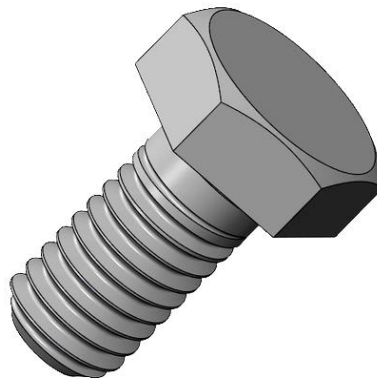


# SPECIFICATION FASTENERS

OAS-DTS-SPC-001



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## 1. Introduction

### 1.1 Purpose

This specification covers the most common fastener material in use in Oceaneering. The specification shall ensure that the quality of the delivered products adhere to minimum industry- and/or Oceaneering specific requirements.

### 1.2 Terms and Abbreviations

All abbreviations used throughout the specification shall be listed in the table.

Abbreviation	Full Name
ASTM	American Society for Testing and Materials
DIN	Deutsches Institut für Normung (German Institute for Standardization)
EN	European Standard
ISO	International Standards Organization
OAS	Oceaneering AS

### 1.3 Reference and standards

Doc.no	Description
ISO 3506	Mechanical properties of corrosion-resistant stainless steel fasteners
EN 10204	Metallic products - Types of inspection documents
ISO 3651	Determination of resistance to intergranular corrosion of stainless steels
ISO 898	Mechanical properties of fasteners made of carbon steel and alloy steel
ASTM A320	Standard Specification for Alloy-Steel and Stainless Steel Bolting for Low-Temperature Service
Norsok-M630	Material data sheets and element data sheets for piping
ASTM A1082	Standard Specification for High Strength Precipitation Hardening and Duplex Stainless Steel Bolting for Special Purpose Applications

## 2. Requirements for fasteners class A4-80

Fasteners class A4-80 shall be delivered according to ISO 3506-1.

### Chemistry requirements

The material shall conform to the requirements in ISO 3506-1 for class A4-80 fasteners. Values shown in table below are maximums unless otherwise noted.

Elements	Wt. Percentage (%)
Carbon, max <sup>1,2</sup>	0.08
Silicon, max	1.00
Manganese, max	2.00
Phosphorus, max	0.045
Sulfur, max	0.03
Chromium	16.00 - 18.50
Molybdenum	2.00 - 3.00
Nickel	10.00 - 15.00
Copper, max	1.00

*1 For a maximum C content of 0.03%, nitrogen may be present to a maximum of 0.22%.*

*2 At the discretion of the manufacturer, the C content may be higher where required to obtain the specified mechanical properties at larger diameters but shall not exceed 0.12%.*

### Testing

All screws, bolts, and studs shall be test in accordance with ISO 3651-1 or ISO 3651-2 in addition to ISO 3506-1

### Documents to be supplied with each batch delivered

A copy of all the documents listed shall be preserved by the fastener manufacturer for minimum 25 years within their electronic document storage system, from the delivery date of each fastener material batch.

The fastener manufacturer shall send the following documents with each delivery.

- Traceability list to all test and inspection records for the batch of parts.
- Batch Test Report consisting of the following documents:
- EN10204 3.1 Material Cert showing the following:
  - Fastener Type and Size
  - Batch/Lot Number and lot size
  - Actual Product Marking
  - Chemistry Tensile test ( $R_m/R_{p0.2}/E$ )

### 3. Requirements for fasteners class A4-70

Fasteners class A4-70 shall be delivered according to ISO 3506-1.

#### Documents to be supplied with each batch delivered

- Certificate of Conformance\*

*\*Minimum requirement, unless otherwise specified on the company issued PO*

### 4. Requirements for carbon steel fasteners

Fasteners class 8.8, 10.9 and 12.9 shall be delivered according to ISO 898-1 for bolts and ISO 898-2 for nuts.

#### Documents to be supplied with each batch delivered

- Certificate of Conformance\*

*\*Minimum requirement, unless otherwise specified on the company issued PO*

### 5. Requirements for fasteners grade L7

Fastener's grade L7 shall be delivered according to ASTM A320/Norsok-M630 MDS X07.

#### Documents to be supplied with each batch delivered

A copy of all the documents listed shall be preserved by the fastener manufacturer for minimum 25 years within their electronic document storage system, from the delivery date of each fastener material batch.

The fastener manufacturer shall send the following documents with each delivery.

- Traceability list to all test and inspection records for the batch of parts.
- Batch Test Report consisting of the following documents:
- EN10204 3.1 Material Cert showing the following:
  - Fastener Type and Size
  - Batch/Lot Number and lot size
  - Actual Product Marking
  - Chemistry Tensile test ( $R_m/R_{p0.2}/E$ )

### 6. Requirements for super duplex fasteners

Fasteners from Super Duplex shall be delivered according to ISO 3506 and material grades EN 1.4410 or UNS S32750. Reference standard Norsok-M630 MDS D60/ASTM A1082.

#### Documents to be supplied with each batch delivered

A copy of all the documents listed shall be preserved by the fastener manufacturer for minimum 25 years within their electronic document storage system, from the delivery date of each fastener material batch.

The fastener manufacturer shall send the following documents with each delivery.

- EN10204 3.1\* Material Cert showing the following:
  - Fastener Type and Size
  - Batch/Lot Number and lot size
  - Actual Product Marking
  - Chemistry Tensile test ( $R_m/R_{p0.2}/\epsilon$ )

*\*Minimum requirement, unless otherwise specified on the company issued PO*

## 7. Fastener supplier qualification

The fastener supplier must be qualified according to OAS procedure SCM-OPR-028.

## 8. Packaging

Packaging shall be according to the established standard based on ordinary shipment and handling. Packaging must prevent any damage to threads due to handling and transport. Packaging should also protect against corrosion and be suitable for the specified mode of transport.

Fasteners shall be packaged by one of two methods as agreed between the supplier and OAS

### 1) Oceaneering managed inventory

Fasteners shall be packaged by individual batch numbers only. No mixing of batches is permitted.

### 2) Vendor Managed Inventory

Fasteners are packaged per the BOM on the OAS work order and have a traceability list for all documentation in the package.

- **Packaging Marking**

The packaging shall be clearly marked with the following

- OAS Purchase order no
- OAS Part no
- Batch no (no mixing of batches in a package)
- OAS part description

## 9. VISUAL INSPECTION

Upon receipt, OAS inspection shall confirm that the materials received are as shown on the Purchase Order and delivered documentation.

OAS inspection shall also confirm that the packaging and handling has been satisfactory to maintain the materials against damage and corrosion.