

KUTUBU - SUMMARY OF MAJOR CUTS

	Whole Crude	Light Naphtha	Medium Naphtha	Heavy Naphtha	Kero	Atm Gas Oil	Light VGO	Heavy VGO	Vacuum Resid	Atm Resid
TBP Temp At Start, °C	Start	10	80	150	200	260	340	450	570	340
TBP Temp At End, °C	End	80	150	200	260	340	450	570	End	End
TBP Temp At Start, °F	Start	55	175	300	400	500	650	850	1050	650
TBP Temp At End, °F	End	175	300	400	500	650	850	1050	End	End
Yield at Start, vol%		4.1	15.5	41.1	51.8	63.4	80.3	92.1	97.6	80.3
Yield at End, vol%		15.5	41.1	51.8	63.4	80.3	92.1	97.6	100.0	100.0
Yield of Cut (wt% of Crude)		9.4	24.4	10.5	12.1	18.1	13.1	6.4	3.0	22.4
Yield of Cut (vol% of Crude)		11.4	25.6	10.7	11.7	16.9	11.8	5.5	2.4	19.7
Gravity, °API	45.1	82.5	53.5	47.2	38.6	32.9	27.9	20.9	8.2	23.2
Specific Gravity	0.8014	0.6613	0.7649	0.7919	0.8318	0.8606	0.8880	0.9285	1.0131	0.9144
Sulfur, wt%	0.04	0.00	0.00	0.00	0.01	0.04	0.09	0.19	0.25	0.14
Mercaptan Sulfur, ppm	3	2	2	2	3	4	4	3	2	3
Nitrogen, ppm	357			2	5	76	604	1779	4971	1522
Hydrogen, wt%	13.9	16.2	14.2	13.9	13.6	13.4	13.0	12.0	11.7	12.5
Viscosity @ 40 °C (104 °F), cSt	2			0.98	1.75	4.02	14.6	230	4.07E+05	58
Viscosity @ 50 °C (122 °F), cSt	1.59	0.497	0.578	0.875	1.50	3.24	10.7	119	71700	35.8
Viscosity @ 100 °C (212 °F), cSt	1.00			0.562	0.829	1.47	3.55	13.9	555	7.02
Viscosity @ 135 °C (275 °F), cSt	0.792			0.450	0.622	1.01	2.14	5.76	99.9	3.48
Freeze Point, °C				-63.000	-35.000	2.00	37.0	49.0	66.0	48.0
Freeze Point, °F				-81	-31	35	98	120	151	118
Pour Point, °C	-1			-68	-37	-1	31	48	32	34
Pour Point, °F	30			-90	-35	30	88	119	90	93
Smoke Point, mm (ASTM)				28	22	17	14	12		
Aniline Point, °C				52	59	69	83	88	91	86
Aniline Point, °F				125	138	157	182	191	195	186
Total Acid Number, mg KOH/g	0.03	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
Cetane Index, ASTM D976				36	42	48				
Diesel Index				59	53	52	51	40	16	43
Characterization Factor (K Factor)	12.2	12.6	11.6	11.8	11.6	11.7	11.9	12.0	11.6	11.8
Research Octane Number, Clear		73.2	58.8	33.7						
Motor Octane Number, Clear		70.8								
Paraffins, vol%		84.7	38.8	49.4	38.8	39.2	36.4			
Naphthenes, vol%		15.3	49.4	35.7	39.1	31.2	33.0			
Aromatics, vol%		0.0	11.7	14.9	22.0	28.7	29.0			
Thiophenes, vol%				0.0	0.1	0.9	1.5	2.6		
Molecular Weight	155	97	112	145	172	219	307	449	675	350
Gross Heating Value, MM BTU/bbl	5.62	4.83	5.39	5.55	5.75	5.90	6.04	6.23	6.55	6.16
Gross Heating Value, kcal/kg	11140	11610	11170	11120	10970	10880	10780	10640	10270	10690
Gross Heating Value, MJ/kg	46.6	48.6	46.8	46.5	45.9	45.5	45.1	44.5	43.0	44.7
Heptane Asphaltenes, wt%	0.0								0.3	0.0
Micro Carbon Residue, wt%	0.6								20.4	2.7
Ramsbottom Carbon, wt%	0.4								14.6	2.0
Vanadium, ppm	0								2	0
Nickel, ppm	0								17	2
Iron, ppm	0								1	0

KUTUBU - DISTILLATION SUMMARY

	Whole Crude	Light Naphtha	Medium Naphtha	Heavy Naphtha	Kero	Atm Gas Oil	Light VGO	Heavy VGO	Vacuum Resid	Atm Resid
TBP Temp At Start, °C		10	80	150	200	260	340	450	570	340
TBP Temp At End, °C		80	150	200	260	340	450	570	End	End
TBP Temp At Start, °F		55	175	300	400	500	650	850	1050	650
TBP Temp At End, °F		175	300	400	500	650	850	1050	End	End
Yield at Start, vol%		4.1	15.5	41.1	51.8	63.4	80.3	92.1	97.6	80.3
Yield at End, vol%		15.5	41.1	51.8	63.4	80.3	92.1	97.6	100.0	100.0
Yield of Cut (wt% of Crude)		9.4	24.4	10.5	12.1	18.1	13.1	6.4	3.0	22.4
Yield of Cut (vol% of Crude)		11.4	25.6	10.7	11.7	16.9	11.8	5.5	2.4	19.7
TBP Distillation, vol%	°C Start	10	50	150	200	260	340	450	570	340
	°C 5%	23	82	149	207	264	347	458	573	350
	°C 10%	28	91	152	209	268	351	462	577	357
	°C 30%	36	101	160	220	282	368	477	597	386
	°C 50%	49	113	178	231	297	386	494	623	427
	°C 70%	64	132	190	242	313	409	514	658	482
	°C 90%	71	146	200	254	333	438	546	675	584
	°C 95%	73	147	202	257	338	446	556		647
	°C End	80	150	200	260	340	450	570	End	End
TBP Distillation, vol%	°F Start	50	130	300	400	500	650	850	1050	650
	°F 5%	74	179	301	405	508	657	857	1063	662
	°F 10%	82	195	305	409	514	664	864	1071	674
	°F 30%	96	214	320	428	540	694	891	1106	727
	°F 50%	121	236	353	447	566	727	921	1153	801
	°F 70%	148	269	374	468	595	768	958	1216	899
	°F 90%	160	294	392	490	631	820	1015	1247	1083
	°F 95%	163	296	396	495	640	835	1033		1197
	°F End	175	310	400	500	650	850	1050	End	End