

RATAWI - 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%		1.7	5.6	15.3	21.0	29.2	40.4	57.3	71.5	40.4
Yield at End, vol%		5.6	15.3	21.0	29.2	40.4	57.3	71.5	100.0	100.0
Yield of Cut (wt% of Crude)		2.8	8.0	5.0	7.4	10.6	17.2	15.0	32.9	65.1
Yield of Cut (vol% of Crude)		3.9	9.7	5.8	8.2	11.2	16.9	14.2	28.5	59.6
Gravity, °API	24.5	82.9	57.0	49.3	41.4	33.2	22.1	15.7	3.5	11.2
Specific Gravity	0.9068	0.6601	0.7507	0.7828	0.8182	0.8592	0.9210	0.9615	1.0482	0.9914
Sulfur, wt%	3.88	0.01	0.08	0.33	0.98	2.42	3.50	4.20	6.96	5.41
Mercaptan Sulfur, ppm		274	597	258	72	29	8	0		
Nitrogen, ppm	2066		0	0	1	90	759	1528	5156	3158
Hydrogen, wt%	11.7	16.2	14.3	14.3	13.7	13.0	12.0	11.1	9.2	10.4
Viscosity @ 40 °C (104 °F), cSt	30.5			1.13	1.78	5.87	27.0	272	1.10E+09	4102
Viscosity @ 50 °C (122 °F), cSt	21.5			0.982	1.51	4.40	17.7	143	6.13E+07	1750
Viscosity @ 100 °C (212 °F), cSt	6.19			0.576	0.824	1.59	4.18	17.5	32200	115
Viscosity @ 135 °C (275 °F), cSt	3.52			0.443	0.613	0.996	2.23	7.33	2660	37.9
Freeze Point, °C				-60.000	-38.000	-4.000	27.0			
Freeze Point, °F				-76	-36	25	81			
Pour Point, °C	-23			-68	-41	-6	24	41	40	22
Pour Point, °F	-10			-90	-42	22	76	106	104	72
Smoke Point, mm (ASTM)				28	23	18				
Aniline Point, °C			52	57	61	68	73	78		
Aniline Point, °F			125	135	142	154	164	173		
Total Acid Number, mg KOH/g	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.1		
Cetane Index, ASTM D976				43	48	49				
Diesel Index			71	66	59	51	36	27		
Characterization Factor (K Factor)	11.8	12.8	11.8	12.0	11.8	11.8	11.6	11.7	11.5	11.6
Research Octane Number, Clear		68.1	51.0	18.6						
Motor Octane Number, Clear		66.5	48.9							
Paraffins, vol%		85.7	57.7	62.1	46.8	43.5	29.0			
Naphthenes, vol%		14.3	28.6	21.4	32.9	28.2	30.2	30.2		
Aromatics, vol%		0.0	13.7	16.5	20.3	28.3	40.8	38.4		
Thiophenes, vol%										
Molecular Weight	320	102	116	150	177	228	308	456	1080	525
Gross Heating Value, MM BTU/bbl	6.01	4.83	5.32	5.50	5.66	5.83	6.07	6.22	6.44	6.30
Gross Heating Value, kcal/kg	10530	11610	11230	11140	10990	10750	10470	10280	9740	10080
Gross Heating Value, MJ/kg	44.1	48.6	47.0	46.6	46.0	45.0	43.8	43.0	40.8	42.2
Heptane Asphaltenes, wt%	6.1								18.5	9.4
Micro Carbon Residue, wt%	11.3								34.2	17.3
Ramsbottom Carbon, wt%	10.5								32.0	16.2
Vanadium, ppm	47								144	73
Nickel, ppm	22								67	34
Iron, ppm	4								12	6

RATAWI - 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%			1.7	5.6	15.3	21.0	29.2	40.4	57.3	71.5	40.4
Yield at End, vol%			5.6	15.3	21.0	29.2	40.4	57.3	71.5	100.0	100.0
Yield of Cut (wt% of Crude)			2.8	8.0	5.0	7.4	10.6	17.2	15.0	32.9	65.1
Yield of Cut (vol% of Crude)			3.9	9.7	5.8	8.2	11.2	16.9	14.2	28.5	59.6
TBP Distillation, vol%	°C Start		10	80	140	200	260	340	450	570	340
	°C 5%		24	81	151	208	265	348	459	580	364
	°C 10%		28	90	158	211	269	354	466	597	384
	°C 30%		36	99	176	223	288	378	493	669	462
	°C 50%		58	116	183	233	305	398	508	754	553
	°C 70%		66	126	191	242	321	416	526	866	696
	°C 90%		71	138	199	253	336	443	552	978	917
	°C 95%		73	139	202	256	339	451	558	1047	1047
	°C End		80	150	210	260	340	460	570	End	End
TBP Distillation, vol%	°F Start		50	175	290	400	500	650	850	1050	650
	°F 5%		75	177	303	407	509	659	858	1076	688
	°F 10%		83	194	317	412	517	670	871	1106	723
	°F 30%		96	211	348	433	551	712	920	1236	863
	°F 50%		137	241	361	451	581	748	947	1389	1027
	°F 70%		150	258	375	468	609	780	979	1590	1284
	°F 90%		160	280	391	488	637	830	1025	1792	1683
	°F 95%		163	283	396	493	643	843	1037	1916	1917
	°F End		175	300	410	500	650	860	1050	End	End