BRITISH STANDARD

BS EN ISO 17078-1:2004 +A1:2010

Petroleum and natural gas industries — Drilling and production equipment —

Part 1: Side-pocket mandrels

ICS 75.180.10

Confirmed July 2009

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI Document Sharing Hub British Standards

Full document details: BS EN ISO 17078-1:2004+A1:2010

National foreword

This British Standard is the UK implementation of EN ISO 17078-1:2004+A1:2010. It is identical with ISO 17078-1:2004, incorporating amendment 1:2010. It supersedes BS EN ISO 17078-1:2004 which is withdrawn.

The UK participation in its preparation was entrusted by Technical Committee PSE/17, Materials and equipment for petroleum, petrochemical and natural gas industries, to Subcommittee PSE/17/-/4, Drilling and production equipment for petroleum and natural gas industries.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

This British Standard was published under the authority of the Standards Policy and Strategy Committee on 6 January 2005

© BSI 2010

Amendments/corrigenda issued since publication

Date	Comments
30 April 2010	Implementation of ISO amendment 1:2010 with CEN endorsement A1:2010; **B.1.4.6.2** amended

ISBN 978 0 580 70522 9

Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN ISO 17078-1:2004+A1

March 2010

ICS 75.180.10

English version

Petroleum and natural gas industries - Drilling and production equipment - Part 1: Side-pocket mandrels (ISO 17078-1:2004)

Industries du pétrole et du gaz naturel - Equipement de forage et de production - Partie 1: Raccords à poche latérale (ISO 17078:2004)

This European Standard was approved by CEN on 17 November 2004.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.



EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

Management Centre: rue de Stassart, 36 B-1050 Brussels

© 2004 CEN All rights of exploitation in any form and by any means reserved worldwide for CEN national Members.

Ref. No. EN ISO 17078-1:2004: E

Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

Foreword

This document (EN ISO 17078-1:2004) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum and natural gas industries" in collaboration with Technical Committee CEN/TC 12 "Materials, equipment and offshore structures for petroleum and natural gas industries", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2005, and conflicting national standards shall be withdrawn at the latest by June 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

Endorsement notice

The text of ISO 17078-1:2004 has been approved by CEN as EN ISO 17078-1:2004 without any modifications.

Foreword to amendment A1

This document (EN ISO 17078-1:2004/A1:2010) has been prepared by Technical Committee ISO/TC 67 "Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries" in collaboration with Technical Committee CEN/TC 12 “Materials, equipment and offshore structures for petroleum, petrochemical and natural gas industries” the secretariat of which is held by AFNOR.

This Amendment to the European Standard EN ISO 17078:2004 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by September 2010, and conflicting national standards shall be withdrawn at the latest by September 2010.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland and the United Kingdom.

Endorsement notice

The text of ISO 17078-1:2004/Amd 1:2010 has been approved by CEN as a EN ISO 17078-1:2004/A1:2010 without any modification.

Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

Contents

Page

Introduction iv

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 Abbreviated terms 7

5 Functional specification 7
5.1 General 7
5.2 Functional characteristics 7
5.3 Well parameters 8
5.4 Operational parameters 9
5.5 Compatibility with related well devices 9
5.6 Environmental service classes 10
5.7 Design validation 10
5.8 Product functional testing grades 10
5.9 Quality-control grades 10
5.10 Additional requirements 10

6 Technical specification 11
6.1 General 11
6.2 Technical characteristics 11
6.3 Design criteria 12
6.4 Design verification 13
6.5 Allowable design changes 13
6.6 Design validation 14
6.7 Product-functional testing requirements 14

7 Supplier/manufacturer requirements 15
7.1 General 15
7.2 Documentation and data control 15
7.3 Product identification requirements 17
7.4 Quality-control requirement 17
7.5 Heat treatment requirements 19
7.6 Welding requirements 20
7.7 Non-destructive examination (NDE) requirements 20
7.8 Storage and shipping preparation 22
7.9 Repair 23

Annex A (normative) Environmental-service requirements 24

Annex B (normative) Design-validation requirements 26

Annex C (normative) Product-functional testing requirements 30

Annex D (normative) Quality-control requirements 33

Annex E (informative) Operating performance envelope 35

Annex F (informative) Schematics of side-pocket mandrels 38

Bibliography 40

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

Introduction

This part of ISO 17078 has been developed by users/purchasers and suppliers/manufacturers of side-pocket mandrel products intended for use in the worldwide petroleum and natural gas industry. This part of ISO 17078 is intended to provide requirements and information to all parties who are involved in the specification, selection, manufacture, testing and use of side-pocket mandrel products. Further, this part of ISO 17078 addresses supplier/manufacturer requirements that set the minimum parameters with which each supplier/manufacturer shall comply, in order to be able to claim conformity with this part of ISO 17078.

This has been structured to allow different quality control grades to support quality control, design-validation, design-verification, and product-functional testing. These variations allow the user/purchaser to select the grades that are required for a specific application. If the user/purchaser does not specify a specific grade for the following categories, the supplier/manufacturer will meet the requirements of grade 3.

Well environmental service classes. There are four environmental service classes for side-pocket mandrel products that provide the user/purchaser with a range of choices to select products to meet varying environmental conditions.

Design-validation grades. There are three design validation grades for side-pocket mandrel products that provide the user/purchaser with a range of technical and performance requirements. Users of this part of ISO 17078 should be aware that requirements in addition to those outlined herein might be needed for individual applications. This part of ISO 17078 is not intended to inhibit a supplier/manufacturer from offering, or the user/purchaser from accepting, alternative equipment or engineering solutions. Where an alternative is offered, the supplier/manufacturer should identify any variations from this part of ISO 17078 and provide details.

Product-functional testing grades. There are three product functional testing grades for side-pocket mandrel products that provide the user/purchaser with a range of choices for validating that individual products manufactured under this part of ISO 17078 meet the design specifications.

Quality-control grades. There are three quality-control grades that provide the user/purchaser with varying grades of quality control requirements to meet specific preferences or applications. Additional quality upgrades can be specified by the user/purchaser as supplemental requirements.

Annexes A, B, C and D of this part of ISO 17078 are normative requirements; Annexes E and F are informative.

Documents
Document Sharing Hub
Full document details: BS EN ISO 17078-1:2004+A1:2010

Petroleum and natural gas industries — Drilling and production equipment —

Part 1:
Side-pocket mandrels

1 Scope

This part of ISO 17078 provides requirements for side-pocket mandrels used in the petroleum and natural gas industry. This part of ISO 17078 includes specifying, selecting, designing, manufacturing, quality control, testing, and preparation for shipping of side-pocket mandrels.

This part of ISO 17078 does not address nor include requirements for end connections between the side-pocket mandrels and the well conduit. The installation and retrieval of side-pocket mandrels is outside the scope of this part of ISO 17078. Additionally, this part of ISO 17078 does not include specifications for centre-set mandrels, or mandrels that employ or support tubing-retrievable flow control devices.

This part of ISO 17078 does not include gas-lift or any other flow-control valves or devices, latches, and/or associated wire line equipment that can or cannot be covered in other ISO specifications.

The side-pocket mandrels to which this part of ISO 17078 refers are independent devices that can accept installation of flow-control or other devices down-hole.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method (Scales A, B, C, D, E, F, G, H, K, N, T)*

ISO 6892, *Metallic materials — Tensile testing at ambient temperature*

ISO 9000:2000, *Quality management systems — Fundamentals and vocabulary*

ISO 9712, *Non-destructive testing — Qualification and certification of personnel*

ISO 11960:2001, *Petroleum and natural gas industries — Steel pipes for use as casing or tubing for wells*

ISO 15156-1, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 1: General principles for selection of cracking-resistant materials*

ISO 15156-2, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 2: Cracking-resistant carbon and low alloy steels, and the use of cast irons*

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

ISO 15156-3, *Petroleum and natural gas industries — Materials for use in H_2S-containing environments in oil and gas production — Part 3: Cracking-resistant CRAs (corrosion-resistant alloys) and other alloys*

ANSI/NCSL Z540-1, *Calibration Laboratories and Measuring and Test Equipment General Requirements*[1)]

ASME Boiler and Pressure Vessel Code, Section V, *Nondestructive Examination*[2)]

ASME Boiler and Pressure Vessel Code, Section VIII, *Pressure Vessels*, Division 1, *Rules for Construction of Pressure Vessels*

ASME Boiler and Pressure Vessel Code, Section IX, *Welding and Brazing Qualifications*

ASTM E94, *Standard Guide for Radiographic Examination*[3)]

ASTM E140, *Standard Hardness Conversion Tables for Metals*

ASTM E165, *Standard Test Method for Liquid Penetrant Examination*

ASTM E709, *Standard Guide for Magnetic Particle Examination*

BS 2M 54:1991, *Specification for temperature control in the heat treatment of metals*[4)]

SAE AMS-H-6875:1998, *Heat Treatment of Steel Raw Materials*[5)]

3 Terms and definitions

For the purpose of this document, the terms and definitions given in ISO 9000:2000 and the following apply.

3.1
acceptance
agreement/acknowledgement that side-pocket mandrel component(s) and/or assembly(ies) can be used without restriction

3.2
certificate of conformance
documentation declaring that a specific side-pocket mandrel meets the requirements of this part of ISO 17078 and the requirements of the functional specification

3.3
coating
internal and/or external application of a material to a side-pocket mandrel for corrosion protection, paraffin control, etc.

3.4
compressive load
force creating compression that may be applied to a side-pocket mandrel

1) NCSL International, 2995 Wilderness Place, Suite 107, Boulder, Colorado 80301-5404, USA.
2) American Society of Mechanical Engineers, Three Park Avenue, New York, NY 10016-5990, USA.
3) ASTM International, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA.
4) British Standards Institute, Customer Services, 389 Chiswick High Road, London W4 4AL, UK.
5) SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, USA.

Documents
Document Sharing Hub
Full document details: BS EN ISO 17078-1:2004+A1:2010

3.5
date of manufacture
date of manufacturer's final acceptance of finished products

NOTE The date is expressed as “day-month-year” in the format DD-MM-YYYY.

3.6
deflector
internal device that guards landed side-pocket devices or discriminates the landing of side-pocket devices into the side-pocket mandrel pocket (receptacle for mandrel devices), but deflects non-side-pocket devices, thus allowing the latter to pass through the side-pocket mandrel, when being deployed down hole

3.7
design family
group of products whose configurations, sizes, materials and applications are sufficiently similar that identical design methodologies can be used to establish the design parameters for each product within the family

3.8
design method
method, procedure or equations used by the supplier/manufacturer to design a side-pocket mandrel product

3.9
design validation
process of proving a design by testing to demonstrate conformity of the product to design requirements

[ISO/TS 29001:2003]

NOTE See also 5.7.

3.10
design verification
process of examining the result of a given design or development activity to determine conformity with specified requirements

[ISO/TS 29001:2003]

3.11
dogleg
change in well bore inclination

NOTE The “severity” of the dogleg is proportional to the change in inclination, typically measured in degrees.

3.12
drift outside diameter
tube's ID through which all elements of the assembled side-pocket mandrel can pass

3.13
end connection
thread(s) on the side-pocket mandrel end(s) used to attach the side-pocket mandrel to the tubing string

3.14
environmental service class
category of environmental conditions for which the side-pocket mandrel product is designed to be used

NOTE See also 5.6.

3.15
external drifting
test to observe the unencumbered or unrestricted passage of a side-pocket mandrel having a specific diameter through a drift test tool of specified inside diameter and length

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

3.16
external test pressure
differential pressure between the applied external pressure and internal pressure at which a side-pocket mandrel is tested for collapse resistance

3.17
full life cycle
expected period of time in which the product shall function according to manufacturer's specifications

3.18
functionality
capability of a side-pocket mandrel to conform to defined properties, characteristics and limits

3.19
gas passage undercut
clearance between the flow-control device and the pocket of the side-pocket mandrel through which injected media flow

3.20
heat
material originating from a final melt or cast lot

NOTE For re-melted alloys, the heat is the raw material originating from a single re-melted ingot.

3.21
internal drifting
test to observe the unencumbered or unrestricted passage of a drift bar having a specific diameter and length through a side-pocket mandrel to determine its full-bore capability

3.22
internal test pressure
differential pressure between the applied internal pressure and external pressure at which a side-pocket mandrel is tested for burst resistance

3.23
job lot
group or quantity of piece parts, sub-assemblies or assemblies that are grouped or processed together during the manufacturing process

3.24
latch
retention mechanism for a flow-control device that is landed in the side-pocket mandrel

3.25
latch profile
feature such as a lug or recess that is suitable for the reception of the locking mechanism within a side-pocket mandrel

3.26
linear indication
material inconsistency whose length is equal to or greater than three times the width of the material inconsistency

3.27
linear mass
mass per length of tubular product

Documents
Document Sharing Hub
Full document details: BS EN ISO 17078-1:2004+A1:2010

3.28
manufacturing
process(es) and action(s) performed by an equipment supplier/manufacturer that are necessary to provide finished component(s), assemblies, and related documentation that fulfil the requests of the user/purchaser and that meet the standards of the supplier/manufacturer

NOTE Manufacturing begins when the supplier/manufacturer receives the order and is completed at the moment the component(s), assembly(ies), and related documentation are transferred to a transportation provider.

3.29
model
side-pocket mandrels with unique components and functional characteristics that differentiate it from other side-pocket mandrels of the same type

NOTE Side-pocket mandrels can have a variety of end connections.

3.30
operating environment
set of environmental conditions to which the product is exposed during its service life

NOTE Environmental conditions can include temperature, pressure, liquid composition and properties, gas composition and properties, solids, etc.

3.31
operational parameter
requirement and/or restriction that the product is exposed to during its service life

EXAMPLES Operating environment, through-tubing drift, landing and retrieval of flow-control devices, passage of various tools through the side-pocket mandrel, injection of various well treatment chemicals/fluids, etc.

3.32
orienting profile
design feature (e.g. orienting sleeve) of a side-pocket mandrel that acts together with certain wireline tools to aid in radial and vertical alignment of tools used to install and remove side-pocket landed equipment

3.33
perceptible leak
any leak during a hydro test that can be observed

3.34
pocket
parallel bore, including sealing surfaces and latching profiles, that is offset from and essentially parallel with the through-bore of the side-pocket mandrel

3.35
product functional-testing grade
category based on a defined range of processes, method(s) and/or test(s) that are used by the supplier/manufacturer to demonstrate that a particular side-pocket mandrel has been manufactured to fully meet the functional and manufacturing requirements for that product

3.36
quality-control grade
category based on a defined range of processes and/or method(s) that are used by the supplier/manufacturer to assure the quality of the materials and manufacturing process(es) used to produce a particular side-pocket mandrel

3.37
rated pressure
maximum differential pressure, at the rated temperature, to which the side-pocket mandrel is designed to be subjected in normal operation

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

3.38
rated temperature
maximum temperature, at the rated pressure, to which the mandrel is designed to be subjected in normal operation in a well

3.39
rounded indication
material inconsistency that is circular or elliptical in shape, such that the length of the material inconsistency is less than three times its width

3.40
side-pocket mandrel
tubing-mounted device that accepts a flow-control or other device in a bore that is offset from and essentially parallel with the through-bore of the tubing product

NOTE This parallel bore includes sealing surfaces and latching profiles.

3.41
special-service side-pocket mandrel
side-pocket mandrel designed for special operations including chemical injection, CO_2 injection, hydraulic control, electrical control, or other applications where a secondary conduit terminates at the side-pocket mandrel

3.42
supplier/manufacturer
company, organization or entity that designs, manufactures and/or markets side-pocket mandrel products

3.43
technical specification
parameter(s) stating the operating limit(s) relating to the manufacture of the component parts or assemblies

3.44
tensile load
maximum force creating tension that may be applied to a side-pocket mandrel, as defined by the supplier/manufacturer

3.45
test pressure
maximum differential pressure between the applied pressure and atmospheric pressure, as specified by the pertinent test procedure, when the test is conducted in such a way that the article being tested is a “closed” system with no inputs or outputs allowed during the test time period

3.46
test temperature
temperature, as specified by the pertinent test procedure, at which the test is conducted

3.47
traceability
⟨job lot⟩ ability to identify individual components as originating from a particular job lot, including the particular heat(s)

3.48
type
kind of side-pocket mandrel or other component (e.g. valve, flow control device, latch, wireline tool, etc.) that is distinguished by a particular method of being positioned and retrieved from a well, and that has a specific name and/or description

Documents
Document Sharing Hub
Full document details: BS EN ISO 17078-1:2004+A1:2010

3.49
user/purchaser
company, organization or entity that purchases, installs and/or uses side-pocket mandrel products

3.50
wireline
one type of equipment and associated technique(s) used to perform various operations in a well using a continuous length of solid line (slick line) or stranded wire, appropriate spooling equipment at the surface and weight stem and specialized tools attached to the well (downhole) end of the wire

3.51
yield strength
stress level measured at a specific test temperature beyond which the material plastically deforms and will not return to its original dimensions

NOTE The yield strength is expressed in units of force per unit area.

4 Abbreviated terms

AWS	American welding society
COC	certificate of compliance
EOEC	exclusive of end connections
ID	inside diameter
NDE	non-destructive examination method
OD	outside diameter
PQR	procedure qualification record
Ra	roughness, expressed in micrometers (micro-inches)
WPS	welding procedure specification
WPQ	welder performance qualification

5 Functional specification

5.1 General

The user/purchaser shall prepare a functional specification to order products that conform to this part of ISO 17078. The specification shall specify the requirements and operating conditions listed in 5.2 through 5.10, as appropriate, and/or identify the supplier's/manufacturer's specific product. These requirements and operating conditions may be conveyed by means of a dimensional drawing, a data sheet, a functional specification form (see Annex E), or other suitable documentation.

5.2 Functional characteristics

A side-pocket mandrel is a tubing-mounted device that accepts a flow-control or other device in a bore that is offset from and essentially parallel with the through-bore of the tubing product. This parallel bore includes sealing surfaces and latching profiles.

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010

The user/purchaser shall specify, as applicable, the following functional characteristics:

— latch: nominal size and/or type and/or model(s) of the latch(es) used to secure the flow-control or other equipment to the side-pocket mandrel;

— seal bore: nominal seal bore size and configuration to accommodate the flow-control or other devices and/or the model(s) of the flow-control or other device(s) to be installed in the side-pocket mandrel;

— communication ports: location and configuration of the internal and external communication ports or outlets on the side-pocket mandrel and/or the specification for which the side-pocket mandrel is to be used and/or the model(s) of the flow-control or other device(s) to be installed in the mandrel;

— conduit ports: connection size and configuration for the external ports and outlets to which side-string, control or injection conduits are to be attached;

— tubing connections: top and bottom tubular connection(s) and the material and dimensions of the side-pocket mandrel that is connected to the tubing; or tubing size, thread, mass, grade, and material to which the side-pocket mandrel will be connected;

— loading conditions: loading conditions anticipated to be applied to the side-pocket mandrel, including but not limited to tensile loads, burst pressures, collapse pressures, bending stresses, etc.

5.3 Well parameters

5.3.1 General

The user/purchaser shall specify the well parameters listed in 5.3.2 through 5.3.5, as applicable.

5.3.2 Well-fluid parameters

Well-fluid parameters include production/injection composition, specific gravity, chemical/physical composition and the condition of the fluid and/or its components, in the form of solids (sand production, scale, paraffin, etc.), liquids, and/or gases to which the side-pocket mandrel will be exposed during its full life cycle, together with both the minimum and the maximum anticipated values of the production/injection pressures, pressure differentials, temperatures and expected flow rates.

5.3.3 Well physical parameters

The following physical well parameters shall be defined:

— size, material, mass and grade of the casing and tubing;

— well depth and trajectory from the vertical to the installed position;

— deviations and restrictions through which the product is required to pass;

— loading conditions anticipated to be applied to the side-pocket mandrel.

5.3.4 Allowable well operations

Expected well intervention(s) together with its (their) parameters include the following:

— acidizing, including acid composition, pressure, temperature, and acidizing velocity as well as exposure time, and any other chemicals used during the stimulation;

— fracturing, including proppant description, fracture fluid velocity, proppant/fluid ratio;

AVA Documents
Document Sharing Hub
Full document details: BS EN ISO 17078-1:2004+A1:2010

— sand consolidation operations;

— electric line, wireline, coiled tubing, snubbing, and other through-tubing conveyance methods;

— devices which might be run/installed via these means;

— size, type, and configuration of other products to be used in conjunction with the side-pocket mandrel, where applicable;

— hole deflections including “doglegs.” State the depth of any “dogleg” and its measured deviation.

5.3.5 Corrosion information

If the user/purchaser has access to the corrosion property data for the operating environment based on historical data and/or research, this information may be made available to the supplier/manufacturer; or the user/purchaser shall indicate to the supplier/manufacturer which material(s) has/have the ability to perform as required within the particular corrosion environment.

5.4 Operational parameters

The user/purchaser shall specify specific installation, testing and operational parameters to which the side-pocket mandrel will be subjected. These shall include but are not limited to the following:

— expected maximum external-to-internal differential pressure across the side-pocket mandrel;

— expected maximum internal-to-external differential pressure across the side-pocket mandrel;

— expected maximum tubing force on the mandrel;

— expected maximum temperature at the mandrel;

— expected maximum gas- and/or fluid-injection rate and rate of fluid production at the mandrel;

— expected installation, testing, and operational procedures.

There can be exceptional operating conditions that require side-pocket mandrel products that are clearly outside of the scope of this part of ISO 17078. In such cases, the user/purchaser and the supplier/manufacturer should work together to design mutually acceptable products to meet these requirements and the intent of this part of ISO 17078.

5.5 Compatibility with related well devices

5.5.1 General

The user/purchaser shall provide data/information such as maximum length, maximum outside diameter, etc. on any other related well products (e.g. sub-surface safety valves, wireline tools, electrical cables, injection conduits, tubing strings and associated equipment for dual completions, etc.) that will be run in conjunction with the side-pocket mandrel. This information may be conveyed by means of a dimensional drawing, a data sheet, or other suitable documentation. The purpose is to assure compatibility between the other well products and the side-pocket mandrel.

5.5.2 Polished bore dimensions

Table 1 specifies the polished bore dimensions required for side-pocket mandrels built in accordance with this part of ISO 17078. There can be occasions where the design of the side-pocket mandrel can require polished bore dimensions other than those listed. In those cases, agreement between user/purchaser and supplier/manufacturer shall be documented.

AVA Documents
Document Sharing Hub

Full document details: BS EN ISO 17078-1:2004+A1:2010