



Specification for ICE B'GONE®

(1) Description

A liquid comprising specific ratios of Magnesium Chloride and ICE B'GONE -a quality controlled by-product of the alcohol distillation industry.

ICE B'GONE® is a complex aqueous solution containing carbohydrates, proteins and other organic moities derived from fermentation and distillation processes of agricultural products together with magnesium chloride and other inorganic chlorides. It is a slightly viscous, brown liquid employed in deicing and anti-icing operations.

(2) Physical Properties

- (a) Density 1.27 to 1.29 grams per ml, typically 1.28 g per ml.
- (b) Weight per gallon (US) 10.6 to 10.75 lbs., typically 10.7 lbs.
- (c) Total solids (105° C) 53 to 56%, typically 54.6%.

(3) Chloride Contents

<u>Salt</u>	<u>Range (%)</u>	<u>Typical Value (%)</u>
Magnesium chloride	12.5 to 14.5	13.9
Calcium chloride	3.8 to 4.3	4.2
Sodium chloride	0.1 to 0.4	0.3
Potassium chloride	0.1 to 0.3	0.1
Total	16.5 to 19.5	18.5

(4) Miscellaneous Components

- (a) Sulfate content 1.5 to 2.5%, typically 2.1%.
- (b) Phosphorus content (as total P)400 to 800 ppm, typically 500 ppm.
- (c) Cyanide CN⁻, less than 0.02 ppm i.e. not detectable.
- (d) Nitrate NO₃⁻, less than 100 ppm i.e. not detectable.

(5) Trace Metals Concentrations

Metal	Range (ppm)	Typical Value (ppm)
Aluminum	20 to 50	43
Arsenic	0.1 to 0.25	0.2
Barium	4 to 10	7.2
Beryllium	Less than 1.0	Less than 1.0
Cadmium	Less than 1.0	Less than 1.0
Cobalt	0.5 to 2.0	0.6
Chromium	Less than 1.0	0.5
Copper	5 to 15	10.0
Lead	Less than 10	1.3
Manganese	6 to 20	13.0
Mercury	Less than 0.005	Less than 0.004
Molybdenum	Less than 5.0	Less than 5.0
Nickel	Less than 1.0	0.3
Selenium	0.1 to 0.5	0.1
Silver	Less than 1.0	Less than 1.0
Vanadium	3 to 8	4.5
Zinc	2 to 6	2.7



- ...is safe to use around animals and humans. It does not affect skin, leather, clothing, or carpets. No special handling equipment is required .
- ...is water soluble and biodegradable.
- ...reduces the levels of sodium and chloride ion exposure to wells, vegetation, surface water.
- ...eliminates the need for sand, a major source of phosphorus and PM-10 contamination.

Sears warrants that ICE B'GONE® shall be fit for the purpose for which such goods are ordinarily intended. Such warranty is in lieu of all other warranties, express or implied, all of which are hereby disclaimed and excluded by Sears. In no event shall Sears be liable for any special, indirect, incidental or consequential losses or damages of any kind.

This technology is covered by various US and foreign patents which are owned by:
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ENVIRONMENTALLY
SAFE AND SOUND ROAD MAINTENANCE

ICE B'GONE® (DCS) FREEZING POINTS AND SPECIFIC GRAVITY

Prepared by RA Hartley, FRSC, Consulting Chemist, August 29, 2005

Mixing Ratios by Volume		Specific Gravity	Freezing Point °F
ICE B'GONE® (DCS) gallons	Dilution with Water US Gallons		
100	Nil	1.275	-31
95	5	1.261	-20.5
90	10	1.247	-14.5
85	15	1.234	-10.0
80	20	1.220	-6.0
75	25	1.206	-2.0
70	30	1.192	+1.5
65	35	1.179	+4.5
60	40	1.165	+7.0
55	45	1.151	+10.0
50	50	1.137	+12.5
45	55	1.124	+15.0
40	60	1.110	+17.0
35	65	1.096	+19.0
30	70	1.082	+21.0
25	75	1.069	+23.5
20	80	1.055	+25.5
15	85	1.041	+27.0
10	90	1.027	+29.0
5	95	1.014	+30.5
0	100	1.000	+32.0

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Client: Sears Petroleum & Transport Corp.**Certificate of Analysis**

No.: 06-0621

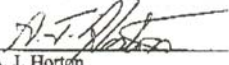
Date: July 17, 2006

Attention: Dave Wood
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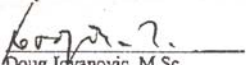
	Ice B' Gone Magie-0	New York State Specifications	PNS 2006 Specifications
Arsenic	<2.0ppm	5.00ppm	5.0 ppm
Barium	0.33ppm	75.00ppm	100.0 ppm
Calcium	417ppm		
Cadmium	<0.2ppm	0.20ppm	0.20 ppm
Chromium	<0.5ppm	0.50ppm	1.0 ppm
Copper	<0.5ppm	0.50ppm	1.0 ppm
Iron	70ppm		
Lead	2.3ppm	1.0ppm	1.0 ppm
Magnesium	45250ppm		
Mercury	<0.01ppm	0.05ppm	0.05 ppm
Potassium	21370ppm		
Phosphorous	106ppm	250ppm	2500ppm
Selenium	<5ppm	5.00ppm	5.0 ppm
Sodium	13200ppm		
Zinc	11ppm	10.0ppm	10.0 ppm
Chloride	175800ppm		
Cyanide (total)	<0.15ppm	0.20ppm	0.20 ppm
pH	6.8	3.2 to 7.0	6.0 to 9.0
Magnesium chloride	17.8%	13.0 to 24%	>25%
Dissolved Solids @ 105C	50%	35% Minimum	
Specific Gravity @ 25C	1.28		
Settleable Solids	1.0%	<1.0%	<1.0%
Freezing Point	-29°C (-20.2°F)	-20°F (-28.8°C)	
Corrosion Effectiveness	19.3	<30%	<30%
MPY Mils/Year	9.65	<13.5	<13.5

Bodycote Materials Testing Canada Inc.

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