

MINAS - 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%		0.9	3.1	10.3	18.2	26.7	41.5	62.7	79.1	41.5
Yield at End, vol%		3.1	10.3	18.2	26.7	41.5	62.7	79.1	100.0	100.0
Yield of Cut (wt% of Crude)		1.8	6.3	7.2	8.1	14.5	21.3	17.0	23.3	61.6
Yield of Cut (vol% of Crude)		2.2	7.2	7.9	8.5	14.8	21.2	16.4	20.9	58.5
Gravity, °API	35.3	82.0	58.4	51.4	43.5	39.1	34.6	29.1	18.2	26.9
Specific Gravity	0.8482	0.6627	0.7451	0.7736	0.8088	0.8292	0.8518	0.8812	0.9453	0.8934
Sulfur, wt%	0.09	0.00	0.00	0.01	0.02	0.05	0.08	0.10	0.19	0.13
Mercaptan Sulfur, ppm		4	3	2	3	5	6	4		
Nitrogen, ppm	1164	0	0	0	1	31	296	969	4000	1882
Hydrogen, wt%	13.5	16.2	15.0	14.5	14.1	13.9	13.6	13.2	12.3	13.0
Viscosity @ 40 °C (104 °F), cSt	19.2			1.02	1.77	3.91	14.6	89.6	56840	131
Viscosity @ 50 °C (122 °F), cSt	14.1		0.617	0.917	1.53	3.18	10.6	54.6	12900	80.0
Viscosity @ 100 °C (212 °F), cSt	4.67			0.615	0.878	1.47	3.44	10.1	187	14.9
Viscosity @ 135 °C (275 °F), cSt	2.06			0.503	0.669	1.02	2.05	4.90	41.6	6.41
Freeze Point, °C			-94.000	-59.000	-26.000	9.00	42.0	62.0		
Freeze Point, °F			-137	-74	-14	49	108	143		
Pour Point, °C	38		-109	-61	-29	4	38	59	46	43
Pour Point, °F	100		-164	-78	-21	39	101	138	114	110
Smoke Point, mm (ASTM)			50	37	29	22	17			
Aniline Point, °C		62	63	64	70	82	101	113		
Aniline Point, °F		143	145	148	158	179	214	235		
Total Acid Number, mg KOH/g	0.08	0.0	0.1	0.1	0.1	0.1	0.1	0.0		
Cetane Index, ASTM D976				45	52	59				
Diesel Index		117	85	76	68	70	74	68		
Characterization Factor (K Factor)	12.6	12.7	11.9	12.1	12.0	12.2	12.5	12.7	12.3	12.4
Research Octane Number, Clear		64.1	42.9	15.3						
Motor Octane Number, Clear		62.6	42.5							
Paraffins, vol%		87.4	57.2	61.5	47.3	49.4	49.6			
Naphthenes, vol%		12.6	39.2	31.7	38.6	31.8	33.2			
Aromatics, vol%		0.0	3.7	6.6	14.1	17.9	16.0			
Thiophenes, vol%				0.0	0.2	0.9	1.2			
Molecular Weight	326	103	118	148	181	238	340	499	780	489
Gross Heating Value, MM BTU/bbl	5.88	4.84	5.30	5.46	5.65	5.77	5.90	6.05	6.32	6.09
Gross Heating Value, kcal/kg	10990	11580	11270	11190	11080	11050	10990	10910	10600	10800
Gross Heating Value, MJ/kg	46.0	48.5	47.2	46.8	46.4	46.2	46.0	45.7	44.4	45.2
Heptane Asphaltene, wt%	0.3								1.5	0.6
Micro Carbon Residue, wt%	2.9								12.3	4.6
Ramsbottom Carbon, wt%	2.8								11.9	4.5
Vanadium, ppm	0								1	0
Nickel, ppm	10								41	15
Iron, ppm	2								9	4

MINAS - 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%		0.9	3.1	10.3	18.2	26.7	41.5	62.7	79.1	41.5
Yield at End, vol%		3.1	10.3	18.2	26.7	41.5	62.7	79.1	100.0	100.0
Yield of Cut (wt% of Crude)		1.8	6.3	7.2	8.1	14.5	21.3	17.0	23.3	61.6
Yield of Cut (vol% of Crude)		2.2	7.2	7.9	8.5	14.8	21.2	16.4	20.9	58.5
TBP Distillation, vol%	°C Start	10	80	150	200	260	340	450	570	340
	°C 5%	26	90	152	207	264	348	460	575	358
	°C 10%	30	92	156	211	269	354	465	581	373
	°C 30%	43	101	167	223	289	376	486	609	434
	°C 50%	61	118	178	235	306	399	504	639	503
	°C 70%	67	133	188	245	321	421	524	669	589
	°C 90%	71	145	199	255	336	443	551	699	672
	°C 95%	72	148	201	257	339	448	558	718	720
	°C End	80	160	200	260	340	450	570	End	End
TBP Distillation, vol%	°F Start	50	175	300	400	500	650	850	1050	650
	°F 5%	78	194	306	405	508	659	860	1067	676
	°F 10%	86	197	312	411	517	669	869	1078	703
	°F 30%	110	213	332	434	552	708	907	1129	814
	°F 50%	142	245	352	455	582	750	940	1182	938
	°F 70%	153	271	371	473	610	789	976	1236	1093
	°F 90%	159	293	390	491	637	829	1024	1290	1241
	°F 95%	162	299	394	495	643	838	1036	1324	1328
	°F End	175	320	400	500	650	850	1050	End	End