



ULTIMATE AIRCRAFT DEICING

FEAMTM

GROUND SERVICES | DEICING

Winter Ops

Winter Operations Plan

2017-2018 - ANC

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SCOPE

The purpose of this Winters Operation Plan is for employee information use only, gives a quick guide on ultimate/feam aircraft deicing procedural requirement in accordance with latest deicing manual.

The Winter OP's includes and not limited to types of deicer trucks in our ANC fleet, location of type I and IV tanks, Type I and IV fluid name. Deicing fluid and anti-icing fluid check and its limitation and blending and mixing of the fluid to the trucks

It also includes fluid testing methods and types of refractometer used on the field. GSE shop location and contact info.

The Winter OP's also includes and Post Deicing and Anti-icing check, communication procedures and engine contamination removal.

Coordinators/Leads

There are 3 deicing coordinators/leads in the deicing season consisting of

1. TJ FEILDING
2. BRUCE GEIRKE
3. JOHN WILL

Deicing Trucks:

Ultimate Aircraft has currently fifteen trucks in total, four types of the FORD family model deicing trucks and they are listed below.

1. PREMIER Forced Air
2. Ford D2-40 Trump
3. Ford FMC-Trump LMD 2000

Truck Location:

All of our Deicing trucks during the winter operation season is parked and staged at ALASKA CARGO PORT Ramp area. The keys to all the deicing trucks are located in the mobile trailer adjacent to the trucks parking area.

We also stage certain amounts of trucks by INTERNATIONAL TERMINAL and PENAIR GATES AREA during winter weather inclement.

During the off-season all deicing trucks are parked at ALASKA CARGO PORT.

All trucks are equipped with two intercoms and have necessary deicing/ anti-icing fluid markings and labels. All trucks also have both Type I and IV fluid sight gauge and fill ports.

Note: Emergency Stop switch both in the cab and bucket of all deicing trucks and all trucks are equipped with a manual override.

GSE Shop Location:

GSE shop is located Alaska Cargo port. In case if truck breakdown or emergency truck situation GSE can be contacted on a two-way UHF radio. Call sign for GSE (GSE ONE). If unable to get in touch via two way radio see contact information below.

Bruce Gierke: (907) 782-9011

Chris Dementief: (907) 970-6748

Deicing/Anti-Icing fluid:

Ultimate Aircraft/Feam currently uses these types of deicing and anti-icing fluid.

TYPE I: Clariant OctoFlo EF 1424 *both Concentrate and Dilute and Clariant DF plus 88*

TYPE IV: Clariant *MP IV Launch* AMS 1428, *Max Flight 04 1428*

Type I fluid is mix manually in the truck and 50/50 or 40/60 mix is preferred due to strict EPA requirement and can be blend in reference to the outside air temperature (OAT). *(See charts)*

NOTE: Type I fluid has to be 18F degrees above the outside air temperature (OAT) when blending and has to be within the Lowest Operational Use Temperature (LOUT) requirement.

CAUTION: Type IV fluid is not blended or diluted.

Deicing/Anti-Icing Tanks:

The type I and 4 tanks is located Alaska Cargo port. Three 5000 gal type 1 tank and one 5000 gal type 4 tank.

Deicing/Anti-Icing fluid Check:

Ultimate Aircraft has several different types of refractometer to check fluid before commencing deicing.

1. **7048VP** Refractometer: checks for freeze point of deicing fluid and normally for both type I and IV only. It is orange in color. The fluid manufacturer range for Clariant Octo Flo EF on freeze point for 50/50 mix is -12F to -22F. Max Flight 04 100% is -28F to -32F.
2. **10431VP** Refractometer: checks for Brix of the type I and IV fluid. The brix Range for Octo Flo EF is 30.25 to 33.75. Max Flight 04 is 34.50 to 37.50 *and MP IV launch is 34.3 to 36.0.*
3. **PA202** Digital Refractometer checks both Brix and RI. Octo Flo EF RI range is 1.4235 to 1.4270 and the Brix range is 51.50 to 53.25. Both test for concentrate level only. Max Flight 04 RI range is 1.3900 to 1.3935 and Brix range is 34.50 to 37.50 *and MP IV launch is 34.3 to 36.0 not mentioned on COA compare reading to Refractometer 10431VP.*

All fluid check must be documented in our deicing work order ticket prior to deicing every aircraft.

Deicing/Anti-icing Check Procedure:

Contamination Check: This is a check for the need to de-ice. This check shall include the areas mentioned in 12.1 to 12.8 and any other as recommended by the aircraft manufacturer. It shall be performed from points offering sufficient visibility of these parts (e.g. from the de-icing vehicle itself or any other suitable piece of equipment that allows the staff performing the test to safely access the critical flight control area eg. Maintenance ladder or man lift). Any contamination found, except frost mentioned in 12.2 and 12.8, shall be removed by a de-icing treatment. If anti-icing is also required, this treatment may be performed as a one-step or two-step de-icing/anti-icing of the relevant surfaces.

A tactile/clear ice check is a visually and physical (hands-on) check of the wing surfaces to verify that the wing is clear of ice accumulation.

The following are examples of when a tactile check may be required:

- At the request of the pilot to perform an inspection only
- Before deicing
- After deicing
- Before anti-icing
- At the gate
- Preferably after aircraft fueling
- Clear ice formation

The **tactile/clear ice check** is performed by physically touching the wing of the aircraft. Starting at the root of the wing and around the entire wing with both hands extended, one on top and the other on the bottom of the wing, move your hand in a forward and back motion. Seams and rivets should be felt with your hands. If not, most likely there are contaminants adhering to the wing.

CAUTION: IF THE ENGINE IS RUNNING WHILE TACTILE/CLEAR ICE INSPECTION IS PERFORMED, ONLY FROM THE FRONT OF THE WING AND FROM THE BACK OF THE WING.

NOTE: The use of any type of gloves, hand warmers, or hand protection while performing a tactile check is not permitted.

Deicing: Ice, snow, slush or frost may be removed from aircraft surfaces by heated fluids, mechanical methods, alternate technologies or combinations thereof. The following procedures shall be used for their removal when using fluids and/or infrared de-icing.

NOTE 1 Alternate technology can be used to accomplish the de-icing process, provided that the requirements in be accomplished.

NOTE 2 A pre-step process can be done prior to de-icing/anti-icing.

If agreed to by the aircraft operator, a pre-step process prior to the de-icing process, in order to remove large amounts of frozen contamination (e.g. snow, slush or ice), can be considered to reduce the quantity of glycol-based de-icing fluid needed. This pre-step process can be performed with various means (e.g. brooms, forced air, heat, heated water, and heated fluids with negative buffer freezing point). If the pre-step procedure is used, make sure that the subsequent de-icing process removes all frozen contamination including the contamination that may have formed on surfaces and or in cavities due to the pre-step process.

Anti-icing: Ice, snow, slush or frost will, for a period of time, be prevented from adhering to, or accumulating on, aircraft surfaces by the application of anti-icing fluids. The following procedures shall be adopted when using anti-icing fluids. For effective anti-icing, an even layer of fluid of sufficient thickness is required over the prescribed aircraft surfaces that are clean (free of frozen deposits). For maximum anti-icing protection, undiluted, ISO type II, III or IV fluids should be used. The high fluid pressures and flow rates normally associated with de-icing are not required for this operation and, where possible, pump speeds should be reduced accordingly. The nozzle of the spray gun should be adjusted to provide a medium spray.

Post-de-icing/anti-icing-treatment check:

An aircraft shall not be dispatched after a de-icing/anti-icing treatment until the aircraft has received a final check by a trained and qualified person. This check, in accordance with Operating Procedure Manual shall visually cover all critical parts of the aircraft and be performed from points offering higher sufficient visibility of these parts (for example from the deicer itself or another elevated piece of equipment). Any contamination found shall be removed by further de-icing/anti-icing treatment and the check repeated. The anti-icing code according to 15.2 shall not be transmitted before the post de-icing/anti-icing treatment check is completed.

This check shall cover wings, horizontal stabilizer, vertical stabilizer and fuselage. This check shall also include any other parts of the airplane on which a de-icing/anti-icing treatment was performed according to the requirements identified during the contamination check.

The check shall be performed from points offering sufficient visibility of all prescribed surfaces (e.g. from the deicer itself or other equipment suitable for gaining access). Any contamination found, shall be removed by further de-icing/anti-icing treatment and the check repeated.

Before take-off the Commander must ensure that he has received confirmation that this Post De-icing/Anti-icing Check has been accomplished.

NOTE: For specific airplane types, additional requirements exist e.g. special clear ice checks, such as tactile checks on wings. These special checks are not covered by the Post De-icing/Anti-icing Check. Airplane operators shall make arrangements for suitably qualified personnel to meet these requirements.

Where the de-icing provider is carrying out the de-icing/anti-icing process and also the Post De-icing/ Anti-icing Check, it may either be performed as a separate check or incorporated into the de-icing operation as defined below.

The de-icing provider shall specify the actual method adopted, where necessary by customer, in his winter procedures:

- a) As the de-icing/anti-icing operation progresses the De-icing Operator will closely monitor the surfaces receiving treatment, in order to ensure that all forms of frost, ice, slush or snow are removed and that, on completion of the treatment, these surfaces are fully covered with an adequate layer of anti-icing fluid..
- b) Once the operation has been completed, the De-icing Operator will carry out a close visual check of the surface where treatment commenced, in order to ensure it has remained free of contamination (this procedure is not required under 'frost only' conditions).

c) Where the request for de-icing/anti-icing did not specify the fuselage, it shall also receive a visual check at this time, in order to confirm that it has remained free of contamination

d) Any evidence of contamination that is outside the defined limits shall be reported to the PIC immediately. Please utilize a Deicer truck to maximize sufficient visibility on control surfaces when conducting post deicing and anti-icing treatment check. Deicing truck open bucket can accommodate two deicing agents at the same time. Please use extreme caution when the deicer bucket is elevated. The use of safety harness is mandatory. A tactile check (hands on) is only required if implemented in carrier specific aircraft procedures manual.

Caution: When engine is running a visual check will suffice unless it is required by the carrier then utilize carrier specifications and procedures.

Engine Contamination check: Engine inlets and fan blades, aeroplane probes and sensors and other external aeroplane instruments need de-icing in some cases (based on the aeroplane operators instructions). Engine inlets can generally be cleaned with a brush or manually by hand. Engine covers may be installed after engine shut down in order to minimize engine ice buildup (refer to airline operator and engine manufacturer instructions). Fan blades and the bottom of the engine air inlet needs to be de-iced with hot air (noting manufacturer recommended temperature limits), or other means recommended by the engine manufacturer. No de-icing fluid is to be sprayed into engines. Propellers may have ice along the leading edges and/or may collect snow/slush along the side during a ground stop. This contamination can be removed manually with a soft cloth or by hand. Some manufacturers allow the propellers to be sprayed but some forbid the use of glycol. Hot air, or other means recommended by the engine manufacturer, can be used for de-icing propellers (composite propellers have temperature limits that must be noted). Aeroplane external instruments, probes and sensors may need de-icing and this should be performed using aeroplane operators procedures in accordance with the aeroplane manufacturer (e.g. aeroplanes own de-icing system, manually or hot air). This task shall only be performed or supervised by properly trained and qualified (as applicable) personnel.

Engine Contamination Removal: Deposits of snow should be mechanically removed from engine intakes prior to departure. Any frozen deposits that may have bonded to either the lower surface of the intake or the fan blades may be removed by hot air or other means recommended by the engine manufacturer. If use of deicing fluid is permitted, do not spray directly into engine core. If using deicing fluid the spray pattern has to be in a mist form and not more than 15-20 psi from nozzle. This has to be supervised and authorized by a certified aircraft maintenance representative from the respective carrier

GUIDE ON ENGINE CONTAMINATION REMOVAL

1. WHEN USING HOT AIR UNIT (TRUCK 118) ENSURE TEMPERATURE DOES NOT EXCEED 150°F AND WITH DISTANCE OF 3 FEET.
2. USE OF DEICING FLUID IS ALLOWED WHEN SUPERVISED BY AN AIRLINE REP, THE NOZZLE SETTING SHOULD BE AT MIST WITH PRESSURE NO MORE THAN 15-20 PSI.
3. THE USE OF MECHANICAL MEANS SUCH AS A SOFT BRISTLE BRUSH AND SQUEEGEE IS ALLOWED AS PER THE AIRLINE REQUEST.

COMMUNICATION: DURING OFF-GATE DE-ICING/ANTI-ICING A TWO-WAY COMMUNICATION BETWEEN FLIGHT CREW AND DE-ICING/ANTI-ICING OPERATOR/SUPERVISOR SHALL BE ESTABLISHED PRIOR TO THE DE-ICING/ANTI-ICING TREATMENT. THIS MAY BE DONE EITHER BY INTERCOM OR BY VHF RADIO. IN CASE VHF IS USED, THE REGISTER OR "TAIL NUMBER" OF THE AIRCRAFT INSTEAD OF FLIGHT NUMBER SHALL BE USED DURING ALL COMMUNICATIONS. AN ALTERNATE MEANS OF COMMUNICATION MAY BE THE USE OF ELECTRONIC MESSAGE BOARDS. IN THE EVENT OF CONFLICT, VERBAL COMMUNICATION SHALL TAKE PRECEDENCE. BEFORE AND AFTER THE TREATMENT, ALL NECESSARY INFORMATION TO THE COCKPIT SHALL BE GIVEN BY THIS MEANS (BEGINNING OF TREATMENT, TREATMENT OF SECTIONS REQUIRING DE-ACTIVATION OF AIRCRAFT SYSTEMS, ANTI-ICING CODE, ETC.). CONTACT WITH FLIGHT CREW MAY BE CLOSED AFTER ANTI-ICING CODE AND READINESS FOR TAXI-OUT HAS BEEN ANNOUNCED.

Equipment/Staff Information Transmission: Communication between staff includes:

- Fluid type
- Start time
- End time
- Cleanliness of the aircraft
- Upon completion, all vehicles and personnel clear of aircraft

Communication Levels: There are four levels of communication between the staff performing the Deicing/Anti-icing and the staff performing the Post Deicing/Anti-icing staff:

- The deicing vehicle intercom system is used between the vehicle driver and boom operator
- Two-way communication between multiple vehicle drivers must be performed via VHF radio
- Two-way communication between vehicle driver and deicing/anti-icing coordinator must be performed via VHF radio for the Post deicing/Anti-icing check.
- The aircraft's intercom system is used between the deicing/anti-icing coordinator and flight crew

De/Anti-icing Fluid Shortage:

Please contact Swissport for our secondary de-anti-icing fluid provider in case of shortages. Swissport utilizes the same Type 1 and 4 fluid as Ultimate/FEAM here in ANC.

SwissPort Contact:

John Langly- Deicing supervisor: Tel: 347-545-4478 or 347-306-5431

Here are some best practice approach and guideline to combat de-anti-icing fluid shortage:

- During a deicing event always have a spare or secondary trucks standing by while deice is commenced
- If there is a truck failure, dispatch another truck, stand by and notify the flight crews of any delays or operational impact. If trucks arrive swiftly notify the flight crew again of deicing being commenced.
- During frost or light snow set the nozzle at fan spray for best economical fluid outcome.

Emergency Procedures: When accomplishing de-icing/anti-icing treatments at either a remote de-icing/anti-icing location or a centralized de-icing/anti-icing facility, local procedures shall be established to ensure that either aircraft or ground emergencies are handled safely and expeditiously and are coordinated with the airport operations emergency plan.

Emergency Contact List:

Operation Director: TJ Feilding (907) 529-7984

Director of Training/Q.C.: Waseque Miah (646) 643-1089 or (917) 299-1468

GSE Manager: Bruce Gierke (907) 782-9011

Airport Zones: ANC

Each Airport Zone consists of locations where deicing will part take at and the coordinators that are in charge of the area.

Zone A

South Airport Area

Zone B

East Side Airport Ramp Area

Both Zones A/B cover all aircraft areas for deicing operation.

Forced Air Deicing-

Air Only Application

- ✓ Forced air shall always be applied at a shallow angle to the aircraft surface
- ✓ Never apply forced air directly on a surface at a 90 degree angle.
- ✓ To remove contamination from wings and tails, position the blower nozzle level or slightly above the leading edge using the contour of the wing to assist the air flow in pushing the snow aft.
- ✓ If the forced air fails to blow the accumulation off the aft section of the wing or tail, raise the FEDS cab and extend the boom over the wing to allow the air from the nozzle to get closer to desired area - this may be necessary for all aircraft types for heavy accumulation or if the snow is wet.

CAUTION: Closely monitor your boom height and angle to avoid contact with the aircraft when positioning the closed bucket/feds cab over any surface.

If the snow is heavy or wet, it may be necessary to blow the accumulation off the back section of the wing or tail first to avoid piling up the snow on the upper surface to a point where the forced air is no longer effective.

CAUTION: The air is hot when it leaves the nozzle but will assume ambient temperature after several feet – the nozzle shall be kept a minimum of 3 feet from the aircraft to avoid melting the snow or damaging the surface.

Special Precautions:

- ✓ All areas designated in this manual deemed as requiring special precaution will be adhered to when using forced air.
- ✓ Air flow shall not be directed towards windshields, windows, probes, antennas or other parts protruding from the wings or fuselage as the high pressure could damage these parts.
- ✓ Extreme caution shall be used to avoid blowing snow into any openings such as pitot tubes, APU inlets and outflow valves, as snow could get packed into these areas causing problems in-flight.
- ✓ Never direct forced air from the aft section of a wing or tail toward the front - this could cause snow to be blown under the slats, flaps or other quiet areas.
- ✓ Air flow shall be directed in the flight direction, (i.e., from the front of the aircraft rearwards).
- ✓ Should the operator's vision be impaired by blowing snow while applying the forced air they will stop all truck and boom movement until the snow settles and safe visual conditions are restored.
- ✓ Ensure that all ground personnel are clear of the area when using forced air.

Note: Forced air deicing on its own may NOT be sufficient to remove all the contamination on an aircraft - to maximize use of the trucks under such conditions, the operator should concentrate on clearing only as much accumulation as the forced air system effectively allows, then sending aircraft to standard de-ice before moving on to next aircraft.

Using Forced Air in Combination with Glycol:

Definitions:

The following 4 deicing methods are available options on the equipped with the Air Plus System.

1. "Fluid Only" – the application of deicing fluid on its own without air assist.
2. "Fluid over Air" - the application of Type I deicing fluid from the fluid nozzle over the air stream
3. dispensed from the air nozzle below.
4. "Fluid Injection" – applying forced air with fluid injected into the air stream.
5. "Air Only" – the application of forced air on its own without deicing fluid.
6. Several Global deicing trucks (Model 2110TE-EC-AP) are equipped with the Air Plus System. These trucks have
7. dual engines which enables the heaters and the Forced Air system to be operated at the same time. The
8. trucks can operate in 4 modes (glycol only - air only - fluid over air - fluid injection).
9. The following procedures will apply when using deicing fluid in combination with forced air:
10. Do not apply Type IV using fluid over air or fluid injection.
11. (Note: trucks have been set up to restrict this operation)
12. ✓ The "Fluid over Air Method" can be used anytime during non-precipitation or precipitation deicing.
13. ✓ "Fluid injection" can be used during non-precipitation deicing for removal of frost or light snow.
14. ✓ "Fluid injection" is the recommended method for frost deicing where available.
15. ✓ "Fluid injection" is not to be used when applying an overcoat of anti-icing fluid (Type IV) or during
16. precipitation deicing – use fluid over air or fluid only during precipitation.
17. Note: When employing the use of forced air with fluid, follow the operating guidelines outlined in the section
18. titled Forced Air Deicing.