

046-PS.11.16 *Trykdata*
CAPILLARY PRESSURE CURVES
STATOIL PETROPHYSICS LAB.
STATOIL WELL [REDACTED]
REPORT DATE 8/6-77

Object

Capillary Pressure Curves by mercury injection for 7 samples from well number 15/9-1.

Using mercury - injection apparatus (maximum pressure 2000 psia). Multipoint curves were plotted as shown in fig 1 for each of the selected plugs. Porosity and permeability values were ascribed to each of the curves, and depth is in meters.

Note

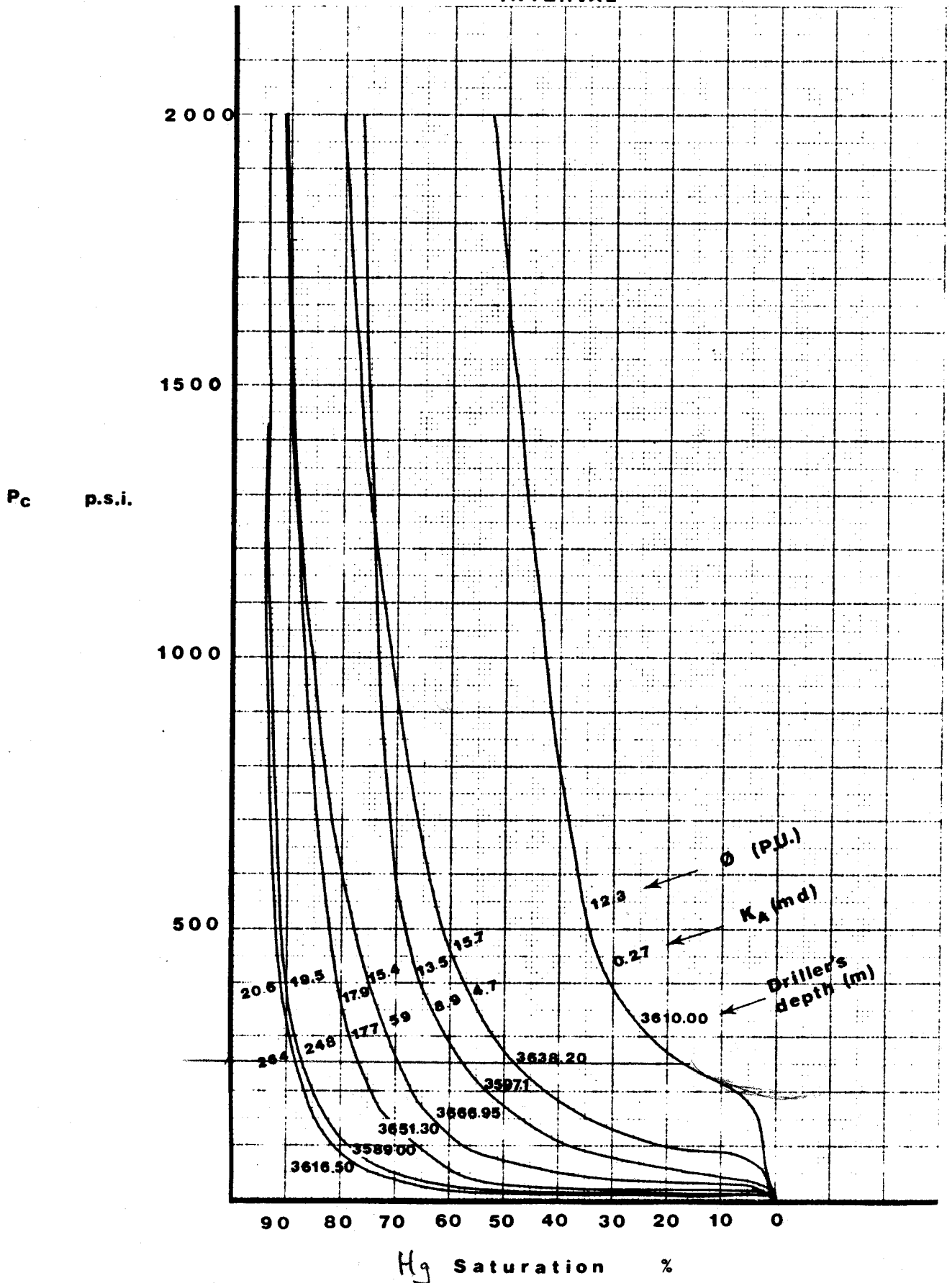
- 1) A slight anomaly is shown with the plug at 3638,20 m, where the porosity is out of sequence, but generally there is the expected trend of increasing ϕ and K from top right to bottom left.
- 2) Dry core porosities were determined in the lab. with the Mercury Pump using Boyle's Law method of calculation.
- 3) Air Permeabilities were calculated with the lab. equipment, apart from plug at 3610,00, where the Statex value was taken.

Fair agreement was found between Statoil and Statex poroperms.

Capillary Pressure Measurement (Hg INJECTION)

ϕ : 12.3 \rightarrow 20.6%

7 PLUGS TOTAL, DEPTH: OVER WHOLE HYDROCARBON K:27 \rightarrow 264 mD
INTERVAL



originals

$$15/a - 1$$

$$P_c - (H_g H_j -)$$

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STATOIL LAB.

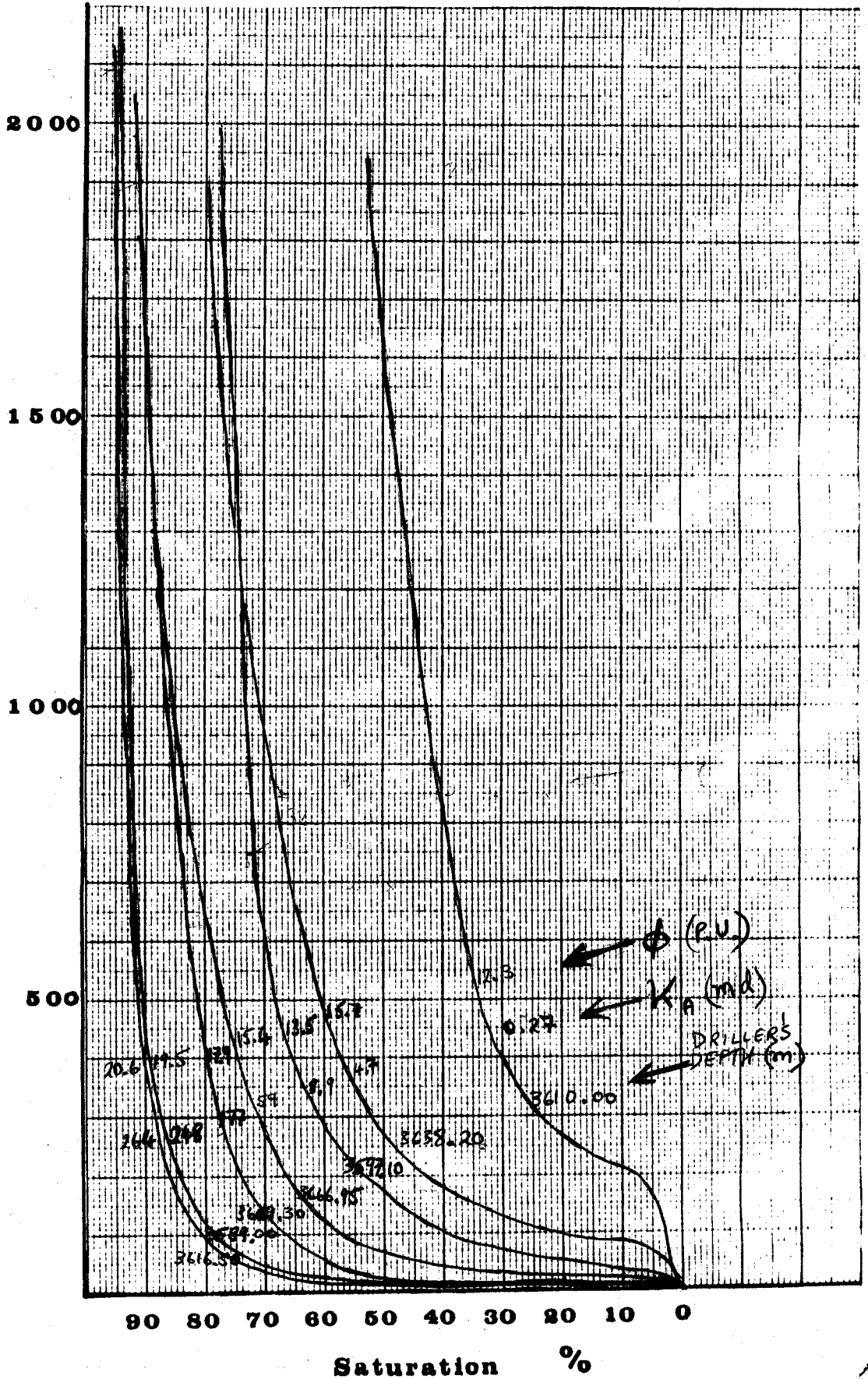
Capillary Pressure Measurement

[Hg INJECTION]

ϕ : 12.3 \rightarrow 20.6%

7 PLUGS TOTAL, Depth: OVER WHOLE HYDROCARBON K: .27 \rightarrow 264 mD
INTERVAL

P₀ psi.



Capillary Pressure Measurement

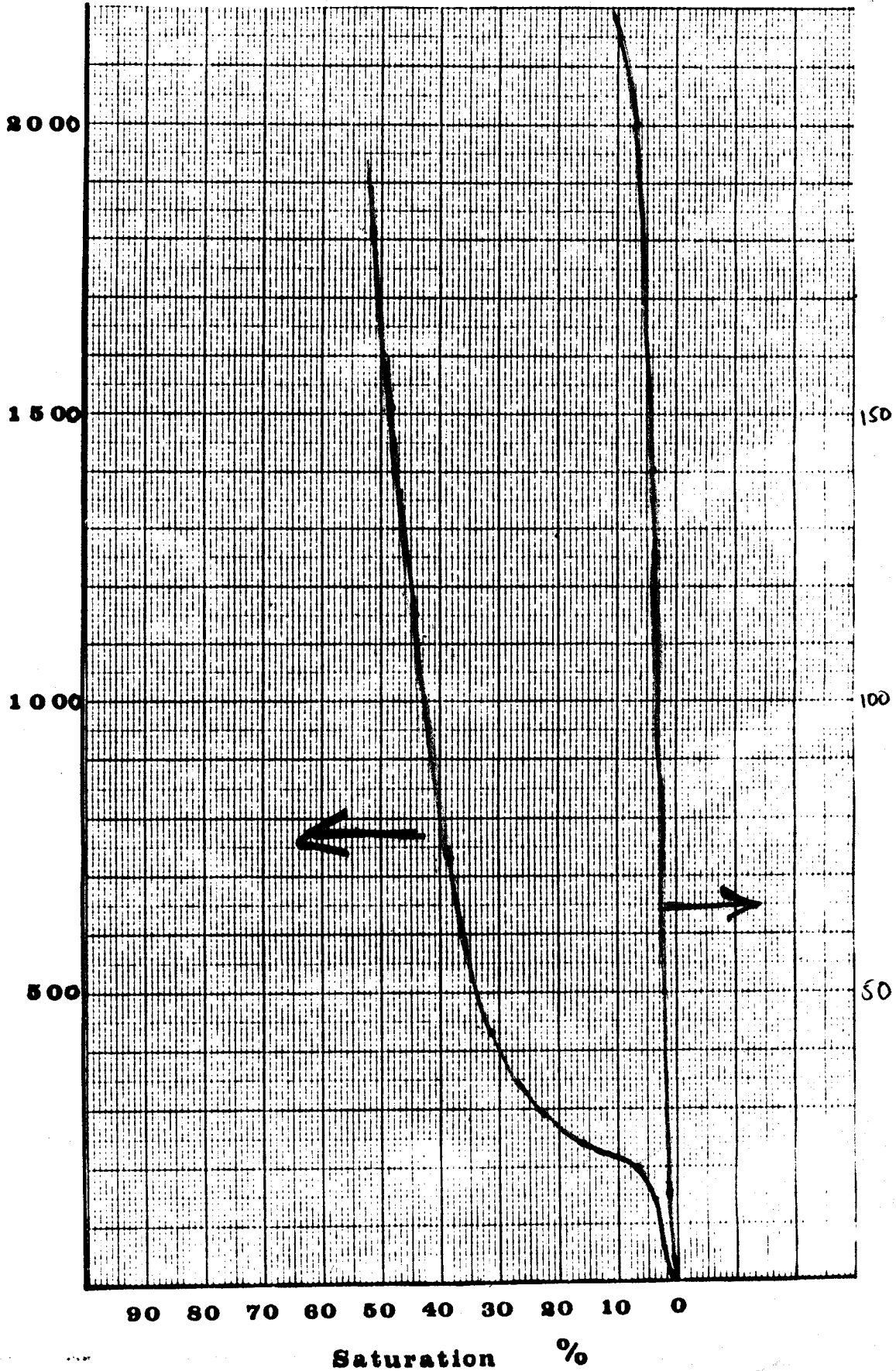
Core No.: 233+

Depth: 3610.00

ϕ : 12.3%

K: 0.27 test mD

P_0 psi.



Capillary Pressure Measurement

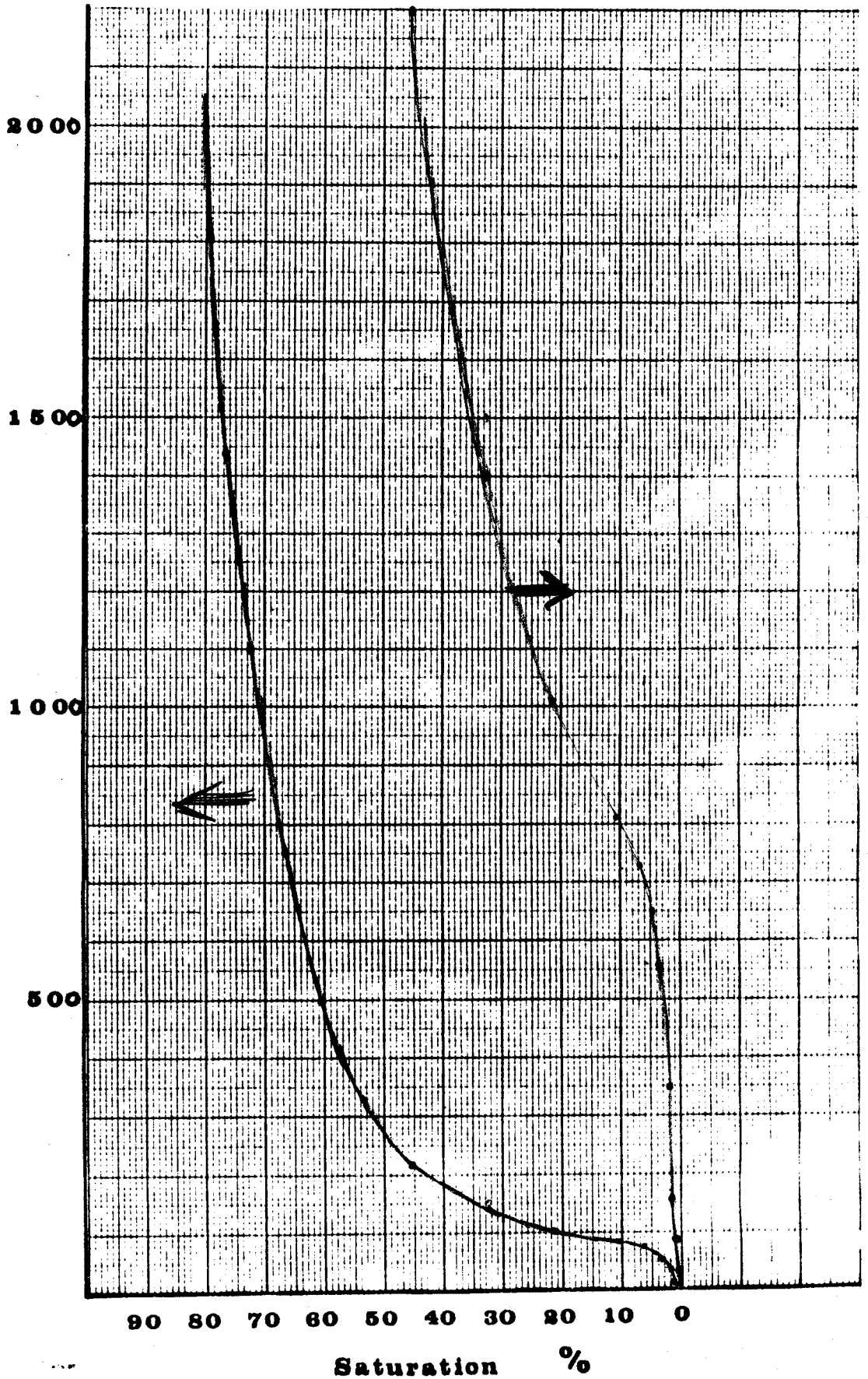
ϕ : 15.7 %

Core No.: 3057

Depth: 3638.20

K: 4.7 mD

P_c psi



Capillary Pressure Measurement

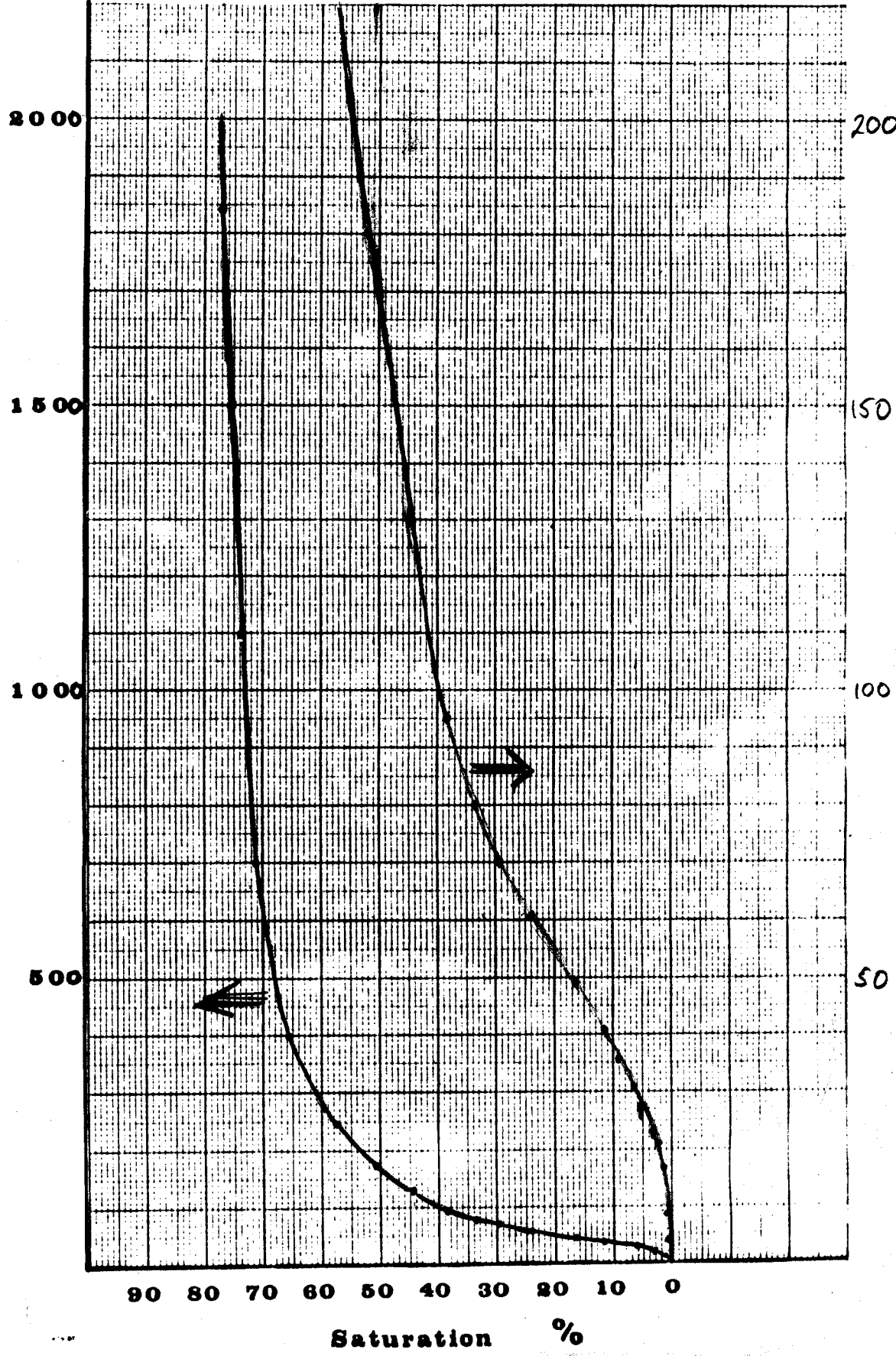
ϕ : 13.5 %

Core No.: 191x

Depth: 3597.10

K: 8.9 mD

P_o psi.

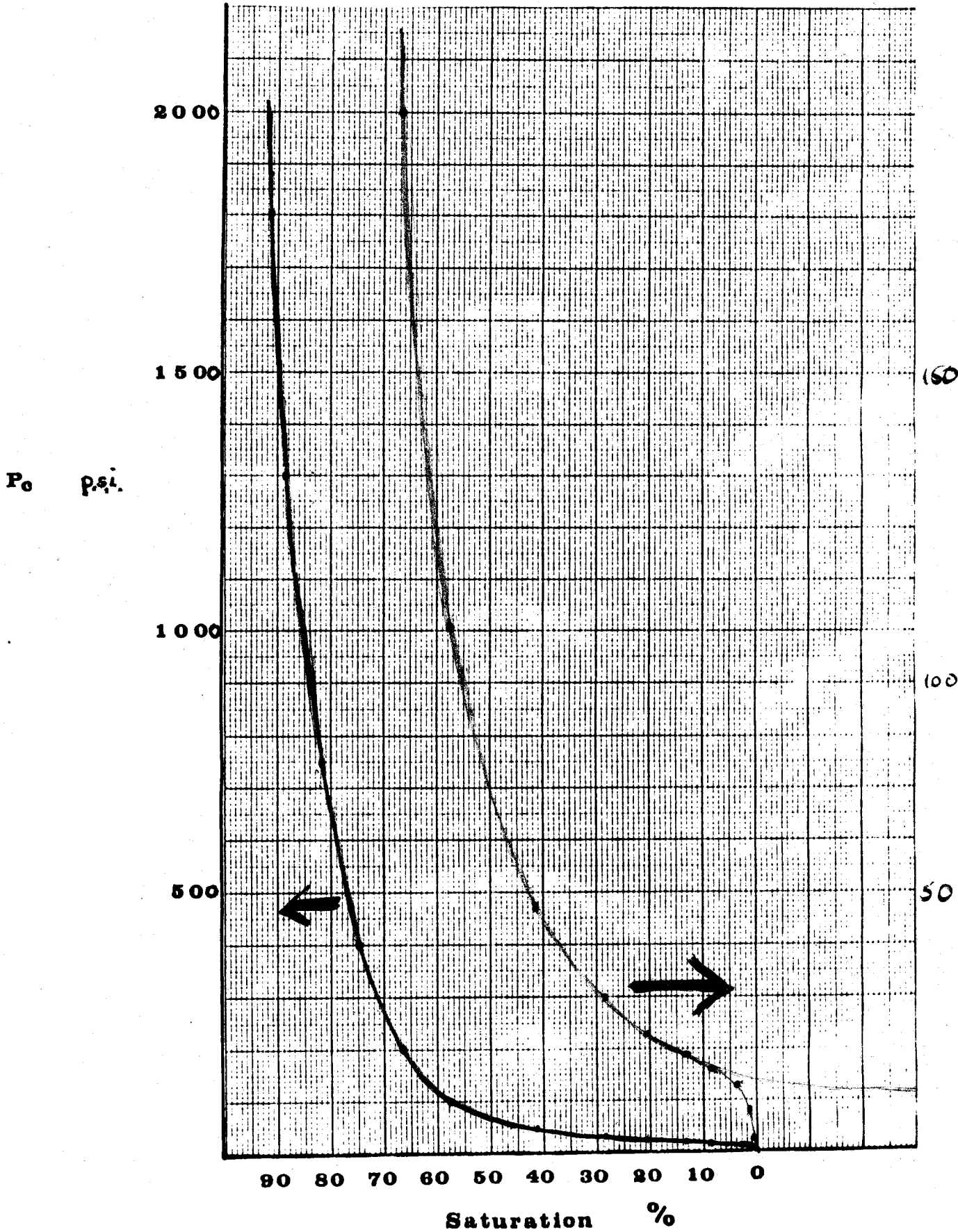


Capillary Pressure Measurement

ϕ : 15.4 %

Core No.: 386 x Depth: 3666.95 m

K: 59 mD
A



Capillary Pressure Measurement

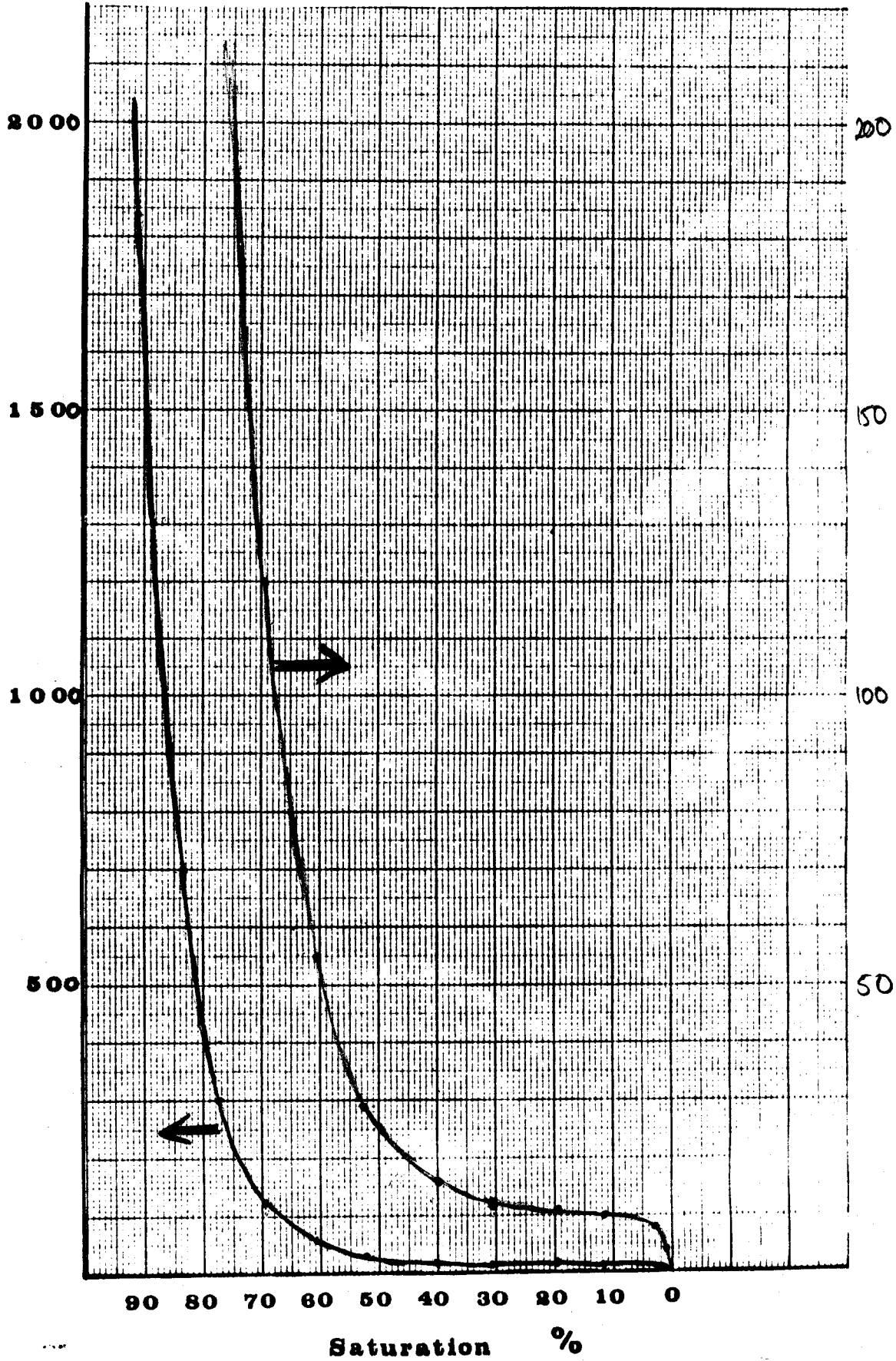
ϕ : 17.9 %

Core No.: 339x

Depth: 3651.30

K: 177 mD

P_0 psi.



Capillary Pressure Measurement

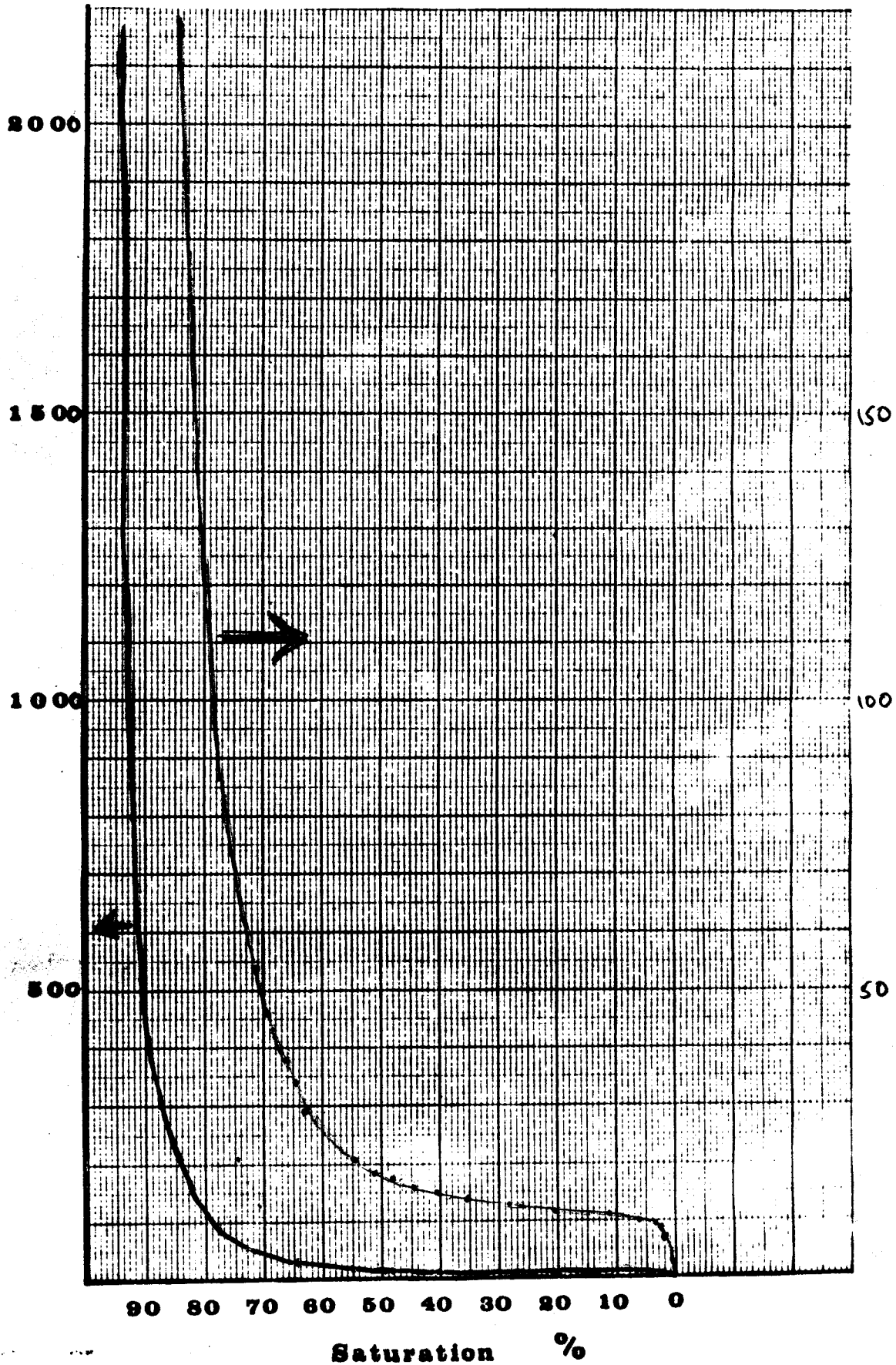
ϕ : 19.5 %

Core No.: 165

Depth: 3589.00

K: 248 mD

P_c psi.



Capillary Pressure Measurement

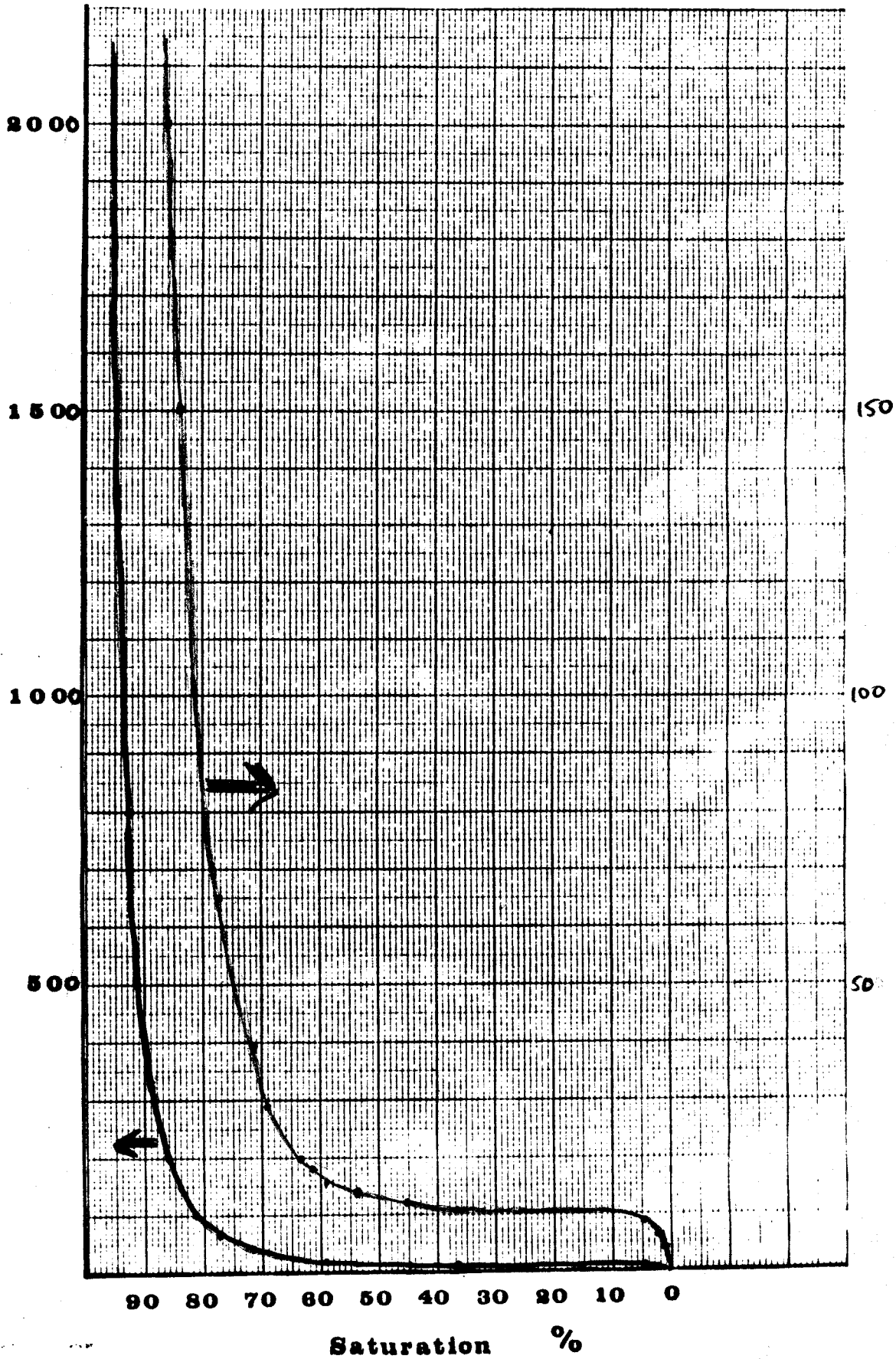
ϕ : 20.6 %

Core No.: 252 x

Depth: 3616.50

K: 264 mD

P_0 psi.



INDICATED PRESS (psi)	CORRECTED PRESS (psi)	INDICATED VOL Hg (cc)	P-V CORRECTION (cc)	ACTUAL VOL Hg (cc)	Hg SATURATION %	HP	INDICATED PRESS (psi)	CORRECTED PRESS (psi)	P _{corr}	H _{total}	H _{Pre} (2)	
3	3.8	0.03	0.008		1.2	0.9	3	3.8	0.025	0.008	1.1	0.8
7	7.8	0.042	0.012		1.6	1.5	15	14	0.04	0.014	1.7	1.7
12	13	0.07	0.013		3.1	3.0	49	50	0.05			2.1
15	16	0.17	0.014		8.4	8.4	140	141	0.088			4.0
18	19	0.265				13.4	200		0.14			7.0
22	23	0.4				20.7	242		0.28			16.1
29	30	0.55				28.7	290		0.385			22.7
46	47	0.79				41.5	430		0.53			31.4
100	101	1.1				57.9	730		0.67			38.5
200	201	1.27				66.4	1100		0.80			44.2
400		1.45				74.9	1500		0.90			48.3
750		1.62				82.0	1810		0.98			51.4
1300		1.80				88.5						
1800		1.91				91.5						

SAMPLE # 386 $V_a = 10.19$
 $V_B = 12.05$ (12.03) $\Rightarrow 27.32$
 $\therefore P.V. = 1.86$

SAMPLE # 233 $V_a = 20.70$
 $V_B = 12.20$ (12.10)
 $\therefore P.V. = 1.50$

INDICATED PRESS (psi)	CORRECTED PRESS (psi)	INDICATED VOL Hg cc	P-V CORRECTION cc	ACTUAL VOL Hg cc	Hg SATURATION %	INDICATED PRESS (psi)	CORRECTED PRESS (psi)					
3	3.8	0.02	0.008		0.7	0.4						
8	8.8	0.03	0.011		1.1	0.9						
15	16	0.04	0.014		1.5	1.4						
34	35	0.05				1.9						
56	57	0.075				3.2						
64	65	0.10				4.5						
72	73	0.14				6.7						
80	81	0.21				10.6						
100		0.41				21.8						
140		0.61				32.8						
220		0.84				45.4						
330		1.00				53.7						
500		1.13				60.1						
750		1.27				66.4						
1100		1.41				72.2						
1440		1.52				76.4						
1810		1.61				79.2						

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(+ 0.8 psi)

SAMPLE # 305 $V_a = 9.50$
 $V_B = 11.27$
 $\therefore P.V. = 1.77$

(-11.61)

SAMPLE # $V_a =$
 $V_B =$
 $\therefore P.V. =$

INDICATED PRESS (A)	CORRECTED PRESS (1)	INDICATED Hg (B)	P-V CORRECTION CC	ACTUAL VOL Hg (cc)	Hg SATURATION %	Curve Filter (2)	INDICATED PRESS (A)	CORRECTED PRESS (1)	(B)	P _{norm}	Hg Sat	Curve Filter (2)
3.0	3.8	0.020	0.008		-74	0.41	3.0	3.8	0.034	0.008	1.2	0.95
8.0	8.8	0.025	0.011		0.86	0.68	7	7.8	0.08	0.012	3.1	3.1
15.0	16.8	0.034	0.014		1.2	1.2	9	10	0.27	0.012	11.8	11.8
20.0	20.8	0.055	0.015		2.5	2.5	10	11	0.44		19.6	19.6
22.0	23	0.07	0.017		3.3	3.3	12	13	0.68		30.7	30.7
27.0	28	0.10			-	5.2	15	16	0.88		39.9	39.9
30.0	31	0.12	0.018		6.3	6.4	28	29	1.15		52.3	52.3
35.0	36	0.164				9.0	55	56	1.33		60.4	60.4
40.0	41	0.21				11.8	120		1.54		69.8	69.8
48	49	0.285				16.4	300		1.73		77.6	77.6
60		0.41				24.0	700		1.90		83.5	83.5
70		0.50				29.4	1300		2.08		88.8	88.8
80		0.57				33.6	1840		2.19		91.2	91.2
95		0.65				38.4						
130		0.75				44.4						
175		0.86				50.8						
250		0.98				57.7						
400		1.13				65.9						
700		1.25				71.2						
1100		1.33				73.5						
1500		1.41				75.8						
1840		1.47				77.2						

SAMPLE #191x V_a = 10.46
 V_B = 12.09 (12.05 w/c)
 ∴ P.V. = 1.63

SAMPLE #339x V_a = 9.90 (3)
 V_B = 12.07 (4) (11.98)
 ∴ P.V. = 2.17

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INDICATED PRESS (psi)	CORRECTED PRESS (psi)	INDICATED VOL Hg (cc.)	P-V CORRECTION cc.	ACTUAL VOL Hg (cc.)	Hg SATURATION %	(Curve Fitted)	INDICATED PRESS (psi)	CORRECTED PRESS (psi)					
3.0	3.8	0.030	0.008	0.9	0.7		3.2	4.0	0.036	0.008	1.2	0.9	x
6.0	6.8	0.050	0.010	1.7	1.6		6.0	6.8	0.060	0.010	2.1	1.9	x
8.0	8.8	0.068	0.011	2.4	2.3		8.0	8.8	0.120	0.018	4.5	4.4	✓
9.0	9.8	0.095	0.012	3.5	3.5		10.0	10.8	0.910	0.012	37.0	36.9	✓
10.0	10.8	0.160	0.012	6.3	6.2		11.0	11.8	1.110	0.012	45.2	45.1	✓
11.0	11.8	0.280	0.012	11.5	11.4		13.0	13.8	1.330	0.013	54.2	54.1	✓
12.0	12.8	0.490	0.013	20.4	20.3		15.0	15.8	1.450	0.014	59.1	59.1	✓
13.0	13.8	0.680	0.013	28.5			17.2	18.0	1.51	0.015	61.5	61.5	✓
14.0	14.8	0.840	0.014	35.3	35.3		19.2	20.0	1.56	0.015	63.6	63.6	✓
15.0	15.8	0.960	0.014	40.4			28.2	29.0	1.70	0.018	69.2	69.3	✓
16.2	17.0	1.055	0.015	44.4			38.2	39.0	1.76	0.019	71.7	71.7	✓
17.2	18.0	1.145	0.015	48.3			64.2	65.0	1.90	0.021	77.3	77.4	✓
18.4	19.2	1.220	0.015	51.5			100.	101	2.01	0.025	81.7	81.7	✓
20.2	21.0	1.300	0.016	54.9			150	151	2.07	0.030	84.0	84.0	✓
24.							200		2.13	0.035	86.2	86.2	✓
28.2	29.0	1.500	0.018	63.3	63.4		320		2.21			89.0	✓
33.2	34.0	1.530	0.019	64.6			500		2.28			91.1	✓
37.2	38.0	1.570	0.019	66.3			800		2.35			92.2	
45.2	46.0	1.640	0.019	69.3	69.3		1300		2.45			94.2	
53.2	54.0	1.700	0.020	71.8			1860		2.54			95.7	
65.2	66.0	1.76	0.021	74.3									
86.2	87.0	1.84	0.023	77.6									
130	130	1.92	0.028	80.9									
170	170	1.97	0.032	82.8									
210	210	2.01	0.037	84.3									
300	300	2.09	0.046	87.4									
520	520	2.20	0.070	91.0									
800		2.26	0.100	92.3									
1200		2.33	0.142	93.5									
1600		2.38	0.185	93.8									
2000		2.44	0.228	94.5									

HP.67 (2) (HP.67 + curve fit)

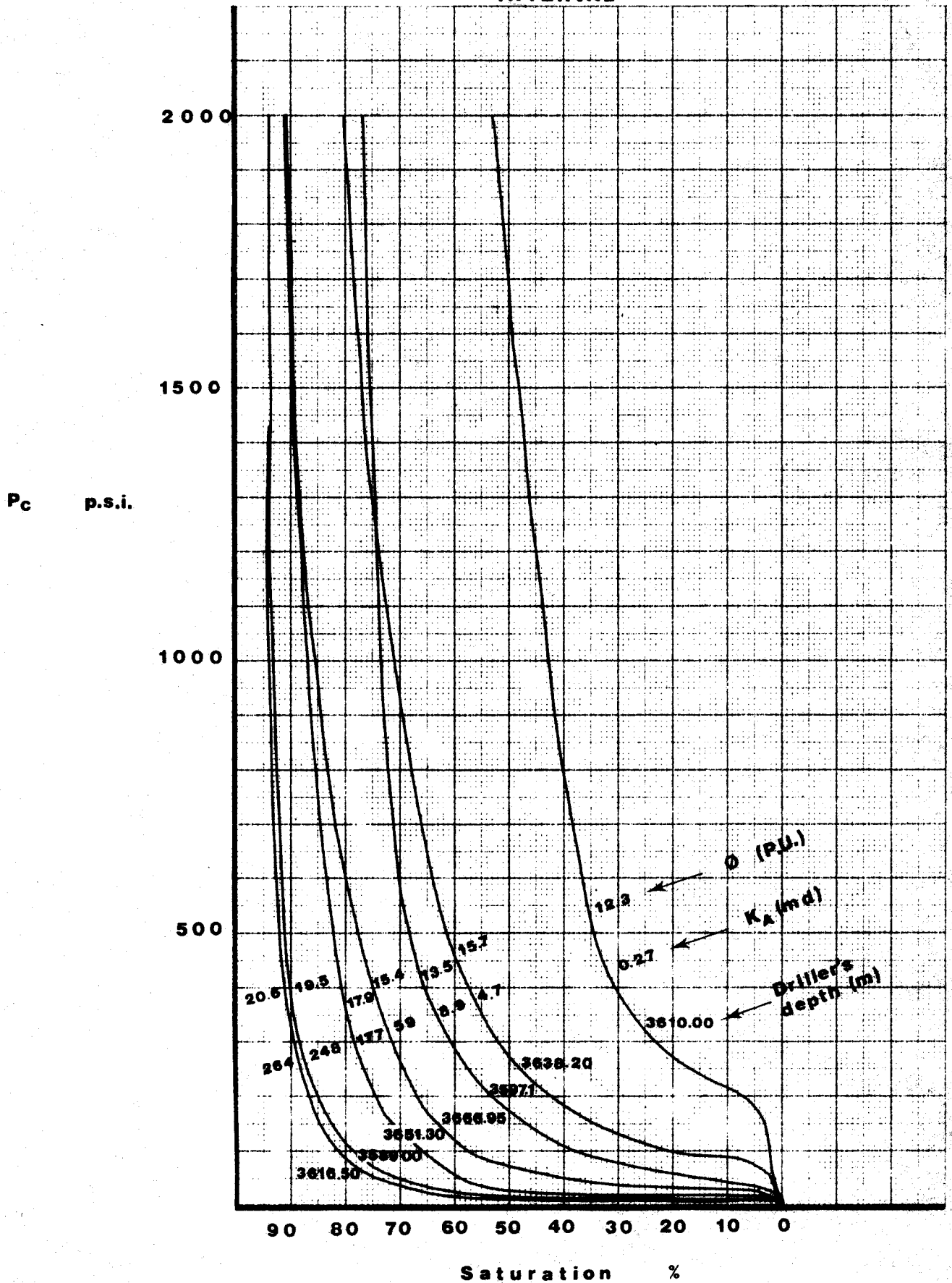
SAMPLE # 165 V_a = 9.63
 V_B = 11.97
 ∴ P.V. = 2.34
 (11.95 w/P_c) ⇒ 27.32

SAMPLE # 252x V_a = 9.36
 V_B = 11.79
 ∴ P.V. = 2.43
 (11.72 P_c)

Capillary Pressure Measurement (Hg INJECTION)

ϕ : 12.3 \rightarrow 20.6%

7 PLUGS TOTAL, DEPTH: OVER WHOLE HYDROCARBON K:27 \rightarrow 264 mD
 INTERVAL



Capillary Pressure Measurement (Hg INJECTION)

ϕ : 12.3 \rightarrow 20.6%

7 PLUGS TOTAL, DEPTH: OVER WHOLE HYDROCARBON K_A : 27 \rightarrow 264 mD
 INTERVAL

