

DIN EN ISO 10407-2:2010-08 (E)

Petroleum and natural gas industries - Rotary drilling equipment - Part 2:
Inspection and classification of used drill stem elements (ISO 10407-2:2008 +
Cor. 1:2009); English version EN ISO 10407-2:2008 + AC:2009, only on CD-ROM

Contents

Page

Foreword.....	5
Introduction	6
1 Scope	7
2 Normative references	7
3 Terms and definitions	7
4 Symbols and abbreviated terms	14
4.1 Symbols	14
4.2 Abbreviated terms	15
5 Conformance.....	16
5.1 Basis for inspection	16
5.2 Repeatability of results	17
5.3 Ordering information	17
6 Quality assurance	17
6.1 General.....	17
6.2 Standardization and operating procedures	17
6.3 Equipment description	18
6.4 Personnel qualification	18
6.5 Dynamic test data demonstrating the system capabilities for detecting the reference indicators.....	18
6.6 Reports	18
7 Qualification of inspection personnel	18
7.1 General.....	18
7.2 Written procedure.....	18
7.3 Qualification responsibility and requirements	19
7.4 Training programmes	19
7.5 Examinations.....	19
7.6 Experience.....	19
7.7 Re-qualification	19
7.8 Documentation.....	20
7.9 NDT personnel certification.....	20
8 General inspection procedures.....	20
8.1 General.....	20
8.2 Owner/operator work site requirements for quality inspection.....	20
8.3 Documents at job site	20
8.4 Pre-inspection procedures	21
8.5 Drill-pipe and tool-joint classification markings	21
8.6 Post-inspection procedures	22
9 General non-destructive inspection method requirements	25
9.1 General.....	25
9.2 Equipment	25
9.3 Illumination.....	26
9.4 Magnetic-particle-inspection equipment.....	27
9.5 Ultrasonic	29
9.6 Electromagnetic inspection units	30
10 Drill stem element inspection and classification	30
10.1 Pipe body — Full-length visual inspection	30
10.2 Drill body — Outside diameter gauging	31
10.3 Pipe body — Ultrasonic wall-thickness gauging.....	33
10.4 Pipe body — Full-length electromagnetic inspection (EMI).....	35

10.5	Pipe body — Full-length ultrasonic transverse and wall thickness.....	37
10.6	Pipe body — Full-length ultrasonic transverse, wall thickness and longitudinal inspection	40
10.7	Drill-pipe body — External magnetic-particle inspection of the critical area	43
10.8	Drill-pipe body — Bi-directional external magnetic-particle inspection of the critical area.....	46
10.9	Pipe body — Full-length wall-loss inspection	49
10.10	Pipe body — Ultrasonic inspection of the critical area	51
10.11	Pipe body — Calculation of cross-sectional area	55
10.12	Pipe body — Document review (traceability)	56
10.13	Pipe body — Evaluation and classification	56
10.14	Tool joints	61
10.15	Tool joints — Check for box swell and pin stretch	66
10.16	Repair of rejected tool joints	67
10.17	Tool joints — Check tool-joint pin and box outside diameter and eccentric wear	67
10.18	Tool joints — Measure tool-joint pin and box outside diameter and check for eccentric wear.....	69
10.19	Tool joints — Check tool-joint pin and box tong space	70
10.20	Tool joints — Measure tool-joint pin and box tong space	71
10.21	Tool joint — Magnetic-particle inspection of the pin threads.....	72
10.22	Tool joint — Magnetic-particle inspection of box threads	74
10.23	Tool joints — Measure tool-joint pin inside diameter.....	76
10.24	Magnetic-particle inspection of the connection OD for heat-check cracking.....	77
10.25	Bi-directional wet magnetic-particle inspection of the connection OD for heat-check cracking	78
10.26	Tool joints — Measure the tool-joint counterbore depth, pin-base length and seal width	82
10.27	BHA connection — Visual inspection of bevels, seals, threads and stress-relief features	83
10.28	BHA — Measure box outside diameter, pin inside diameter, counterbore diameter and benchmark location if a benchmark is present.....	86
10.29	BHA — Check bevel diameter	88
10.30	BHA — Measure bevel diameter	89
10.31	BHA — Magnetic-particle inspection of the pin and box threads	89
10.32	BHA connection — Liquid-penetrant inspection of the pin and box threads	92
10.33	BHA — Dimensional measurement of stress-relief features	93
10.34	Length measurements of the counterbore, pin and pin neck.....	96
10.35	Drill collar — Visual full-length OD and ID, markings, fish-neck length and tong space	97
10.36	Drill-collar elevator groove and slip-recess magnetic-particle inspection	98
10.37	Drill-collar elevator-groove and slip-recess measurement.....	100
10.38	Subs (full-length visual OD and ID), fish-neck length, section-change radius and markings ..	102
10.39	Float-bore recess measurements	103
10.40	Magnetic-particle inspection of subs — Full-length, internal and external	105
10.41	HWDP — Visual full-length OD and ID, markings and tong space.....	107
10.42	Visual inspection and wear pattern report for kelly.....	108
10.43	Magnetic-particle evaluation of critical areas on kellys	110
10.44	Magnetic-particle evaluation, full length, of the drive section on kellys	110
10.45	Stabilizer (full-length visual OD and ID), fish-neck length, blade condition, ring gauge and markings.....	110
10.46	Magnetic-particle inspection of the base of stabilizer blades for cracking	112
10.47	Function test.....	114
10.48	Bi-directional, wet magnetic-particle inspection of the base of stabilizer blade for cracking	115
10.49	Visual inspection of jars (drilling and fishing), accelerators and shock subs	118
10.50	Maintenance review.....	119
10.51	Dimensional measurement of wear areas as specified by OEM requirements	119
10.52	Original equipment manufacturer designated testing for used equipment	120
10.53	MWD/LWD — Visual, full-length OD and ID, and markings, including visual inspection of hard-banding and coatings	120
10.54	Motors and turbines — Visual, full-length OD and ID and markings, including visual inspection of hard-banding and coatings.....	122

10.55	Reamers, scrapers, and hole openers — Visual, full-length OD and ID and markings, including visual inspection of hard-banding and coatings.....	123
10.56	Rotary steerable — Visual, full-length OD and ID and markings, including visual inspection of hard-banding	124
10.57	Full-length drift.....	125
10.58	Proprietary equipment inspection	126
10.59	Hard-banding inspection	127
10.60	Transverse magnetic-particle inspection of tool-joint OD and ID under the pin threads	131
10.61	Drill-pipe body — Internal magnetic-particle inspection of the critical area	132
10.62	Drill-pipe body — Bi-directional, internal magnetic-particle inspection of the critical area	134
10.63	API external upset-thread connection inspection.....	136
Annex A	(normative) Original equipment manufacturer (OEM) requirements	138
Annex B	(normative) Required and additional inspections by product and class of service.....	140
Annex C	(normative) SI units	151
Annex D	(informative) USC units	180
Annex E	(informative) Inspection-level guidelines	209
Annex F	(informative) Proprietary drill stem connection	213
Annex G	(informative) Used work-string tubing proprietary-connection thread inspection.....	218
Bibliography	220