FORENSIC DYNAMICS INC.
CONSULTING FORENSIC & BIOMECHANICAL ENGINEERS

OUR FILE: SB23

February 28th, 2006

Levelton Consultants Ltd.
150-12791 Clarke Place
Richmond, BC
V6V 2H9

Attention: Brent Mussato

Dear Sir:

RE: Friction Testing of Sears Ecological Ice B'Gone II 10/90 & 20/80

As requested, we have completed the testing of these two anti-icing agents on an asphalt test surface. Enclosed please find the tabulated and graphical result of the humidity and friction versus time testing.

Briefly, during testing, each anti-icing agent is applied at a rate of 60 liters per lane kilometer, 25 gallons per lane mile, to the test surface. The environmental chamber, in which the testing is done, is then sealed and the temperature is rapidly reduced to 5• •Celsius, 41• •Fahrenheit. The humidity in the chamber is then reduced to approximately 30% until each chemical dehydrates into its solid state. Once this has been achieved, humidity is reintroduced into the chamber, to allow teach agent, if possible, to re-hydrate into its liquid state. Throughout, friction tests are performed at five minute intervals to monitor each agent's effect on the friction on the asphalt test surface.

As you can see from the enclosed data, when applied in liquid form, **Ice B'Gone II 10/90** produced a friction of 0.70. **Ice B'Gone II 20/80** produced a friction of 0.72. The same asphalt surface had an average friction of 1.08 ± 0.05 when dry and 0.92 ± 0.05 when wetted with water only. Application of the chemicals, therefore, reduced the friction on the asphalt surface to a value less than if the test surface was wetted with water only. This is seen with almost all anti-icers, and a friction of about 0.7, when first applied, is in line with the liquid friction of most anti-icers tested to date on asphalt.

As you will appreciate from the enclosed graphs, at relative humidity levels below about 40%, both agents dehydrated from liquid to solid. During this liquid to solid transition a minimum friction of 0.56 was recorded for **Ice B'Gone II 20/80**. **Ice B'Gone II 10/90** had a minimum friction of 0.62 during this transition. The agents continued to dehydrate rapidly, causing the friction values to increase to a maximum of 1.17 for the **Ice B'Gone II 10/90** and 1.34 for the **Ice B'Gone II 20/80**. Both, when dry, therefore, achieved a friction greater than the dry asphalt test track. When relative humidity levels were then increased above 45% the friction produced by both agents dropped

ASSOCIATE OFFICES:

☐ VANCOUVER
141 - 757 W. Hastings Street
Vancouver, B.C. V6C 1A1
Telephone (604) 684-6742
Fax (604) 684-5603
E-mail: info@forensic-dynamics.com
Internet: www.forensic-dynamics.com

☐ KAMLOOPS
230 - 1210 Summit Drive
Kamloops, B.C. V2C 6M1
Telephone (250) 374-6742
Fax (250) 828-2743
E-mail: info@forensic-dynamics.com
Internet: www.forensic-dynamics.com

rapidly. **Ice B'Gone II 20/80**, during this rehydration phase produced a minimum friction of 0.6 before levelling out at about 0.65. **Ice B'Gone II 10/90**, during the rehydration process, did not show a marked drop in friction before levelling out at 0.67. Please note, these last values are a better estimate of each agent's friction in liquid form after having been trafficked.

We trust the above is satisfactory for your needs at this time. Please contact the undersigned should you require clarification on the results. We trust we were of service and look forward to serving your needs in the future..

Yours very truly,
FORENSIC DYNAMICS INC.

GERALD D. SDOUTZ, P. Eng.
Project Engineer

GDS:gs
Enc.

Company: Sears Ecological **Date:** 22-Feb-06

Product: Ice B'Gone II 20/80 **App Rate:** 60 L/Lane km

	1	2	3	4	Avg	Friction
Dry	12.53	12.75	12.83	12.90	12.75	1.10
Wet	10.35	10.20	10.65	10.80	10.50	0.91

Time	Temp	Humidity	Force	Friction
0	8.89	34.5	8.4	**0.72**
5	5.2	42.3	6.9	**0.60**
10	3.13	44.6	6.5	**0.56**
15	4.47	36	7.7	**0.66**
20	5.11	36.5	10.3	**0.89**
25	4.69	32.3	12.9	**1.11**
30	5.07	31.5	13.2	**1.14**
35	4.96	25.4	14.7	**1.27**
40	4.48	20.6	14.9	**1.28**
45	5.05	21.8	14.1	**1.22**
50	4.2	18.9	13.6	**1.17**
55	5.08	18.9	13.4	**1.16**
60	4.86	30.2	13.6	**1.17**
65	4.43	24.9	13.4	**1.16**
70	4.09	15.7	13.4	**1.15**
75	4.07	16.5	13.4	**1.15**
80	4.16	25.6	13.4	**1.15**
85	4.7	23.9	13.4	**1.15**
90	4.8	17	13.4	**1.15**
95	5.11	38.4	15.5	**1.34**
100	4.8	43.4	13.8	**1.19**
105	4.8	47.9	11.3	**0.97**
110	4.78	45.2	9.6	**0.83**
115	5.11	42.3	10.8	**0.93**
120	4.48	50	7.3	**0.63**
125	4.41	49.5	7.0	**0.61**
130	4.45	48.8	7.0	**0.60**
135	4.59	50.5	7.0	**0.61**
140	4.38	50	7.0	**0.61**
145	4.48	51.2	7.1	**0.61**
150	5.08	59.8	7.3	**0.63**
155	4.78	60.2	7.4	**0.64**
160	4.82	59.2	7.4	**0.64**
165	4.78	58.4	7.4	**0.64**
170	4.78	57.8	7.4	**0.64**
175	4.9	57.8	7.4	**0.64**
180	4.99	57.3	7.4	**0.64**
185	5	58.1	7.5	**0.64**
190	4.86	58.8	7.5	**0.65**
195	4.8	57.5	7.4	**0.64**
200	4.86	56.8	7.5	**0.64**
205	5.11	60.4	7.5	**0.64**
210	4.84	59.3	7.5	**0.65**

215	4.8	59.3	7.5	**0.65**
220	4.84	57.8	7.5	**0.65**
225	4.88	57.2	7.5	**0.65**
230	5.04	59.8	7.5	**0.65**
235	4.88	59.8	7.5	**0.65**
240	4.8	58.9	7.5	**0.65**
245	4.88	61.2	7.6	**0.65**
250	4.78	59.5	7.6	**0.65**
255	5.04	61.3	7.5	**0.65**
			Min:	**0.56**
			Max:	**1.34**

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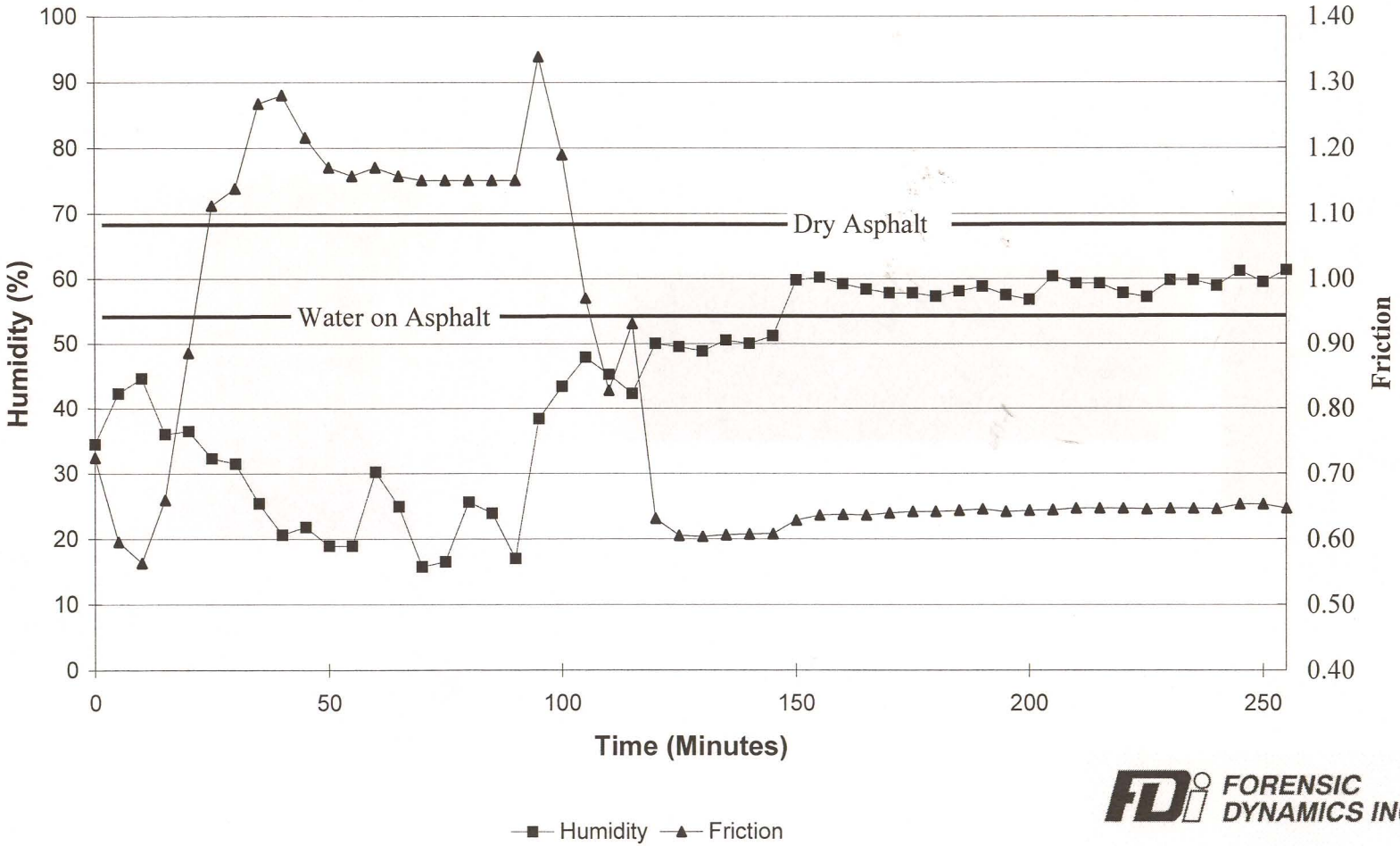
Sears Ecological - Ice B'Gone II 20/80

Humidity & Friction vs. Time



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Company: Sears Ecological **Date:** 27-Feb-06

Product: Ice B'Gone II 10/90 **App Rate:** 60 L/Lane km

	1	2	3	4	Avg	Friction
Dry	13.07	13.07	13.07	12.99	13.05	1.12
Wet	10.59	9.78	10.15	10.44	10.24	0.88

Time	Temp	Humidity	Force	Friction
0	8.92	38.7	8.2	**0.70**
5	4.33	44.5	7.9	**0.68**
10	1.81	45.6	7.6	**0.65**
15	1.42	52.1	7.4	**0.64**
20	3.95	43.4	7.2	**0.62**
25	3.8	38.8	7.6	**0.65**
30	4.11	36.5	9.7	**0.84**
35	4.6	37.6	11.2	**0.97**
40	4.69	42.1	11.0	**0.95**
45	4.07	31.8	12.0	**1.03**
50	3.86	31.7	12.7	**1.10**
55	4.11	32.9	13.0	**1.12**
60	4.27	36	12.9	**1.11**
65	4.27	34.8	13.1	**1.13**
70	4.69	35.2	13.3	**1.15**
75	4.27	38	13.3	**1.15**
80	4.69	36.3	13.3	**1.15**
85	4.63	33.9	13.4	**1.15**
90	5.11	36.3	13.5	**1.16**
95	4.76	40.2	13.4	**1.15**
100	5.02	36.8	13.4	**1.16**
105	4.78	43.1	13.0	**1.12**
110	4.52	32.2	13.5	**1.16**
115	4.37	30.4	13.6	**1.17**
120	4.98	41.6	12.8	**1.10**
125	4.27	35.7	13.5	**1.16**
130	4.21	32.8	13.4	**1.16**
135	4.29	32.6	13.4	**1.16**
140	4.51	41	12.6	**1.09**
145	5.07	51.3	8.5	**0.73**
150	4.78	62	7.6	**0.65**
155	4.99	63.6	7.6	**0.65**
160	4.91	63.4	7.6	**0.65**
165	4.78	63.8	7.7	**0.66**
170	5.02	63.6	7.7	**0.66**
175	4.88	63.7	7.7	**0.67**
180	5.02	63.6	7.7	**0.67**
185	5.02	63.6	7.7	**0.67**
190	4.8	63	7.7	**0.67**
			Min:	**0.62**
			Max:	**1.17**

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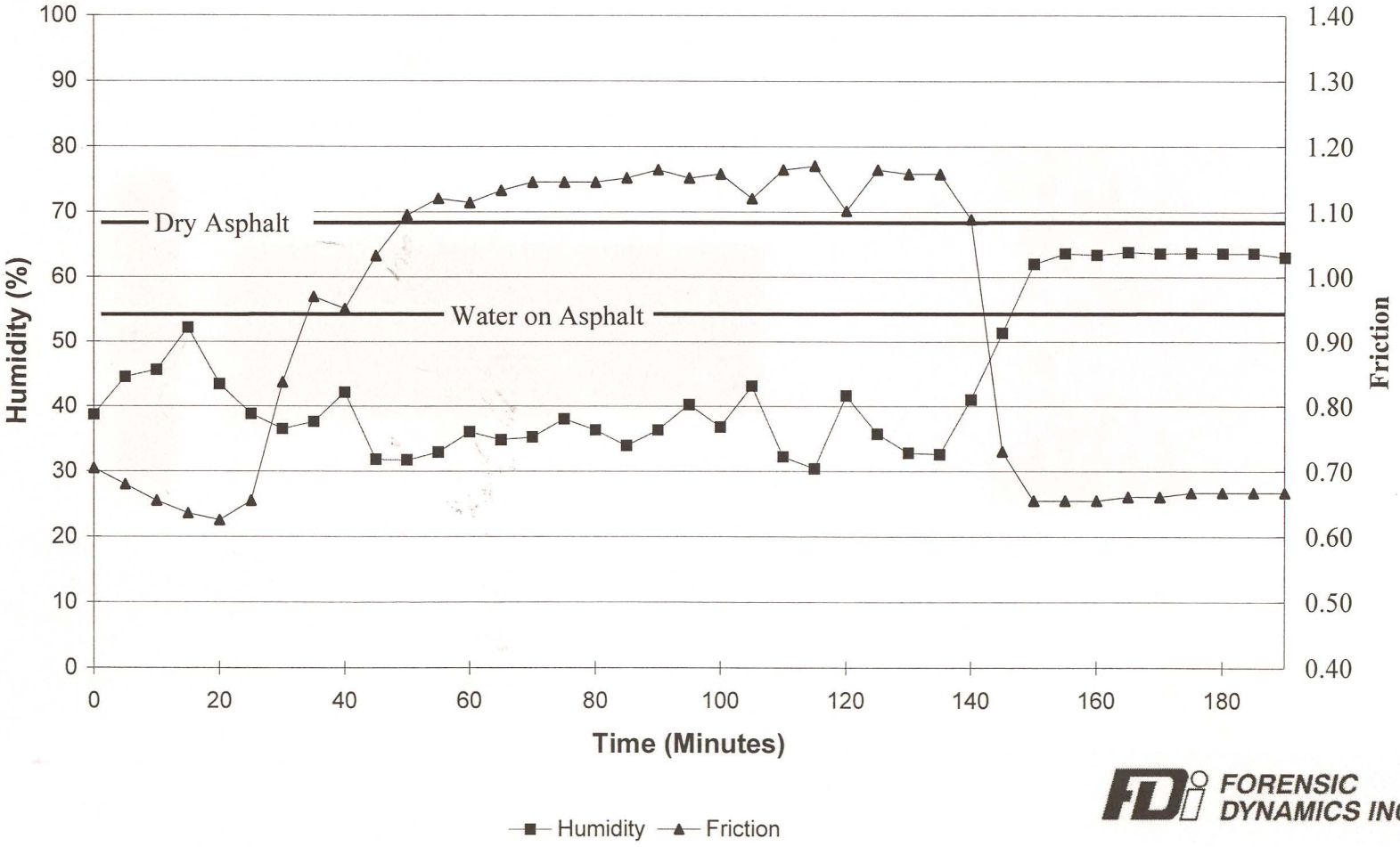
Sears Ecological - Ice B'Gone II 10/90

Humidity & Friction vs. Time



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