ISO 27509:2020 (E)

Petroleum and natural gas industries — Compact flanged connections with IX seal ring

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Abbreviations and symbols

4.1 Abbreviated terms
4.2 Symbols

5 Design

5.1 General
5.2 Design principles
5.3 Assembly requirements
5.4 Standard components
5.5 Units of measurements
5.6 Rounding
5.7 Conformance with piping design codes
5.8 Conformance with this document

6 Designation

6.1 Designation of flanges
6.2 Designation of seal rings

7 Materials

7.1 General
7.2 Flange materials
7.3 Bolting materials
7.4 Seal ring materials

8 Strength, pressure/temperature ratings and leak tightness

8.1 General
8.2 Pressure/temperature ratings
8.3 Pressure testing and leak tightness

9 Dimensions of flanges

9.1 General
9.2 Weld neck dimensions
9.3 Blind flange (BL) dimensions
9.4 Integral flange (IF) dimensions
9.5 Rigid interface dimensions
9.6 Dimensions of paddle blanks (PB) and paddle spacers (PS)
9.7 Handle and lifting lugs
9.8 Dimensions of orifice spacers (OS)
9.9 Dimensions of reducing threaded flanges
9.10 Auxiliary connections
9.11 Flange tolerances
9.12 Surface finish

10 Marking of flanges

10.1 Flanges other than integral flanges
10.2 Manufacturer's name or trademark
10.3 Nominal size
10.4 Pressure class designation
10.5 Pipe dimensions
10.6 Material identification
10.7 Identification of internally threaded flanges
10.8 Material traceability
10.9 Marking examples
10.10 Stamping

11 Dimensions of seal rings

12 Manufacture, testing and inspection of IX seal rings

13 Coating and colour coding

14 Marking of seal rings

15 Quality management systems

16 Bolt dimensions and masses

Annex A (normative) Pressure temperature ratings and load capacity

A.1 Flange structural capacity
A.1.1 General
A.1.2 Capacity
A.1.3 Loads
A.1.4 Flange utilization ratio
A.1.5 Allowable utilization ratios

Annex B (normative) Integral flange angle selection

B.1 General
B.2 Method 1
B.3 Method 2: Special flange neck geometries
B.4 Examples
B.4.1 Standard flange length with interpolated face angles
B.4.2 Special flange neck geometries with interpolated face angle from cross-sectional area estimation (non-standard flange neck geometry)
B.4.3 Special flange neck geometries with interpolated face angle from effective inner diameter and cross-sectional area estimation
B.4.4 Special flange neck geometries with extrapolated face angle from effective inner diameter in “extended range” and cross-sectional area estimation

Annex C (normative) Bolt dimensions and masses

Annex D (normative) Handling, installation, assembly and repair of flanges

D.1 General
D.2 Protection
D.3 Flange handling
D.4 Welding
D.5 Painting
D.6 Procedure personnel and equipment for assembly
D.7 Preparation before final preloading
D.7.1 Clean and check dimensions and surfaces
D.7.2 IX seal ring – Installation and check for stand-off
D.7.3 Use of lubrication and sealant
D.7.4 Lubrication of nuts and bolts
D.7.5 Alignment
D.7.6 Fitting
D.8 Final pre-loading procedure
D.8.1 Torque tightening

D.8.2 Tightening by hydraulic tensioner
D.9 Maintenance
D.10 Disassembly
D.11 Bolt tensioning qualification procedure
D.11.1 General
D.11.2 Competence management
D.11.3 Torque preloading
D.11.3.1 Background
D.11.3.2 Equipment
D.11.3.3 Calibration and qualification
D.11.3.4 Lubrication procedure
D.11.4 Hydraulic tension preloading
D.11.4.1 Background
D.11.4.2 Equipment
D.11.4.3 Qualification and calibration

Annex E (informative) Mass of flanges

Annex F (informative) Metric bolting

Annex G (informative) Additional information on bibliographical references

Page count: 107