

TANTAWAN - 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%		1.4	7.2	22.2	35.0	47.6	66.0	82.9	92.9	66.0
Yield at End, vol%		7.2	22.2	35.0	47.6	66.0	82.9	92.9	100.0	100.0
Yield of Cut (wt% of Crude)		4.8	13.9	12.2	12.4	18.7	17.7	11.0	8.5	37.2
Yield of Cut (vol% of Crude)		5.8	15.0	12.8	12.6	18.4	16.9	10.1	7.1	34.0
Gravity, °API	43.3	83.2	57.2	51.8	46.3	40.9	35.6	29.0	13.0	28.5
Specific Gravity	0.8094	0.6592	0.7500	0.7718	0.7958	0.8206	0.8466	0.8817	0.9791	0.8845
Sulfur, wt%	0.05	0.00	0.00	0.00	0.01	0.03	0.07	0.11	0.18	0.11
Mercaptan Sulfur, ppm		1	2	3	2	2	2			
Nitrogen, ppm	327			1	3	32	178	679	2521	864
Hydrogen, wt%		16.3	14.4	15.7	15.2	14.6	14.1	13.3		
Viscosity @ 40 °C (104 °F), cSt	3.52				1.65	3.83	12.2	74	8.68E+04	101.6
Viscosity @ 50 °C (122 °F), cSt	3.00			0.872	1.41	3.14	9.24	46.8	19100	59.9
Viscosity @ 100 °C (212 °F), cSt	1.63				0.781	1.50	3.38	9.68	252	10.1
Viscosity @ 135 °C (275 °F), cSt	1.21				0.585	1.05	2.12	4.86	53.2	4.76
Freeze Point, °C				-61.000	-26.000	20.0	48.0			
Freeze Point, °F				-78	-14	68	118			
Pour Point, °C	16			-60	-29	15	45	58	82	59
Pour Point, °F	60			-76	-20	59	113	137	179	138
Smoke Point, mm (ASTM)				39	31	23	19			
Aniline Point, °C				68	77	92	105	116		
Aniline Point, °F				154	171	197	221	240		
Total Acid Number, mg KOH/g	0.08			0.0	0.1	0.1	0.2	0.7		
Cetane Index, ASTM D976				46	57	62				
Diesel Index				80	79	81	79	69		
Characterization Factor (K Factor)	12.5	12.8	11.8	12.1	12.2	12.3	12.5	12.7	11.9	12.4
Research Octane Number, Clear		65.0	49.6	15.9						
Motor Octane Number, Clear		63.8	48.3							
Paraffins, vol%		90.5	58.5	63.8	59.9	55.1				
Naphthenes, vol%		9.5	29.6	25.3	28.9	30.2				
Aromatics, vol%		0.0	11.9	10.8	11.1	14.7	16.2	21.1		
Thiophenes, vol%										
Molecular Weight	211	103	116	149	182	237	331	493	707	408
Gross Heating Value, MM BTU/bbl	5.68	4.82	5.32	5.45	5.59	5.73	5.87	6.05	6.44	6.05
Gross Heating Value, kcal/kg	11140	11580	11270	11210	11160	11080	11010	10910	10450	10870
Gross Heating Value, MJ/kg	46.6	48.5	47.2	46.9	46.7	46.4	46.1	45.7	43.7	45.5
Heptane Asphaltene, wt%	0.3								3.0	0.7
Micro Carbon Residue, wt%	1.2								13.8	3.2
Ramsbottom Carbon, wt%	1.1								13.1	3.0
Vanadium, ppm	0								2	0
Nickel, ppm	1								9	2
Iron, ppm	4								47	11

TANTAWAN - 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%		1.4	7.2	22.2	35.0	47.6	66.0	82.9	92.9	66.0
Yield at End, vol%		7.2	22.2	35.0	47.6	66.0	82.9	92.9	100.0	100.0
Yield of Cut (wt% of Crude)		4.8	13.9	12.2	12.4	18.7	17.7	11.0	8.5	37.2
Yield of Cut (vol% of Crude)		5.8	15.0	12.8	12.6	18.4	16.9	10.1	7.1	34.0
TBP Distillation, vol%	°C Start	10	80	150	200	260	340	450	570	340
	°C 5%	25	81	151	207	264	348	458	571	352
	°C 10%	29	90	154	209	268	352	462	576	362
	°C 30%	42	98	166	221	284	371	479	598	403
	°C 50%	61	116	177	232	301	391	502	624	456
	°C 70%	66	129	188	243	317	414	528	655	526
	°C 90%	71	142	199	254	334	442	553	707	627
	°C 95%	72	149	202	257	339	449	560	724	688
	°C End	80	160	200	260	340	450	570	End	End
TBP Distillation, vol%	°F Start	50	170	300	400	500	650	850	1050	650
	°F 5%	77	177	304	405	507	658	857	1059	666
	°F 10%	85	194	310	409	514	666	864	1068	683
	°F 30%	107	209	331	429	544	699	895	1109	757
	°F 50%	141	241	351	449	574	735	935	1155	852
	°F 70%	151	265	371	470	603	778	982	1211	979
	°F 90%	159	288	390	490	634	827	1027	1304	1160
	°F 95%	161	301	395	495	642	840	1040	1336	1270
	°F End	175	320	400	500	650	850	1050	End	End