

# 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

<b>Annex J (normative) Opening and closing pressure testing .....</b>	<b>94</b>
<b>Annex K (normative) Bellows actuation life cycle testing.....</b>	<b>101</b>
<b>Annex L (normative) Erosion testing requirements .....</b>	<b>104</b>
<b>Annex M (normative) Shelf (bellows integrity) testing requirements for nitrogen-pressure-charged flow-control devices.....</b>	<b>107</b>
<b>Annex N (normative) Conducting port/seat leakage rate testing.....</b>	<b>111</b>
<b>Annex O (informative) Performance testing — Recommendations for a flow-control device performance test facility .....</b>	<b>115</b>
<b>Annex P (informative) Performance testing — Prediction correlations using a simplified flow- control device performance model.....</b>	<b>124</b>
<b>Bibliography.....</b>	<b>132</b>