

BENCHAMAS - 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%		1.3	8.7	22.2	32.2	41.6	56.6	76.2	89.4	56.6
Yield at End, vol%		8.7	22.2	32.2	41.6	56.6	76.2	89.4	100.0	100.0
Yield of Cut (wt% of Crude)		6.0	12.7	9.5	9.4	15.3	20.1	14.1	12.0	46.3
Yield of Cut (vol% of Crude)		7.4	13.6	10.0	9.4	15.0	19.6	13.3	10.6	43.4
Gravity, °API	43.0	83.2	55.0	51.4	43.7	40.0	38.2	32.2	22.4	32.2
Specific Gravity	0.8108	0.6592	0.7589	0.7735	0.8075	0.8252	0.8340	0.8646	0.9195	0.8641
Sulfur, wt%	0.04	0.00	0.00	0.00	0.01	0.03	0.05	0.07	0.14	0.08
Mercaptan Sulfur, ppm		0	1	1	2	2	1			
Nitrogen, ppm	250	0	0	1	2	28	145	407	1358	539
Hydrogen, wt%		16.3	14.3	15.6	14.9	14.5	14.3	13.7		
Viscosity @ 40 °C (104 °F), cSt	5.07		0.503	0.914	1.66	3.56	11.4	49.2	13069	82.9
Viscosity @ 50 °C (122 °F), cSt	4.23	0.367	0.477	0.823	1.42	2.94	8.71	33.8	5090	51.7
Viscosity @ 100 °C (212 °F), cSt	2.13		0.387	0.546	0.784	1.45	3.30	8.92	253	10.3
Viscosity @ 135 °C (275 °F), cSt	1.53		0.346	0.445	0.587	1.03	2.10	4.89	75.3	5.08
Freeze Point, °C			-90.000	-56.000	-22.000	16.0	47.0	68.0		
Freeze Point, °F			-130	-69	-7	61	116	154		
Pour Point, °C	32			-58	-26	9	41	58	60	50
Pour Point, °F	89			-73	-15	48	106	136	140	122
Smoke Point, mm (ASTM)				29	25	22	19			
Aniline Point, °C				66	74	88	107	119		
Aniline Point, °F				151	165	191	225	247		
Total Acid Number, mg KOH/g	0.12	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.2
Cetane Index, ASTM D976				43	51	60				
Diesel Index				77	72	76	86	79		
Characterization Factor (K Factor)	12.7	12.8	11.6	12.0	12.0	12.3	12.7	12.9	12.7	12.7
Research Octane Number, Clear		64.7	60.6	20.4						
Motor Octane Number, Clear		63.4	58.5							
Paraffins, vol%		89.7	44.6	64.9	54.6	46.9	47.7			
Naphthenes, vol%		10.3	44.6	18.0	31.2	35.7				
Aromatics, vol%		0.0	10.8	17.3	14.2	17.4				
Thiophenes, vol%										
Molecular Weight	245	103	111	145	178	235	340	502	837	441
Gross Heating Value, MM BTU/bbl	5.69	4.82	5.36	5.46	5.64	5.75	5.82	5.98	6.23	5.97
Gross Heating Value, kcal/kg	11120	11580	11230	11190	11100	11050	11070	10990	10740	10980
Gross Heating Value, MJ/kg	46.5	48.5	47.0	46.8	46.5	46.2	46.3	46.0	45.0	46.0
Heptane Asphaltene, wt%	0.4								3.2	0.8
Micro Carbon Residue, wt%	1.1								9.2	2.4
Ramsbottom Carbon, wt%	1.0								8.6	2.2
Vanadium, ppm	0								2	1
Nickel, ppm	0								2	1
Iron, ppm										

BENCHAMAS - 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%		1.3	8.7	22.2	32.2	41.6	56.6	76.2	89.4	56.6
Yield at End, vol%		8.7	22.2	32.2	41.6	56.6	76.2	89.4	100.0	100.0
Yield of Cut (wt% of Crude)		6.0	12.7	9.5	9.4	15.3	20.1	14.1	12.0	46.3
Yield of Cut (vol% of Crude)		7.4	13.6	10.0	9.4	15.0	19.6	13.3	10.6	43.4
TBP Distillation, vol%	°C Start	10	80	140	200	260	340	450	570	340
	°C 5%	26	81	149	207	264	349	458	573	355
	°C 10%	29	90	150	209	268	354	463	579	367
	°C 30%	40	98	161	219	284	373	480	608	416
	°C 50%	60	111	173	231	301	393	500	648	468
	°C 70%	66	129	187	243	318	419	521	709	536
	°C 90%	71	138	199	255	335	443	549	787	672
	°C 95%	72	139	202	258	339	449	557	836	754
	°C End	80	150	210	260	340	450	570	End	End
TBP Distillation, vol%	°F Start	50	170	280	400	500	650	850	1050	650
	°F 5%	78	177	300	404	507	661	857	1063	671
	°F 10%	85	194	302	409	514	670	865	1074	692
	°F 30%	104	209	322	427	543	704	896	1127	780
	°F 50%	140	231	344	447	574	740	932	1199	874
	°F 70%	150	265	368	470	604	787	970	1309	996
	°F 90%	159	280	390	491	635	829	1020	1449	1242
	°F 95%	161	282	395	496	642	840	1034	1536	1389
	°F End	175	300	410	500	650	850	1050	End	End