



**BSI Standards Publication**

## **Ships and marine technology — High holding power balance anchors**

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## National foreword

This British Standard is the UK implementation of ISO 24061:2021.

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## **Ships and marine technology — High holding power balance anchors**

*Navires et technologie maritime — Ancres à grande tenue*



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## 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)).

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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 8, *Ships and marine technology*, Subcommittee SC 4, *Outfitting and deck machinery*.

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).

# Ships and marine technology — High holding power balance anchors

## 1 Scope

This document specifies the design and production requirements, test methods, marking and inspection certificate for high holding power balance anchors (hereinafter referred to as anchors).

It is applicable to the design, selection, production and acceptance of high holding power balance anchors.

## 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 3828, *Shipbuilding and marine structures — Deck machinery — Vocabulary and symbols*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 3828 and the following 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>
- IEC Electropedia: available at <https://www.electropedia.org/>

### 3.1

#### high holding power balance anchor

#### HHPB anchor

anchor with a rotatory fluke that can be restored back to upright position by gravity once the anchor is hoisted from the sea bed, and with a holding power of at least twice that of an ordinary stockless anchor of the same mass

## 4 Design

### 4.1 Structure

An anchor is generally composed of a shank, a fluke, a head pin, a lateral pin, a shackle and an anchor shackle. The typical structure is shown in [Annex A](#).

### 4.2 Basic specifications and dimensions

Anchors shall be designed as per the quantity required by outfitting. They shall be classified into different specifications based on the anchor theoretical mass. The corresponding basic dimensions are shown in [Table A.1](#).

### 4.3 Material

**4.3.1** The chemical composition of the anchor components shall be as specified in [Table 1](#).

**Table 1 — Chemical composition of anchor components**

Values in percent (%)

| Component                                                                                        | Chemical element content <sup>a</sup> |      |                 |       |       |                               |      |      |      |       |
|--------------------------------------------------------------------------------------------------|---------------------------------------|------|-----------------|-------|-------|-------------------------------|------|------|------|-------|
|                                                                                                  | C                                     | Si   | Mn <sup>c</sup> | S     | P     | Residual element <sup>b</sup> |      |      |      |       |
|                                                                                                  |                                       |      |                 |       |       | Ni                            | Cr   | Cu   | Mo   | total |
| shackle body, shank                                                                              | 0,29                                  | 0,35 | 1,10 to 1,60    | 0,035 | 0,035 | -                             | -    | -    | -    | -     |
| shank, fluke                                                                                     | 0,23                                  | 0,60 | 0,50 to 1,60    | 0,04  | 0,04  | 0,40                          | 0,30 | 0,30 | 0,15 | 0,80  |
| head pin, lateral pin, shackle pin                                                               | 0,23                                  | 0,45 | 0,30 to 1,50    | 0,035 | 0,035 | 0,25                          | 0,25 | 0,25 | 0,15 | 0,80  |
| <sup>a</sup> All figures are maximum values, in %, except the ranges.                            |                                       |      |                 |       |       |                               |      |      |      |       |
| <sup>b</sup> Unless required by the purchaser, the residual elements do not need to be analyzed. |                                       |      |                 |       |       |                               |      |      |      |       |
| <sup>c</sup> 0,04 % Mn may be added to the upper limit for each 0,01 % carbon reduction.         |                                       |      |                 |       |       |                               |      |      |      |       |

**4.3.2** The mechanical properties of anchor components shall be as specified in [Table 2](#).

**Table 2 — Mechanical properties of anchor components**

| Component                                    | Mechanical property <sup>a</sup> |                   |                      |                                       |               |
|----------------------------------------------|----------------------------------|-------------------|----------------------|---------------------------------------|---------------|
|                                              | Tensile strength                 | Yield strength    | Extension percentage | Percentage of breaking area reduction | Impact energy |
|                                              | N/mm <sup>2</sup>                | N/mm <sup>2</sup> | %                    | %                                     | J             |
| shackle body shank                           | 490                              | 295               | 22                   | -                                     | 27            |
| shank, fluke, shank                          | 450                              | 230               | 22                   | 35                                    | 25            |
| head pin, lateral pin, shackle pin           | 410                              | 245               | 25                   | 35                                    | 27            |
| <sup>a</sup> All figures are minimum values. |                                  |                   |                      |                                       |               |

**4.3.3** The surface and the inside of cast and forged components of anchors should be free from cracks, airholes, cratering, cold shuts, scabs and any other defects that may affect the strength.

**4.3.4** A Charpy V-notch impact test below 0 °C should be carried out regarding ice zone navigation requirements. The impact absorbing energy should not be less than 27 J.

**4.3.5** The welding material used during the fabrication of the anchor should be compatible with the parent material.

## 5 Production

### 5.1 Visual appearance

Anchor rotary parts should be ground to Ra 25 µm and be able to flexibly rotate around the centre of gravity. The surface roughness of non-processed parts should be not more than Ra 100 µm.