

Certificate of Composition  
 Part #: SD-053-051  
 Heavy Naphtha II

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	18.847	20.327	18.575	20.218	0.141
I-Paraffins	26.709	28.398	25.018	28.652	0.200
Aromatics	14.264	12.321	14.879	15.301	0.107
<i>Mono-Aromatics</i>	14.157	12.238	14.781	15.187	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>	0.106	0.083	0.098	0.114	0.001
Naphthenes	39.139	37.960	40.658	41.986	0.294
<i>Mono-Naphthenes</i>	39.139	37.960	40.658	41.986	0.294
<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	1.041	0.994	0.870	1.117	0.008
Plus	0.000	0.000	0.000	0.000	0.000
	<b>100.000</b>	<b>100.000</b>	<b>100.000</b>	<b>107.273</b>	<b>0.750</b>

Certificate of Composition  
 Part #: SD-053-051  
 Heavy Naphtha II

ASTM D6730 with Helium Carrier

## Component List

<u>Pk#</u>	<u>Time</u>	<u>C#</u>	<u>Component</u>	<u>%Wgt</u>	<u>%Vol</u>	<u>%Mol</u>
1	20.452	5	Cyclopentane	0.020	0.020	0.031
2	20.640	6	2,3-Dimethylbutane	0.059	0.067	0.074
3	21.038	6	2-Methylpentane	0.583	0.670	0.726
4	22.230	6	3-Methylpentane	0.704	0.795	0.877
5	23.802	6	n-Hexane	2.464	2.803	3.067
6	26.092	7	2,2-Dimethylpentane	0.061	0.068	0.066
7	26.310	6	Methylcyclopentane	2.735	2.740	3.485
8	26.737	7	2,4-Dimethylpentane	0.173	0.193	0.186
9	27.238	?	Unidentified	0.008	0.009	0.009
10	28.953	6	Benzene	0.733	0.625	1.006
11	29.450	7	3,3-Dimethylpentane	0.054	0.058	0.057
12	29.920	6	Cyclohexane	3.201	3.085	4.080
13	31.025	7	2-Methylhexane	1.658	1.833	1.775
14	31.222	7	2,3-Dimethylpentane	0.797	0.860	0.854
15	31.583	7	1,1-Dimethylcyclopentane	0.618	0.615	0.676
16	32.135	7	3-Methylhexane	2.451	2.675	2.623
17	32.995	7	1t,3-Dimethylcyclopentane	1.612	1.615	1.761
18	33.378	7	1c,3-Dimethylcyclopentane	1.511	1.522	1.651
19	33.523	7	3-Ethylpentane	0.260	0.279	0.278
20	33.763	7	1t,2-Dimethylcyclopentane	2.621	2.617	2.864
21	33.923	?	Unidentified	0.032	0.034	0.030
22	35.612	7	n-Heptane	5.643	6.191	6.041
23	38.735	7	1c,2-Dimethylcyclopentane	0.145	0.149	0.159
24	38.930	7	Methylcyclohexane	7.970	7.771	8.707
25	39.403	8	2,2-Dimethylhexane	1.012	1.092	0.950
26	41.007	7	Ethylcyclopentane	0.975	0.955	1.065
27	41.502	8	2,4-Dimethylhexane	0.384	0.412	0.361
28	42.658	8	1c,2t,4-Trimethylcyclopentane	1.195	1.175	1.143
29	42.888	8	3,3-Dimethylhexane	0.103	0.109	0.097
30	44.170	8	Cyclopentane, 1,2,3-trimethyl-, (1à,2à1.404	1.404	1.380	1.342
31	44.745	8	2,3,4-Trimethylpentane	0.037	0.039	0.035
32	45.863	7	Toluene	3.779	3.269	4.399
33	47.210	8	2,3-Dimethylhexane	0.354	0.373	0.333
34	47.450	8	2-Methyl-3-ethylpentane	0.520	0.548	0.489
35	48.680	8	2-Methylheptane	2.800	3.010	2.630
36	49.040	8	4-Methylheptane	0.743	0.792	0.698
37	49.335	8	3-Methyl-3-ethylpentane	0.125	0.132	0.118
38	49.473	8	3,4-Dimethylhexane	0.155	0.161	0.145
39	50.130	8	C8_Mono-Naphthenes(1)	0.155	0.152	0.148
40	50.590	8	3-Methylheptane	1.497	1.591	1.405
41	51.048	8	3-Ethylhexane	3.187	3.350	2.993
42	51.283	8	trans-1,3-dimethylcyclohexane	0.082	0.061	0.078
43	51.532	8	1t,4-Dimethylcyclohexane	1.001	0.985	0.957
44	53.025	8	C8 MonoNaph - 1	0.335	0.326	0.321

Certificate of Composition  
Part #: SD-053-051  
Heavy Naphtha II

ASTM D6730 with Helium Carrier

## Component List

<u>Pk#</u>	<u>Time</u>	<u>C#</u>	<u>Component</u>	<u>%Wgt</u>	<u>%Vol</u>	<u>%Mol</u>
45	54.010	8	3c-Ethylmethylcyclopentane	0.385	0.377	0.368
46	54.627	8	3t-Ethylmethylcyclopentane	0.337	0.330	0.322
47	55.003	8	2t-Ethylmethylcyclopentane	0.823	0.802	0.786
48	55.612	8	1,1-Methylethylcyclopentane	0.067	0.064	0.064
49	56.457	8	1t,2-Dimethylcyclohexane	1.411	1.364	1.349
50	58.405	8	n-Octane	5.769	6.161	5.418
51	58.728	8	1c,4-Dimethylcyclohexane	0.622	0.596	0.595
52	61.025	8	i-Propylcyclopentane	0.162	0.157	0.155
53	63.050	9	Cyclopentane, 1,1,3,4-tetramet	0.072	0.070	0.061
54	63.885	?	Unidentified	0.029	0.029	0.024
55	64.568	8	Cyclopentane, 1-ethyl-2-methyl	0.090	0.088	0.086
56	65.205	?	Unidentified	0.024	0.023	0.023
57	66.758	9	2,4-Dimethylheptane	0.471	0.494	0.394
58	67.048	9	C9 - IsoParaffin - 0	0.109	0.115	0.092
59	68.810	8	Ethylcyclohexane	2.685	2.569	2.566
60	69.398	9	2,2,3-Trimethylhexane	1.116	1.170	0.933
61	70.057	9	4,4-Dimethylheptane	0.064	0.067	0.054
62	70.823	9	C9 - MonoNaph - 1a	1.468	1.426	1.247
63	71.865	9	2,5-Dimethylheptane	0.593	0.621	0.496
64	72.310	?	Unidentified	0.071	0.073	0.059
65	72.710	9	1,1,3-Trimethylcyclohexane	0.138	0.132	0.117
66	73.145	9	C9 - MonoNaph - 3a	0.263	0.256	0.224
67	73.698	?	Unidentified	0.109	0.106	0.093
68	75.067	?	Unidentified	0.102	0.088	0.103
69	75.498	8	Ethylbenzene	2.225	1.925	2.248
70	76.075	9	1c,2t,4t-Trimethylcyclohexane	0.701	0.674	0.596
71	76.732	?	Unidentified	0.037	0.035	0.031
72	78.270	8	m-Xylene	2.155	1.871	2.178
73	78.588	8	p-Xylene	1.114	0.971	1.126
74	78.808	9	2,3-Dimethylheptane	0.082	0.085	0.068
75	79.298	?	Unidentified	0.044	0.046	0.037
76	79.667	9	3,5-Dimethylheptane	0.292	0.303	0.244
77	80.233	9	4-Ethylheptane	0.227	0.236	0.190
78	81.153	9	4-Methyloctane	0.639	0.665	0.534
79	81.463	9	2-Methyloctane	0.767	0.807	0.642
80	82.108	9	Cyclohexane, 1,2,3-trimethyl-, (1à,2à,	0.118	0.113	0.100
81	82.883	9	Heptane, 3-ethyl-	0.416	0.430	0.348
82	83.317	9	3,4-Dimethylheptane	1.185	1.215	0.991
83	83.767	?	Unidentified	0.018	0.018	0.015
84	84.088	?	Unidentified	0.029	0.024	0.029
85	84.312	?	Unidentified	0.018	0.015	0.018
86	84.642	8	o-Xylene	1.169	0.996	1.181
87	86.183	9	Cyclopentane, 1-methyl-2-propy	0.414	0.353	0.352
88	86.408	9	trans-1,3-Diethylcyclopentane	0.792	0.675	0.673

Certificate of Composition  
Part #: SD-053-051  
Heavy Naphtha II

ASTM D6730 with Helium Carrier

### Component List

<u>Pk#</u>	<u>Time</u>	<u>C#</u>	<u>Component</u>	<u>%Wgt</u>	<u>%Vol</u>	<u>%Mol</u>
89	86.960	9	Cyclohexane, 1-ethyl-4-methyl-	0.478	0.465	0.406
90	87.697	10	2,2,4-trimethylheptane	0.049	0.050	0.037
91	88.097	9	C9-MonoNaph-1b	0.137	0.141	0.116
92	89.378	?	Unidentified	0.021	0.022	0.018
93	90.008	9	C9 - MonoNaph - 2b	0.055	0.056	0.047
94	90.548	9	n-Nonane	3.795	3.967	3.174
95	91.052	9	1,1-Methylethylcyclohexane	0.481	0.448	0.409
96	91.573	?	Unidentified	0.039	0.036	0.033
97	91.742	?	Unidentified	0.041	0.039	0.035
98	92.903	9	i-Propylbenzene	0.211	0.184	0.188
99	93.428	9	C9-MonoNaph - 6	0.549	0.411	0.466
100	93.928	9	i-Propylcyclohexane	0.194	0.182	0.165
101	94.365	10	2,3,6-trimethylheptane	0.089	0.067	0.067
102	94.865	10	2,2-Dimethyloctane	0.146	0.152	0.110
103	95.835	10	2,4-Dimethyloctane	0.065	0.067	0.049
104	96.062	10	C10 - IsoParaffin - 1c	0.024	0.025	0.018
105	96.303	9	Propylcyclohexane	0.722	0.675	0.614
106	97.225	10	C10 - IsoParaffin - 3	0.200	0.205	0.151
107	97.505	10	C10 - IsoParaffin - 4	0.107	0.110	0.081
108	97.947	9	C9 - MonoNaph - 8	0.040	0.037	0.034
109	98.222	10	2,7-dimethyloctane	0.664	0.682	0.501
110	98.653	?	Unidentified	0.027	0.026	0.021
111	98.815	?	Unidentified	0.039	0.041	0.030
112	99.215	9	n-Propylbenzene	0.381	0.332	0.340
113	99.393	10	3,6-Dimethyloctane	0.118	0.120	0.089
114	99.643	10	C10 Isoparaffin - 6	0.341	0.349	0.257
115	100.152	9	C9_Mono-Aromatics(1)	0.067	0.058	0.060
116	100.768	9	1-Methyl-3-ethylbenzene	0.537	0.466	0.479
117	101.143	9	1-Methyl-4-ethylbenzene	0.216	0.188	0.192
118	101.697	9	C9_Mono-Aromatics(2)	0.170	0.148	0.152
119	102.258	9	1,3,5-Trimethylbenzene	0.322	0.279	0.287
120	102.447	10	C10 MonoNaph - 1	0.133	0.124	0.102
121	102.925	10	5-Methylnonane	0.033	0.034	0.025
122	103.280	10	C10_I-Paraffins(1)	0.053	0.054	0.040
123	103.587	10	4-Methylnonane	0.276	0.282	0.208
124	103.800	9	1-Methyl-2-ethylbenzene	0.007	0.006	0.006
125	104.068	10	2-Methylnonane	0.365	0.377	0.275
126	104.685	10	Cyclohexane, 2-ethyl-1,3-dimethyl-	0.031	0.029	0.024
127	105.033	10	C10-MonoNaph-2a	0.061	0.057	0.046
128	105.248	10	3-Methylnonane	0.209	0.214	0.157
129	105.585	?	Unidentified	0.051	0.052	0.039
130	106.780	9	1,2,4-Trimethylbenzene	0.537	0.460	0.479
131	106.942	10	C10 MonoNaph - 3a	0.124	0.117	0.095
132	107.402	10	t-Butylbenzene	0.173	0.150	0.155

Certificate of Composition  
 Part #: SD-053-051  
 Heavy Naphtha II

ASTM D6730 with Helium Carrier

## Component List

<u>Pk#</u>	<u>Time</u>	<u>C#</u>	<u>Component</u>	<u>%Wgt</u>	<u>%Vol</u>	<u>%Mol</u>
133	107.828	10	C10 MonoNaphth - 3b	0.005	0.005	0.004
134	108.272	?	Unidentified	0.006	0.006	0.005
135	108.968	10	3-Ethyl-3-methylheptane	0.027	0.027	0.019
136	109.248	10	i-Butylbenzene	0.034	0.030	0.027
137	110.158	10	n-Decane	0.998	1.025	0.752
138	111.438	9	1,2,3-Trimethylbenzene	0.153	0.128	0.137
139	111.735	10	1-Methyl-3-i-propylbenzene	0.059	0.052	0.047
140	113.752	10	1-H-Indene	0.106	0.083	0.098
141	114.042	11	C11 Isoparaffin - 4	0.192	0.194	0.132
142	114.918	11	C11 IsoParaffin - 5	0.071	0.071	0.048
143	115.542	?	Unidentified	0.035	0.035	0.024
144	116.050	?	Unidentified	0.017	0.014	0.013
145	116.437	10	1-Methyl-3-n-propylbenzene	0.115	0.100	0.092
146	117.000	?	Unidentified	0.021	0.019	0.017
147	117.432	?	Unidentified	0.022	0.019	0.018
148	118.182	10	Cyclooctene, 1,2-dimethyl-	0.000	0.000	0.000
149	119.138	?	Unidentified	0.031	0.031	0.021
150	119.577	?	Unidentified	0.014	0.015	0.010
151	120.087	?	Unidentified	0.040	0.034	0.032
152	120.980	?	Unidentified	0.041	0.035	0.033
153	121.318	?	Unidentified	0.037	0.037	0.025
154	124.153	?	Unidentified	0.011	0.009	0.008
155	124.872	11	n-Undecane	0.178	0.179	0.122
156	128.597	?	Unidentified	0.007	0.006	0.005
157	137.142	?	Unidentified	0.021	0.018	0.014

Certificate of Composition  
Part #: SD-053-051  
Heavy Naphtha II

ASTM D6730 with Helium Carrier

### Sample Chromatogram



































