



Exploration & Production

GENERAL SPECIFICATION

PIPING VALVES VESSELS

GS PVV 146

Bolting for piping

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1. Scope

This specification completes the description given in the requisitions issued by the Engineering Company and stipulates the particular requirements for the fabrication, inspection and shipment of the bolting.

2. Reference documents

The reference documents listed below form an integral part of this General Specification. Unless otherwise stipulated, the applicable version of these documents, including relevant appendices and supplements, is the latest revision published at the EFFECTIVE DATE of the CONTRACT.

Standards

Reference	Title
ASME B 1.1	Unified Inch Screw Threads
ASME B 1.2	Gages and Gaging for Unified Screw Threads
ASME B 16.5	Steel Pipe Flanges and Flanged Fittings
ASME B 18.2.1	Square and Hex Bolts and Screws
ASME B 18.2.2	Square and Hex Nuts
ASTM A 193	Alloy-Steel and Stainless Steel Bolting Materials for High-temperature Service
ASTM A 194	Carbon and Alloy-Steel Nuts for Bolts for High-pressure and High-temperature Service
ASTM A 320	Alloy-Steel Bolting Materials for Low-temperature Service
ASTM A 370	Mechanical Testing of Steel Products

Professional Documents

Reference	Title
Not applicable	

Regulations

Reference	Title
Not applicable	

Codes

Reference	Title
ASME B 31.3	Process piping



Other documents

Reference	Title
Not applicable	

Total General Specifications

Reference	Title
Not applicable	

3. Materials

3.1 General

The steels used for the fabrication of the bolting shall be produced in a MARTIN furnace, in an electric furnace, or by the basic oxygen process.

All parts shall undergo thermal hardness treatments in accordance with the requirements of the applicable codes and standards listed as reference documents.

3.2 Toughness tests

Except as otherwise specified in the order, only bolting specified to standard [ASTM A 320](#) or specified for low-temperature service shall undergo toughness tests.

4. Dimensions

4.1 Stud bolts and screws

The diameters and lengths of stud bolts and Hex screws ("Heavy" series) shall comply with the standards [ASME B 16.5](#) and [ASME B 18.2.1](#) and shall conform to the dimensions shown on the materials requisitions.

Diameters shall be in inches, and lengths shall be in millimeters.

The lengths given on the requisitions are service lengths that do not include the dimensions of the end bevels.

4.2 Nuts

All nuts shall be of the hexagonal type ("Heavy" series) and shall be in accordance with the standard [ASME B 18.2.2](#).

5. Fabrication

5.1 General

Stud bolts and nuts may be machined from treated steel rods. However, nuts may also be forged.

Screws shall be made by die-working the heads.

After these operations of forging and die-working, the bolting shall undergo the hardness treatments required by the reference codes and standards.

5.2 Threading

Threading shall be in conformity with the following series of standard [ASME B 1.1](#):

- "Coarse" series: for diameters less than or equal to 1"
- "8 threads" series: for diameters equal to or greater than 1" 1/8.

Stud bolts shall be threaded along their entire length. The machining and surface-condition tolerances applicable to the various threadings shall be in conformity with the following classes:

- Class 2A of standard [ASME B 1.1](#) for stud bolts and screws
- Class 2B of standard [ASME B 18.2.2](#) for nuts.

5.3 Surface treatment

Except for stainless steel materials, the bolting must undergo surface treatment of the "zinc plated/bichromate-treated" type.

6. Quality control

The inspection and tests necessary to confirm that the products meet the requirements of the standards, specifications and requisitions shall be carried out in the Manufacturer's plant by personnel of the plant. This specially-qualified personnel shall be independent of the production department of the plant.

Products shall be guaranteed by an inspection certificate (conformity, material, test, etc.), which must COMPANY the supply.

If the Manufacturer does not have the necessary means of examination, these tests may be carried out by an Inspection Agency and at a place approved by the COMPANY or the Engineering Company.

7. Manufacturer's dossier

7.1 Certificates of conformity

The Manufacturer shall submit certificates of conformity with the standards specified in the requisitions.



7.2 Material certificates

The Manufacturer shall submit material certificates giving the results of the chemical analysis and of the mechanical tests carried out in accordance with the requirements of the reference codes and standards.

8. Preparation for shipment

8.1 Marking

In addition to the markings required by the reference standards, the grade of steel and the maker's mark shall be cold-stamped on each bolting element.

The marking shall be located on one of the ends of each stud bolts and one of the flats of each screw head and each nut.

8.2 Packing

The bolting must be packed in sea-packing, which must, in addition, be water-proof in the case of austenitic stainless steel. Packing must be suitable for all stages of transport (rail, road, air and sea).