

# DIN EN ISO 13501:2011-09 (E)

Petroleum and natural gas industries - Drilling fluids - Processing equipment evaluation (ISO 13501:2011); English version EN ISO 13501:2011

---

## Contents

	Page
Foreword.....	5
Introduction .....	6
1 Scope .....	7
2 Normative references .....	7
3 Terms, definitions, symbols and abbreviated terms.....	7
3.1 Terms and definitions .....	7
3.2 Symbols and abbreviated terms .....	17
3.2.1 Symbols .....	17
3.2.2 Abbreviated terms .....	18
4 Requirements .....	19
5 System performance of drilled-solids removal .....	19
5.1 Principle.....	19
5.2 Apparatus .....	19
5.3 Sampling.....	20
5.4 Procedure .....	21
5.4.1 Suction pit drilling fluid density chloride content, and solids by retort .....	21
5.4.2 Base fluid additions to the drilling fluid .....	21
5.4.3 Base fluid fraction.....	21
5.4.4 Drilled-solids fraction .....	21
5.4.5 Volume of drilling fluid built .....	22
5.4.6 Excavated volume of solids drilled.....	22
5.4.7 Total dilution .....	22
5.4.8 Dilution factor.....	23
5.4.9 Calculation of drilled-solids removal system performance .....	23
6 Rigsite evaluation of drilled-solids management equipment .....	24
6.1 Principle.....	24
6.2 Application .....	24
6.3 Sampling of streams for capture analysis .....	25
6.4 Determination of mass fraction (percent) solids.....	25
6.5 Calculation of capture .....	26
6.6 Interpretation of results .....	26
6.7 Procedure for characterizing removed solids .....	27
6.8 Calculation of mass fraction (percent) of low-gravity solids .....	27
6.9 Particle size assessment on removed solids .....	28
6.10 Economics.....	28
6.10.1 Unweighted drilling fluids.....	28
6.10.2 Weighted drilling fluids .....	28
7 Practical operational guidelines.....	28
7.1 Principle.....	28
7.2 Apparatus .....	28
7.3 Procedure for design and operation.....	29
7.3.1 General.....	29
7.3.2 Flow line.....	29
7.3.3 Tank.....	29
7.3.4 Process rate .....	29
7.3.5 Surface tank .....	30
7.3.6 Sand trap .....	30

	Page
7.3.7	Removal section ..... 31
7.3.8	Flow direction ..... 31
7.3.9	Tank agitation ..... 32
7.3.10	Fluid routing..... 32
7.4	Design of shale shakers ..... 32
7.5	Operation of shale shakers ..... 33
7.6	Design of degassers ..... 33
7.7	Operation of degassers ..... 34
7.8	Design of desanders and desilters ..... 34
7.9	Design of mud cleaners ..... 35
7.10	Design of centrifuges ..... 36
7.11	Use of addition sections ..... 36
7.12	Use of drilling fluid mixing and blending equipment ..... 36
7.13	Use of suction section ..... 37
7.14	Use of discharge section ..... 37
8	Conductance of shale shaker screens ..... 37
8.1	Principle..... 37
8.2	Principle of conductance ..... 37
8.2.1	General ..... 37
8.2.2	Darcy's law ..... 37
8.3	Apparatus for measurement of conductance ..... 39
8.4	Procedure for calibrating fluid ..... 40
8.5	Procedure for flow test ..... 40
8.6	Procedure for measuring pressure drop ..... 40
8.7	Procedure for conductance test ..... 41
8.8	Calculation of conductance..... 41
9	Shale shaker screen designation ..... 43
9.1	Principle..... 43
9.2	Apparatus ..... 44
9.3	Preparation of aluminium oxide test media..... 46
9.3.1	Preparation of aluminium oxide cuts ..... 46
9.3.2	Preparation of sample for test range..... 46
9.4	Preparation of test screen ..... 48
9.5	Test procedure..... 48
9.6	Calculation of D100 separation for test screen cloth ..... 49
10	Non-blanked area of shale shaker screen panel ..... 52
10.1	Principle..... 52
10.2	Apparatus ..... 53
10.3	Procedure for pretensioned or perforated panel-type screens ..... 53
10.4	Calculation for pretensioned or perforated panel-type screens ..... 53
10.5	Procedure for open-hook strip panels ..... 53
10.6	Calculation for open-hook strip panels..... 53
10.7	Example calculation of total non-blanked area for a panel-mount screen..... 54
11	Shale shaker screen labelling ..... 55
11.1	API screen designation..... 55
11.1.1	General ..... 55
11.1.2	Procedure – label design information ..... 55
11.1.3	API screen number designation and D100 separation potential ..... 56
11.1.4	Screen conductance ..... 56
11.1.5	Non-blanked area ..... 56
11.1.6	Manufacturer's screen designation ..... 57
11.1.7	API screen designation label..... 57
11.1.8	Optional information ..... 57
11.2	Label and tag format ..... 57
11.3	API screen designation label examples ..... 58
11.4	Other screen label and tags ..... 60

<b>Annex A (informative) Derivation of capture equation .....</b>	<b>61</b>
<b>A.1 Principle.....</b>	<b>61</b>
<b>A.2 Procedure of derivation .....</b>	<b>61</b>
<b>Annex B (informative) Finder's method .....</b>	<b>63</b>
<b>B.1 Principle.....</b>	<b>63</b>
<b>B.2 Materials and reagents .....</b>	<b>63</b>
<b>B.3 Apparatus .....</b>	<b>63</b>
<b>B.4 Procedure .....</b>	<b>63</b>
<b>B.5 Calculation.....</b>	<b>65</b>
<b>Bibliography .....</b>	<b>66</b>