

# CRUDE OIL ASSAY REPORT

## "RAJASTHAN CRUDE OIL"

**CRUDE OIL ASSAY REPORT NUMBER:**

FCA/1491/18

**DATE OF ISSUE:**

24-11-2018



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## Job Reference Information

Date: 24/11/2018

**Crude Oil Assay Report No: FCA/1491/18**

**FOR THE ATTENTION OF** : Anupriya Srivastava

**SAMPLE DETAILS** : Crude Oil

**SOURCE** : Rajasthan, India

**DESCRIPTION** : "RAJASTHAN CRUDE OIL"

**CONTAINERS** : 3 X 25 Litre IATA CANS

**SEALS** : No Seal

Reported by: Anoop Renganath  
Shift Leader

Approved by: John T Abraham  
Laboratory Manager

INTERTEK FUJAIRAH FZC  
WARE HOUSE 201 & 203  
FUJARIAH FREE ZONE PHASE II  
FUJIRAH, UNITED ARAB EMIRATES

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**LABORATORY REPORT NO. FCA/1491/18**

**"RAJASTHAN CRUDE OIL"**

**SUMMARY & COMMENTS**

**General:**

The Crude Oil sample labeled as "RAJASTHAN CRUDE Oil" was received on 22 nd October 2018. The sample was in 3 x 25 Litre IATA Cans.

**Appearance & Initial Examination:**

The initial examination revealed that the sample was very waxy and solid at room temperature. Due to high pour point and non flowing nature, the sample was pre-heated to 85°C for further analysis. The H<sub>2</sub>S content on the vapor phase from the original containers were measured and noted to be <5 ppm Vol. A representative portion of the sample was taken and tested for API and Water content. API was found to be 29.8 and Water Content 0.025% Vol.

**BPT Factor : 7.172**

**Distillation:**

The distillation of the sample was carried out in two major steps as per ASTM D 2892 (15 Theoretical plate column) & ASTM D 5236 (Vacuum potstill) methods. The yield pattern of each fraction collected is tabulated in percentage weight and percentage volume and in graphical form.

During distillation, it is observed that there is no Gas collection and the initial Boiling point is above 50°C .

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**Client:** VEDANTA LIMITED

**Client Contact:** ANUPRIYA SRIVASTAVA

**Intertek Reference:** FCA/1491/18

**Date Received:** 22/10/2018

**Date Completed:** 23/11/2018

**Subject:** Assay Project

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LABORATORY REPORT NO. - FCA/1491/18

"RAJASTHAN CRUDE OIL"

CRUDE OIL - DETAILED ASSAY ALL CUTS OVERVIEW

Test	Method	Unit	Whole Crude	NAPHTHA	KEROSENE	GAS OIL	VACUUM GAS OILS				RESIDUE CUTS	
							Light VGO Cut 1	Light VGO Cut 2	Heavy VGO Cut	Total VGO Cut	AR Cut 1	VR cut
Initial BP				C5	140	230	360	400	450	360		
Final BP				140	230	360	400	450	540	540	360+	540 +
Distillation of Crude Oil												
Yield	ASTM D 2892 /ASTM D 5236	%Wt		1.81	4.21	17.51	6.76	14.07	16.66	37.49	76.47	38.98
Yield		%Vol		2.18	4.68	18.68	7.11	14.41	16.64	38.16	74.46	36.30
Appearance	Visual											
Density @ 15° C	ASTM D 5002/4052/IP 365	kg/L	0.8770	0.7228	0.7900	0.8221	0.8335	0.8561	0.8782	0.8619	0.9024	0.9415
Specific Gravity @ 60/60° F	Conv.		0.8775	0.7230	0.7904	0.8225	0.8339	0.8566	0.8787	0.8624	0.9029	0.9420
API Gravity @ 60° F	Calc.	° API	29.8	64.2	47.5	40.5	38.2	33.7	29.5	32.6	25.2	18.7
Pour Point	ASTM D 97	°C	+39		<-30	+9	+39	+45	+48	+45	+48	+51
Flash Point	ASTM D 93	° C	69.0			>120.0	>120.0	>120.0	>120.0	>120.0	>120.0	>120.0
Freeze Point	ASTM D 2386	°C			-47							
Cloud Point	ASTM D 2500	°C			<-30							
BS & Water	ASTM D 4007	% Vol.	0.050									
Wax Content	UOP 46	% Wt.	27.3				28.0	29.8	32.3	36.6	# 1	# 1
Ash Content	ASTM D 482	% Wt.	0.017				<0.001	<0.001	<0.001	0.001	0.020	0.038
Asphaltenes	IP 143	%Wt	<0.50				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Salt Content	ASTM D 3230	PTB	0.20									
Vapour Pressure	ASTMD 323	psi	# 1									
Kinematic Viscosity @ 20°C	ASTM D 445	cSt			1.624	6.744						
Kinematic Viscosity @ 60°C	ASTM D 445	cSt	27.63		0.9248	2.709	5.974	9.197	22.74	13.49	220.5	5384
Kinematic Viscosity @ 100°C	ASTM D 445	cSt	10.07				2.894	4.155	7.690	5.197	33.80	257.0
Kinematic Viscosity @ 135°C	ASTM D 445	cSt	5.825								15.02	78.01
Sulphur Content	D 4294	%Wt	0.0820	0.0063	0.0115	0.0409	0.0441	0.0460	0.0576	0.0501	0.0970	0.140
Hydrogen Sulphide	UOP163	ppm Vol	<1									
Mercaptan Sulphur	UOP163	ppm wt	<1									
Total Nitrogen	ASTM D 4629 / D 5762	ppm wt	1500	0.60	5.0	53	220	340	700	580	2000	3300
Basic Nitrogen	UOP 269	ppm Wt	640	<1	<1	28	90	140	300	226	800	1320
Total Acid Number	ASTM D 664	mgKOH/g	0.35			0.10						
Research Octane Number	ASTM D 2699			56.0								
Smoke Point	ASTM D 1322	mm			25							
Cetane Index	ASTM D 976				45.3	62.4						
Aniline Point	ASTM D 611	° C			64.6	87.4						
UOP K Factor	UOP 375	calc.	12.4622				12.5702	12.4196	12.3459	12.4369		
Carbon Residue	ASTM D 189	% Wt.	4.10				0.03	0.04	0.11	0.06	5.34	10.6
Full compositional metals												
Nickel	IP 501	ppm Wt	85				<1	<1	<1	<1	106	215
Vanadium			3				<1	<1	<1	<1	5	8
Iron			2				<1	<1	<1	<1	3	4
Aluminium			<5				<5	<5	<5	<5	<5	<5
Tin			<1				<1	<1	<1	<1	<1	<1
Sodium			3				<1	<1	<1	<1	2	5
Manganese			<1				<1	<1	<1	<1	<1	<1
Zinc			1				<1	<1	<1	<1	1	2
Molybdenum			<1				<1	<1	<1	<1	<1	<1
Lead			<1				<1	<1	<1	<1	<1	<1
Calcium			<3				<3	<3	<3	<3	3	5
Magnesium			<1				<1	<1	<1	<1	<1	<1
Chromium			<1				<1	<1	<1	<1	<1	<1
Copper			<1				<1	<1	<1	<1	<1	<1
Mercury			<1				<1	<1	<1	<1	<1	<1
PIONA analysis												
Total Paraffins	ASTM D 6730	%Vol		57.718								
n-Paraffins		%Vol		32.183								
iso - Paraffins		%Vol		25.535								
Total Olefins		%Vol		0.286								
Total Naphthalenes		%Vol		33.816								
Total Aromatics		%Vol		7.938								
Unidentified		%Vol		0.242								
Wax Appearance Temperature	Cross PolarizationMicroscopy	°C	45.5									
Wax Disappearance Temperature		°C	47.0									
SARA Analysis												
Saturates	ASTM D2007	%Wt	56.8									
Aromatics			16.6									
Asphaltenes			4.3									
Polar (Resin)			18.0									

Note : (# 1 ) Not possible due to the nature of sample

WHOLE CRUDE

Sample Descriptions / Label : "RAJASTHAN CRUDE OIL"

TEST	METHOD	UNIT	RESULT
Appearance	Visual		
Density @ 15° C	ASTM D 4052	kg/L	0.8770
Specific Gravity @ 60/60° F	Conv.		0.8775
API Gravity @ 60° F	Calc.	° API	29.8
Pour Point	ASTM D 97	°C	+39
Flash Point	ASTM D 93	° C	69.0
BS & Water	ASTM D 4007	% Vol.	0.050
Wax Content	UOP 46	% Wt.	27.3
Ash Content	ASTM D 482	% Wt.	0.017
Asphaltenes	IP 143	%Wt	<0.50
Salt Content	ASTM D 3230	PTB	0.20
Vapour Pressure	ASTMD 323	psi	# 1
Kinematic Viscosity @ 60°C	ASTM D 445	cSt	27.63
Kinematic Viscosity @ 100°C	ASTM D 445	cSt	10.07
Kinematic Viscosity @ 135°C	ASTM D 445	cSt	5.825
Sulphur Content	D 4294	%Wt	0.0820
Hydrogen Sulphide	UOP163	ppm wt	<1
Mercaptan Sulphur	UOP163	ppm wt	<1
Total Nitrogen	ASTM D 4629 / D 5762	ppm wt	1500
Basic Nitrogen	UOP 269	ppm Wt	640
Total Acid Number	ASTM D 664	mgKOH/g	0.35
UOP K Factor	UOP 375	calc.	12.4622
Carbon Residue	ASTM D 189	% Wt.	4.10
<b>Full compositional metals</b>			
Nickel	IP 501	ppm Wt	85
Vanadium			3
Iron			2
Aluminium			<5
Tin			<1
Sodium			3
Manganese			<1
Zinc			1
Molybdenum			<1
Lead			<1
Calcium			<3
Magnesium			<1
Chromium			<1
Copper			<1
Mercury			<1
Wax Appearance Temperature			Cross Polarization Microscopy
Wax Disappearance Temperature	°C	47.0	
<b>SARA Analysis</b>			
Saturates	ASTM D2007	%Wt	56.8
Aromatics		%Wt	16.6
Asphaltenes		%Wt	4.3
Polar (Resin)		%Wt	18.0

Note : (# <sup>1</sup>) Not possible due to the nature of sample

# Lab Report No. FCA/1491/18

## WHOLE CRUDE OIL COMPOSITION

Sample Label : "RAJASTHAN CRUDE OIL"

Component	Mole %	Weight %	Density g/cc (g/cc @ 60 °F)	MW (g/mole)
Nitrogen		0.00	0.806	28.01
Carbon Dioxide		0.00	0.8164	44.01
Hydrogen Sulfide		0.00	0.7981	34.08
Methane		0.00	0.2997	16.04
Ethane	0.00	0.00	0.3558	30.07
Propane	0.00	0.00	0.5065	44.10
iso-Butane	0.13	0.02	0.5623	58.12
n-Butane	0.25	0.04	0.5834	58.12
Neo-pentane	0.00	0.00	0.5968	72.15
iso-Pentane	0.31	0.06	0.6238	72.15
n-Pentane	0.41	0.08	0.6305	72.15
Hexanes	2.87	0.67	0.6631	86.18
Methyl Cyclo Pentane	0.22	0.05	0.7533	84.16
Benzene	0.09	0.02	0.8820	78.11
Cyclohexane	0.22	0.05	0.7827	84.16
Heptanes	1.11	0.30	0.6875	100.20
Methyl Cyclo Hexane	0.53	0.14	0.7740	98.19
Toluene	0.16	0.04	0.8734	92.14
Octanes	1.72	0.53	0.7063	114.23
Ethyl Benzene	0.07	0.02	0.8735	106.17
Meta+Para Xylene	0.21	0.06	0.8671	106.17
Ortho Xylene	0.10	0.03	0.8840	106.17
Nonanes	1.79	0.62	0.7212	128.26
Iso-Propyl benzene	0.00	0.00	0.8797	120.19
n-Propyl benzene	0.00	0.00	0.8797	120.19
1,2,4-Trimethylbenzene	0.00	0.00	0.8797	120.19
Decanes	2.28	0.88	0.7335	142.28
Undecanes	2.48	0.99	0.7890	147.00
Dodecanes	2.62	1.14	0.8000	161.00
Tridecanes	2.63	1.25	0.8110	175.00
Tetradecanes	3.54	1.82	0.8220	190.00
Pentadecanes	3.37	1.88	0.8320	206.00
Hexadecanes	2.69	1.62	0.8390	222.00
Heptadecanes	3.19	2.04	0.8470	237.00
Octadecanes	3.34	2.27	0.8520	251.00
Nonadecanes	2.95	2.10	0.8570	263.00
Eicosanes	2.81	2.09	0.8620	275.00
Heneicosanes	2.48	1.95	0.8670	291.00
Docasanes	2.78	2.30	0.8720	305.00
Tricosanes	2.40	2.06	0.8770	318.00
Tetracosanes	2.39	2.14	0.8810	331.00
Pentacosanes	2.58	2.41	0.8850	345.00
Hexacosanes	2.44	2.37	0.8890	359.00
Heptacosanes	2.81	2.85	0.8930	374.00
Octacosanes	2.49	2.62	0.8960	388.00
Nonacosanes	2.48	2.69	0.8990	402.00
Triacontanes	2.38	2.68	0.9020	416.00
Hentriacontanes	2.03	2.36	0.9060	430.00
Dotriacontanes	1.60	1.92	0.9090	444.00
Tritriacontanes	1.47	1.83	0.9120	458.00
Tetraatriacontanes	1.16	1.48	0.9140	472.00
Pentatriacontanes	1.18	1.55	0.9170	486.00
Hexatriacontanes plus	25.24	46.00	1.1591	673.86
Totals	100.00	100.00		
Residue Totals	Mole %	Weight %	Density g/cc (g/cc @ 60 °F)	MW (g/mole)
Pentanes plus	99.62	99.94	0.999	370
Heptanes plus	95.49	99.01	1.001	382
Undecanes plus	87.53	96.39	1.002	403
Eicosanes plus	60.72	81.30	1.021	495
Hexatriacontanes plus	25.24	46.00	1.159	674
Average Molecular Weight of sample (g/mole)		369.65		
Density of Sample @ 60 °F (kg/L)			0.9995	
Water Content (% Weight)			0.0000	

**Note:** GPSA, Katz & Firoozabadi data are used for mole weight and density.



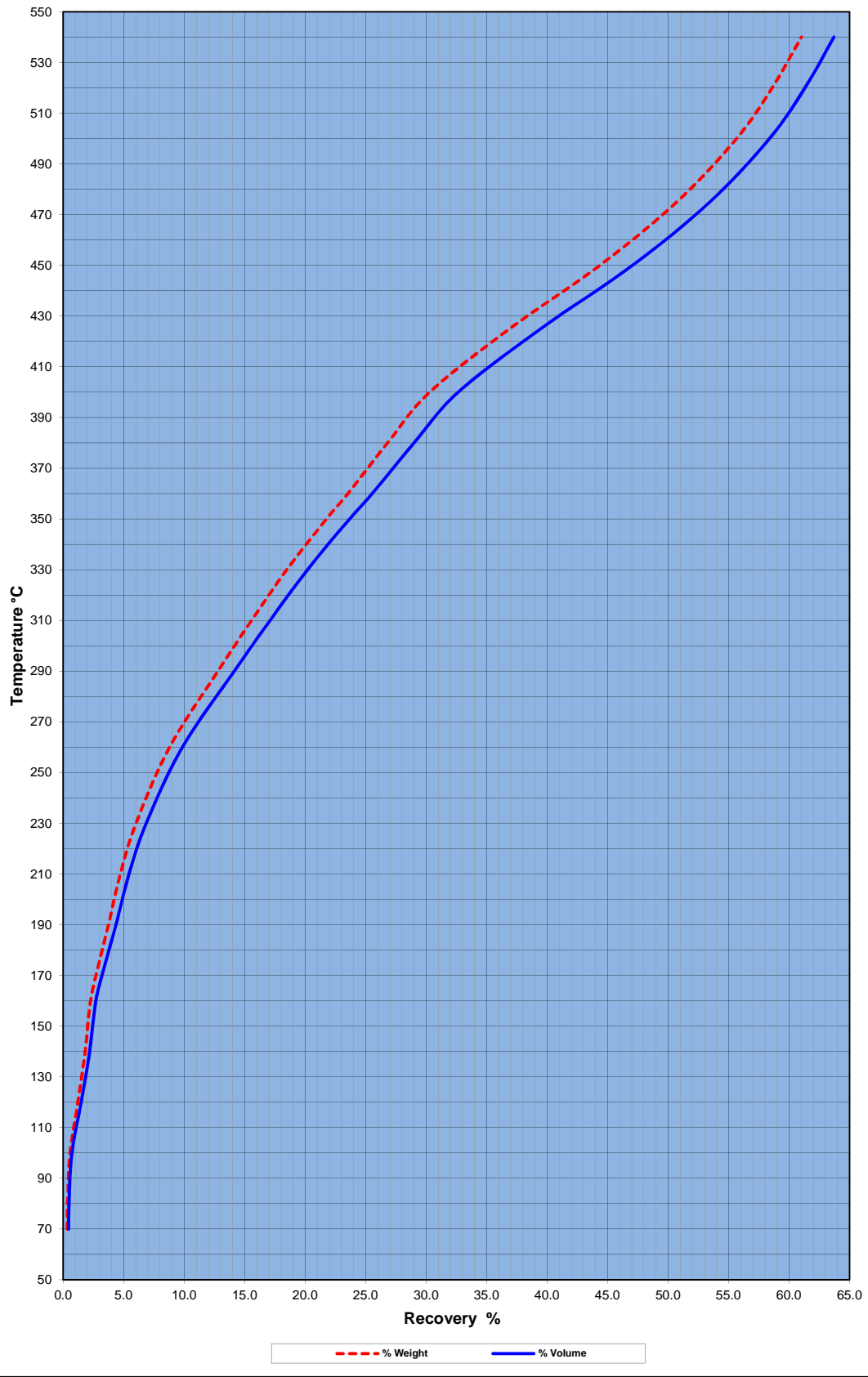
Sample Descriptions / Label :

"RAJASTHAN CRUDE OIL"

Sl. No.	Vapour Temperature °C	Density@15°C kg/l	% mass	Cumulative % mass	% Volume	Cumulative % Volume
1	LPG	0.00	0.00	0.00	0.00	0.00
2	15.0 - 70.0	0.6396	0.32	0.32	0.44	0.44
3	70.0 - 80.0	0.6625	0.04	0.36	0.04	0.48
4	80.0 - 100.0	0.7156	0.20	0.56	0.23	0.71
5	100.0 - 120.0	0.7392	0.65	1.21	0.77	1.48
6	120.0 - 140.0	0.7560	0.60	1.81	0.70	2.18
7	140.0 - 160.0	0.7695	0.45	2.26	0.52	2.70
8	160.0 - 175.0	0.7780	0.70	2.96	0.79	3.49
9	175.0 - 190.0	0.7870	0.78	3.74	0.87	4.36
10	190.0 - 210.0	0.7950	0.98	4.72	1.08	5.44
11	210.0 - 230.0	0.8017	1.30	6.02	1.42	6.86
12	230.0 - 260.0	0.8125	2.77	8.79	2.99	9.85
13	260.0 - 290.0	0.8180	4.00	12.79	4.29	14.14
14	290.0 - 310.0	0.8230	2.78	15.57	2.96	17.10
15	310.0 - 330.0	0.8250	2.91	18.48	3.09	20.19
16	330.0 - 350.0	0.8275	3.28	21.76	3.48	23.67
17	350.0 - 360.0	0.8301	1.77	23.53	1.87	25.54
18	360.0 - 380.0	0.8320	3.28	26.81	3.46	29.00
19	380.0 - 400.0	0.8350	3.48	30.29	3.65	32.65
20	400.0 - 425.0	0.8495	6.61	36.90	6.82	39.47
21	425.0 - 450.0	0.8620	7.46	44.36	7.59	47.06
22	450.0 - 475.0	0.8725	6.36	50.72	6.39	53.45
23	475.0 - 500.0	0.8790	4.94	55.66	4.93	58.38
24	500.0 - 520.0	0.8820	2.94	58.60	2.93	61.31
25	520.0 - 540.0	0.8870	2.42	61.02	2.39	63.70
26	540.0 + Residue	0.9415	38.98	100.00	36.30	100.00

TRUE BOILING POINT DISTILLATION CURVE  
(ASTM D 2892 & ASTM D 5236)

"RAJASTHAN CRUDE OIL"



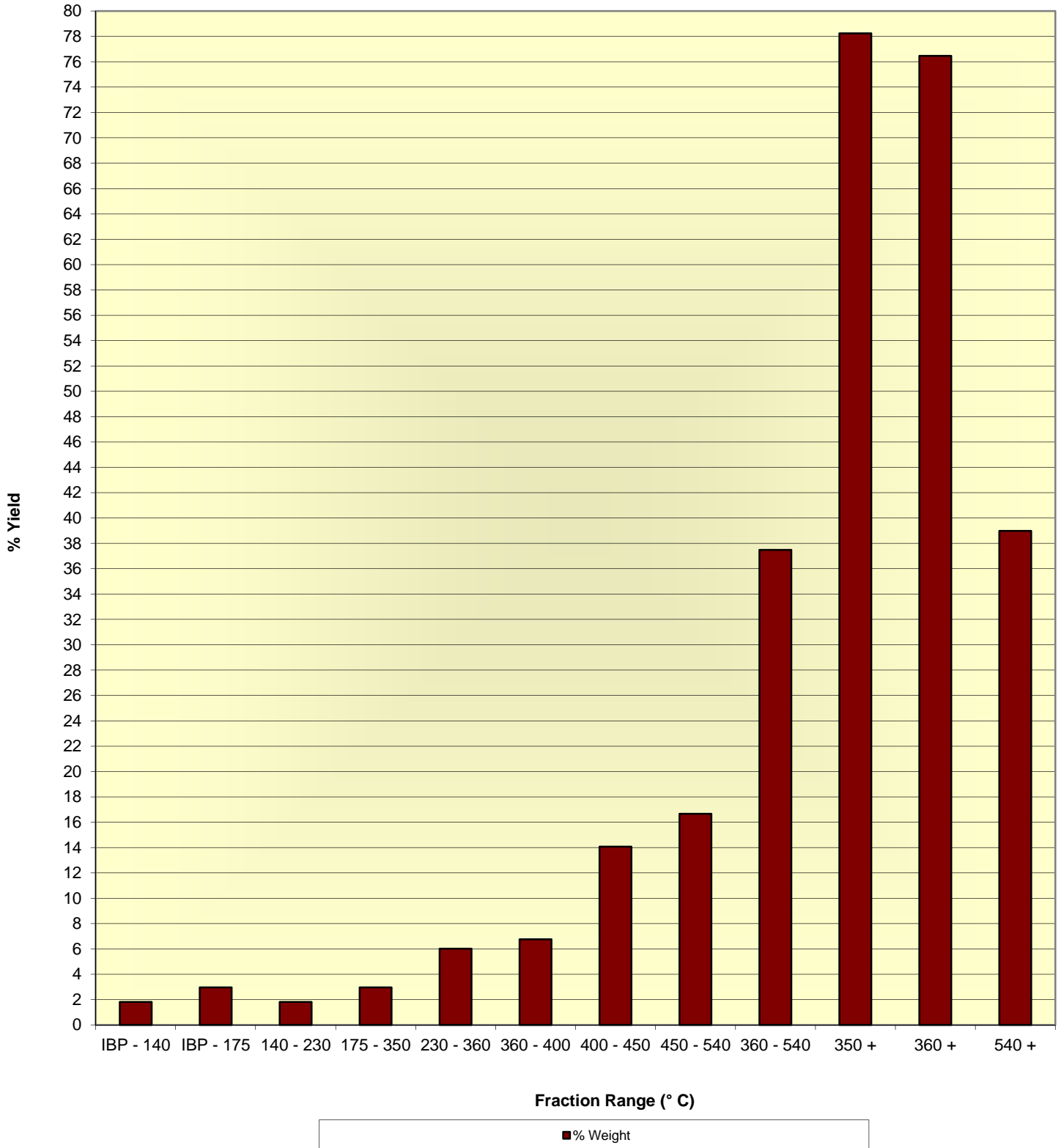
**LABORATORY REPORT NO. - FCA/1491/18**

**SUMMARY OF PRODUCT / RESIDUE CUT POINTS AND YIELDS**

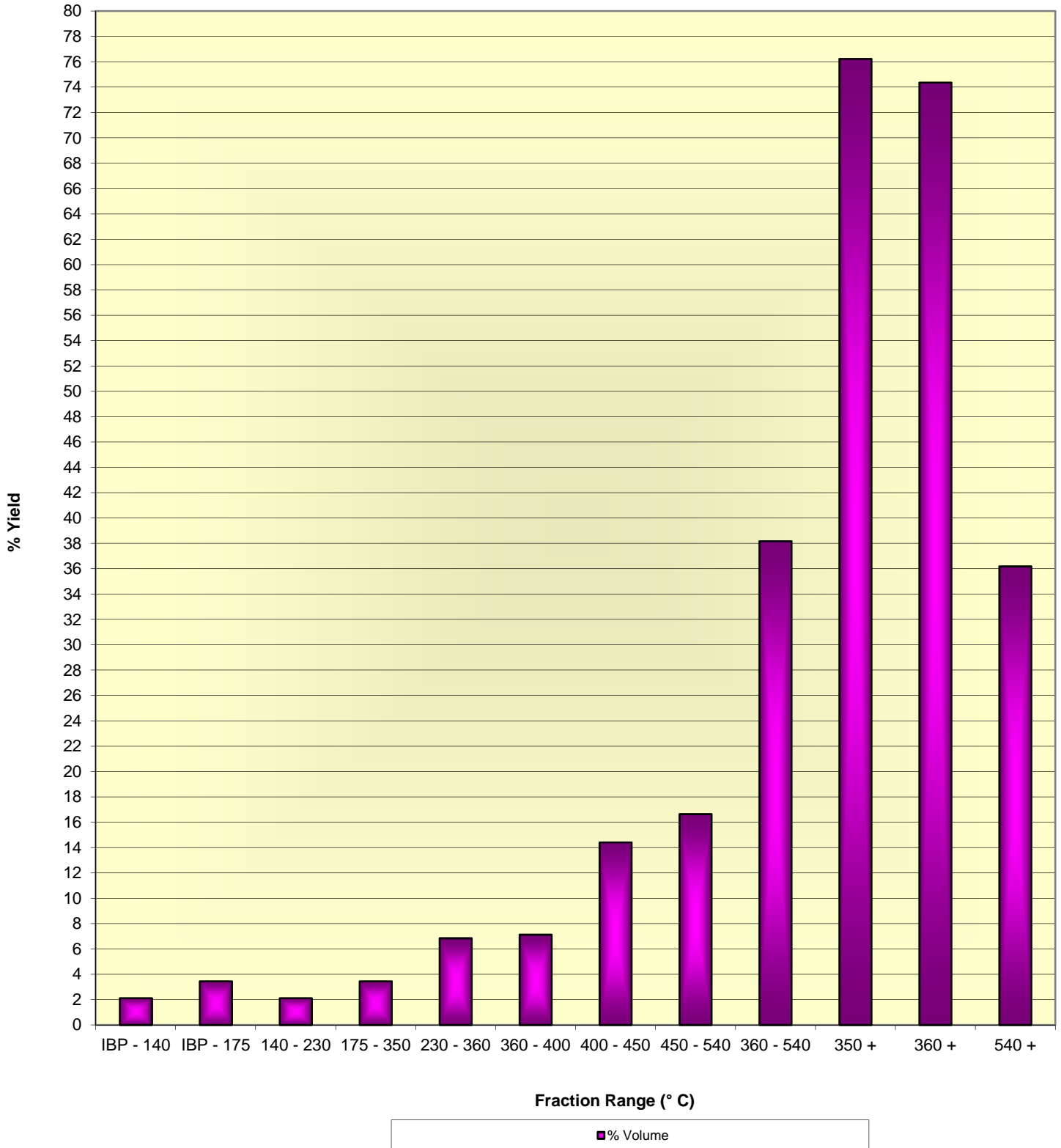
**Sample Descriptions / Label :** "RAJASTHAN CRUDE OIL"

	Cut Points	Yield %	
		"RAJASTHAN CRUDE OIL"	
		(° C)	Weight %
LPG	Up to C4	0.00	0.00
Naphtha	C5 - 140	1.81	2.18
	C5 - 175	2.96	3.49
Kerosene	140 - 230	4.21	4.68
Distillate	175 - 350	18.80	20.18
	230 - 360	17.51	18.68
Light VGO	360 - 400	6.76	7.11
	400 - 450	14.07	14.41
Heavy VGO	450 - 540	16.66	16.64
Total VGO	360 - 540	37.49	38.16
Residue	350 +	78.24	76.33
	360 +	76.47	74.46
	540 +	38.98	36.30

## Yield Distribution-Graph (% Mass) "RAJASTHAN CRUDE OIL"



## Yield Distribution-Graph (% Volume) "RAJASTHAN CRUDE OIL"



**LABORATORY REPORT NO. - FCA/1491/18**

**NAPHTHA - CHARACTERISTICS**

**Sample Descriptions / Label :** "RAJASTHAN CRUDE OIL"

TEST	METHOD	UNIT	NAPHTHA
<b>Initial BP</b>		°C	<b>C5</b>
<b>Final BP</b>		°C	<b>140</b>
Distillation of Crude Oil			
Yield	ASTM D 2892	% Wt.	1.81
Yield		% Vol.	2.18
Density @ 15° C	ASTM D 4052	kg/L	0.7228
Specific Gravity @ 60/60° F	Conv.		0.7230
API Gravity @ 60° F	Calc.	° API	64.2
Sulphur Content	ASTM D 4294	%Wt	0.0063
Total Nitrogen	ASTM D 4629	ppm wt	0.60
Basic Nitrogen	UOP 269	ppm Wt	<1
Research Octane Number	ASTM D 2699		56.0
Total Paraffins	ASTM D 6730	%Vol	57.718
n-Paraffins		%Vol	32.183
iso - Paraffins		%Vol	25.535
Total Oleffins		%Vol	0.286
Total Naphthalenes		%Vol	33.816
Total Aromatics		%Vol	7.938
Unidentified		%Vol	0.242

**LABORATORY REPORT NO. - FCA/1491/18**  
**KEROSENE - CHARACTERISTICS**

Sample Descriptions / Label : "RAJASTHAN CRUDE OIL"

TEST	METHOD	UNIT	KEROSENE
Initial BP		°C	140
Final BP		°C	230
Distillation of Crude Oil			
Yield	ASTM D 2892	% Wt.	4.21
Yield		% Vol.	4.68
Density @ 15° C	ASTM 4052	kg/L	0.7900
Specific Gravity @ 60/60° F	Conv.		0.7904
API Gravity @ 60° F	Calc.	° API	47.5
Pour Point	ASTM D 97	°C	<-30
Freeze Point	ASTM D 2386	°C	-47
Cloud Point	ASTM D 2500	°C	<-30
Kinematic Viscosity @ 20°C	ASTM D 445	cSt	1.624
Kinematic Viscosity @ 60°C	ASTM D 445	cSt	0.9248
Sulphur Content	ASTM D 4294	%Wt	0.0115
Total Nitrogen	ASTM D 4629	ppm wt.	5.0
Basic Nitrogen	UOP 269	ppmWt	<1
Smoke Point	ASTM D 1322	mm	25
Cetane Index	ASTM D 976		45.3
Aniline Point	ASTM D 611	° C	64.6

**LABORATORY REPORT NO. - FCA/1491/18**

**DISTILLATE & VGO CHARACTERISTICS**

Sample Descriptions / Label :

"RAJASTHAN CRUDE OIL"

TEST	METHOD	UNIT	Gas Oil	Vacuum Gas Oil			
				Light VGO Cut 1	Light VGO Cut 2	Heavy VGO Cut	Total VGO Cut
Initial BP		°C	230	360	400	450	360
Final BP		°C	360	400	450	540	540
Distillation of Crude Oil							
Yield	ASTM D 2892 / ASTM D 5236	% Wt.	17.51	6.76	14.07	16.66	37.49
Yield		% Vol.	18.68	7.11	14.41	16.64	38.16
Density @ 15° C	ASTM 4052	kg/L	0.8221	0.8335	0.8561	0.8782	0.8619
Specific Gravity @ 60/60° F	Conv.		0.8225	0.8339	0.8566	0.8787	0.8624
API Gravity @ 60° F	Calc.	° API	40.5	38.2	33.7	29.5	32.6
Pour Point	ASTM D 97	°C	+9	+39	+45	+48	+45
Flash Point	ASTM D 93	° C	>120.0	>120.0	>120.0	>120.0	>120.0
Cloud Point	ASTM D 2500	°C	+10				
Wax Content	UOP 46	% Wt.		28.0	29.8	32.3	36.6
Ash Content	ASTM D 482	% Wt.		<0.001	<0.001	<0.001	0.001
Asphaltenes	IP 143	%Wt		<0.50	<0.50	<0.50	<0.50
Kinematic Viscosity @ 20°C	ASTM D 445	cSt	6.744				
Kinematic Viscosity @ 60°C	ASTM D 445	cSt	2.709	5.974	9.197	22.74	13.49
Kinematic Viscosity @ 100°C	ASTM D 445	cSt		2.894	4.155	7.690	5.197
Sulphur Content	ASTM D 4294	%Wt	0.0409	0.0441	0.0460	0.0576	0.0501
Total Nitrogen	ASTM D 4629	ppm wt.	53	220	340	700	580
Basic Nitrogen	UOP 269	ppmWt	28	90	140	300	226
Total Acid Number	ASTM D 664	mgKOH/g	0.10				
Cetane Index	ASTM D 976		62.4				
Aniline Point	ASTM D 611	° C	87.4				
UOP K Factor	UOP 375	calc.		12.5702	12.4196	12.3459	12.4369
Carbon Residue	ASTM D 189	% Wt.		0.03	0.04	0.11	0.06
Full compositional metals							
Nickel	IP 501	ppm Wt		<1	<1	<1	<1
Vanadium			<1	<1	<1	<1	
Iron			<1	<1	<1	<1	
Aluminium			<5	<5	<5	<5	
Tin			<1	<1	<1	<1	
Sodium			<1	<1	<1	<1	
Manganese			<1	<1	<1	<1	
Zinc			<1	<1	<1	<1	
Molybdenum			<1	<1	<1	<1	
Lead			<1	<1	<1	<1	
Calcium			<3	<3	<3	<3	
Magnesium			<1	<1	<1	<1	
Chromium			<1	<1	<1	<1	
Copper			<1	<1	<1	<1	
Mercury			<1	<1	<1	<1	



**LABORATORY REPORT NO. - FCA/1491/18**

**RESIDUE CHARACTERISTICS**

Sample Descriptions / Label :

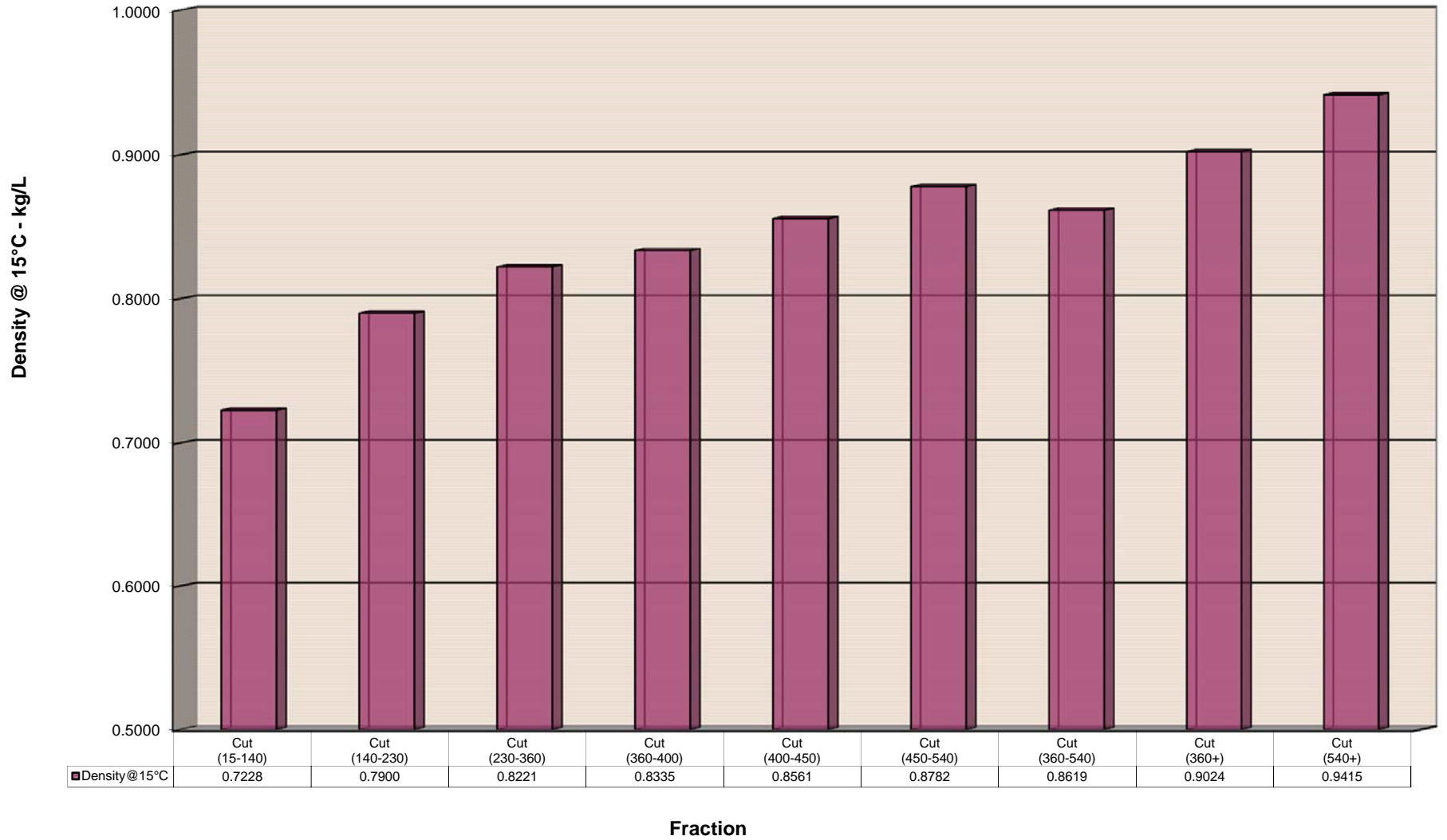
"RAJASTHAN CRUDE OIL"

TEST	METHOD	UNIT	RESIDUE CUTS	
Initial BP		°C	360+	540 +
Final BP		°C		
Distillation of Crude Oil				
Yield	ASTM D 2892 / ASTM D 5236	% Wt.	76.47	38.98
Yield		% Vol.	74.46	36.30
Density @ 15° C	IP 365	kg/L	0.9024	0.9415
Specific Gravity @ 60/60° F	Conv.		0.9029	0.9420
API Gravity @ 60° F	Calc.	° API	25.2	18.7
Pour Point	ASTM D 97	°C	+48	+51
Flash Point	ASTM D 93	° C	>120.0	>120.0
Wax Content	UOP 46	% Wt.	# <sup>1</sup>	# <sup>1</sup>
Ash Content	ASTM D 482	% Wt.	0.020	0.038
Asphaltenes	IP 143	%Wt	<0.50	<0.50
Kinematic Viscosity @ 60°C	ASTM D 445	cSt	220.5	5384
Kinematic Viscosity @ 100°C	ASTM D 445	cSt	33.80	257.0
Kinematic Viscosity @ 135°C	ASTM D 445	cSt	15.02	78.01
Sulphur Content	D 4294	%Wt	0.0970	0.140
Total Nitrogen	ASTM D 5762	ppm wt	2000	3300
Basic Nitrogen	UOP 269	ppm Wt	800	1320
Carbon Residue	ASTM D189	%Wt	5.34	10.6
Full compositional metals				
Nickel	IP 501	ppm Wt	106	215
Vanadium			5	8
Iron			3	4
Aluminium			<5	<5
Tin			<1	<1
Sodium			2	5
Manganese			<1	<1
Zinc			1	2
Molybdenum			<1	<1
Lead			<1	<1
Calcium			3	5
Magnesium			<1	<1
Chromium			<1	<1
Copper			<1	<1
Mercury			<1	<1

Note : (#<sup>1</sup>) Not possible due to the nature of sample

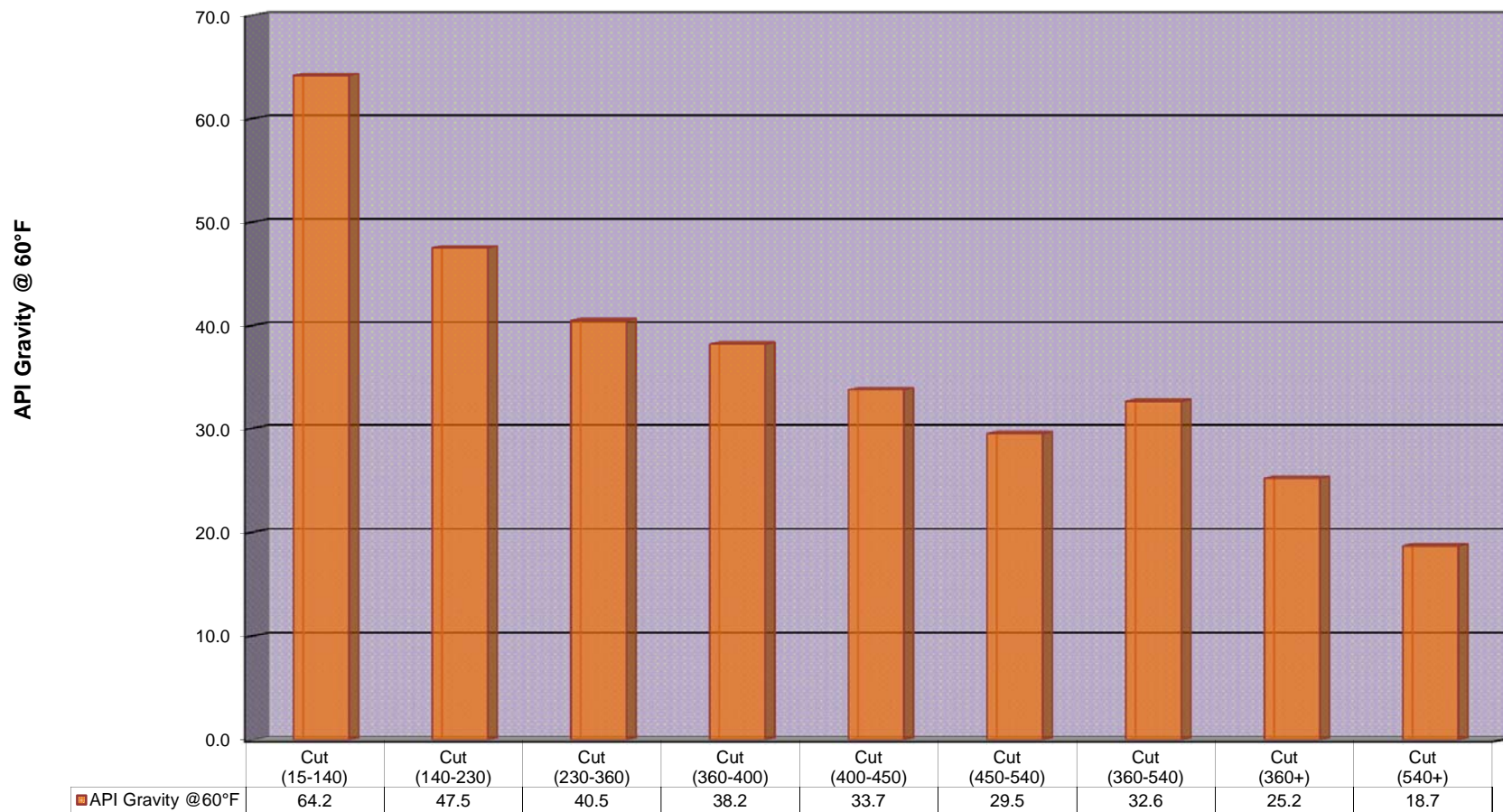
"RAJASTHAN CRUDE OIL"

Fractions Mid B.P. Vs Density @ 15°C



"RAJASTHAN CRUDE OIL"

Fractions Vs API Gravity @ 60°F

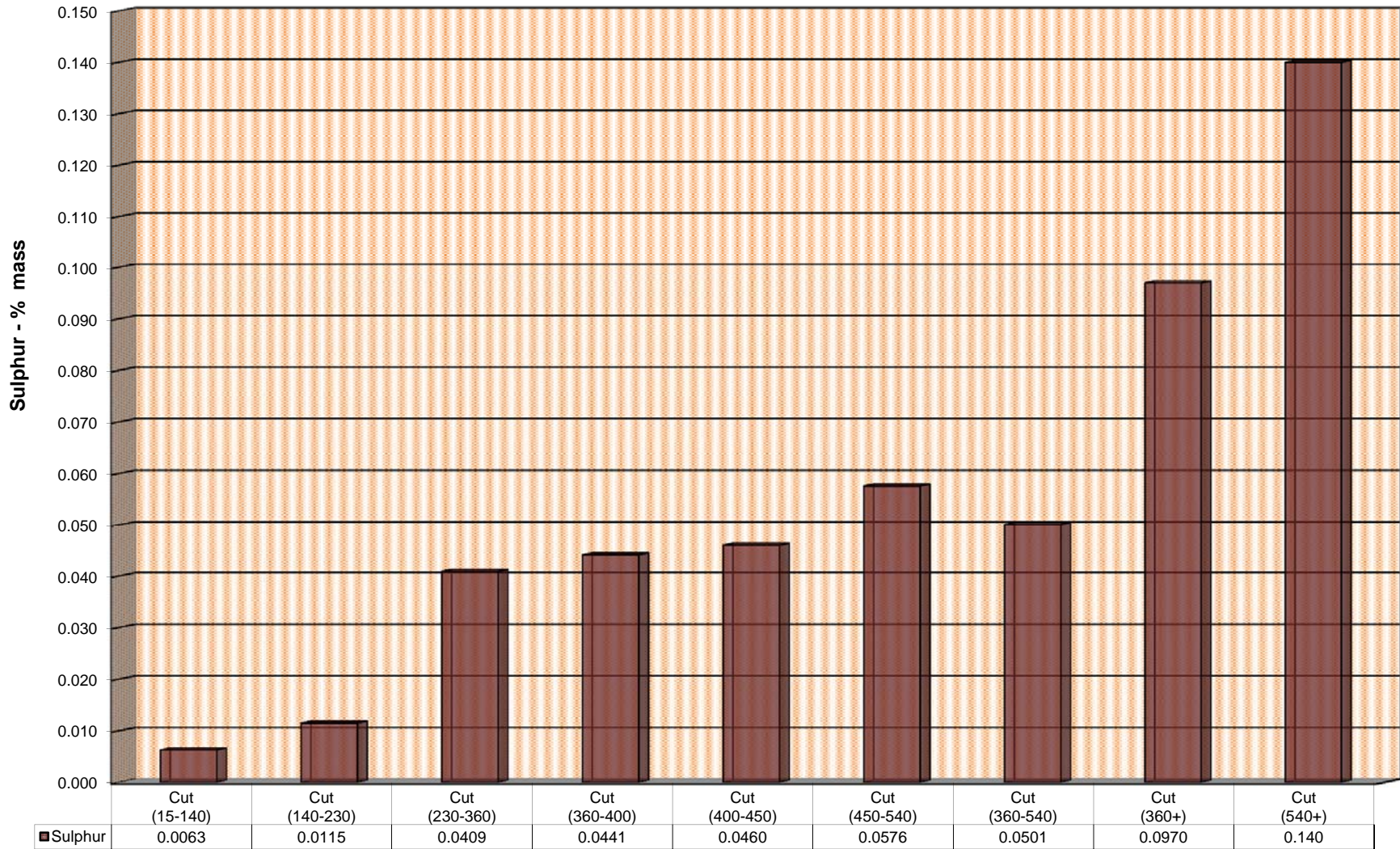


Fraction



"RAJASTHAN CRUDE OIL"

Fractions Vs Sulphur



Fraction