam

beam designed to support trolley hoists or other devices rolling directly on its bottom flange

3.1.2

padeye

lift point consisting essentially of a plate, reinforced by cheek plates if necessary, with a hole through which a shackle can be connected

Note 1 to entry: Padeye only covers material handling as repair and maintenance activity during operation and not construction activities, such as module lifting and block lifting.

[SOURCE: ISO 19901-6:2009, 3.63, modified — Note 1 to entry has been added.]

3.1.3

proof load test

production load test performed to validate the structural strength of *monorail beams* (3.1.1) and *padeyes* (3.1.2) including supporting structures

3.1.4

sampling test

conservative selection of *monorail beam* (3.1.1) or *padeye* (3.1.2) to ensure structural strength check considering variable design parameters, such as safety working load, size, shape and span

Note 1 to entry: To reduce actual load test, design verification is required to verify structural strength of monorail beams and padeyes.

3.2 Abbreviated terms

ASD	allowable stress design
CJP	complete joint penetration
DF	design factor
DAF	dynamic amplification factor
DLF	design load factor
LRFD	load and resistance factor design
MPI (MT)	magnetic particle inspection (magnetic particle test)
NDT (NDE)	non-destructive test (non-destructive examination)
PJP	partial joint penetration
PVC	polyvinyl chloride
SWL	safety working load
UT	ultrasonic test
VT	visual test
WPG	welded plate girder

4 Requirements and specifications for monorail beams

4.1 General

This clause specifies requirements for design and test of monorail beams made from rolled or built-up section as per material data sheets in [Annex A](#). This specification applies to monorail beams and their components only; it does neither apply to supporting structures, to travelling trolleys and lifting appliances operating on the beams nor to crane gantries or rails.

Monorail beams should be designed to sufficiently support the loads from lifting equipment considering SWL and arrangement of supporting structures. The design shall be based on the loads and load effects, which are described by the manufacturer of the specific lifting equipment or described in [4.2](#), that are to be suspended by the monorail beams.

4.2 Design loads

Unless otherwise agreed or stated by the manufacturer of the lifting equipment, the following design loads apply:

- The safety working load (SWL) for monorail beams shall be designed equal to or larger than the selected trolley hoist SWL.
- Design load factor (DLF) shall be taken as per [Table 1](#).
- The information on trolley hoist self-weight provided by manufacturer shall be used for design.
- The horizontal load shall be taken as minimum 10 % of the design load in longitudinal direction and 20 % of the design load in transverse direction acting in the lowest suspension point including DLF. Horizontal loads in both directions shall be applied simultaneously to the vertical design load.

Table 1 — Design load factor depending on SWL

SWL	DLF for LRFD	DLF for ASD
SWL ≤ 5 t	2,52	1,74
SWL > 5 t	2,18	1,51

NOTE 1 DLF for LRFD is based on DAF and DF.

NOTE 2 DLF for ASD is converted from DLF for LRFD considering safety factor (0,6) and material resistance factor (1,15).

NOTE 3 In the proposed DLF, the value of the dynamic amplification factor (DAF) has been taken as 1,5 for SWL up to and including 5 t, and 1,3 for SWL above 5 t.

NOTE 4 Design factor (DF) is defined as partial load factor multiplied with consequence factor. For design of monorail beams, DF 1,68 is considered as single critical elements.

4.3 Deflection

Vertical deformation, δ_{ver} , of a monorail beam shall be calculated under the SWL with trolley hoist self-weight as single load at middle of simple support or at end of cantilever (excluding load factors and self-weight of monorail beam). δ_{ver} shall conform to the following allowable values:

- for simple support member with both side boundary as shown in [Figure 1](#): $\delta_{\text{ver}} \leq L / 500$
- for cantilever member: $\delta_{\text{ver}} \leq L / 250$

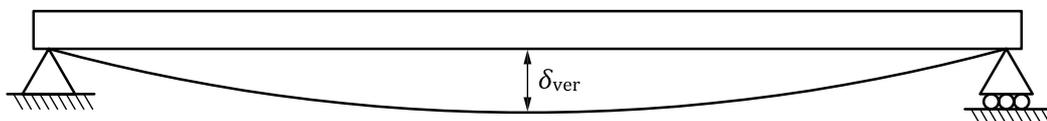


Figure 1 — Vertical deformation