

Certificate of Composition  
 Part #: SD-053-050  
 Heavy Naphtha I

ASTM D6730 with Helium Carrier

### Summary by Group

<u>Group</u>	<u>%Wgt</u>	<u>%Vol</u>	<u>%Mol</u>	<u>Avg MW</u>	<u>Avg SG</u>
Paraffin	18.984	20.492	18.855	20.551	0.143
I-Paraffins	26.669	28.351	25.051	28.870	0.200
Aromatics	14.238	12.315	14.866	15.413	0.107
<i>Mono-Aromatics</i>	14.148	12.245	14.782	15.315	0.106
<i>Naphthalenes</i>	0.000	0.000	0.000	0.000	0.000
<i>Indanes</i>	0.000	0.000	0.000	0.000	0.000
<i>Indenes</i>	0.090	0.070	0.084	0.097	0.001
Naphthenes	39.542	38.300	40.735	42.805	0.297
<i>Mono-Naphthenes</i>	39.542	38.300	40.735	42.805	0.297
<i>Di/Bicyclo-Naphthenes</i>	0.000	0.000	0.000	0.000	0.000
Olefins	0.000	0.000	0.000	0.000	0.000
<i>n-Olefins</i>	0.000	0.000	0.000	0.000	0.000
<i>Iso-Olefins</i>	0.000	0.000	0.000	0.000	0.000
<i>Naphtheno-Olefins</i>	0.000	0.000	0.000	0.000	0.000
<i>Di-Olefins</i>	0.000	0.000	0.000	0.000	0.000
Oxygenates	0.000	0.000	0.000	0.000	0.000
Unidentified	0.566	0.542	0.493	0.613	0.004
Plus	0.000	0.000	0.000	0.000	0.000
	<b>100.000</b>	<b>100.000</b>	<b>100.000</b>	<b>108.252</b>	<b>0.751</b>

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1	9.113	3	Propane	0.003	0.004	0.007
2	10.200	4	n-Butane	0.043	0.056	0.080
3	13.965	5	i-Pentane	0.195	0.237	0.293
4	15.747	5	n-Pentane	0.388	0.465	0.582
5	18.303	6	2,2-Dimethylbutane	0.008	0.010	0.010
6	20.463	5	Cyclopentane	0.102	0.102	0.157
7	20.653	6	2,3-Dimethylbutane	0.054	0.061	0.068
8	21.052	6	2-Methylpentane	0.529	0.608	0.664
9	22.245	6	3-Methylpentane	0.427	0.483	0.536
10	23.812	6	n-Hexane	1.283	1.461	1.612
11	26.107	7	2,2-Dimethylpentane	0.032	0.035	0.034
12	26.320	6	Methylcyclopentane	1.364	1.368	1.755
13	26.752	7	2,4-Dimethylpentane	0.085	0.095	0.092
14	28.968	6	Benzene	0.339	0.289	0.470
15	29.465	7	3,3-Dimethylpentane	0.037	0.040	0.040
16	29.927	6	Cyclohexane	2.063	1.990	2.653
17	31.035	7	2-Methylhexane	1.367	1.512	1.476
18	31.232	7	2,3-Dimethylpentane	0.590	0.637	0.637
19	31.593	7	1,1-Dimethylcyclopentane	0.508	0.506	0.561
20	32.147	7	3-Methylhexane	2.122	2.319	2.292
21	33.007	7	1t,3-Dimethylcyclopentane	1.476	1.480	1.627
22	33.388	7	1c,3-Dimethylcyclopentane	1.427	1.439	1.573
23	33.533	7	3-Ethylpentane	0.223	0.240	0.241
24	33.773	7	1t,2-Dimethylcyclopentane	2.510	2.508	2.767
25	35.623	7	n-Heptane	6.097	6.696	6.586
26	38.735	7	1c,2-Dimethylcyclopentane	0.117	0.120	0.128
27	38.945	7	Methylcyclohexane	9.533	9.304	10.511
28	39.413	8	2,2-Dimethylhexane	1.149	1.240	1.088
29	41.020	7	Ethylcyclopentane	1.043	1.022	1.150
30	41.513	8	2,4-Dimethylhexane	0.395	0.423	0.374
31	42.670	8	1c,2t,4-Trimethylcyclopentane	1.336	1.314	1.288
32	42.900	8	3,3-Dimethylhexane	0.105	0.111	0.100
33	44.183	8	Cyclopentane, 1,2,3-trimethyl-, (1à,2à1.543	1.543	1.517	1.488
34	44.748	8	2,3,4-Trimethylpentane	0.009	0.010	0.009
35	45.872	7	Toluene	4.103	3.554	4.821
36	47.217	8	2,3-Dimethylhexane	0.346	0.365	0.328
37	47.453	8	2-Methyl-3-ethylpentane	0.545	0.574	0.516
38	48.687	8	2-Methylheptane	3.063	3.296	2.903
39	49.050	8	4-Methylheptane	0.779	0.830	0.739
40	49.345	8	3-Methyl-3-ethylpentane	0.132	0.139	0.125
41	49.483	8	3,4-Dimethylhexane	0.150	0.157	0.142
42	50.132	8	C8_Mono-Naphthenes(1)	0.176	0.174	0.170
43	50.600	8	3-Methylheptane	1.575	1.675	1.492
44	51.055	8	3-Ethylhexane	3.541	3.726	3.356

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45	51.283	8	trans-1,3-dimethylcyclohexane	0.115	0.086	0.111
46	51.538	8	1t,4-Dimethylcyclohexane	1.115	1.098	1.075
47	53.033	8	C8 MonoNaph - 1	0.363	0.352	0.350
48	54.022	8	3c-Ethylmethylcyclopentane	0.391	0.382	0.377
49	54.637	8	3t-Ethylmethylcyclopentane	0.347	0.340	0.335
50	55.017	8	2t-Ethylmethylcyclopentane	0.873	0.853	0.843
51	55.627	8	1,1-Methylethylcyclopentane	0.072	0.069	0.069
52	56.470	8	1t,2-Dimethylcyclohexane	1.568	1.517	1.513
53	58.407	8	n-Octane	6.133	6.555	5.812
54	58.733	8	1c,4-Dimethylcyclohexane	0.720	0.691	0.695
55	61.038	8	i-Propylcyclopentane	0.154	0.149	0.149
56	63.072	9	Cyclopentane, 1,1,3,4-tetramet	0.068	0.066	0.058
57	64.593	8	Cyclopentane, 1-ethyl-2-methyl	0.083	0.082	0.081
58	66.763	9	2,4-Dimethylheptane	0.499	0.524	0.421
59	67.060	9	C9 - IsoParaffin - 0	0.117	0.123	0.099
60	68.828	8	Ethylcyclohexane	2.823	2.704	2.723
61	69.410	9	2,2,3-Trimethylhexane	1.072	1.125	0.905
62	70.055	9	4,4-Dimethylheptane	0.048	0.050	0.040
63	70.837	9	C9 - MonoNaph - 1a	1.499	1.458	1.286
64	71.875	9	2,5-Dimethylheptane	0.564	0.592	0.476
65	72.723	9	1,1,3-Trimethylcyclohexane	0.213	0.203	0.182
66	73.155	9	C9 - MonoNaph - 3a	0.267	0.259	0.229
67	73.717	?	Unidentified	0.106	0.103	0.091
68	75.083	?	Unidentified	0.097	0.084	0.099
69	75.512	8	Ethylbenzene	1.831	1.586	1.867
70	76.082	9	1c,2t,4t-Trimethylcyclohexane	0.771	0.742	0.661
71	76.747	?	Unidentified	0.027	0.026	0.023
72	78.280	8	m-Xylene	2.303	2.001	2.349
73	78.607	8	p-Xylene	1.103	0.962	1.125
74	78.808	9	2,3-Dimethylheptane	0.104	0.107	0.088
75	79.303	?	Unidentified	0.045	0.047	0.038
76	79.683	9	3,5-Dimethylheptane	0.309	0.321	0.261
77	80.245	9	4-Ethylheptane	0.217	0.226	0.183
78	81.165	9	4-Methyloctane	0.638	0.665	0.538
79	81.470	9	2-Methyloctane	0.779	0.820	0.657
80	82.120	9	Cyclohexane, 1,2,3-trimethyl-, (1à,2à,	0.115	0.111	0.099
81	82.888	9	Heptane, 3-ethyl-	0.440	0.454	0.371
82	83.332	9	3,4-Dimethylheptane	1.211	1.243	1.022
83	84.093	?	Unidentified	0.030	0.026	0.031
84	84.650	8	o-Xylene	1.207	1.029	1.230
85	86.187	9	Cyclopentane, 1-methyl-2-propy	0.430	0.367	0.369
86	86.423	9	trans-1,3-Diethylcyclopentane	0.878	0.749	0.753
87	86.973	9	Cyclohexane, 1-ethyl-4-methyl-	0.536	0.521	0.460
88	87.715	10	2,2,4-trimethylheptane	0.048	0.050	0.037

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89	88.095	9	C9-MonoNaph-1b	0.129	0.134	0.111
90	89.393	?	Unidentified	0.027	0.028	0.023
91	90.020	9	C9 - MonoNaph - 2b	0.070	0.072	0.060
92	90.560	9	n-Nonane	4.147	4.339	3.500
93	91.060	9	1,1-Methylethylcyclohexane	0.571	0.532	0.490
94	91.585	?	Unidentified	0.052	0.049	0.045
95	91.747	?	Unidentified	0.045	0.042	0.039
96	92.917	9	i-Propylbenzene	0.211	0.184	0.190
97	93.442	9	C9-MonoNaph - 6	0.627	0.471	0.538
98	93.943	9	i-Propylcyclohexane	0.234	0.219	0.201
99	94.382	10	2,3,6-trimethylheptane	0.088	0.066	0.067
100	94.885	10	2,2-Dimethyloctane	0.161	0.166	0.122
101	95.845	10	2,4-Dimethyloctane	0.082	0.085	0.063
102	96.082	10	C10 - IsoParaffin - 1c	0.024	0.025	0.018
103	96.313	9	Propylcyclohexane	0.866	0.811	0.743
104	97.242	10	C10 - IsoParaffin - 3	0.228	0.235	0.174
105	97.515	10	C10 - IsoParaffin - 4	0.119	0.122	0.090
106	97.970	9	C9 - MonoNaph - 8	0.050	0.047	0.043
107	98.232	10	2,7-dimethyloctane	0.734	0.755	0.558
108	98.667	?	Unidentified	0.033	0.031	0.026
109	98.825	?	Unidentified	0.049	0.050	0.037
110	99.230	9	n-Propylbenzene	0.426	0.371	0.384
111	99.402	10	3,6-Dimethyloctane	0.139	0.142	0.106
112	99.663	10	C10 Isoparaffin - 6	0.382	0.391	0.291
113	100.170	9	C9_Mono-Aromatics(1)	0.077	0.067	0.070
114	100.783	9	1-Methyl-3-ethylbenzene	0.629	0.546	0.567
115	101.158	9	1-Methyl-4-ethylbenzene	0.234	0.204	0.211
116	101.712	9	C9_Mono-Aromatics(2)	0.198	0.171	0.178
117	102.270	9	1,3,5-Trimethylbenzene	0.381	0.331	0.344
118	102.460	10	C10 MonoNaph - 1	0.153	0.143	0.118
119	102.937	10	5-Methylnonane	0.038	0.039	0.029
120	103.295	10	C10_I-Paraffins(1)	0.057	0.058	0.043
121	103.608	10	4-Methylnonane	0.303	0.310	0.230
122	103.818	9	1-Methyl-2-ethylbenzene	0.010	0.008	0.009
123	104.085	10	2-Methylnonane	0.411	0.425	0.313
124	104.705	10	Cyclohexane, 2-ethyl-1,3-dimethyl-	0.035	0.032	0.027
125	105.045	10	C10-MonoNaph-2a	0.073	0.069	0.056
126	105.257	10	3-Methylnonane	0.217	0.223	0.165
127	105.593	?	Unidentified	0.055	0.057	0.042
128	106.795	9	1,2,4-Trimethylbenzene	0.630	0.540	0.567
129	106.955	10	C10 MonoNaph - 3a	0.129	0.122	0.100
130	107.417	10	t-Butylbenzene	0.132	0.114	0.119
131	107.852	10	C10 MonoNaphth - 3b	0.004	0.004	0.003
132	108.983	10	3-Ethyl-3-methylheptane	0.018	0.018	0.012

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133	109.258	10	i-Butylbenzene	0.027	0.023	0.021
134	110.170	10	n-Decane	0.848	0.873	0.646
135	111.458	9	1,2,3-Trimethylbenzene	0.159	0.134	0.143
136	111.753	10	1-Methyl-3-i-propylbenzene	0.053	0.046	0.043
137	113.772	10	1-H-Indene	0.090	0.070	0.084
138	114.058	11	C11 Isoparaffin - 4	0.120	0.121	0.083
139	114.933	11	C11 IsoParaffin - 5	0.047	0.047	0.032
140	116.462	10	1-Methyl-3-n-propylbenzene	0.094	0.082	0.076
141	118.203	10	Cyclooctene, 1,2-dimethyl-	0.000	0.000	0.000
142	124.900	11	n-Undecane	0.042	0.043	0.029

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### Sample Chromatogram



































