DIN EN ISO 21329:2005-07 (E)

Petroleum and natural gas industries - Pipeline transportation systems - Test procedures for mechanical connectors (ISO 21329:2004); English version EN ISO 21329:2004

Contents

Page

Foreword ... 4

Introduction ... 5

1 Scope ... 7

2 Normative references ... 7

3 Terms and definitions ... 8

4 Symbols and abbreviated terms ... 10
4.1 Symbols ... 10
4.2 Abbreviated terms ... 12

5 Test categories ... 12
5.1 General ... 12
5.2 Pressure, temperature and depth ratings ... 12
5.3 Application levels ... 13
5.4 Confidence levels ... 13

6 Test requirements ... 14
6.1 General ... 14
6.2 Purpose of tests ... 15
6.3 Basis for mechanical loads ... 15
6.4 Test-house selection ... 16
6.5 Selection of tests and number of test samples ... 16
6.6 Additional tests ... 17
6.7 Prior test results ... 17

7 Connector manufacturer requirements ... 19
7.1 General ... 19
7.2 Quality control ... 19
7.3 Connector geometry and performance data ... 19
7.4 Selection of diameter ... 19
7.5 Setting tolerances ... 19
7.6 Connector material requirements ... 21
7.7 Preparation of test samples ... 22
7.8 Ports ... 25
7.9 Replacement test samples ... 25
7.10 Test record retention ... 25

8 Test-house preparations ... 25
8.1 General ... 25
8.2 Calibration requirements ... 26
8.3 Pressurization media ... 27

9 Leak detection ... 27
9.1 Leak-detection methods ... 27
9.2 Leak-detection sensitivity ... 27
9.3 External pressure leak detection ... 27

10 Make-and-break testing ... 28
10.1 General requirements ... 28
10.2 Make-up method ... 29
10.3 Repeated make-up and breakout ... 31
10.4 Final make-up ... 31
10.5 Reverse-torque tests of non-rotational make-up connectors ... 31
10.6 Acceptance criteria ... 31

Page

11 Service-load test **32**
11.1 Set-up **32**
11.2 Confirmation of seal integrity **34**
11.3 Selection of test pressures and temperatures **34**
11.4 Installation tests **36**
11.5 Hydrostatic pressure tests **38**
11.6 Operational unrestrained tests **39**
11.7 Operational restrained tests **41**

12 Limit-load tests **43**
12.1 General **43**
12.2 Tension-to-failure test **44**
12.3 Compression-to-failure test **45**
12.4 Pressure-to-failure test **46**
12.5 Bending-to-failure test **46**

13 Bending-fatigue test procedures **47**
13.1 General **47**
13.2 Setting stress ranges for the test **47**
13.3 Bending-fatigue test set-up **48**
13.4 Bending-fatigue test procedure **48**
13.5 Interpretation of fatigue results **49**

Annex A (normative) **Application levels** **50**

Annex B (normative) **Connector geometry and performance data** **53**

Annex C (normative) **Calculation of connector service loads** **56**

Annex D (normative) **Test data tables** **60**

Annex E (normative) **Connector test reports — Content** **68**

Annex F (informative) **Test sizes and data extrapolation considerations** **71**

Annex G (informative) **Additional testing for special applications** **73**

Annex H (informative) **Additional information on fatigue** **81**

Bibliography **86**