

COSSACK - 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%		3.8	15.0	41.5	54.4	68.1	81.8	92.5	98.0	81.8
Yield at End, vol%		15.0	41.5	54.4	68.1	81.8	92.5	98.0	100.0	100.0
Yield of Cut (wt% of Crude)		9.4	25.4	12.7	14.2	14.8	12.0	6.4	2.4	20.8
Yield of Cut (vol% of Crude)		11.2	26.5	12.9	13.8	13.7	10.7	5.5	2.0	18.2
Gravity, °API	48.1	82.7	55.8	50.1	42.8	34.4	29.7	23.4	13.0	25.8
Specific Gravity	0.7877	0.6607	0.7554	0.7791	0.8117	0.8529	0.8779	0.9136	0.9793	0.8996
Sulfur, wt%	0.04	0.00	0.00	0.00	0.02	0.04	0.08	0.15	0.33	0.13
Mercaptan Sulfur, ppm		1	2	2	2	3	4			
Nitrogen, ppm	379		0	0	3	55	493	2293	6792	1782
Hydrogen, wt%	14.2	16.2	14.6	14.3	13.9	13.6	13.1	12.5	11.9	12.8
Viscosity @ 40 °C (104 °F), cSt	1.4			0.906	1.55	3.27	11.3	67	3.43E+04	47
Viscosity @ 50 °C (122 °F), cSt	1.18			0.820	1.36	2.74	8.76	45.4	11500	31.0
Viscosity @ 100 °C (212 °F), cSt	0.650			0.557	0.819	1.41	3.46	11.5	387	7.21
Viscosity @ 135 °C (275 °F), cSt	0.487			0.458	0.637	1.02	2.23	6.19	102	3.78
Freeze Point, °C				-63.000	-33.000	0.000	34.0			
Freeze Point, °F				-81	-27	32	93			
Pour Point, °C	-18			-69	-36	-4	31	49	42	33
Pour Point, °F	0			-92	-32	24	87	120	108	92
Smoke Point, mm (ASTM)				28	21	18	15	14		
Aniline Point, °C				58	65	73	91	97	101	93
Aniline Point, °F				137	149	164	195	207	213	200
Total Acid Number, mg KOH/g	0.02			0.0	0.1	0.1	0.1	0.1	0.1	0.1
Cetane Index, ASTM D976				40	50	50				
Diesel Index				68	64	56	58	48	28	52
Characterization Factor (K Factor)	12.0	12.8	11.8	11.9	11.9	11.8	12.1	12.2	11.9	12.0
Research Octane Number, Clear		64.9	51.5	28.6						
Motor Octane Number, Clear		63.4								
Paraffins, vol%		87.3	46.0	49.5	46.5	45.0				
Naphthenes, vol%		12.7	47.2	44.9	40.1	38.0				
Aromatics, vol%		0.0	6.8	5.6	13.2	16.6				
Thiophenes, vol%			0.0		0.2	0.4				
Molecular Weight	148	102	116	144	177	224	316	461	676	363
Gross Heating Value, MM BTU/bbl	5.54	4.83	5.35	5.49	5.66	5.87	6.00	6.17	6.44	6.10
Gross Heating Value, kcal/kg	11140	11610	11250	11170	11060	10940	10850	10700	10420	10750
Gross Heating Value, MJ/kg	46.6	48.6	47.1	46.8	46.3	45.8	45.4	44.8	43.6	45.0
Heptane Asphaltenes, wt%	0.0								1.4	0.2
Micro Carbon Residue, wt%	0.4								17.8	2.1
Ramsbottom Carbon, wt%	0.4								16.5	1.9
Vanadium, ppm	0								1	0
Nickel, ppm	0								5	1
Iron, ppm	2								83	10

COSSACK - 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%		3.8	15.0	41.5	54.4	68.1	81.8	92.5	98.0	81.8
Yield at End, vol%		15.0	41.5	54.4	68.1	81.8	92.5	98.0	100.0	100.0
Yield of Cut (wt% of Crude)		9.4	25.4	12.7	14.2	14.8	12.0	6.4	2.4	20.8
Yield of Cut (vol% of Crude)		11.2	26.5	12.9	13.8	13.7	10.7	5.5	2.0	18.2
TBP Distillation, vol%	°C Start	10	50	150	200	260	340	450	570	340
	°C 5%	26	83	151	208	263	347	458	570	350
	°C 10%	29	91	153	211	267	351	461	574	357
	°C 30%	38	103	163	221	282	369	476	593	391
	°C 50%	60	118	173	231	299	390	496	613	431
	°C 70%	66	128	184	241	316	412	518	634	481
	°C 90%	71	139	198	253	334	439	546	638	571
	°C 95%	72	144	201	257	339	447	554		627
	°C End	80	160	200	260	340	450	570	End	End
TBP Distillation, vol%	°F Start	55	130	300	400	500	650	850	1050	650
	°F 5%	78	181	304	407	506	657	856	1058	662
	°F 10%	85	196	308	411	513	664	862	1065	675
	°F 30%	101	218	325	430	540	697	888	1099	736
	°F 50%	140	245	343	447	570	734	924	1135	808
	°F 70%	151	263	364	466	601	774	964	1174	897
	°F 90%	159	283	388	488	633	823	1014	1181	1060
	°F 95%	162	291	394	494	642	837	1030		1161
	°F End	175	320	400	500	650	850	1050	End	End