

Ten Blend (36.25 API, 0.39 Sul WT%)

Crude Name:	Ten Blend	API Gravity	API	36.25	Component	Wt %	Vol %
Crude ID:	TENBLEND2019	Density @15 deg C	kg/l	0.8431	C2 Minus	0	0
Country:	Ghana	Sulfur	WT%	0.39	C3	0.204	0.339
Region:	Africa	Reid Vapor Pressure	kPa	44.82	IC4	0.255	0.382
State:	--	Nitrogen (Total)	ppm	1500	NC4	0.916	1.323
Assay Year:	2019	Pour Point	deg C	9	IC5	0.053	0.072
Assay Library:	TULLOW	Acidity (TAN)	mgKOH/g	0.05	NC5	0.022	0.029
Assay Source:	--	Vanadium	ppm	2.3	CycP	0	0
Sulfur Type:	Low	Nickel	ppm	5.5	IC6	--	--
Crude Type:	Light	Viscosity @104 F (40 C)	cSt	5.2	NC6	--	--
Chemical Class:	Intermediate	Viscosity @122 F (50 C)	cSt	4.2 C	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	2.14	9.03	18.44	12.68	8.66	8.83	13.11
Cut Yield (Wgt)	WT%	100	1.45	7.3	16.7	12.32	8.68	9.01	13.95
API Gravity	API	36.25	117.35	76.33	54.19	41.51	36.26	33.23	26.55
Specific Gravity (@60/60 F)	--	0.8435	0.5686	0.6808	0.762	0.8179	0.8434	0.859	0.8953
Density @15 deg C	kg/l	0.8431	0.5686	0.6807	0.7617	0.8175	0.843	0.8585	0.8948
K-Factor (Watson)	--	12.23 C	13.82	12.36	11.74	11.66	11.75	11.9	11.85
Molecular Weight	--	201 C	58	81	114	167	214	267	349
Hydrogen	WT%	12.8 C	17.9	15.6	14.3	13.5	13.2	13.1	12.7
Sulfur	WT%	0.39	0.001	0.003	0.003	0.037	0.164	0.351	0.525
Mercaptan Sulfur	ppm	2	0	1	1	1	2	3	5
Nitrogen (Total)	ppm	1500	0	0	0	5.3	57.2	307.4	1106.4
Basic Nitrogen	ppm	476	0	0	0	3	37.6	142.3	383.8
Research Octane (clear)	--	--	88.4	76.1	58.6	26.2	8.6	0.1	--
Motor Octane (clear)	--	--	85.5	73.3	57.9	28	10.7	0.4	--
Flash Point	deg C	--	--	--	2	66	105	128	149
Reid Vapor Pressure	kPa	44.82	510.8	14.86	5.72	0.18	--	--	--
Paraffins (Total) Vol	LV%	--	99.8	69.9	38.4	42.7	39	38.9	30.8
iso-Paraffins Vol	LV%	--	49.33	35.55	21.63	--	--	--	--
n-Paraffins Vol	LV%	--	50.49	34.38	16.81	--	--	--	--
Naphthenes Vol	LV%	--	0.2	28.4	53.3	39.8	39.8	38.1	39.2

Property	Unit	WC	GAS	NAP1	NAP2	KERO	LDIST	HDIST	LVGO
Aromatics Vol	LV%	--	0	1.6	8.2	17.5	21.2	23	30
N + 2A	LV%	--	0.18	31.71	69.77	74.79	82.16	84.1	99.16
Freeze Point	deg C	--	-168	-135	-98	-51	-17	6	31
Cloud Point	deg C	--	-169	-136	-99	-49	-18	5	30
Pour Point	deg C	9	-170	-137	-100	-53	-19	5	30
Naphthalenes	LV%	--	0	0	0	1.9	5.1	--	--
Smoke Point	mm	--	--	--	27.62	19.68	15.5	12.68	10.16
Aniline Point	deg C	--	--	--	47	60	71	79	88
Acidity (TAN)	mgKOH/g	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cetane Index (D976)	--	--	0	0.3	20.1	41.3	52.7	61.7	63.4
Cetane Index (D4737-A)	--	--	124.1	39.5	30.4	42.1	52.3	62.7	63.7
Cetane Index (D4737-B)	--	--	81	54.3	41.6	44	51.1	60.4	66.5
Refractive Index @ 20deg C	--	--	1.28116	1.37262	1.42138	1.45218	1.4672	1.47637	1.4925
Refractive Index @ 70deg C	--	--	1.25629	1.34865	1.39839	1.43058	1.44673	1.45698	1.47432
Viscosity @ 68 F (20 C)	cSt	10.7	0.4	0.5	0.9	2	4.5	11	39.7
Viscosity @104 F (40 C)	cSt	5.2	0.3	0.4	0.7	1.5	3	6.8	21.3
Viscosity @122 F (50 C)	cSt	4.2 C	0.3	0.4	0.6	1.2	2.5	5.2	15.5
Viscosity @212 F (100 C)	cSt	0.8 C	0.3	0.3	0.5	0.8	1.3	2.2	4.7
Viscosity @275 F (135 C)	cSt	0.4 C	0.3	0.3	0.5	0.7	1.2	1.6	3.3
MCRT Carbon	WT%	1.92	0	0	0	0	0	0	0
Vanadium	ppm	2.3	0	0	0	0	0	0	0
Nickel	ppm	5.5	0	0	0	0	0	0	0
Vanadium + Nickel Total	ppm	7.8	0	0	0	0	0	0	0
Iron	ppm	0.5	0	0	0	0	0	0	0.3
Wax	WT%	8.6	0	0	0	0	0	11.21	22.89
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%	40.22	14.24	12.86
Cut Yield (Wgt)	WT%	44.54	15.5	15.09
API Gravity	API	20.3	22.96	11.8
Specific Gravity (@60/60 F)	--	0.9321	0.9161	0.9874
Density @15 deg C	kg/l	0.9316	0.9156	0.9868
K-Factor (Watson)	--	12.03	12.1	11.92

Property	Unit	ARES	HVGO	VRES
Molecular Weight	--	505	503	866
Hydrogen	WT%	11.9	12.3	10.9
Sulfur	WT%	0.74	0.672	1.01
Mercaptan Sulfur	ppm	3	4	0
Nitrogen (Total)	ppm	3327.8	2234.9	6503.3
Basic Nitrogen	ppm	1017.1	682.5	1946
Research Octane (clear)	--	--	--	--
Motor Octane (clear)	--	--	--	--
Flash Point	deg C	155	166	172
Reid Vapor Pressure	kPa	--	--	--
Paraffins (Total) Vol	LV%	32.2	31.8	--
iso-Paraffins Vol	LV%	--	--	--
n-Paraffins Vol	LV%	--	--	--
Naphthenes Vol	LV%	35	35.7	--
Aromatics Vol	LV%	32.8	32.5	--
N + 2A	LV%	100.6	100.75	--
Freeze Point	deg C	--	53	--
Cloud Point	deg C	--	52	--
Pour Point	deg C	44	51	40
Naphthalenes	LV%	--	--	--
Smoke Point	mm	3.51	8.93	1.5
Aniline Point	deg C	94	96	96
Acidity (TAN)	mgKOH/g	0.05	0.05	0.05
Cetane Index (D976)	--	37.6	43.1	5.3
Cetane Index (D4737-A)	--	--	--	--
Cetane Index (D4737-B)	--	--	--	--
Refractive Index @ 20deg C	--	1.51539	1.50542	1.54977
Refractive Index @ 70deg C	--	1.49437	1.48771	1.52219
Viscosity @ 68 F (20 C)	cSt	4859.1	381.2	1.07E+018
Viscosity @104 F (40 C)	cSt	319.7	153.8	253613.6
Viscosity @122 F (50 C)	cSt	177.2	101	41631.5
Viscosity @212 F (100 C)	cSt	28.5	14.5	704.8
Viscosity @275 F (135 C)	cSt	11	6.5	132.4
MCRT Carbon	WT%	4.56	0.52	12.92
Vanadium	ppm	5.2	0	15.35
Nickel	ppm	12.02	0.09	35.39

Property	Unit	ARES	HVGO	VRES
Vanadium + Nickel Total	ppm	17.22	0.09	50.74
Iron	ppm	1.42	0.21	3.7
Wax	WT%	17.47	19.97	9.89
Asphaltenes	WT%	0.04	0.03	0.1

C-Calculated Value

Haverly Systems, Inc. (www.haverly.com)

Crude Assay Data from H/COMET Database 1/7/2020 11:38:09 AM

