

# ISO 10414-1:2008-03 (E)

## Petroleum and natural gas industries - Field testing of drilling fluids - Part 1: Water-based fluids

---

<b>Contents</b>		<b>Page</b>
Foreword .....		v
Introduction .....		vi
1	Scope .....	1
2	Terms and definitions .....	2
3	Symbols and abbreviated terms .....	2
3.1	Symbols .....	2
3.2	Abbreviations .....	6
4	Drilling fluid density (mud weight) .....	7
4.1	Principle .....	7
4.2	Apparatus .....	7
4.3	Procedure .....	7
4.4	Calculation .....	8
5	Alternative drilling fluid density method .....	9
5.1	Principle .....	9
5.2	Apparatus .....	10
5.3	Procedure .....	10
5.4	Calculation .....	10
6	Viscosity and gel strength .....	11
6.1	Principle .....	11
6.2	Determination of viscosity using the Marsh funnel .....	11
6.3	Determination of viscosity and/or gel strength using a direct-indicating viscometer .....	11
7	Filtration .....	14
7.1	Principle .....	14
7.2	Low-temperature/low-pressure test .....	14
7.3	High-temperature/high-pressure (HTHP) test .....	15
8	Water, oil and solids contents .....	18
8.1	Principle .....	18
8.2	Apparatus .....	18
8.3	Procedure .....	19
8.4	Calculation .....	20
9	Sand content .....	22
9.1	Principle .....	22
9.2	Apparatus .....	22
9.3	Procedure .....	22
10	Methylene blue capacity .....	23
10.1	Principle .....	23
10.2	Reagents and apparatus .....	23
10.3	Procedure .....	24
10.4	Calculation .....	26
11	pH .....	26

11.1	Principle .....	26
11.2	Reagents and apparatus .....	27
11.3	Procedure for pH measurement .....	28
11.4	Care of electrode .....	29
12	Alkalinity and lime content .....	29
12.1	Principle .....	29
12.2	Reagents and apparatus .....	30
12.3	Procedure -- Phenolphthalein and methyl orange filtrate alkalinities .....	30
12.4	Procedure -- Phenolphthalein drilling fluid alkalinity .....	31
12.5	Calculation of ion concentrations from Pf and Mf .....	31
12.6	Estimation of lime content .....	31
13	Chloride ion content .....	32
13.1	Principle .....	32
13.2	Reagents and apparatus .....	32
13.3	Procedure .....	32
13.4	Calculation .....	32
14	Total hardness as calcium .....	33
14.1	Principle .....	33
14.2	Reagents and apparatus .....	33
14.3	Procedure .....	34
14.4	Calculation .....	35
Annex A (informative) Chemical analysis of water-based drilling fluids .....		36
Annex B (informative) Shear strength measurement using shearometer tube .....		52
Annex C (informative) Resistivity .....		54
Annex D (informative) Removal of air or gas prior to testing .....		56
Annex E (informative) Drill pipe corrosion ring coupon .....		57
Annex F (informative) Sampling, inspection and rejection .....		61
Annex G (informative) Rig-site sampling .....		63
Annex H (informative) Calibration and verification of glassware, thermometers, viscometers, retort-kit cup and drilling fluid balances .....		66
Annex I (normative) High-temperature/high-pressure filtration testing of water-based drilling fluids using the permeability-plugging apparatus and cells equipped with set-screw- secured end caps .....		71
Annex J (normative) High-temperature/high-pressure filtration testing of water-based drilling fluids using the permeability-plugging apparatus and cells equipped with threaded end caps ...		81
Annex K (informative) Water-based drilling fluids report form .....		90
Bibliography .....		91