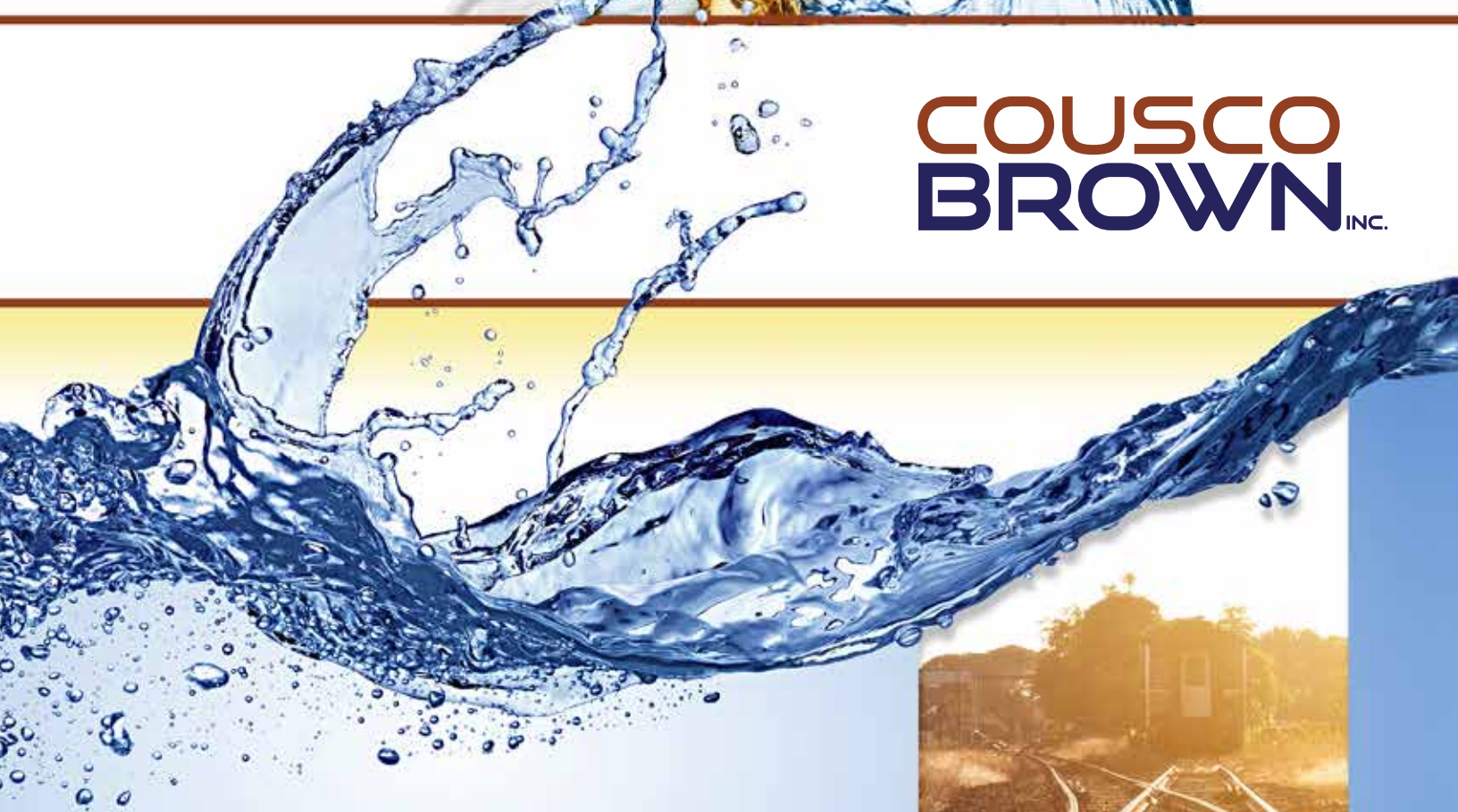


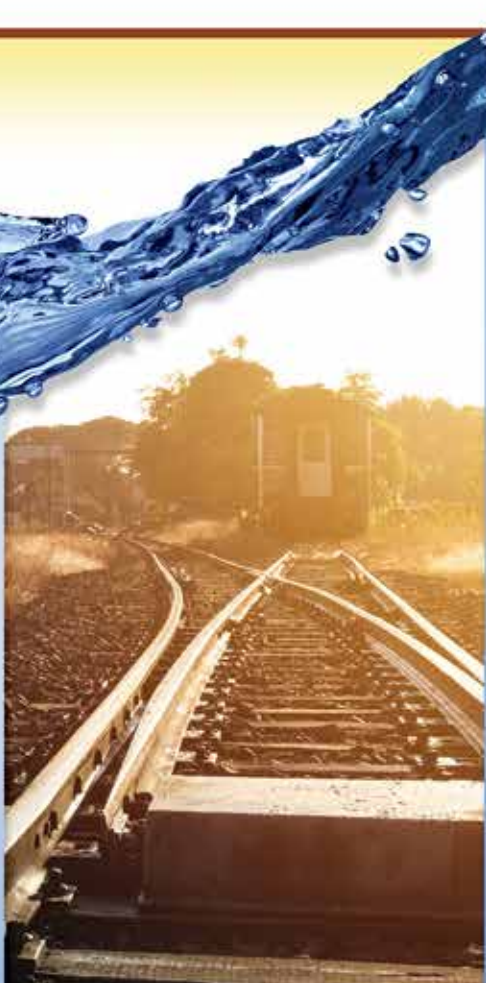


COUSCO
BROWN INC.



SWITCHGUARD

Product Specifications and Analysis





TYPICAL PERFORMANCE & PRODUCT SPECIFICATION

In order to be truly effective, an anti-icing/deicing fluid must not only exhibit low freezing point, **it must have the capacity to absorb large amounts of water from melting ice and continue to function at high dilution.**

SwitchGuard is a non-chloride, potassium acetate (KAc) based liquid de-icer blended with a high grade, engineered corn-based enhancer. SwitchGuard's special blend of corn-based enhancers greatly improves the viscosity of the KAc, resulting in less runoff during application and extending the active life of the KAc after application by **strengthening the de-icers bond to the switch surface.** All of these performance enhancements result in reducing the number of applications needed to maintain a well anti-iced switch surface while reducing the damage caused by traditional chloride de-icers.

ENVIRONMENTAL PERFORMANCE

SwitchGuard prides itself on offering the most complete line of high performance de-icers on the market. We also realize that we have a responsibility for protecting the environment. SwitchGuard is produced as a clear blue-green liquid to improve visibility during application and is free of any suspended solids that may hinder application or storage equipment.

SwitchGuard is composed primarily of materials derived from the processing of starches and sugars making it economical and readily available. It is nontoxic and non-hazardous to

plant and animal life and to the environment. SwitchGuard biodegrades readily and completely to carbon dioxide and water. It has a low Biological Oxygen Demand (BOD) and contains no phosphates or nitrogen that tends to promote eutrophication of natural waterways leading to fish-kills.

TYPICAL PROPERTIES

Odor	Mild
Appearance	Clear Blue-Green
Dissolved Solids	46% ± 1.0%
KAc	25% ± 1.0%
Carbohydrates	20%- 23%
Specific Gravity	1.27 ± 0.02
Weight	10.75 lbs/gallon
Solubility	Complete
Freezing Point	-38°C (-36°F)
Corrosion (NACE Standard TM-01-69 as modified by the PNS)	-3 (less corrosive than distilled water)
pH (ASTM E 70)	6.0 - 8.0
pH (neat)	8.0 -10.0
Flash Point, COC	None
Biological Oxygen Demand	120,000ppm
Chemical Oxygen Demand	260,000ppm

The information included in this Product Specification Sheet relate generally to the product described as it is normally produced by CouscoBrown, Inc. (CB) To the best of CB's knowledge, the information included in this sheet is correct in all significant respects. This Product Specification Sheet does not include any expressed or implied warranties or guaranties from CB whatsoever, and CB will not accept any liability related to the use of the information included in this sheet. CB expressly disclaims all warranties and/or guaranties related to this Product Specification Sheet including, but not limited to, the warranties of MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE.

SWITCHGUARD

Chemical Analysis Report



Tests Performed By:

Levelton Analytical Services
150-12791 Clarke Place
Richmond, B.C.
Canada V6V 2H9
Tel: 604.278.1411 | Fax: 604.278.1042

Work Order: 0410120

PO Number: None

Date Reported: 11.08.04

Lab Comments: None

CHEMICAL ANALYSIS RESULTS*

Total Metals Tested, as per PNS	Analysis Results	MDL	Method	Date Completed
Arsenic	<2.0	2.0 mg/kg		Nov-08-04
Barium	0.05	0.02 mg/kg		Nov-08-04
Cadmium	<0.02	0.02 mg/kg		Nov-08-04
Calcium	<100	100 mg/kg		Nov-08-04
Chromium	0.86	0.05		Nov-08-04
Copper	<1.0	0.10		Nov-08-04
Cyanide	0.15	0.20 ppm Max.		Nov-08-04
Lead	<0.5	0.5		Nov-08-04
Magnesium	<100	100		Nov-08-04
Mercury	<0.01	0.01		Nov-08-04
Phosphates	1.1	25.0 ppm Max.		Nov-08-04
Potassium	99300	100		Nov-08-04
Selenium	<1.0	1.0		Nov-08-04
Sodium	357	100		Nov-08-04
Zinc	2.0	1.0		Nov-08-04
Additional Parameters, as per PNS				
Ammonia as N	<2.0	2.0 mg/kg		Nov-08-04
Nitrate-N + Nitrite-N	<5.0	5.0 mg/kg	SM4500 NC3-G	Nov-08-04
Total Kjeldahl Nitrogen	19	0.05 mg/kg	SM 4500-Norg	Nov-08-04
Chloride	<0.01	0.1% Weight		Nov-08-04
Cyanide	<0.15	0.15		Nov-08-04
Phosphorus	6.8	2.0		Nov-08-04
pH (1 :4 Solution)	7.6	0.1 pH Units		Nov-08-04
Specific Gravity	1.283	0.001 g/ml		Nov-08-04

ADDITIONAL TESTING

Test, as per PNS	Analysis Results	MDL	Date Completed
Corrosion Rate Effectiveness	-7.5	50%	Nov-08-04
Freezing: Solids, Total Settleable	<0.01	1.0%	Nov-08-04
Freezing: Solids Passing through #10 Sieve	>99	1.0%	Nov-08-04

*Note: For a copy of the original test data, please contact the testing laboratories listed and refer to the Work Order Number for the corresponding data.

SWITCHGUARD

Chemical Analysis Report



TYPICAL CORROSION PERFORMANCE

In recent corrosion performance testing, distilled water and salt are assigned relative corrosion rates of 0 and 100 respectively and deicing chemicals are ranked relative to these two standards. To be considered for use, a deicer must score 30 or less (70% less corrosive than salt) on this scale. Tests revealed SwitchGuard was found to be less corrosive than distilled water.

FACTS & FEATURES

TOTAL IMMERSION CORROSION ASTM F483

Test Metal Coupon	SAE AMS 1424 Requirements Wt.Loss,mg/ cm ² /2h	SwitchGuard Results
Carbon Steel	0.8 max.	<0.01
Titanium	0.1 max.	<0.01
Aluminum 2024 Anodized	0.3 max.	<0.01
Aluminum 2024 Alclad	0.3 max.	<0.01
Aluminum 7075 Alclad	0.3 max.	<0.01
Copper	Not Established	<0.01

METAL CORROSION TENDENCY

Deicing Fluid	Corrosion Rate
Distilled Water	0
Rock Salt (NaCl)	100
Calcium Chloride (CaCl ₂) 38%	121
Calcium Chloride (CaCl ₂) 30%	86
Magnesium Chloride (MgCl ₂) 30%	80
SwitchGuard	-3

- ▶ Ideal for railroad switches, truck scales, chutes, loading docks, sidewalks, ramps, stairs, material handling – anywhere ice is problematic
- ▶ A potent non-chloride blue-green liquid ice melter that sticks to any surface, thus preventing ice buildup or adherence
- ▶ Has a freezing temperature of -36°F with a high dilution capacity
- ▶ Considered non-corrosive (with a tested corrosion value that is less corrosive than distilled water)
- ▶ Composed primarily of materials derived from the processing of starches and sugars, making it economical and readily available
- ▶ Is nontoxic and non-hazardous to the environment and to plant and animal life
- ▶ Bio-degrades readily and completely to carbon dioxide and water

Safety data available upon request.