CHAPTER 10 Useful Lists

The list of tables and figures have been included to provide an alternate way of locating tables and figures throughout the guide. The list of symbols used in equations provides all of the symbols used in equations within the book and gives the definition and unit as it appears in the identified equation.

List of Tables

List of Figures

List of Symbols Used in Equations

Symbol	Definition	Unit	EQ #
A	thermal expansion factor	lb/gal/100°F	3
B	hydrostatic compression factor	lb/gal/1000 psi	4
BHP_s	safe bottomhole pressure	psi or lb/in^2	1, 4
BHT	bottomhole temperature	°F	3
C	capacity	bbl/ft	25, 29
C	capacity of hole or pipe	bbl/ft	26
C_{an}	capacity of annulus	bbl/ft	16, 17, 28
C_{an}	capacity of annular space per linear foot	bbl/ft	27
C_{an+t}	combined annular + tubing capacity	bbl/ft	6
CF	correction factor	(lb/gal)/°F	10
C_P	averaged pressure correction	lb/gal	4, 5
C_T	averaged temperature correction	lb/gal	3, 5
C_t	capacity of tubing	bbl/ft	16, 17, 18, 21
d	density of fluid in well	lb/gal	19, 20
d_1	density of starting fluid	lb/gal	7
d_1	density of fluid 1	lb/gal	9, 11, 14, 15
d_2	density of added fluid	lb/gal	7
d_2	density of fluid 2	lb/gal	9, 11
d_c	density corrected for T and P	lb/gal	5
d_c	fluid density, corrected to 60°F	lb/gal	10
d_{dil}	final desired density	lb/gal	15
d_{dil}	density of diluted fluid	lb/gal	12
d_f	density of final target fluid	lb/gal	7
d_f	density of final fluid	lb/gal	9, 11, 14
d_n	density of fluid n in annulus	lb/gal	30
d_{slug}	density of slug fluid	lb/gal	20
d_u	fluid density, uncorrected for T and P	lb/gal	2
d_u	uncorrected density from Equation 2	lb/gal	5
d_w	density of fresh water	lb/gal	10

Symbol	Definition	Unit	EQ #
grad	pressure gradient	psi/ft	2
$grad_s$	safe pressure gradient	psi/ft	1
h	total length of tubing	ft	18
h	length of hole or pipe	ft	26
h	length of annulus	ft	28
h_{bal}	length of pill planned	ft	16, 17, 18
h_{dry}	length of dry pipe	ft	19
h_n	true vertical length of coverage of fluid n in annulus	ft	30
HR	hydrometer reading at sample temperature	unitless	10
h_{slug}	length of slug fluid required	ft	20, 21
ID	inside diameter	in	25
ID	inside (casing, liner) diameter	in	27
ID_{casing}	casing ID	in	6
ID_t	tubing ID	in	6
l	liter	l	22, 23
$lb_{product}$	total product added to the recipe	lb/bbl	13
lb_{pure}	weight of pure salt (100% basis) per barrel of original brine	lb/bbl	12
lb_{pure}	weight of pure salt (100%)	lb/bbl	13
lb_{pure}	weight of salt product per barrel required to weigh up to final fluid density	lb/bbl	14
mg	milligram	mg	22, 23
OD	outside (work string, tubing) diameter	in	27
OD_t	tubing OD	in	6
P_{an}	hydrostatic pressure	psi	30
pct_1	percent of dissolved salt in fluid 1	wt fraction	15
pct_{dil}	percent of pure salt (100% basis) in diluted brine	wt fraction	12
pct_{dil}	percent of dissolved salt in final fluid	wt fraction	15
pct_f	percent of pure salt (100% basis) in original brine	wt fraction	12
P_{dif}	pressure differential	psi	19, 20
ppm	parts per million	10^{-6}	22, 23, 24
P_{sol}	solid content	vol %	31
purity	weight percent as decimal fraction	unitless	13
Q	flow rate	bbl/min	29, 31
SG	specific gravity	unitless	22, 23
surf	surface temperature	°F	3
TVD	true vertical depth	ft	1
v_1	volume of starting fluid	bbl	7, 8
v_1	volume of fluid 1	bbl	9, 11
v_1	volume (as a fraction of a barrel) of fluid 1	bbl	15
v_2	volume of added fluid	bbl	7, 8
v_2	volume of fluid 2	bbl	11
v_{an}	total volume of annulus with pipe/tubing in well	bbl	28

Symbol	Definition	Unit	EQ #
v_{chase}	volume of chase fluid	bbl	18
Vel	velocity	ft/min	29
v_f	volume of final target fluid	bbl	8
v_f	final volume	bbl	14
v_{pill}	volume of balanced pill	bbl	16, 17
v_{slug}	volume of slug	bbl	21
v_{sol}	volume of solid removal rate	ft^3/min	31
v_{surf}	volume of empty lines from pit to drill floor	bbl	18
v_{tot}	total volume of hole or pipe	bbl	26
wt %	weight percent	10^{-2}	24
ΔT	sample temperature – 60°F	°F	10
0.052	units conversion factor	$gal/in^2\text{-}ft$	2, 19, 20, 30
0.056	units conversion factor	$ft^3/(bbl–\%)$	31
1029.4	units conversion factor	$in^2\text{-}ft/bbl$	6, 25, 27

Notes: