

## Jubilee (37.41 API, 0.3 Sul WT%)

Crude Name:	Jubilee	API Gravity	API	37.41	Component	Wt %	Vol %
Crude ID:	JUBILEE2019	Density @15 deg C	kg/l	0.8373	C2 Minus	0.002	0.004
Country:	Ghana	Sulfur	WT%	0.3	C3	0.194	0.32
Region:	Africa	Reid Vapor Pressure	kPa	43.44	IC4	0.735	1.093
State:	--	Nitrogen (Total)	ppm	1200	NC4	0.158	0.226
Assay Year:	2019	Pour Point	deg C	3	IC5	0.979	1.312
Assay Library:	TULLOW	Acidity (TAN)	mgKOH/g	0.05	NC5	0.706	0.938
Assay Source:	TULLOW	Vanadium	ppm	1.9	CycP	0.2	0.223
Sulfur Type:	Low	Nickel	ppm	3	IC6	--	--
Crude Type:	Light	Viscosity @104 F ( 40 C)	cSt	4.6	NC6	--	--
Chemical Class:	Paraffinic	Viscosity @122 F ( 50 C)	cSt	3.6	Benzene	--	--

Property	Unit	WC	GAS	NAP1	NAP2	KERO	LDIST	HDIST	LVGO
Cut IBP Temp	deg C	--	IBP	15	85	175	250	300	360
Cut EBP Temp	deg C	--	15	85	175	250	300	360	450
Cut Yield (Vol)	LV%	100	2.42	8.54	18.91	13.55	8.97	10.75	12.56
Cut Yield (Wgt)	WT%	100	1.65	6.93	17.24	13.23	9.04	11.07	13.4
API Gravity	API	37.41	117.53	77.38	54.45	42.15	36.76	33.07	27.51
Specific Gravity (@60/60 F)	--	0.8377	0.5682	0.6774	0.761	0.8148	0.841	0.8598	0.8899
Density @15 deg C	kg/l	0.8373	0.5682	0.6773	0.7607	0.8144	0.8405	0.8594	0.8894
K-Factor (Watson)	--	12.25 C	13.67	12.41	11.77	11.7	11.78	11.86	11.92
Molecular Weight	--	195 C	56	81	114	167	214	263	349
Hydrogen	WT%	13.2 C	17.9	15.6	14.3	13.6	13.3	13.1	12.7
Sulfur	WT%	0.3	0.003	0.002	0.002	0.024	0.106	0.282	0.413
Mercaptan Sulfur	ppm	2	0	1	1	1	2	3	4
Nitrogen (Total)	ppm	1200	0	0	1	1.8	42.5	363.4	999.2
Basic Nitrogen	ppm	378	0	0	0	0.4	30.2	133.2	333.3
Research Octane (clear)	--	--	97.9	77.5	58.2	32.5	14.6	--	--
Motor Octane (clear)	--	--	93.3	75.3	53.6	24.5	7	--	--
Flash Point	deg C	--	--	--	3	66	105	127	149
Reid Vapor Pressure	kPa	43.44	514.13	28.97	4.86	0.17	--	--	--
Paraffins (Total) Vol	LV%	--	99.7	72.4	43.5	39.9	35.5	33.1	27.6
iso-Paraffins Vol	LV%	--	73.7	35.95	26.09	--	--	--	--
n-Paraffins Vol	LV%	--	26.04	36.44	17.37	--	--	--	--
Naphthenes Vol	LV%	--	0.3	25.7	46.4	39.5	39.6	38.9	38.5

Property	Unit	WC	GAS	NAP1	NAP2	KERO	LDIST	HDIST	LVGO
Aromatics Vol	LV%	--	0	1.9	10.2	20.6	24.9	28	33.9
N + 2A	LV%	--	0.27	29.49	66.73	80.71	89.32	94.92	106.28
Freeze Point	deg C	--	-171	-136	-98	-51	-17	8	33
Cloud Point	deg C	--	-174	-140	-101	-51	-20	5	29
Pour Point	deg C	3	-176	-141	-103	-56	-22	3	27
Naphthalenes	LV%	--	--	--	--	1.9	--	--	--
Smoke Point	mm	--	--	--	26.52	18.68	14.86	10.86	7.3
Aniline Point	deg C	--	--	--	47	60	71	78	90
Acidity (TAN)	mgKOH/g	0.05	0.05	0.05	0.03	0.04	0.05	0.05	0.08
Cetane Index (D976)	--	--	0	0.3	20.7	42.3	53.6	61.1	62.5
Cetane Index (D4737-A)	--	--	101.8	42.3	31.4	43.4	53.4	60.8	66.1
Cetane Index (D4737-B)	--	--	78.3	55.5	42.3	45.1	52	58.7	68.4
Refractive Index @ 20deg C	--	--	1.32502	1.38191	1.4235	1.4531	1.46731	1.47796	1.4915
Refractive Index @ 70deg C	--	--	1.30014	1.35794	1.40053	1.4315	1.44684	1.45849	1.47332
Viscosity @ 68 F ( 20 C)	cSt	7.7	0.4	0.5	0.9	1.9	4.4	9.9	47.7
Viscosity @104 F ( 40 C)	cSt	4.6	0.3	0.4	0.7	1.4	2.9	6.2	22.3
Viscosity @122 F ( 50 C)	cSt	3.6	0.3	0.5	0.8	1.5	2.5	4.6	12.7
Viscosity @212 F (100 C)	cSt	1.6 C	0.3	0.3	0.5	0.8	1.2	1.9	4.1
Viscosity @275 F (135 C)	cSt	1.1 C	0.3	0.3	0.4	0.6	0.9	1.4	2.7
MCRT Carbon	WT%	1.44	0	0	0	0	0	0	0
Vanadium	ppm	1.9	0	0	0	0	0	0	0
Nickel	ppm	3	0	0	0	0	0	0	0
Vanadium + Nickel Total	ppm	4.9	0	0	0	0	0	0	0
Iron	ppm	0.3	0	0	0	0	0	0.02	0.29
Wax	WT%	11.9	0	0	0	0	0	9.97	25.84
Asphaltenes	WT%	0	0	0	0	0	0	0	0

Property	Unit	ARES	HVGO	VRES
Cut IBP Temp	deg C	360	450	565
Cut EBP Temp	deg C	EBP	565	EBP
Cut Yield (Vol)	LV%	36.86	13.73	10.56
Cut Yield (Wgt)	WT%	40.83	15.03	12.41
API Gravity	API	21.54	23.45	12.8
Specific Gravity (@60/60 F)	--	0.9246	0.9132	0.9806
Density @15 deg C	kg/l	0.924	0.9127	0.98
K-Factor (Watson)	--	12.03	12.12	11.94

Property	Unit	ARES	HVGO	VRES
Molecular Weight	--	494	498	878
Hydrogen	WT%	12.2	12.5	11.2
Sulfur	WT%	0.614	0.549	0.91
Mercaptan Sulfur	ppm	2	3	0
Nitrogen (Total)	ppm	2876.4	2134.7	5801
Basic Nitrogen	ppm	841.7	614.6	1665.5
Research Octane (clear)	--	--	--	--
Motor Octane (clear)	--	--	--	--
Flash Point	deg C	155	166	172
Reid Vapor Pressure	kPa	--	--	--
Paraffins (Total) Vol	LV%	26.5	27.2	24.2
iso-Paraffins Vol	LV%	--	--	--
n-Paraffins Vol	LV%	--	--	--
Naphthenes Vol	LV%	34.9	35.2	30.1
Aromatics Vol	LV%	38.6	37.6	45.7
N + 2A	LV%	112.13	110.41	121.55
Freeze Point	deg C	--	56	--
Cloud Point	deg C	--	52	--
Pour Point	deg C	44	51	55
Naphthalenes	LV%	--	--	--
Smoke Point	mm	0.72	5.63	0.23
Aniline Point	deg C	98	100	105
Acidity (TAN)	mgKOH/g	0.11	0.01	0.26
Cetane Index (D976)	--	38.1	42	4.1
Cetane Index (D4737-A)	--	--	--	--
Cetane Index (D4737-B)	--	--	--	--
Refractive Index @ 20deg C	--	1.51235	1.5048	1.54697
Refractive Index @ 70deg C	--	1.49145	1.48709	1.51868
Viscosity @ 68 F ( 20 C)	cSt	1690.8	916.1	2.31E+008
Viscosity @104 F ( 40 C)	cSt	301.5	188.6	357924.8
Viscosity @122 F ( 50 C)	cSt	80.2	58.2	5234.4
Viscosity @212 F (100 C)	cSt	19.8	14.1	440.2
Viscosity @275 F (135 C)	cSt	8.3	6.1	93.8
MCRT Carbon	WT%	3.54	0.6	10.92
Vanadium	ppm	5.18	0	17.05
Nickel	ppm	8.47	0.12	27.74

Property	Unit	ARES	HVGO	VRES
Vanadium + Nickel Total	ppm	13.66	0.12	44.79
Iron	ppm	1.93	0.4	5.55
Wax	WT%	21.26	26.24	10.29
Asphaltenes	WT%	0.09	0	0.31

C-Calculated Value

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Crude Assay Data from H/COMET Database 8/27/2019 2:38:46 PM

