DIN EN ISO 17078-2:2010-08 (E)

Petroleum and natural gas industries_- Drilling and production equipment_- Part_2: Flow control devices for side-pocket mandrels (ISO_17078-2:2007_+ Cor._1:2009); English version EN_ISO_17078-2:2007_+ AC:2009, only on CD-ROM

Contents

Page

Foreword 4

Introduction 5

1 Scope 6

2 Normative references 6

3 Terms and definitions 7

4 Symbols and abbreviated terms 11
4.1 Abbreviations 11
4.2 Symbols and engineering terms 12

5 Functional specification 14
5.1 General 14
5.2 Functional characteristics 14
5.3 Well parameters 15
5.4 Operational parameters 16
5.5 Compatibility with well-related equipment 16
5.6 Environmental service classes 17
5.7 Design validation grades 17
5.8 Product functional testing grades 17
5.9 Quality control grades 17
5.10 Additional required testing 18

6 Technical specification 18
6.1 General requirements 18
6.2 Technical characteristics 19
6.3 Design criteria 20
6.4 Allowable design changes 23
6.5 Design verification and validation requirements 23
6.6 Product functional testing requirements 24

7 Supplier/manufacturer requirements 24
7.1 General 24
7.2 Documentation and data control 24
7.3 Product identification requirements 27
7.4 Quality control requirements 27
7.5 Heat-treating-equipment qualification 32
7.6 Welding requirements 33
7.7 Non-destructive examination requirements 33
7.8 Storage and shipping preparation 34
7.9 Allowable changes after manufacturing 34
7.10 Reconditioning of flow-control devices 34

Annex A (normative) **Design validation and product functional testing requirements** 35

Annex B (normative) **Environmental service classes** 40

Annex C (normative) **Design validation grades** 42

Annex D (normative) **Product functional testing grades** 43

Annex E (normative) **Interface testing requirements** 44

Annex F (normative) **Insertion testing requirements** 47

Annex G (normative) **Probe and travel testing and load rate determination** 51

Annex H (normative) **Dynamic flow testing and flow coefficient calculation** 61

Annex I (normative) **Back-check testing** 86

Page

Annex J (normative) **Opening and closing pressure testing** **94**

Annex K (normative) **Bellows actuation life cycle testing** **101**

Annex L (normative) **Erosion testing requirements** **104**

Annex M (normative) **Shelf (bellows integrity) testing requirements for nitrogen-pressure-charged flow-control devices** **107**

Annex N (normative) **Conducting port/seat leakage rate testing** **111**

Annex O (informative) **Performance testing — Recommendations for a flow-control device performance test facility** **115**

Annex P (informative) **Performance testing — Prediction correlations using a simplified flow-control device performance model** **124**

Bibliography **132**