

ICS 75.200
CCS E 16



**NATIONAL STANDARD OF THE
PEOPLE'S REPUBLIC OF CHINA**

GB/T 46554-2025

**Petroleum and natural industries - Pipeline transportation
systems - Test procedures for mechanical connectors**

石油天然气工业 管道输送系统 机械连接件试验程序

(English Translation)

Issued on: December 2, 2025

Implemented on: April 1, 2026

Issued by: State Administration for Market Regulation

Table of Contents

Preface	
1 Scope	
2 Normative References	
3 Terms and Definitions	
4 Symbols and Abbreviations	
4.1 Symbol	
4.2 Abbreviations	
5 Test Level	
5.1 General Rules	
5.2 Pressure, Temperature and Depth Ratings	
5.3 Application Level	
5.4 Confidence Level	
6 Test Items 7.	
6.1 Requirement	
6.2 Experimental Objectives	
6.3 Determination of Mechanical Load	
6.4 Laboratory Selection	
6.5 Selection of Tests and Specimen Quantity	
6.6 Additional Tests	
6.7 Previous test results	
7 Sample preparation requirements 9.	
7.1 General Rules	
7.2 Connector Geometry and Performance Data	
7.3 Diameter selection	
7.4 Determination of Limit Tolerances	
7.5 Sample Material	
7.6 Sample Preparation	
7.7 Opening	
7.8 14 spare samples	
7.9 Test records shall be retained for 14 days.	
8 Laboratory preparation	
8.1 General Rules	

- 8.2 Calibration Requirements
- 8.3 Test Medium
- 9 Leakage detection
 - 9.1 Leakage Detection Methods
 - 9.2 Sensitivity of Leak Detection
 - 9.3 Leakage Detection During External Pressure Testing
- 10 Assembly and disassembly tests
 - 10.1 General Requirements
 - 10.2 Assembly Method
 - 10.3 Repeated assembly and disassembly
 - 10.4 Final Assembly
 - 10.5 Reverse Torque Test for Non-Rotating Assembly Connectors
 - 10.6 Acceptance Criteria
- 11 Service Load Test
 - 11.1 Experimental Preparation
 - 11.2 Seal Integrity Confirmation
 - 11.3 Selection of Test Pressure and Temperature
 - 11.4 Installation Test
 - 11.5 Hydrostatic pressure test
 - 11.6 Unconstrained Operation Test
 - 11.7 Constrained Operation Test
- 12 Ultimate Load Test
 - 12.1 General Rule
 - 12.2 Tensile test until failure
 - 12.3 Compression to failure test
 - 12.4 Internal pressure to failure test
 - 12.5 Bending to Failure Test
- 13 Bending fatigue test
 - 13.1 General Rule
 - 13.2 Test stress range setting
 - 13.3 Bending fatigue testing apparatus
 - 13.4 Bending fatigue test procedure
 - 13.5 Interpretation of Fatigue Results
- 14 Test Report
 - 14.1 General Rule

14.2 Manufacturer's Detailed Report

14.3 Test Report

Appendix A (Normative) Application Level

A.1 General Rule

A.2 Application Level 1

A.3 Application Level 2

A.4 Application Level 3

A.5 Application Level 4

Appendix B (Normative) Calculation of Service Loads for Connectors

B.1 Reverse torque, Z

B.2 Installation Test

B.3 Hydrostatic pressure test

B.4 Unconstrained operation test

B.5 Constrained Operation Test

Appendix C (Informative) Scope of Experiments and Data Extrapolation

C.1 Experimental Objective

C.2 Product Series

C.3 Experiment

C.4 Extrapolation

Appendix D (Informative) Additional Tests for Special Purposes

D.1 General Rule

D.2 Elastic sealing test

D.3 Corrosion allowance

D.4 Assembly/Disassembly Test under Simulated Field Conditions

D.5 Grease pressure retention in threaded joints

D.6 Rapid Cooling Situation

D.7 Plastic liner tube

D.8 Pipes for corrosive media

D.9 Fire resistance test

D.10 Over-yield compression

D.11 Crevice Corrosion

D.12 Impact

D.13 Deepwater J-shaped pipelaying

Appendix E (Normative) Geometric Dimensions and Performance Data of Connectors

Appendix F (Normative) Test Data Table

Appendix G (Informative) Additional Information on Fatigue

G.1 Finite Element Analysis

G.2 Selection of Fatigue Test Load

G.3 Alternative methods for selecting fatigue loads

G.4 Low Fatigue Test

G.5 Axial load

G.6 Effect of Mean Load

G.7 Statistical Interpretation of Fatigue Test Results

References

Foreword

This document complies with the provisions of GB/T 1.1-2020 "Standardization Work Guidelines Part 1: Structure and Drafting Rules of Standardization Documents".

Drafting.

This document is modified to adopt ISO 21329:2004 "Test procedures for mechanical connections in pipeline transportation systems for the oil and gas industry".

Compared with ISO 21329:2004, this document has undergone the following structural adjustments.

---7.1 corresponds to 7.1 and 7.2 in ISO 21329:2004;

---7.2~7.9 correspond to 7.3~7.10 in ISO 21329:2004;

---Chapter 14 corresponds to Annex E of ISO 21329:2004;

---Appendix B (Normative) corresponds to Annex C of ISO 21329:2004;

---Appendix C corresponds to Appendix F in ISO 21329:2004;

---Appendix D corresponds to Appendix G in ISO 21329:2004;

---Appendix E corresponds to Appendix B in ISO 21329:2004;

---Appendix F corresponds to Appendix D in ISO 21329:2004;

---Appendix G corresponds to Appendix H in ISO 21329:2004.

The technical differences between this document and ISO 21329:2004, and the reasons therefor, are as follows.

---The scope has been changed (see Chapter 1) to comply with relevant national standards;