

CYEG – Stars Tech Product Trail

Overview 2021/22 Winter Operation Report –Final-

CYEG Aerodrome Operations
05/20/2022



EDMONTON INTERNATIONAL AIRPORT



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Overview

CYEG commenced the trial of Stars Tech de-icing product in November 2021 – Groundside identified, designated substrates.

Application season determined to be Winter Operations 2021/22, which commonly runs from Nov to April depending on conditions.

Winter operations essentially wrapped up mid April. This document outlines our findings on the Stars Tech product utilized.

The following parameters will be documented on the test:

- Conditions present at time of application will be documented e.g. photo
- Location of application will be documented
- Amount of product applied to be documented
- Effectiveness of product applied to be documented e.g. observations/photo
- Items considered for application effectiveness – temperatures, winds, rain, sleet, snow

Product:

PRODUCT LINE

Product Type



ECO-ST_1000kg

Volume	2200 lb
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ECO-ST_55 lb

Volume	55 lb
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ECO-ST_22 lb

Volume	22 lb
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How to Use

	Unit: g/m ²			
Temperature	0°C ~ -5°C	-5°C ~ -15°C	-15°C ~ -25°C	-25°C ~ -35°C
below 3cm of snow	30	60	90	120
above 3cm of snow	40	70	100	130

When there is more than 5 cm of snow, broom the snow away moderately before spraying the product.
 You may adjust the amount of product to use depending on the conditions.
 (Frequently freezing area, temperature)

Areas Identified for Trial – CYEG:

AOF Parking area / sidewalk area

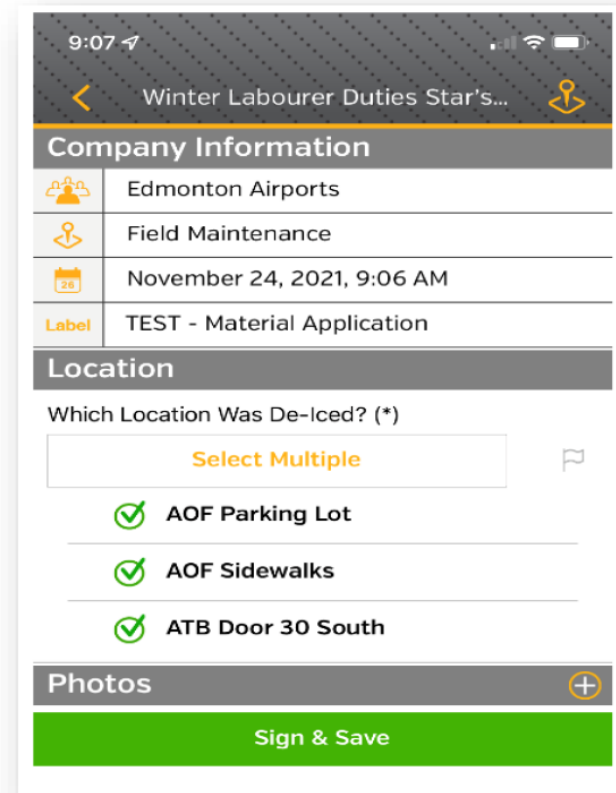


Air Terminal Building – Departures sidewalk (Door 30 – South)



Trail Documentation

- Documentation captured in our Site Docs system.
- Conditions presented at time of application. Photo of area before and after application.
- Type of contaminant at location.
- Approx. amount of product applied.
- Any anomalies noted.

A screenshot of the SiteDocs mobile application interface. At the top, the status bar shows the time 9:07 and signal strength. Below is a navigation bar with a back arrow, the text "Winter Labourer Duties Star's...", and a location pin icon. The main content area is divided into sections: "Company Information" with fields for "Edmonton Airports", "Field Maintenance", "November 24, 2021, 9:06 AM", and "TEST - Material Application"; "Location" with a question "Which Location Was De-Iced? (*)" and a "Select Multiple" button; and a list of locations with checkboxes: "AOF Parking Lot", "AOF Sidewalks", and "ATB Door 30 South". At the bottom, there is a "Photos" section with a plus icon and a green "Sign & Save" button.

Example Documentation

- Example of the sidewalk area-AOF.
- February 20th 2022
- Application before and after a period of time.
- Application 5:28 p.m.
- Temp -17 Celsius.
- Photos demonstrate effectiveness from 1:44pm to 5:27pm in -17 degree weather

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Daily Historical Weather for My Location

Calendar: 2/20/2022   My Location  

AB CYEG RWY 02/20 (717001) (MX1381) for February 20, 2022						
Hour	Temperature (°C)	Dew Point (°C)	Relative Humidity (%)	Precipitation (mm)	Wind (km/h)	Conditions
12:00 AM MST	-15.3	-18.1	79	-	SSE at 21 G 32	Cloudy
1:00 AM MST	-15.7	-18.7	76	-	SSE at 19 G 27	Cloudy
2:00 AM MST	-15.9	-18.7	79	-	SSE at 14 G 24	Cloudy
3:00 AM MST	-16.0	-18.6	83	-	SSE at 14	Cloudy
4:00 AM MST	-16.1	-18.6	83	-	SE at 8	Cloudy
5:00 AM MST	-16.4	-19.6	79	-	SSE at 16	Mostly Cloudy
6:00 AM MST	-17.1	-20.1	79	-	SSE at 13	Snow
7:00 AM MST	-17.2	-20.2	79	-	S at 14	Snow
8:00 AM MST	-17.8	-20.9	75	-	S at 14	Snow
9:00 AM MST	-18.4	-21.3	79	-	SSE at 11	Snow
10:00 AM MST	-18.7	-21.6	79	-	SSE at 13	Snow
11:00 AM MST	-18.4	-21.4	75	-	SE at 11	Snow
12:00 PM MST	-17.4	-21.1	72	-	SSE at 8	Snow
1:00 PM MST	-17.0	-20.8	75	-	S at 10	Snow
2:00 PM MST	-16.9	-21.7	65	-	S at 8 G 24	Snow
3:00 PM MST	-16.6	-21.1	69	-	S at 5	Snow
4:00 PM MST	-16.9	-20.0	76	-	S at 10	Snow
5:00 PM MST	-17.2	-20.7	75	-	SSE at 13	Snow
6:00 PM MST	-17.6	-20.8	79	-	SSE at 13	Snow
7:00 PM MST	-18.1	-21.1	79	-	S at 11	Snow
8:00 PM MST	-18.4	-21.5	75	-	SSE at 11	Snow
9:00 PM MST	-18.7	-21.6	79	-	SSE at 13	Snow
10:00 PM MST	-18.9	-21.8	79	-	S at 11	Snow
11:00 PM MST	-19.0	-22.6	72	-	SSW at 11	Snow



Edmonton Airports
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Winter Labourer Duties Star's Tech Trial

Information

Label	starfish duties
	Field Maintenance
	Sunday, February 20th 2022, 5:28 PM (MST -07:00)

Location

Which Location Was De-Iced?

> AOF Sidewalks



1:44pm put starfish down



1:44pm put starfish down



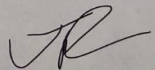
5:27pm after math but it's been snowing all day



5:27pm

Tristen Brown, No title
 February 20th 2022, 5:28 PM (MST -07:00)

 53.3242269, -113.5648281



Example Documentation

- Example of the sidewalk area-AOF.
- December 12th, 2021
- Application 1 p.m.
- Temp -5.4 Celsius.
- Photos demonstrate effectiveness from 1pm to 3pm.

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Daily Historical Weather for My Location

Calendar: 12/12/2021   My Location  

DAILY HISTORY HOURLY HISTORY

AB CYEG RWY 02/20 (717001) (MX1381) for December 12, 2021

Hour	Temperature (°C)	Dew Point (°C)	Relative Humidity (%)	Precipitation (mm)	Wind (km/h)	Conditions
12:00 AM MST	-3.5	-8.3	69	-	NNW at 10	Snow
1:00 AM MST	-4.0	-7.3	78	-	NNW at 10	Snow
2:00 AM MST	-3.6	-7.1	75	-	WNW at 5	Snow
3:00 AM MST	-3.2	-7.0	75	-	WSW at 5	Snow
4:00 AM MST	-2.6	-6.8	75	-	W at 5	Snow
5:00 AM MST	-3.7	-5.7	88	-	LV	Snow
6:00 AM MST	-4.9	-7.0	85	-	Calm	Mostly Cloudy
7:00 AM MST	-3.9	-4.9	92	-	SE at 8	Mostly Cloudy
8:00 AM MST	-4.5	-5.4	92	-	LV	Mostly Cloudy
9:00 AM MST	-6.7	-7.8	92	-	LV	Mostly Cloudy
10:00 AM MST	-6.4	-7.3	96	-	NNE at 5	Partly Cloudy
11:00 AM MST	-6.8	-8.0	92	-	NE at 5	Partly Cloudy
12:00 PM MST	-6.7	-8.0	93	-	LV	Partly Cloudy
1:00 PM MST	-5.4	-7.7	85	-	LV	Mostly Cloudy
2:00 PM MST	-5.1	-7.8	81	-	LV	Mostly Cloudy
3:00 PM MST	-4.1	-7.3	78	-	NNE at 5	Cloudy
4:00 PM MST	-4.4	-7.7	78	-	LV	Mostly Cloudy
5:00 PM MST	-5.2	-7.6	81	-	LV	Mostly Cloudy
6:00 PM MST	-6.1	-7.4	92	-	LV	Mostly Cloudy
7:00 PM MST	-6.7	-10.2	77	-	LV	Mostly Cloudy
8:00 PM MST	-7.7	-8.9	92	-	LV	Mostly Cloudy
9:00 PM MST	-7.2	-10.6	77	-	NW at 5	Mostly Cloudy
10:00 PM MST	-10.9	-12.6	88	-	LV	Partly Cloudy
11:00 PM MST	-9.5	-11.2	88	-	W at 8	Partly Cloudy



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Winter Labourer Duties Star's Tech Trial

Information

Label



Field Maintenance



Sunday, December 12th 2021, 3:58 PM (MST -07:00)

Location

Which Location Was De-iced?

> AOF Sidewalks



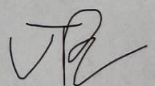
1pm



3pm

Tristen Brown, No title
 December 12th 2021, 3:58 PM (MST -07:00)

53.3242273, -113.5652094



Example Documentation

- Example of the sidewalk area – ATB Door 30
- Application 10:40am
- Temp 2.1 – .02 Celsius.
- Photos demonstrate effectiveness, maintained area wet.

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Daily Historical Weather for My Location

Calendar: 12/2/2021   My Location  

DAILY HISTORY						
HOURLY HISTORY						
AB CYEG RWY 02/20 (717001) (MX1381) for December 2, 2021						
Hour	Temperature (°C)	Dew Point (°C)	Relative Humidity (%)	Precipitation (mm)	Wind (km/h)	Conditions
12:00 AM MST	-1.1	-3.4	85	-	NNW at 8	Mostly Cloudy
1:00 AM MST	0.0	-2.0	85	-	NNW at 11	Mostly Cloudy
2:00 AM MST	0.4	-1.4	85	-	NNW at 10	Mostly Cloudy
3:00 AM MST	0.8	-1.0	89	-	NNW at 11	Mostly Cloudy
4:00 AM MST	1.4	-0.8	85	-	N at 8	Cloudy
5:00 AM MST	2.5	-0.7	79	-	NE at 19 G 24	Cloudy
6:00 AM MST	1.9	-0.1	89	-	NE at 19 G 37	Rain
7:00 AM MST	2.1	-0.3	82	-	SSE at 19 G 27	Snow
8:00 AM MST	0.3	-0.3	92	-	SE at 5 G 27	Snow
9:00 AM MST	-0.2	-2.3	85	-	SE at 24 G 48	Mostly Cloudy
10:00 AM MST	0.2	-5.9	64	-	Calm G 42	Mostly Cloudy
11:00 AM MST	-0.2	-6.2	64	-	Calm	Cloudy
12:00 PM MST	-0.4	-9.0	54	-	Calm	Partly Cloudy
1:00 PM MST	0.5	-8.3	52	-	Calm	Partly Cloudy
2:00 PM MST	0.7	-10.6	44	-	Calm	Partly Cloudy
3:00 PM MST	0.5	-13.8	33	-	ESE at 29 G 63	Partly Cloudy
4:00 PM MST	0.1	-13.6	36	-	ESE at 32 G 56	Partly Cloudy
5:00 PM MST	-0.8	-13.4	38	-	ESE at 21 G 48	Clear
6:00 PM MST	-0.9	-14.1	38	-	ESE at 26 G 48	Clear
7:00 PM MST	-1.7	-13.6	41	-	ESE at 19 G 42	Clear
8:00 PM MST	-3.5	-12.7	48	-	E at 14 G 29	Clear
9:00 PM MST	-4.1	-12.7	50	-	ENE at 13 G 26	Clear
10:00 PM MST	-5.5	-12.9	57	-	ENE at 8	Clear
11:00 PM MST	-7.2	-12.2	68	-	NNE at 5	Clear



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Winter Labourer Duties Star's Tech Trial

Information

Label	No label
	Field Maintenance
	Thursday, December 2nd 2021, 11:05 AM (MST -07:00)

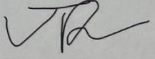
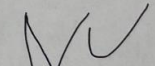
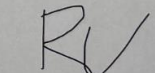
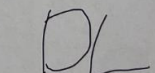
Location

Which Location Was De-Iced?

> ATB Door 30 South




7:10am before picture after the snow fall. 10:40am.

Tristen Brown, No title December 2nd 2021, 11:05 AM (MST -07:00)	 53.3021153, -113.5549721	
Nickolas Uganecz, No title December 2nd 2021, 11:05 AM (MST -07:00)	 53.3021153, -113.5549721	
Rob Vanderlee, No title December 2nd 2021, 11:05 AM (MST -07:00)	 53.3021525, -113.5549	
David Levesque, No title December 2nd 2021, 11:05 AM (MST -07:00)	 53.3021525, -113.5549	

Example Documentation

- Example of the sidewalk area – ATB Door 30
- Application 7:45am
- Temp 0.7 – 1.6 Celsius.
- Photos demonstrate effectiveness, maintained area wet.

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Daily Historical Weather for My Location

Calendar: 11/25/2021  

My Location 

 Print

DAILY HISTORY HOURLY HISTORY

AB CYEG RWY 02/20 (717001) (MX1381) for November 25, 2021

Hour	Temperature (°C)	Dew Point (°C)	Relative Humidity (%)	Precipitation (mm)	Wind (km/h)	Conditions
12:00 AM MST	-3.5	-7.3	75	-	NW at 13	Cloudy
1:00 AM MST	-3.2	-7.1	75	-	NW at 8	Cloudy
2:00 AM MST	-3.5	-7.4	75	-	NW at 10	Cloudy
3:00 AM MST	-3.1	-6.7	78	-	NNW at 8	Cloudy
4:00 AM MST	-2.7	-5.9	78	-	LV	Mostly Cloudy
5:00 AM MST	-2.0	-5.4	78	-	NW at 5	Cloudy
6:00 AM MST	-0.4	-3.4	82	-	NW at 5	Snow
7:00 AM MST	0.7	-1.7	85	-	WNW at 11	Snow
8:00 AM MST	0.9	-1.8	82	-	NNW at 8	Snow
9:00 AM MST	1.3	-1.4	82	-	NNW at 11	Cloudy
10:00 AM MST	1.6	-1.4	79	-	NNW at 10	Cloudy
11:00 AM MST	2.3	-2.0	73	-	N at 14	Cloudy
12:00 PM MST	3.2	-1.5	70	-	NNE at 8	Cloudy
1:00 PM MST	4.1	-1.3	70	-	NNE at 5	Mostly Cloudy
2:00 PM MST	3.9	-1.1	70	-	NNE at 5	Cloudy
3:00 PM MST	5.8	-1.9	60	-	NNW at 5	Showers
4:00 PM MST	4.7	-1.3	68	-	NNW at 10	Showers
5:00 PM MST	4.8	-1.4	62	-	NNE at 8	Rain
6:00 PM MST	4.6	-1.4	65	-	NNW at 5	Mostly Cloudy
7:00 PM MST	4.0	-1.4	67	-	NNE at 10	Mostly Cloudy
8:00 PM MST	3.9	-1.9	67	-	NNE at 11	Mostly Cloudy
9:00 PM MST	4.3	-2.5	62	-	N at 10	Cloudy
10:00 PM MST	3.5	-2.6	65	-	NNE at 8	Mostly Cloudy
11:00 PM MST	4.5	-2.9	60	-	NNE at 8	Cloudy



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Winter Labourer Duties Star's Tech Trial

Information

Label	No label
	Field Maintenance
	Thursday, November 25th 2021, 8:43 PM (MST -07:00)

Location

Which Location Was De-Iced?

> ATB Door 30 South



7:45



8:45

Nickolas Uganecz, No title
 November 25th 2021, 8:43 PM (MST -07:00)

 53.3074569, -113.5835449

N4

Rob Vanderlee, No title
 November 25th 2021, 8:43 PM (MST -07:00)

 53.3067342, -113.5827967

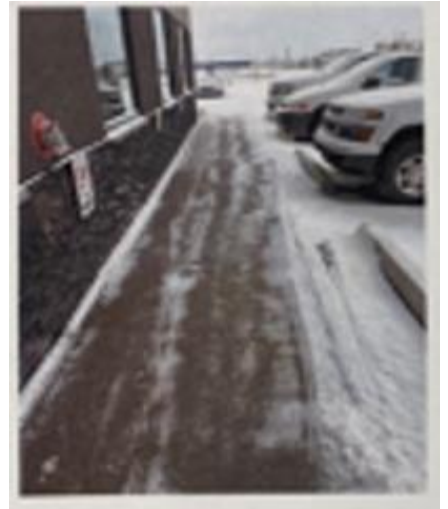
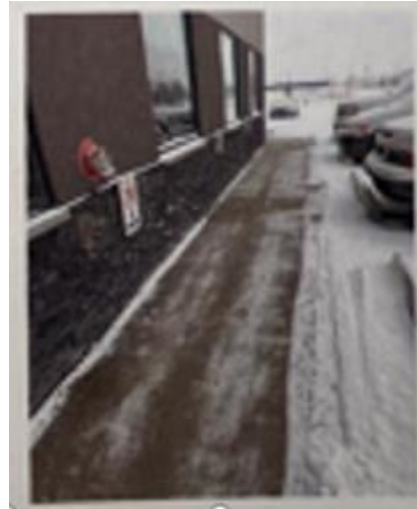
RobV

Trail Overview – Nov to April 2022

Documented Applications

- Nov 25, 2021 8:43 am
- Dec 02, 2021 11:05 am
- Dec 03, 2021 2:02 am
- Dec 09, 2021 4:58 pm
- Dec 12, 2021 3:58 pm
- Jan 15, 2022 10:48 pm
- Feb 04, 2022 5:31 am
- Feb 20, 2022 5:28 pm
- Feb 03, 2022 11:06 am
- Feb 03, 2022 7:20 am
- Feb 03, 2022 6:59 am
- Mar 20, 2022 10:02 am
- Other dates were utilized however not documented (approx. 15 applications)

Approximately 27 application opportunities.



Winter Season Outcomes

Product has been utilized as per parameters set out for the trial. Initial results have been promising.

- We received 2 pallets of product.
- Throughout the season we have utilized approx. 2 pallet in the trial areas identified.
- We have numerous documented applications. **Note:** other applications have been completed, however due to rapid response conditions, documentation was not achieved. Average application amount has been two scoops of product per location application.



Effectiveness Noted:

- YEG has received extreme conditions this season; freezing rain, extreme ranges of temperature, sleet, snow. Accumulations of ice have been significant.
 - The Stars Tech product has done well on ice penetration with its granular nature.
 - Penetrates iced areas well, creates pores holes in substrate allowing ice to delaminate.
- Product effectiveness range has been noted up to approx. -17 Celsius.
- Product seems to last (residue) for an extended period of time after application (allows activation well past application).
- Performs well when applied “prior” to precipitation. Some areas were pre-treated prior to snow, resulting in minimal snow accumulations (temp were approx.. -2.1, light snow)
- Very little “residue” appears to remain from product application, which is common with conventional products utilized. This aspect continues to be monitored as we approach potentially warmer weather and application.
- No corrosion has been noted, however in the short period this would unlikely be noted at this time.



Conclusion – CYEG Winter Season Review

We have not been any negative effects noted with the products ability to address ice or snow conditions, under the conditions noted in this report.

- Product appears to have performed well under our conditions noted.

Throughout the test season we continued the process with enhancements on reporting by staff.

Overall the product performed very well under several differing conditions presented.

- Performs well when applied “prior” to precipitation. Some areas were pre-treated prior to snow, resulting in minimal snow accumulations (temp were approx.. -2.1, light snow)
- Very little “residue” appears to remain form product application, which is common with conventional products utilized. This aspect continues to be monitored as we approach potentially warmer weather and application.
- No corrosion has been noted, however in the short period this would unlikely be noted at this time.

Based on the trial results under the conditions present EA would be interested in utilizing this product further into the future. A full price point on the product will be required for future utilization.