

UND — ARKIVET
Nr: 45
120

CORE LABORATORIES UK L

75 GREENFIELD ROAD,
LONDON E1 1EJ

Directors: J. D. Wisenbaker (USA)
J. W. Barbour (USA)
J. S. Green (Managing)
W. B. P. O'Driscoll (Financial)
M. Blackburn

Telephone: 01-377 9777
Telex: 8811086
Cable: CORELABOR

MBH/jak

A/S Norske Shell Exploration & Production
P.O. Box 40
4056 Tananger
Norway

3rd March 1982

Attn: Mr T. Tosun

Subject: Special Core Analysis
Well: 31/2-5
File: UKSCAL 311-81039

Gentlemen,

Please find enclosed in preliminary form results of gas-oil and water-oil relative permeability measurements performed on samples from the subject well.

Should you have any questions please do not hesitate to contact us.

Yours faithfully
CORE LABORATORIES UK LIMITED

Margarita Healy


Margarita Healy
Data Evaluator

REGISTERED IN ENGLAND NO. 1331818 VAT NUMBER 219 8700 49

Registered Office:— 75 Greenfield Road, London, E1 1EJ.

Associates in UNITED STATES MIDDLE EAST CANADA SOUTH AMERICA EUROPE AFRICA AUSTRALIA ASIA

Denne rapport
tilhører

 STATOIL

L&U DOK. SENTER

L. NR. 20088470038
KODE 31/2-5 nr 47

Returneres etter bruk

UND — ARKIVET

Nr.: 45

L C

CORE LABORATORIES UK LTD.

75 GREENFIELD ROAD,
LONDON E1 1EJ

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Petroleum Reservoir Engineering

LONDON—ABERDEEN

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File: UKSCAL 311-81039

GAS-OIL RELATIVE PERMEABILITY DATA

Sample Number: 3B

Initial Water Saturation *high*
Per Cent Pore Space: 34.5

Air Permeability, Md: 3790

Porosity, Per Cent: 33.6

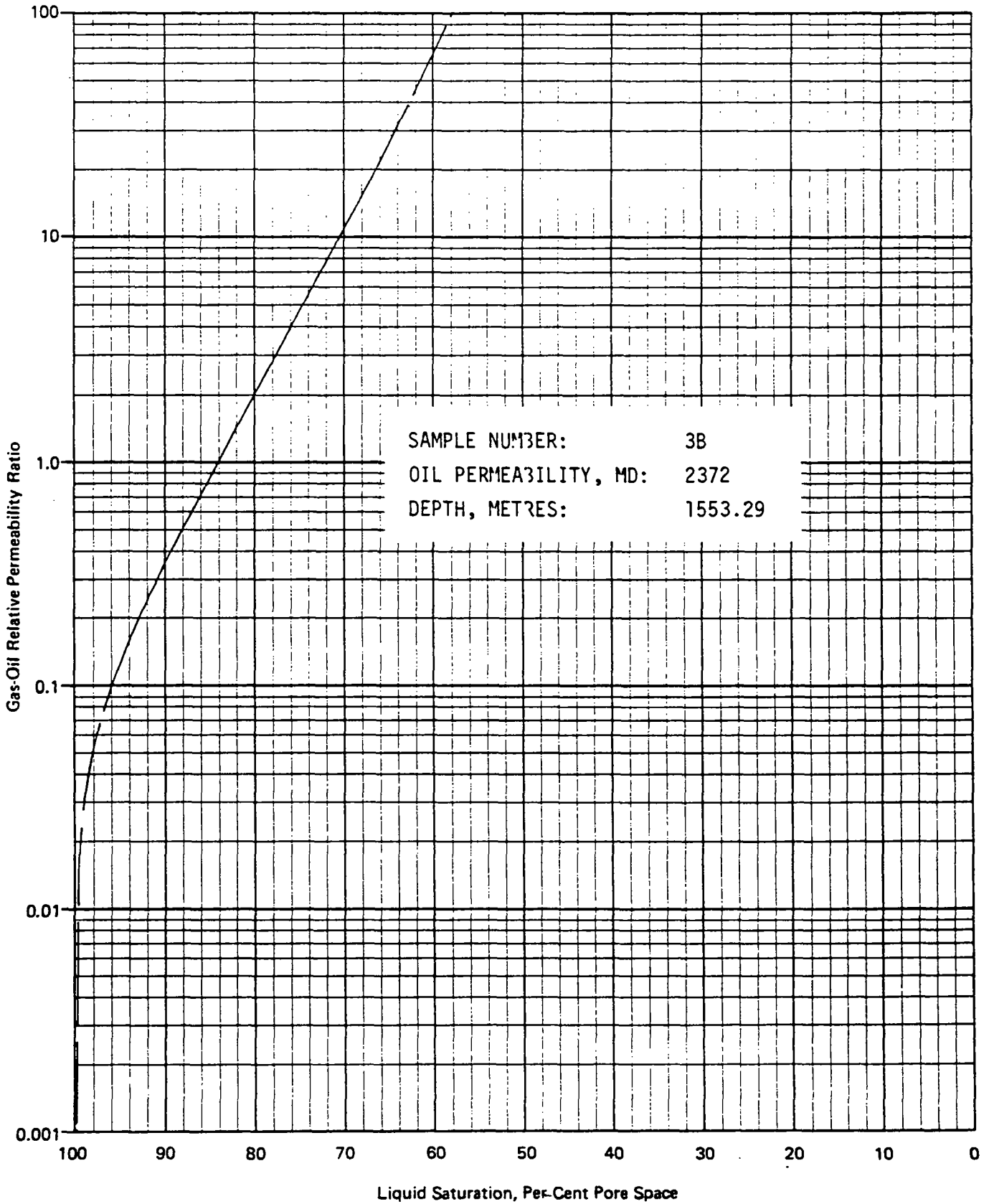
Oil Permeability with
Initial Water Present, Md: 2372

<u>Liquid Saturation Per Cent Pore Space</u>	<u>Gas-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Gas*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
100	0.000	0.000	0.000
96.9	0.079	0.035	0.438
94.3	0.144	0.047	0.325
92.4	0.216	0.057	0.266
87.2	0.558	0.087	0.155
84.3	0.924	0.105	0.114
81.2	1.62	0.129	0.080
78.5	2.62	0.152	0.058
76.0	4.17	0.182	0.044
73.3	6.56	0.219	0.033
66.5	21.2	0.286	0.014
65.0	29.2	0.318	0.011
63.1	39.1	0.336	0.0086

* Relative to Oil Permeability

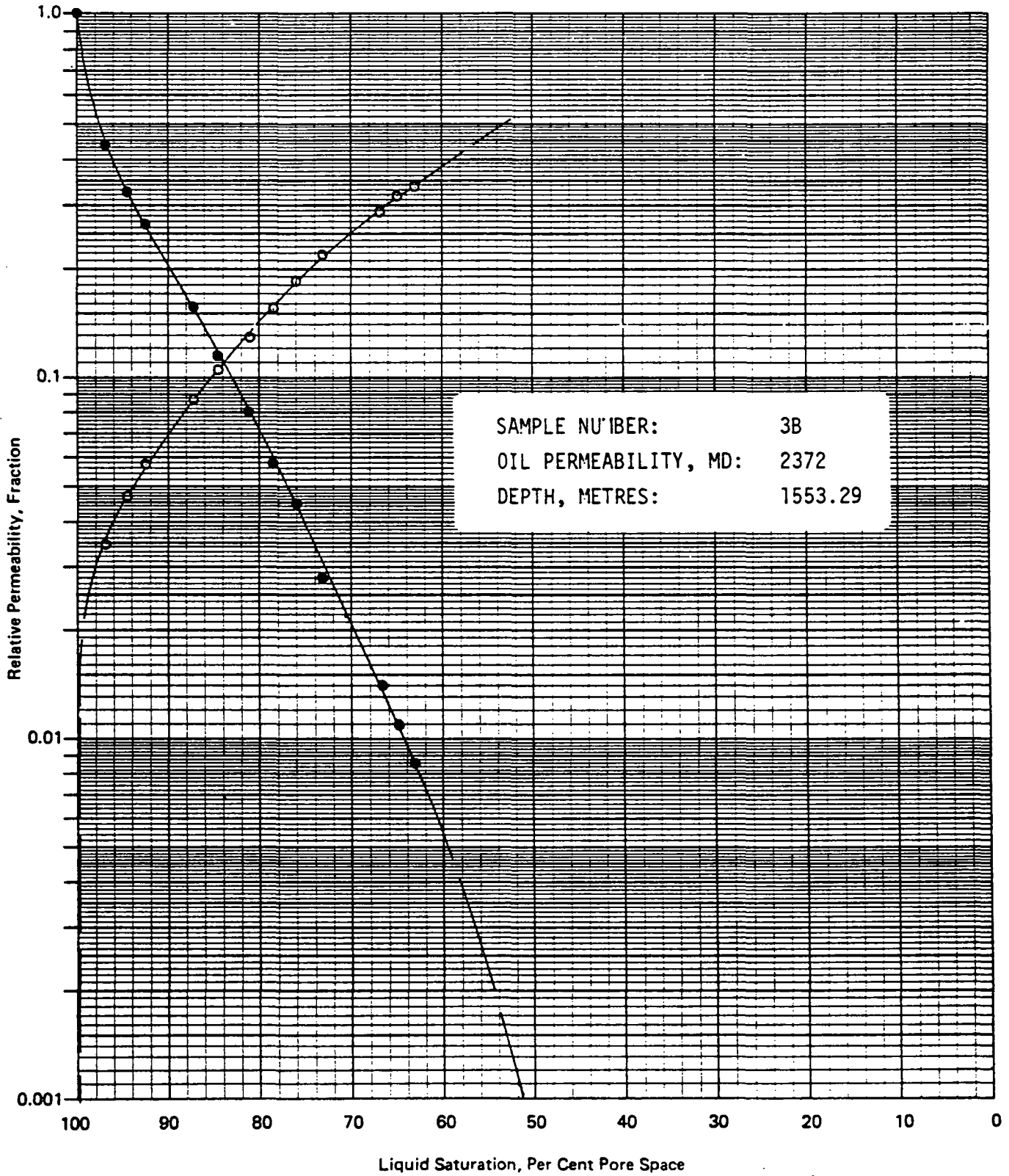
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Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Gas-Oil Relative Permeability Ratio

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



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Petroleum Reservoir Engineering

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File: UKSCAL 311-81039

GAS-OIL RELATIVE PERMEABILITY DATA

high

Sample Number: 5B

Initial Water Saturation
Per Cent Pore Space: 26.4

Air Permeability, Md: 1004

Oil Permeability with
Initial Water Present, Md: 821

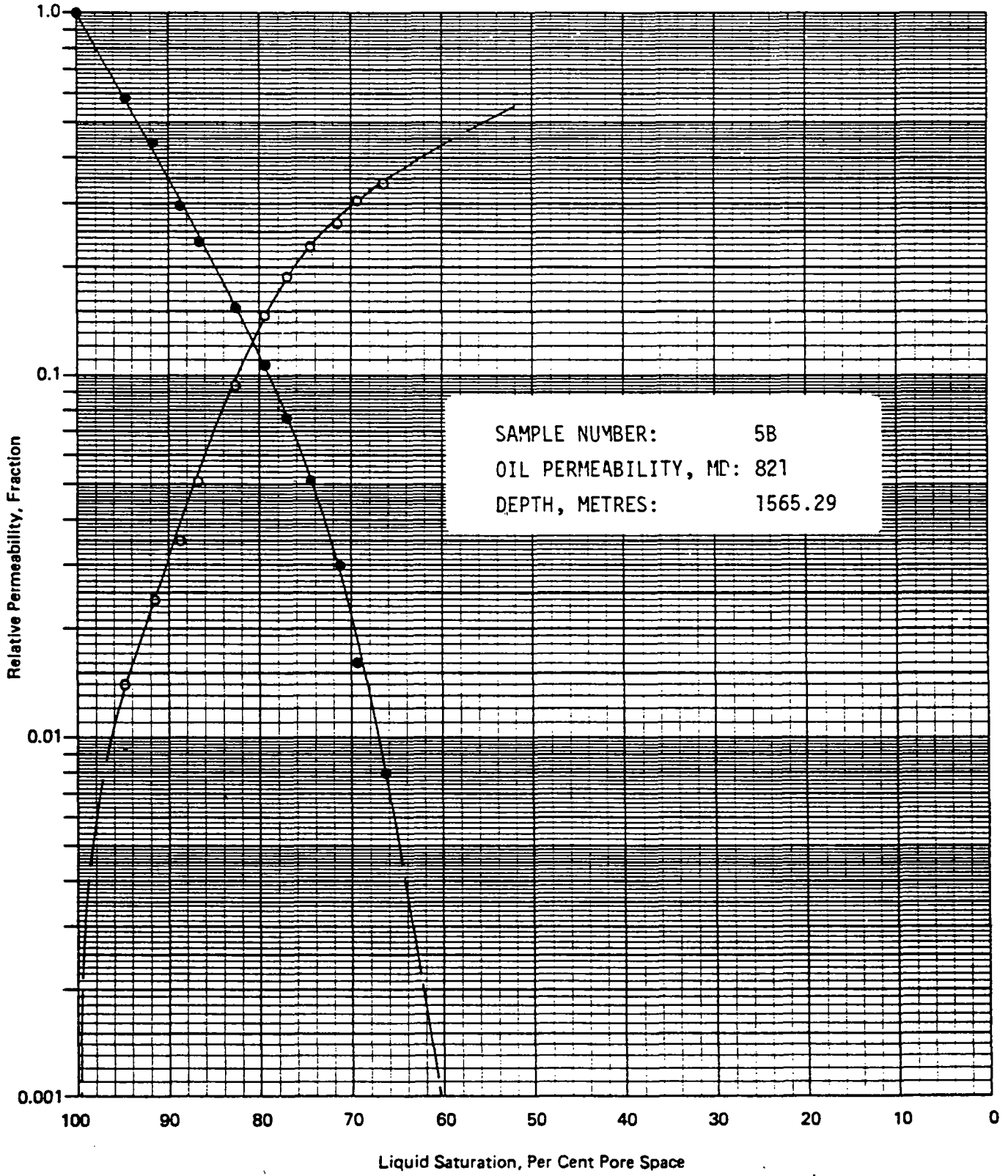
Porosity, Per Cent: 43.4

<u>Liquid Saturation Per Cent Pore Space</u>	<u>Gas-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Gas*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
100	0.000	0.000	1.000
94.6	0.025	0.014	0.580
91.9	0.050	0.024	0.431
88.6	0.121	0.035	0.291
86.7	0.217	0.051	0.233
82.6	0.619	0.094	0.153
79.5	1.37	0.148	0.108
77.1	2.41	0.184	0.076
74.5	4.42	0.223	0.051
71.7	8.84	0.266	0.030
69.6	20.3	0.305	0.016
66.2	42.7	0.339	0.0080

* Relative to Oil Permeability

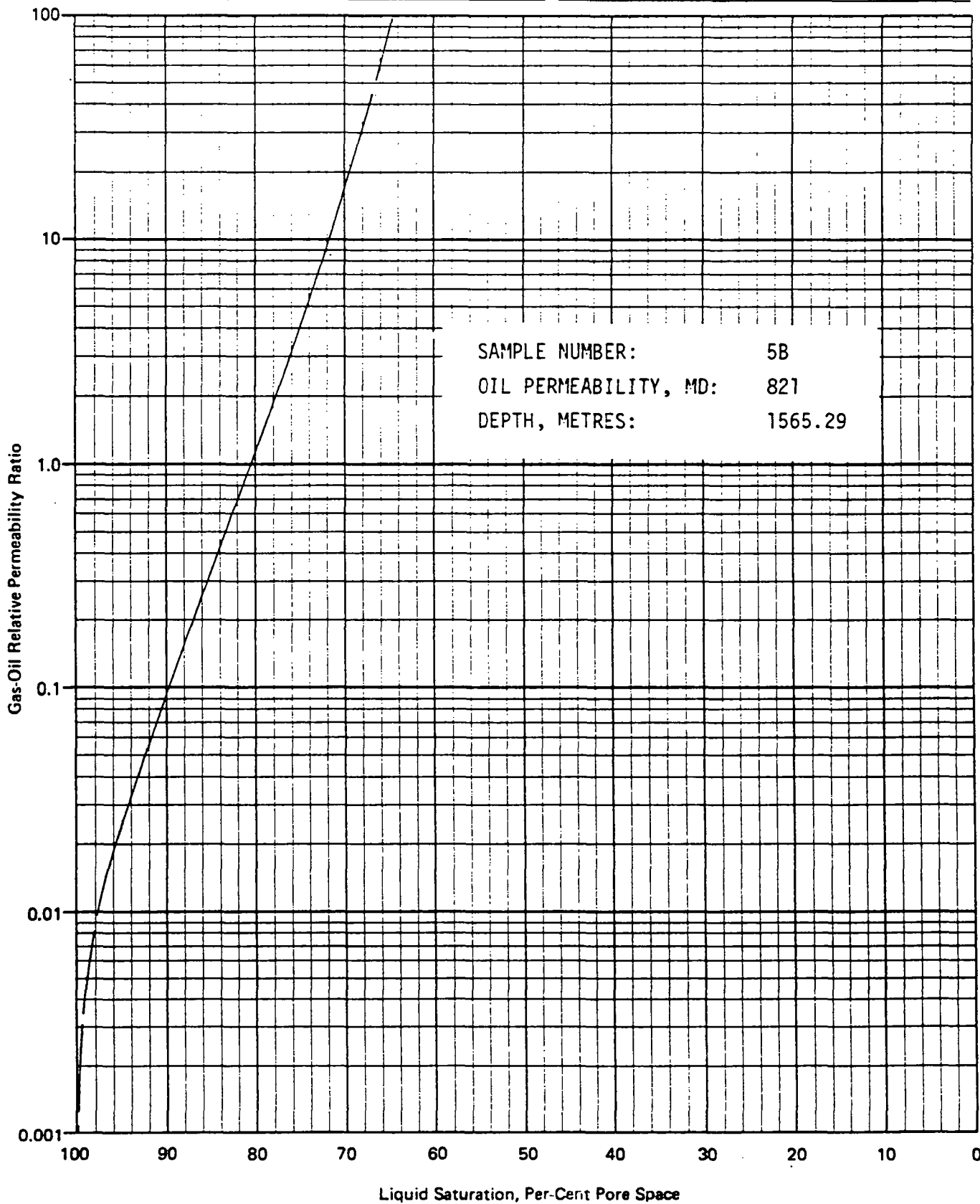
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Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Relative Permeability, Fraction

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Gas-Oil Relative Permeability Ratio

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Petroleum Reservoir Engineering

LONDON—ABERDEEN

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File: UKSCAL 311-81039

WATER-OIL RELATIVE PERMEABILITY DATA

Sample Number: 5B

Initial Water Saturation
Per Cent Pore Space: 26.4

Air Permeability, Md: 1004

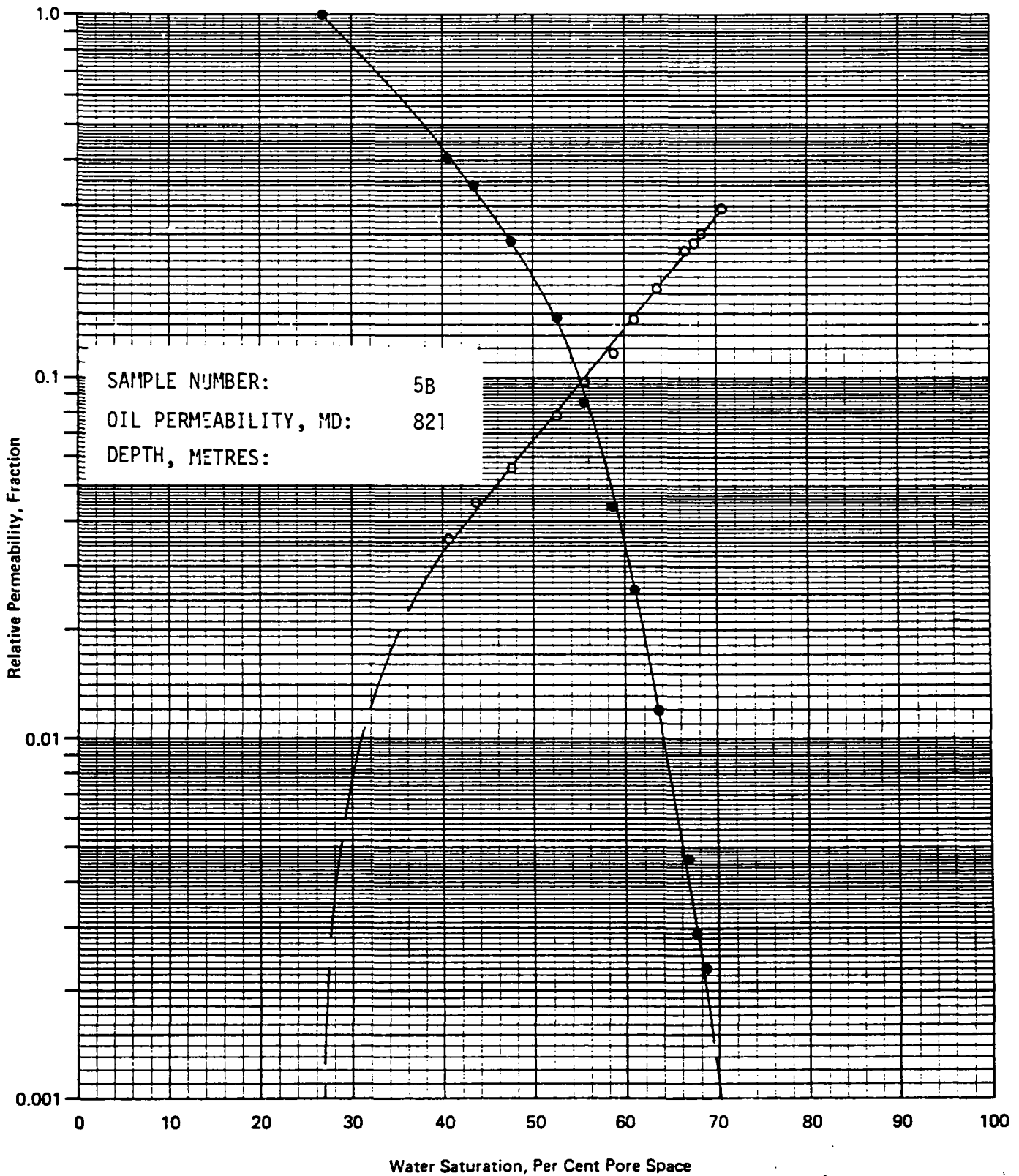
Oil Permeability with
Initial Water Present, Md: 821

Porosity, Per Cent: 43.4

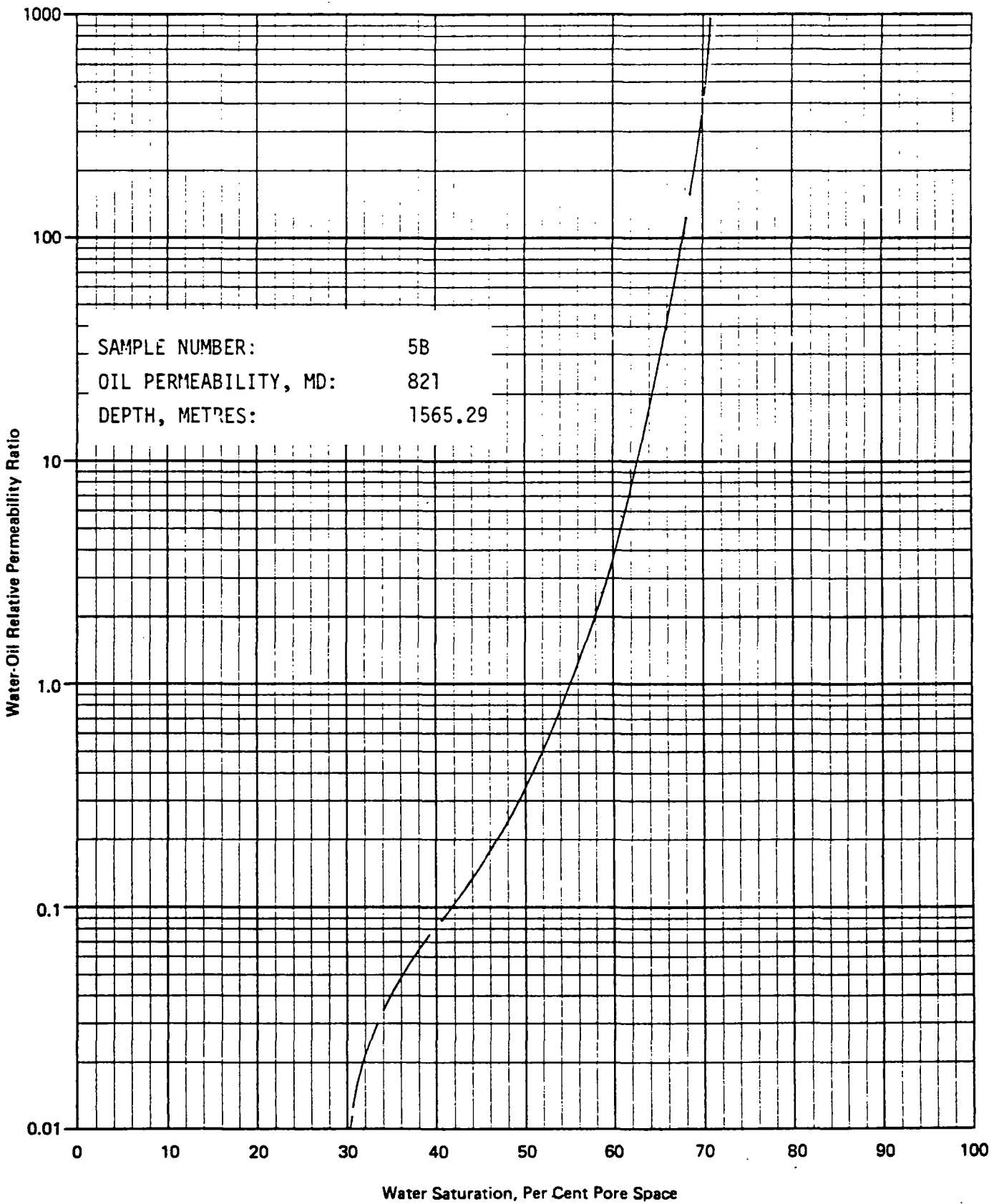
<u>Water Saturation Per Cent Pore Space</u>	<u>Water-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Water*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
26.4	0.000	0.000	1.000
40.5	0.089	0.036	0.402
43.5	0.130	0.045	0.345
47.5	0.232	0.056	0.240
52.3	0.528	0.078	0.148
55.6	1.13	0.097	0.086
58.6	2.64	0.117	0.044
61.0	5.74	0.147	0.026
63.6	14.4	0.177	0.012
66.6	48.5	0.227	0.0047
67.7	81.7	0.239	0.0029
68.2	111	0.250	0.0023
70.3	-	0.297	0.0000

* Relative to Oil Permeability

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 3T/2-5 Country NORWAY
Field _____



Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Water-Oil Relative Permeability Ratio

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Petroleum Reservoir Engineering

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File: UKSCAL 311-81039

WATER-OIL RELATIVE PERMEABILITY DATA

Sample Number: 7B

Initial Water Saturation
Per Cent Pore Space: 25.2 *high*

Air Permeability, Md: 4167

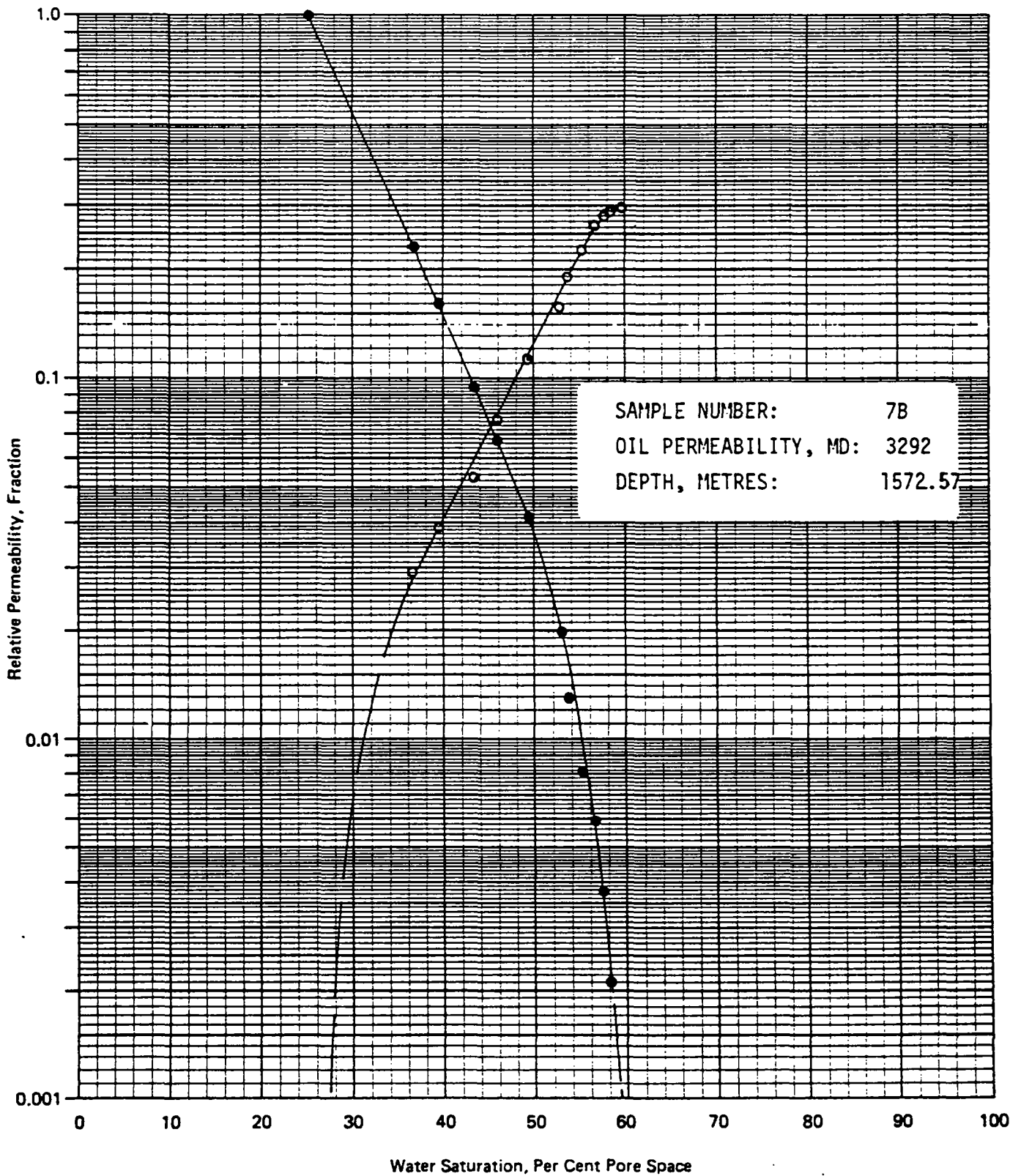
Oil Permeability with
Initial Water Present, Md: 3292

Porosity, Per Cent: 36.5

<u>Water Saturation Per Cent Pore Space</u>	<u>Water-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Water*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
25.2	0.000	0.000	1.000
36.1	0.127	0.029	0.230
39.7	0.250	0.039	0.156
43.5	0.560	0.053	0.095
46.0	1.15	0.077	0.067
49.6	2.66	0.112	0.042
52.7	7.75	0.155	0.020
53.9	14.8	0.190	0.013
55.1	27.2	0.223	0.0082
56.2	44.6	0.263	0.0059
57.5	72.9	0.277	0.0038
58.1	141.	0.297	0.0021
59.5	-	0.299	0.0000

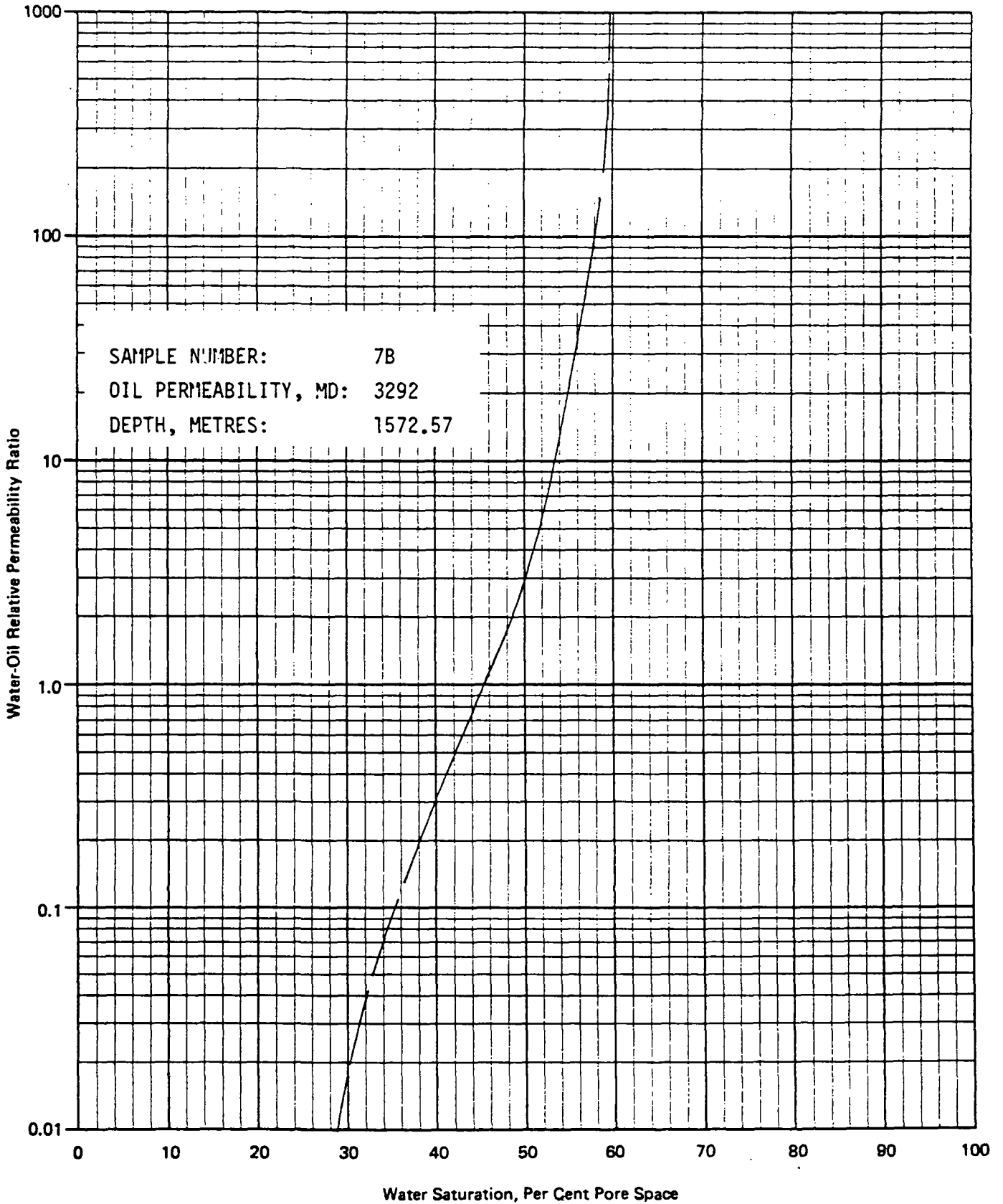
* Relative to Oil Permeability

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Relative Permeability, Fraction

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Water-Oil Relative Permeability Ratio

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Petroleum Reservoir Engineering

LONDON-ABERDEEN

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File: 311-81039

GAS-OIL RELATIVE PERMEABILITY DATA

Sample Number: 8B

Initial Water Saturation
Per Cent Pore Space: 20.6

Air Permeability, Md: 13846

Oil Permeability with
Initial Water Present, Md: 8273

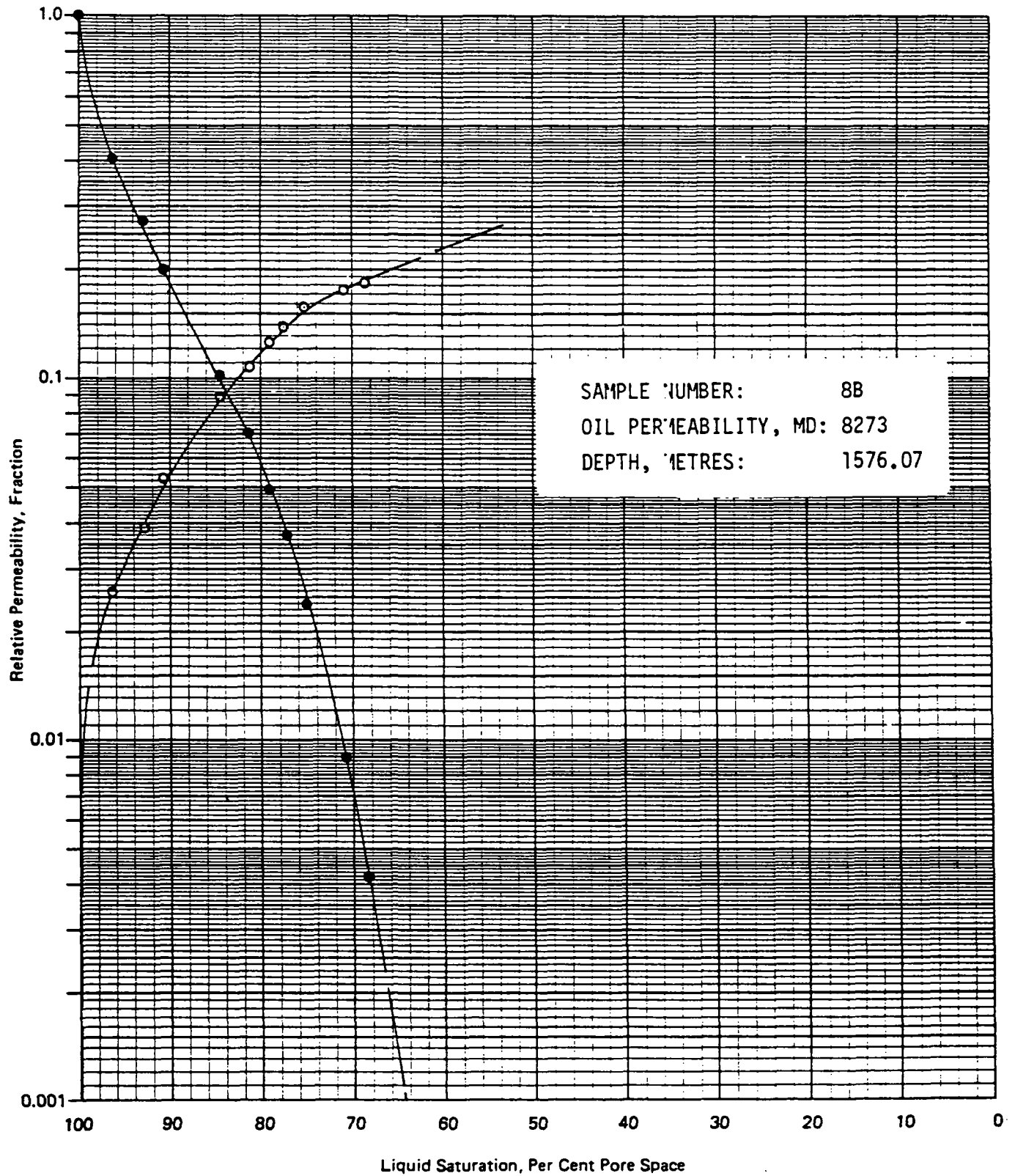
Porosity, Per Cent: 40.1

<u>Liquid Saturation Per Cent Pore Space</u>	<u>Gas-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Gas*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
100	0.000	0.000	1.000
96.2	0.066	0.026	0.402
93.0	0.142	0.039	0.272
90.7	0.264	0.053	0.200
84.1	0.881	0.089	0.101
81.6	1.54	0.109	0.071
79.4	2.51	0.123	0.049
77.7	3.77	0.139	0.037
75.2	6.53	0.156	0.024
70.9	19.0	0.171	0.0090
68.4	43.4	0.182	0.0042

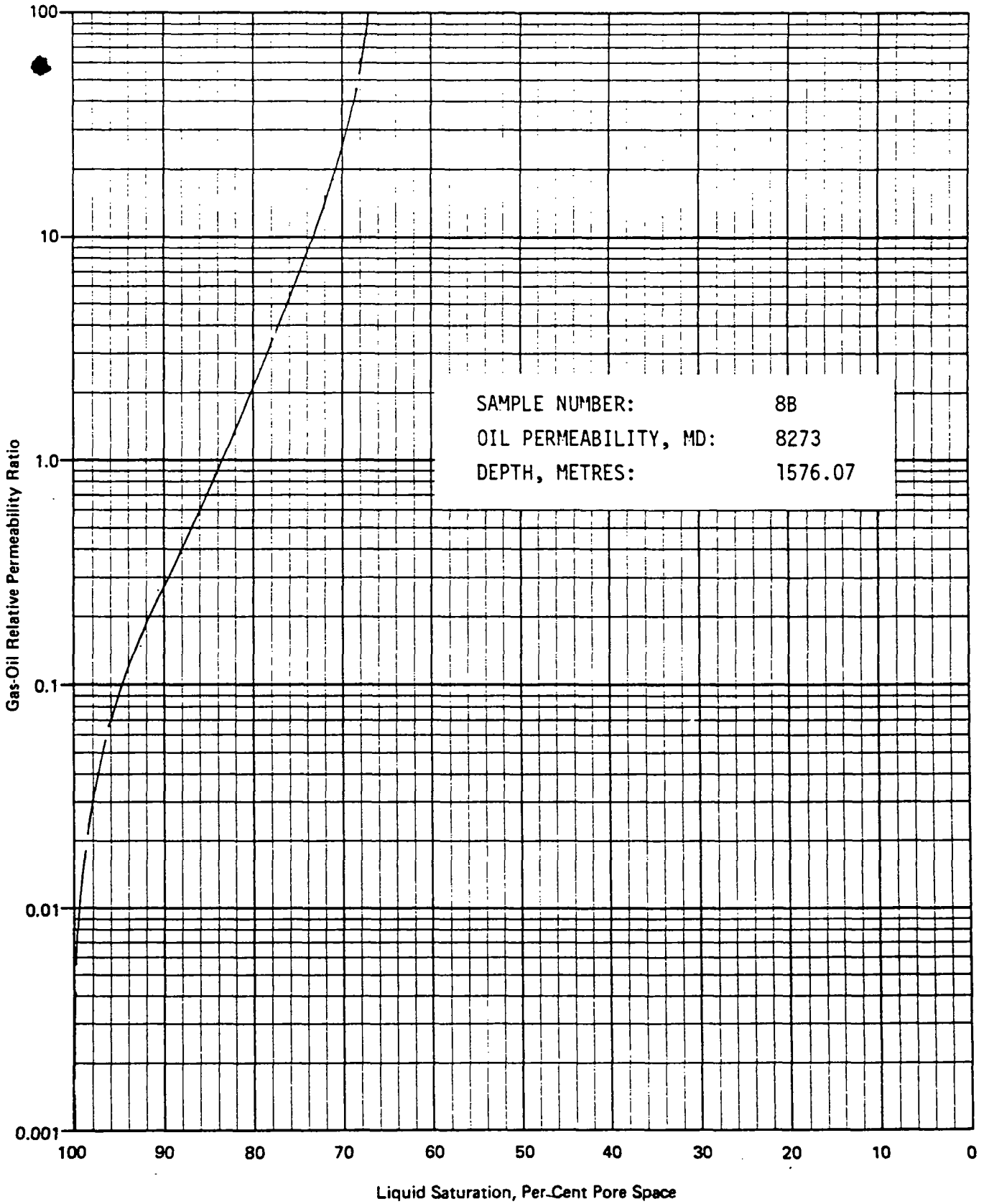
* Relative to Oil Permeability

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Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Gas-Oil Relative Permeability Ratio

CORE LABORATORIES UK LTD.

Petroleum Reservoir Engineering

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File: UKSCAL 311-81039

WATER-OIL RELATIVE PERMEABILITY DATA

Sample Number: 9B

Initial Water Saturation
Per Cent Pore Space: 25.0

Air Permeability, Md: 7785

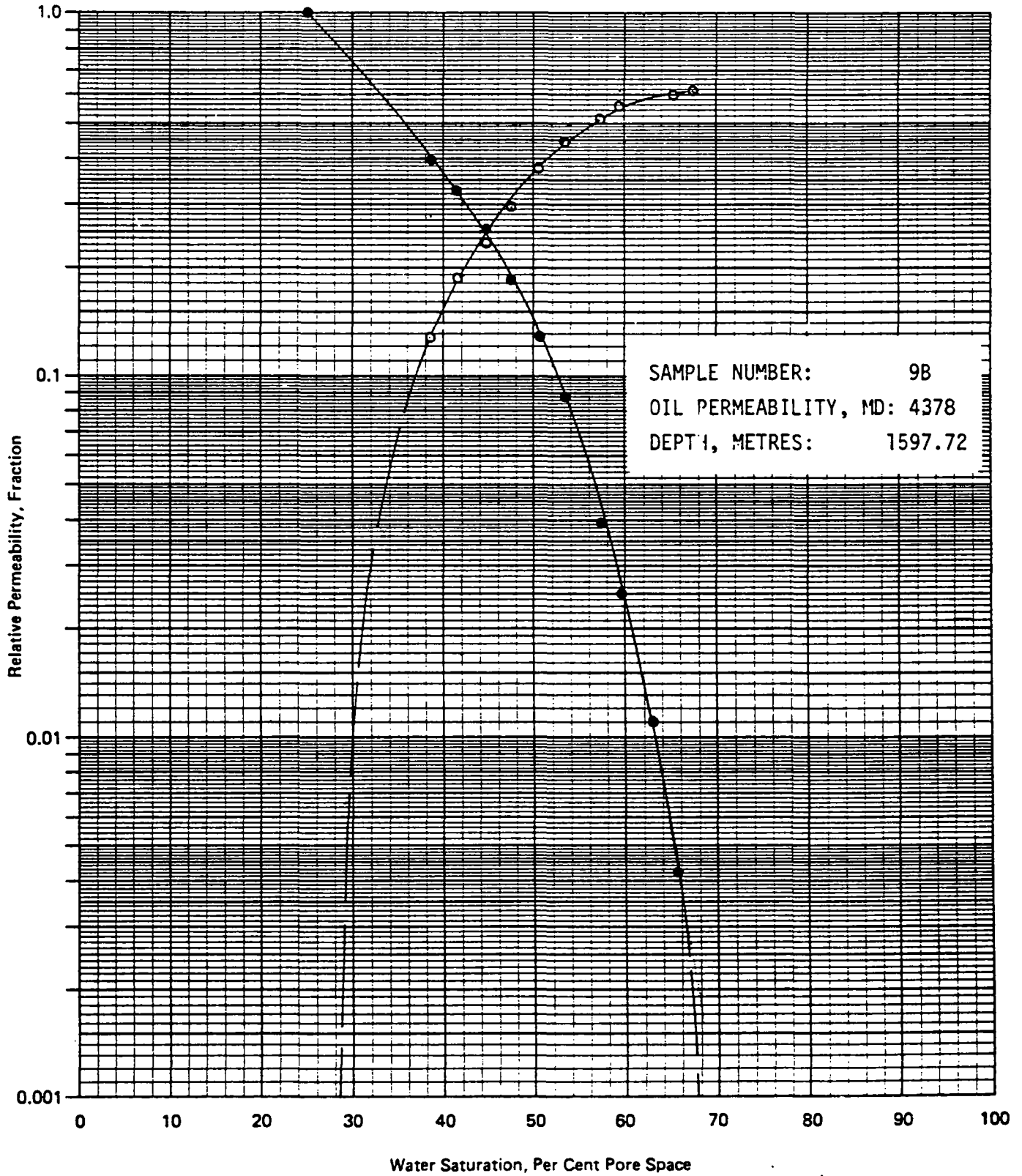
Oil Permeability with
Initial Water Present, Md: 4378

Porosity, Per Cent: 38.7

<u>Water Saturation Per Cent Pore Space</u>	<u>Water-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Water*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
25.0	0.000	0.000	1.000
38.3	0.325	0.129	0.398
41.8	0.572	0.183	0.321
44.6	0.922	0.233	0.253
47.6	1.61	0.295	0.183
50.5	2.90	0.372	0.128
53.3	5.07	0.445	0.087
57.3	12.8	0.510	0.039
59.8	22.5	0.558	0.025
62.9	51.8	0.584	0.011
65.5	144	0.599	0.0042
67.7	-	0.610	0.0000

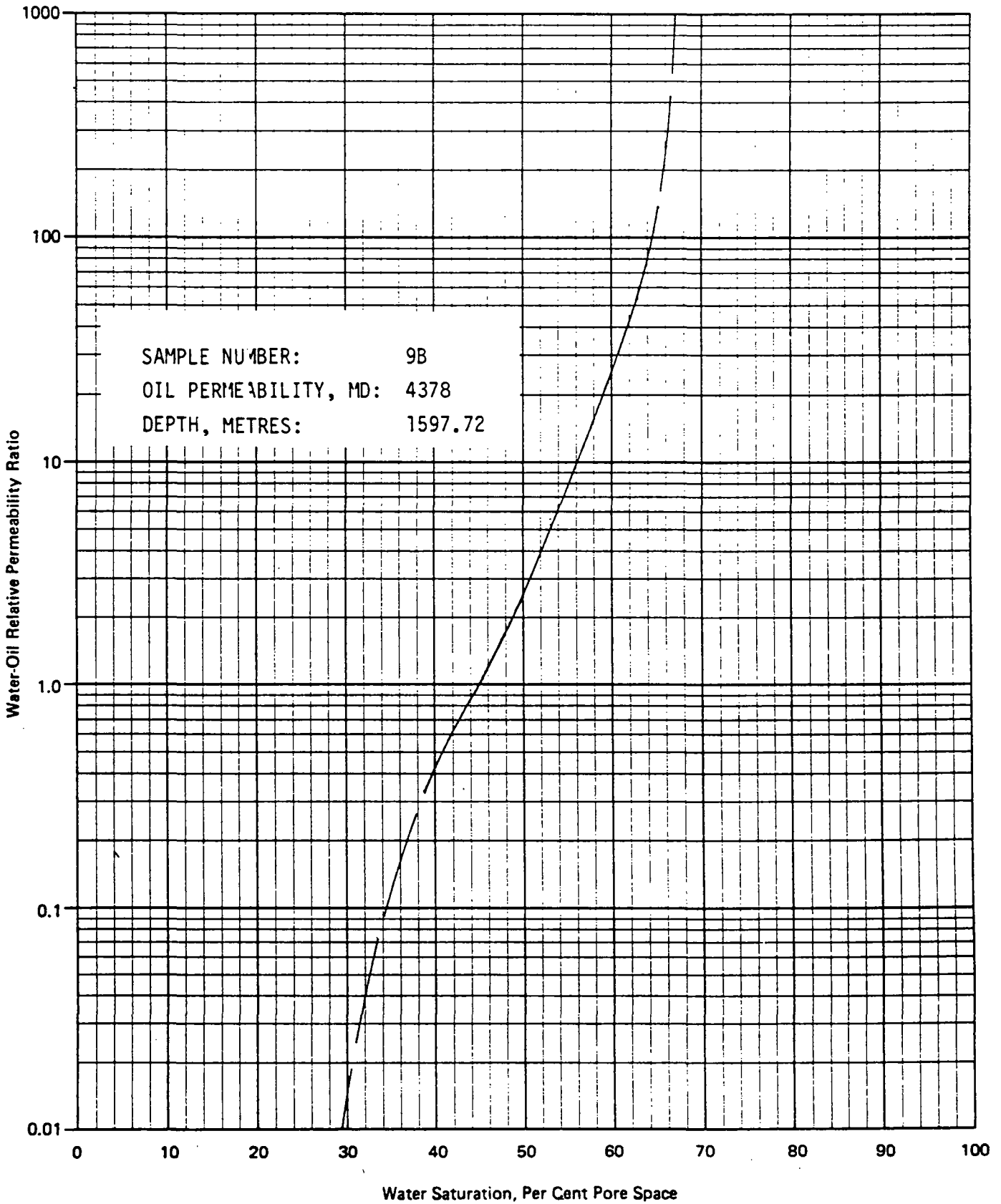
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Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Relative Permeability, Fraction

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Water-Oil Relative Permeability Ratio

CORE LABORATORIES UK LTD.

Petroleum Reservoir Engineering

LONDON—ABERDEEN

Page _____ of _____

File: UKSCAL 311-81039

GAS-OIL RELATIVE PERMEABILITY DATA

Sample Number: 9B

Initial Water Saturation
Per Cent Pore Space: 25.0

Air Permeability, Md: 7785

Oil Permeability with
Initial Water Present, Md: 4378

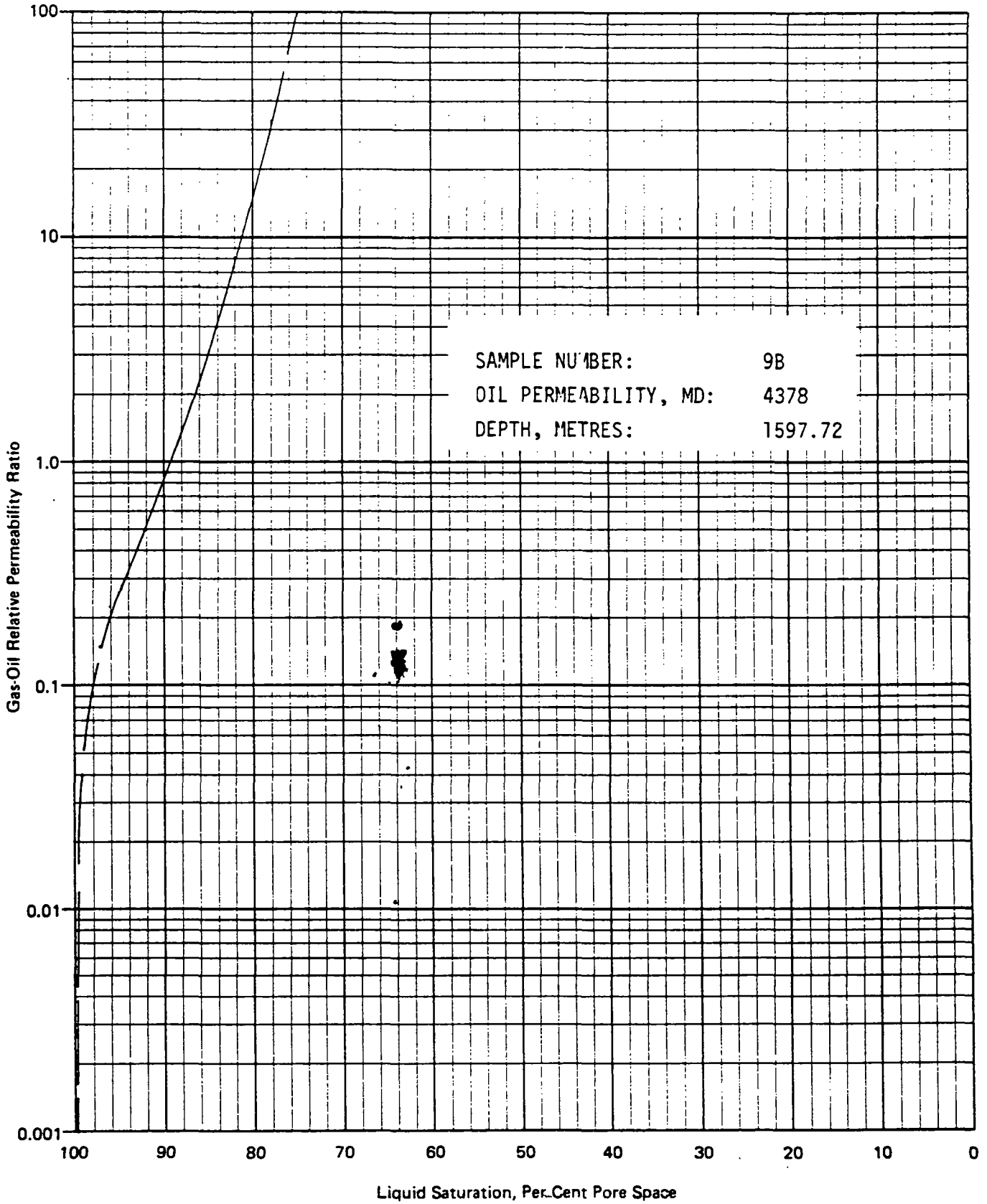
Porosity, Per Cent: 38.7

<u>Liquid Saturation Per Cent Pore Space</u>	<u>Gas-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Gas*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
100	0.000	0.000	1.000
97.2	0.152	0.054	0.354
96.0	0.215	0.064	0.298
94.9	0.274	0.072	0.263
91.9	0.548	0.085	0.156
87.8	1.61	0.117	0.073
86.2	2.37	0.131	0.055
84.0	3.92	0.150	0.038
80.7	10.3	0.174	0.017
79.3	24.5	0.202	0.0082
76.5	52.7	0.232	0.0044

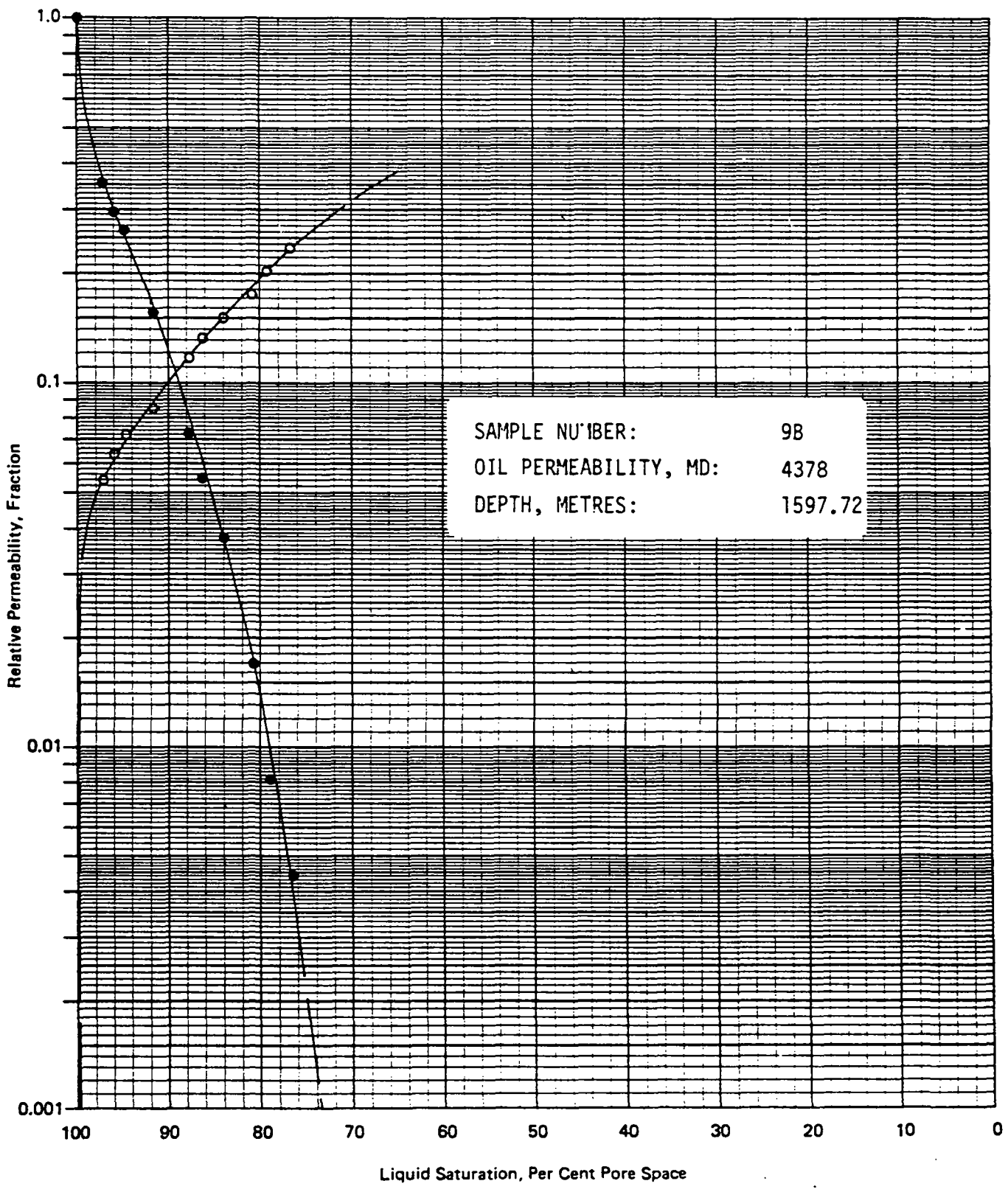
* Relative to Oil Permeability

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Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



CORE LABORATORIES UK LTD.

Petroleum Reservoir Engineering

LONDON—ABERDEEN

Page _____ of _____

File: UKSCAL 311-81039

WATER-OIL RELATIVE PERMEABILITY DATA

Sample Number: 10B

Initial Water Saturation
Per Cent Pore Space: 32.3

Air Permeability, Md: 7238

Porosity, Per Cent: 39.2

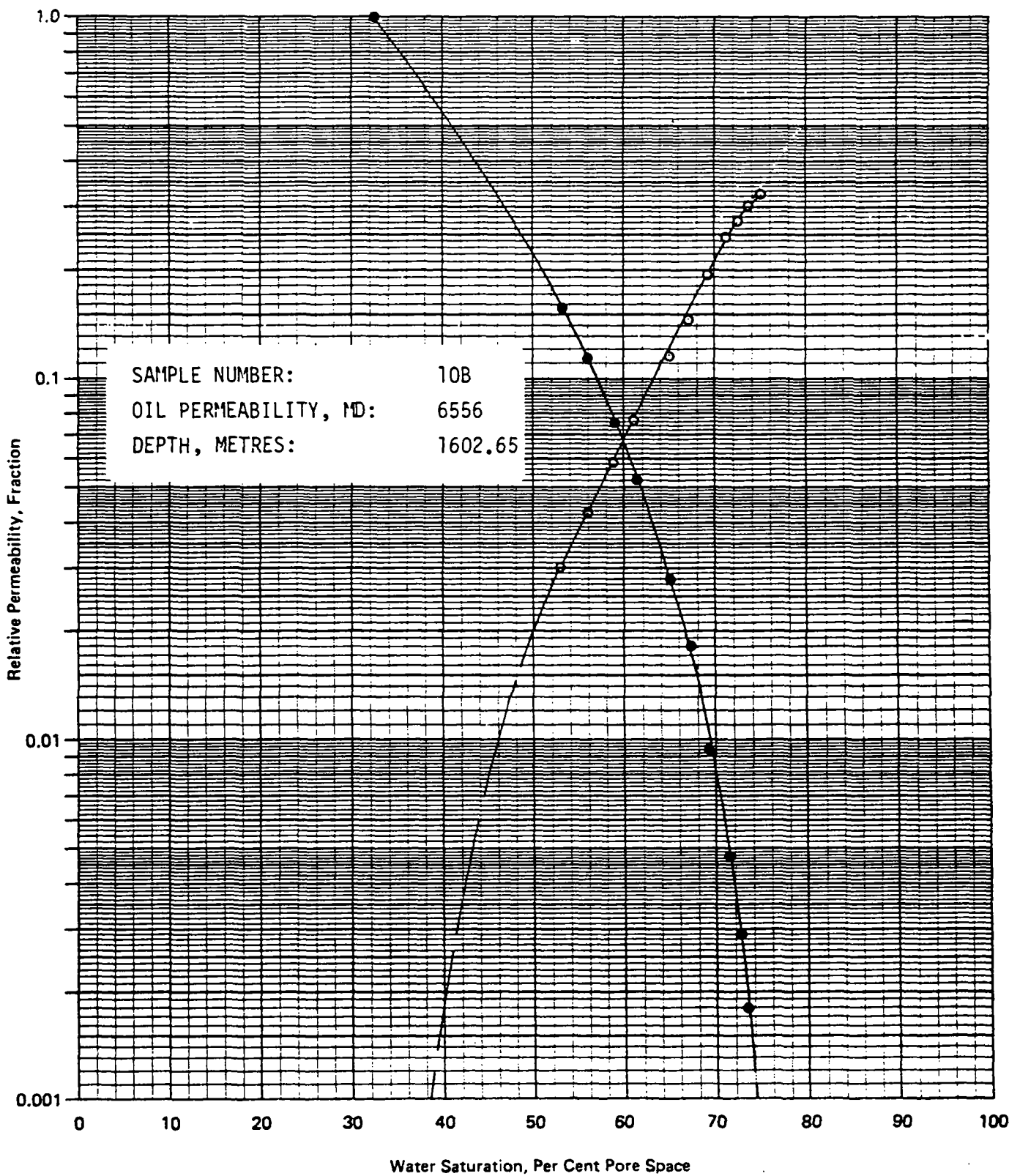
Oil Permeability with
Initial Water Present, Md: 6556

<u>Water Saturation Per Cent Pore Space</u>	<u>Water-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Water*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
32.3	0.000	0.000	1.000
53.1	0.252	0.039	0.154
56.0	0.425	0.048	0.112
58.7	0.769	0.059	0.076
61.4	1.48	0.077	0.052
65.0	4.07	0.116	0.028
67.1	8.28	0.149	0.018
69.4	20.3	0.192	0.0094
71.4	50.9	0.245	0.0048
72.4	96.9	0.277	0.0029
73.2	171	0.301	0.0018
74.8	-	0.322	0.0000

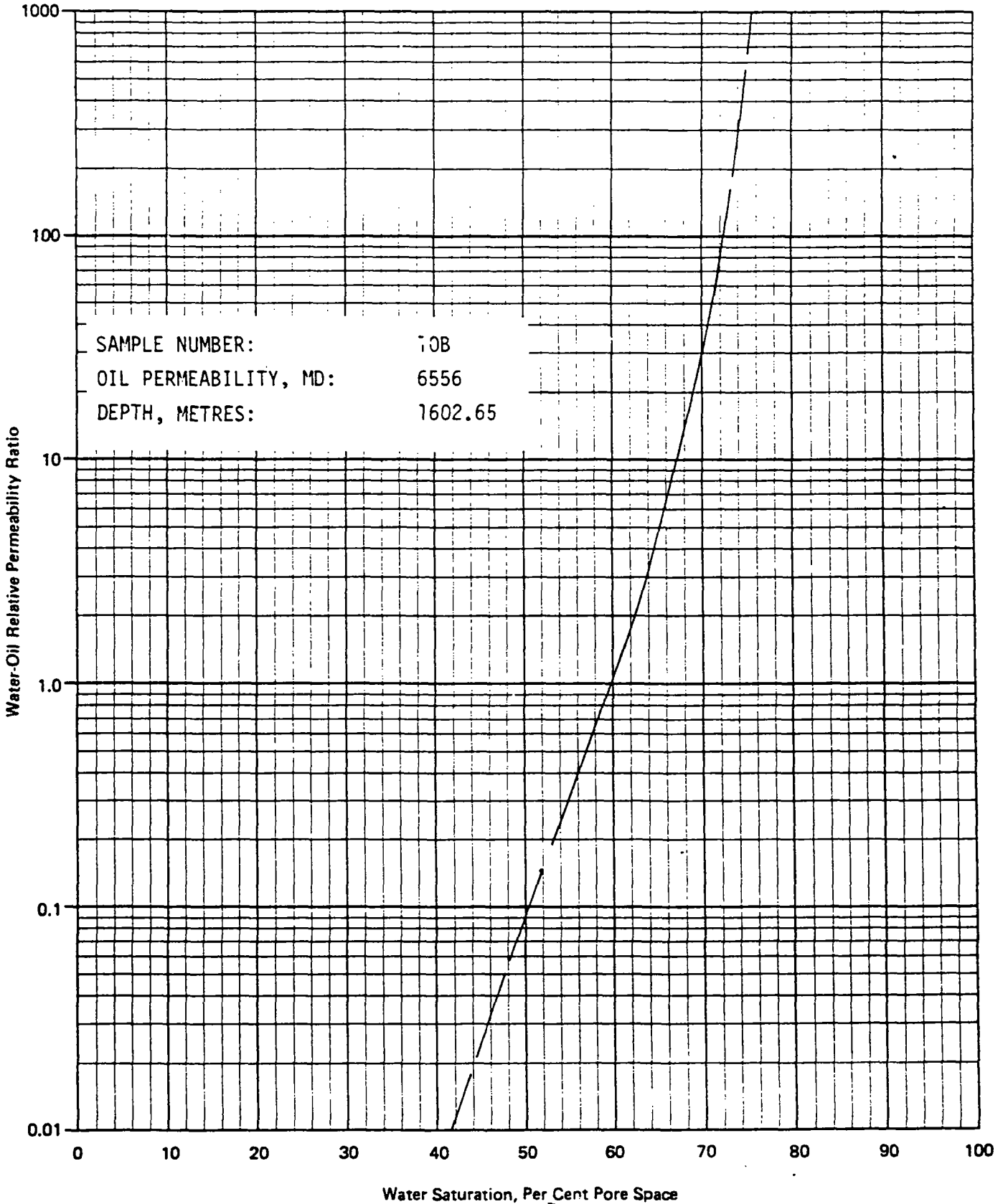
* Relative to Oil Permeability

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Company A/S NORSKE SHELL EXP & PROD Formation _____
 Well 31/2-5 Country NORWAY
 Field _____



Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Water-Oil Relative Permeability Ratio

CORE LABORATORIES UK LTD.

Petroleum Reservoir Engineering

LONDON-ABERDEEN

Page _____ of _____

File: UKSCAL 311-81039

GAS-OIL RELATIVE PERMEABILITY DATA

Sample Number: 11B

Initial Water Saturation
Per Cent Pore Space: 21.8

Air Permeability, Md: 13749

Oil Permeability with
Initial Water Present, Md: 12740

Porosity, Per Cent: 41.2

<u>Liquid Saturation Per Cent Pore Space</u>	<u>Gas-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Gas*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
100	0.000	0.000	1.000
96.1	0.148	0.031	0.207
93.6	0.243	0.040	0.162
92.5	0.302	0.043	0.142
90.3	0.457	0.048	0.105
87.9	0.746	0.053	0.071
85.3	1.31	0.059	0.045
83.0	2.08	0.062	0.030
79.9	4.77	0.065	0.014
77.4	10.7	0.068	0.0064
74.9	34.1	0.072	0.0021

* Relative to Oil Permeability

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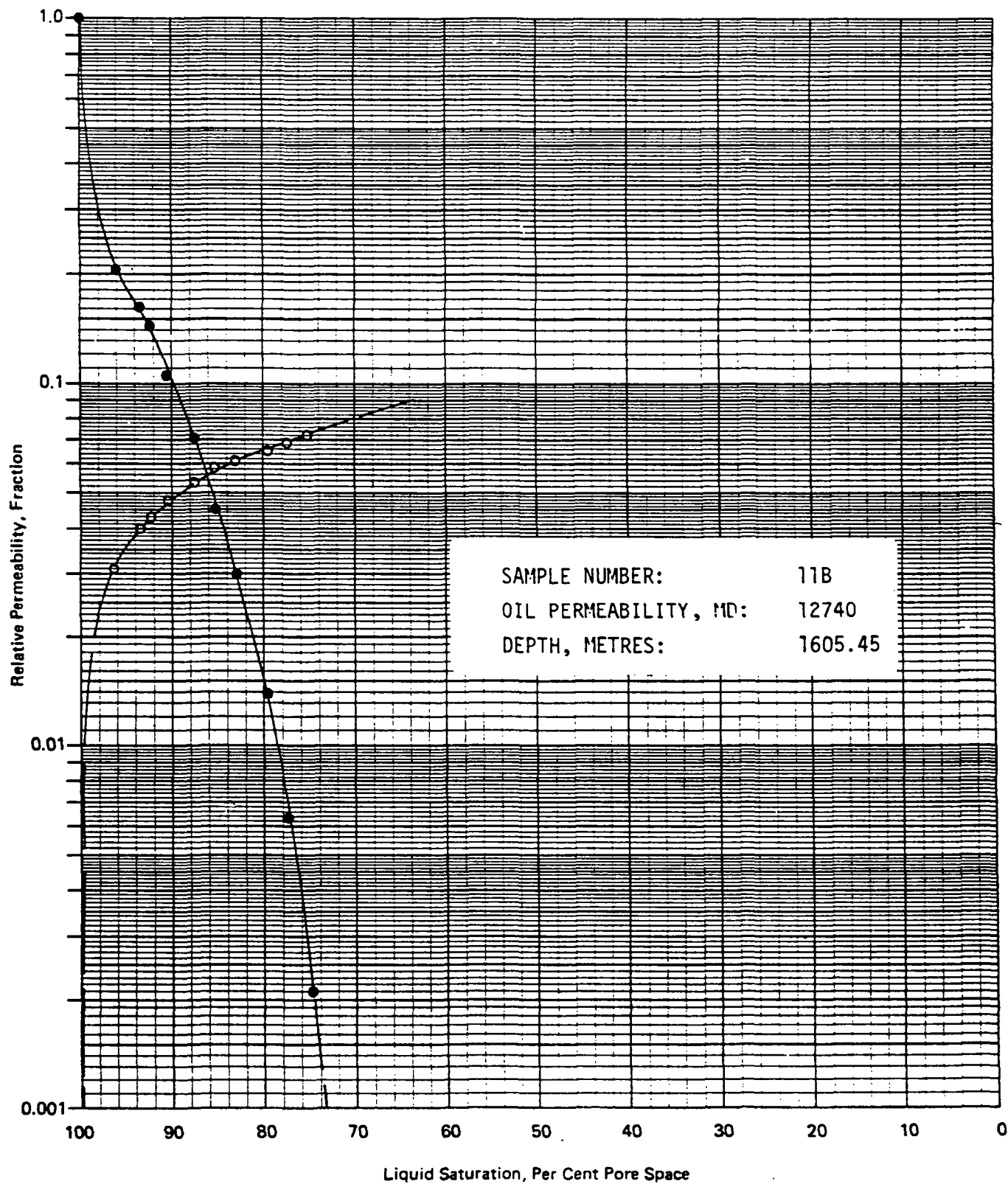
Company A/S NORSKE SHELL EXP & PROD

Well 31/2-5

Formation _____

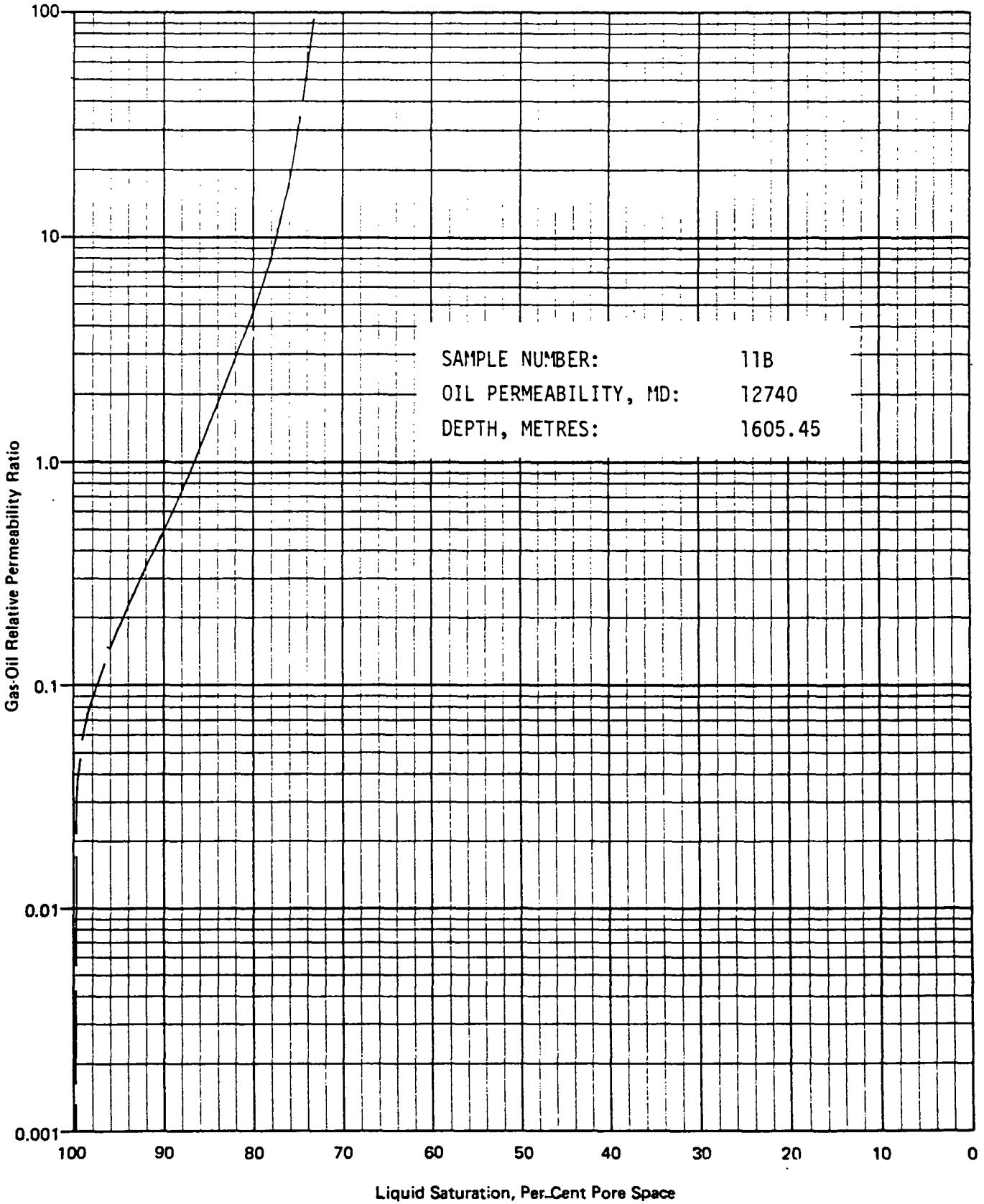
Country NORWAY

Field _____



Relative Permeability, Fraction

Company A/S NORSKE SHELL EXP & PROD Formation _____
Well 31/2-5 Country NORWAY
Field _____



Gas-Oil Relative Permeability Ratio

CORE LABORATORIES UK LTD.

Petroleum Reservoir Engineering

LONDON—ABERDEEN

Page _____ of _____

File: UKSCAL 311-81039

GAS-OIL RELATIVE PERMEABILITY DATA

Sample Number: 16B

Initial Water Saturation

Air Permeability, Md: 95

Per Cent Pore Space: 40.0

Oil Permeability with
Initial Water Present, Md: 46

Porosity, Per Cent: 26.1

<u>Liquid Saturation Per Cent Pore Space</u>	<u>Gas-Oil Relative Permeability Ratio</u>	<u>Relative Permeability To Gas*, Fraction</u>	<u>Relative Permeability To Oil*, Fraction</u>
100	0.000	0.000	1.000
94.3	0.071	0.030	0.425
93.2	0.140	0.052	0.369
92.4	0.212	0.073	0.343
91.0	0.352	0.102	0.289
89.6	0.615	0.129	0.209
87.1	1.56	0.201	0.129
85.7	2.55	0.243	0.095
84.4	4.05	0.293	0.072
82.8	7.03	0.362	0.051
81.0	13.4	0.442	0.033
76.8	51.7	0.627	0.012

* Relative to Oil Permeability

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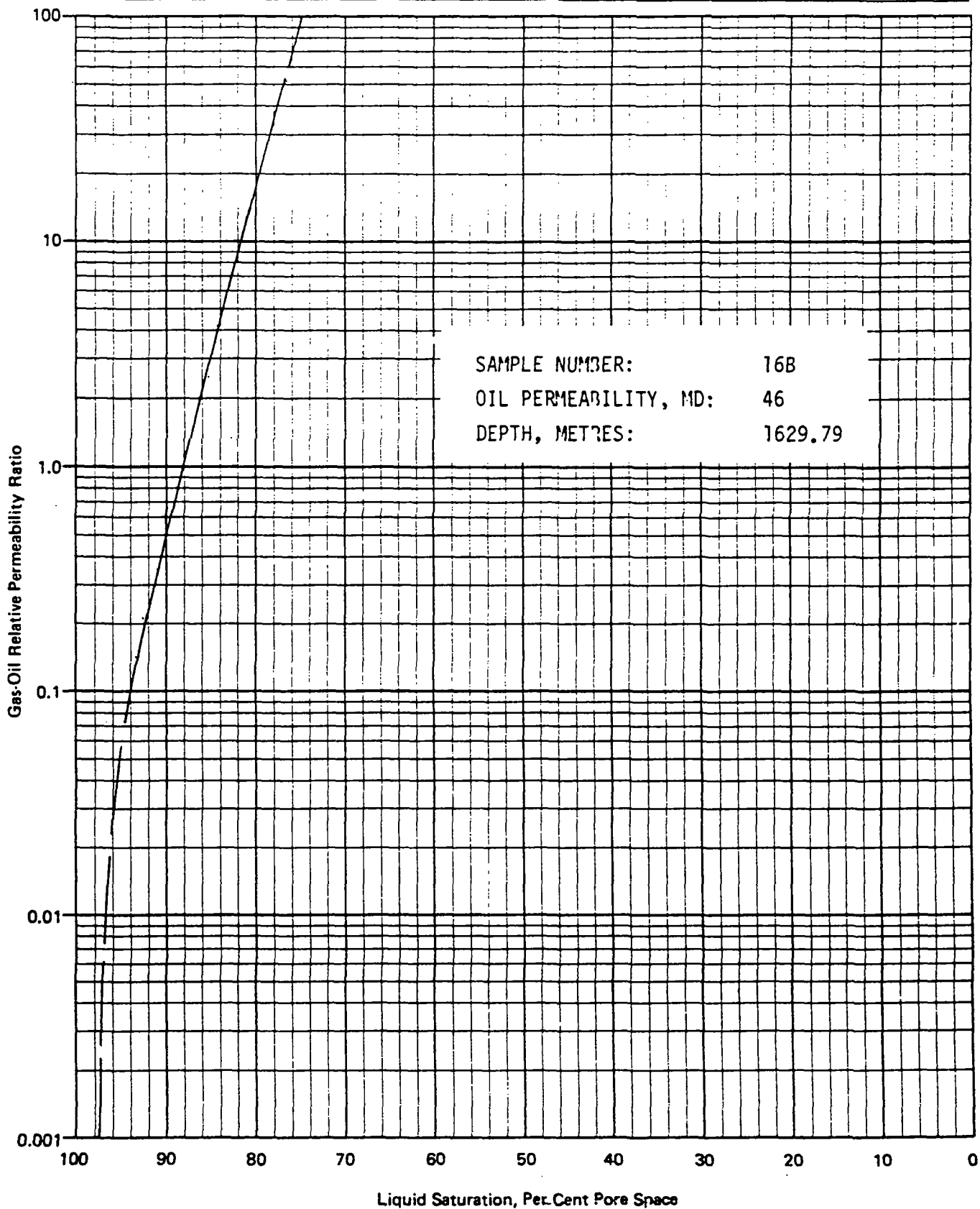
Company A/S NORSKE SHELL EXP & PROD

Formation _____

Well 31/2-5

Country NORWAY

Field _____



Company A/S NORSKE SHELL EXP & PROD Formation _____
 Well 31/2-5 Country NORWAY
 Field _____

