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Winter Operations Manual

Issue 5

Winter 2024/2025

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Expiry date: 30-Sep-2025

Winter Operations Manual – Issue 5 – Winter 2024/2025

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VISTAIR

REVISIONS

Record of Revisions

Issue	Revision	Issue Date	Content Summary
01	01	30-Sep-2011	Initial issue
	02	01-Oct-2012	General updates
	03	08-Aug-2013	General updates
	04	18-Sep-2014	General updates
	05	02-Sep-2015	General updates
	06	08-Sep-2016	General updates
02	01	14-Sep-2017	Major update
	02	30-Sep-2018	General updates
	03	30-Sep-2019	General updates
03	01	30-Sep-2020	Major update
04	01	30-Sep-2021	Updated format, general updates
	02	30-Sep-2022	General updates
	03	30-Sep-2023	General updates
05		30-Sep-2024	General updates

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CHANGE REVISION SUMMARY

Page Number	Description of Change
0-1	Text amended.
0-5	Table amended.
2-4	Note added on communication with Flight Crews to ascertain lowest indicated fuel temperature, in order to help calculate LOUT.
2-20	Extra caution added for underwing deicing procedures.
2-25	Additional information added to allow approved DSPs to use hot air to remove fan blade contamination.
2-25	Caution added when using hot air to remove fan blade contamination.
2-37	Early deicing section updated.
2-40	Section added for anti-icing fluid failure recognition, with examples.
3-1	Caution added for failure to wait for confirmation of aircraft configuration for deicing.
3-3	Note added on the need for VHF communication if ACARS is used to pass information.
5-2	Information added on Winter Readiness Guidance Module available on Connected Portal.
5-2	Requirements for gaining ICC approval to use water for deicing training on aircraft updated.
5-2	Minimum fuel temperature consideration added when using water for deicing training.

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List of Effective Sections

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R	Changes	5	1	30-Sep-2024

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0 INTRODUCTION

0.1 PURPOSE AND SCOPE

This Manual comprises the rules, standards and specifications for de-/anti-icing on all easyJet aircraft, to ensure winter operations activities are safely, efficiently and consistently accomplished.

The application of the procedures specified in this manual are intended to effectively remove and/or prevent the accumulation of frost, snow, slush, or ice contamination which can seriously affect the aerodynamic performance and/or the controllability of an aircraft. The principal method of treatment employed is the use of fluids qualified to AMS1424 (Type I fluid) and AMS1428 (Types II, III, and IV fluids).

The Manual complies with the terms and conditions of the individual Air Operator Certificate (AOC) issued under EASA Regulations by the Competent Authority and the requirements contained therein as applicable within the following individual AOC's:

a. easyJet UK

b. easyJet Switzerland SA

c. easyJet Europe Airline GmbH

All changes to this manual must be communicated to the GO Nominated Persons prior for agreement. The Director of Ground Operations or their delegated authority must approve changes to the Winter Operations Manual prior to publication.

0.2 REFERENCES

This manual is based on IATA/SAE 'Global Aircraft Deicing Standards', which consists of the following documents:

a. SAE AS6285(E) 'Aircraft Ground Deicing/Anti-Icing Processes'.

b. SAE AS6286(D) 'Training and Qualification Program for Deicing/Anti-icing of Aircraft on the Ground'.

c. SAE AS6332(A) 'Aircraft Ground Deicing/Anti-icing Quality Management'.

All further references to SAE documents (e.g. AS6285) in this Manual refer to the **latest** version as stated in this section.

This version of the easyJet Winter Operations Manual includes the changes for the 2024/2025 winter season which all deicing service providers shall follow.

References to (external) documents (e.g. SAE) are always referring to the latest published version of the appropriate document. The service provider must always have the latest version of the documents available.

0.3 EASYJET SAFETY POLICY, PRINCIPLES & OBJECTIVES

The easyJet Safety Policy is a written statement that outlines the Senior Managements commitment to high standards of safety management as an integral part of the airline's business processes. A full copy of the Safety Policy can be found on the easyJet intranet 'Inside', however, it is commonly summarised as; 'Safety is our number one priority'.

This safety policy sets out our commitment to safety across the airline and to minimizing our risk of an accident as far as we can. Your awareness and understanding of it will help us to achieve the highest levels of safety in line with our values.

0.3.1 Safety Management System (SMS)

Our approach to safety is coordinated through our SMS. It allows us to plan ways to reduce our risks, measure how well our plans are working, report safety issues and control risks that we face. It also means we can use the data to improve our processes in the future. It includes, but isn't limited to, the following:

a. Safety reporting and investigation
b. Risk identification and management
c. Managing operational changes
d. Keeping you updated on our safety performance
e. Monitoring our safety performance
f. Emergency response planning
g. Safety training

0.3.2 Safety Culture

Our open reporting culture encourages you to report things you feel could pose a risk to our people, operation or passengers. You can do this knowing that your concern will always be treated sensitively and professionally. You can report anything from an accident in Hangar 89 or your base, to a disruptive passenger on board our aircraft. Please visit SafetyNet via the Connected Portal, the Inside homepage or Crew Portal and submit a report form.

0.3.3 Our Commitment

a. To give you the resources you need to manage safety yourself
b. To ensure that safety management is the primary responsibility of everyone across the airline
c. To establish and maintain a robust SMS that continuously improves our safety performance
d. To apply the principles of Organisational and Human Performance
e. To encourage an open reporting culture where safety concerns are investigated sensitively and professionally

f. To ensure we comply with, and wherever possible exceed, legislative and regulatory requirements and standards

g. To provide safety information, instruction and supervision

h. To put the right people in the right jobs with the right skills, and to provide training where needed

i. To be at the forefront of safety management across the airline industry

j. To ensure that no action is taken against an employee who reports a safety risk unless the risk indicates, beyond reasonable doubt, gross negligence or a wilful disregard of regulations or procedures

k. To continually measure and review our safety performance.

0.4 ABBREVIATIONS

Abbreviation	Definition
ACARS	Aircraft Communications Addressing and Reporting System
AIP	Aeronautical Information Publication
AIR	Aerospace Information Reports (SAE)
AMM	Aircraft Maintenance Manual
AMS	Aerospace Material Specification (SAE)
AOCM	Airport Operations & Contract Manager (easyJet)
AOM	Aerodrome Operating Minima
APU	Auxiliary Power Unit
ARP	Aerospace Recommended Practice (SAE)
AS	Aerospace Standard (SAE)
ATC	Air Traffic Control
C of A	Certificate of Acceptance
C of C	Certificate of Conformance
CAA	Civil Aviation Authority
CDF	Central Deicing Facility
DAQCP	IATA De-/Anti-icing Quality Control Pool
DD	Day in 2 Digits (e.g. 03 for 3rd day of month)
DDF	Designated Deicing Facility
DIO	De-/Anti-icing Operator
DIS	De-/Anti-icing Supervisor

Abbreviation	Definition
EASA	European Union Aviation Safety Agency
EFB	Electronic Flight Bag
EJU	easyJet Europe (‘OE’ registered aircraft)
EMB	Electronic Message Board
EWIS	Electrical Wiring Interconnect System
EZS	easyJet Switzerland (‘HB’ registered aircraft)
EZY	easyJet UK (‘G’ registered aircraft)
FAA	Federal Aviation Administration
FOD	Foreign Object Debris or Foreign Object Damage
FP	Freezing Point
GHM	easyJet Ground Handling Manual
GHP	Ground Handling Partner
GOM	Ground Operations Manager
GOMM	Ground Operations Management Manual
GPU	Ground Power Unit
GSE	Ground Service Equipment
GSR	easyJet Ground Safety Report
h	Hours
HHET	High-Humidity Endurance Test
HOT	Holdover Time
HOWV	Highest On-Wing Viscosity
IATA	International Air Transport Association
ICC	easyJet Integrated Control Centre (previously known as OCC)
IGOM	IATA Ground Operations Manual
ISO	International Standards Organization
LOUT	Lowest Operational Use Temperature
LOWV	Lowest On-Wing Viscosity
MEL	Minimum Equipment List
MMM	Month in 3 Digits (e.g. MAR for March)

Abbreviation	Definition
NOTAM	Notice To Airmen
NP	Nominated Person
°C	Degrees Celsius
°F	Degrees Fahrenheit
OAT	Outside Air Temperature
OCC	See ICC
OTP	On-Time Performance
Pads	Remote Deicing Pad
PIC	Pilot-in-Command
PPE	Personal Protective Equipment
QA	Quality Assurance
QC	Quality Control
ROCM	Regional Operations & Contract Manager (easyJet)
SAE	Society of Automotive Engineering
SDS	Safety Data Sheet
SMS	Safety Management System
STD	Scheduled Time of Departure
TAT	Total Air Temperature
TC	Transport Canada
VHF	Very High Frequency
WSET	Water Spray Endurance Test
YY	Year in 2 Digits (e.g. 20 for 2020)

0.5 DEFINITIONS

0.5.1 Advisory Word Definitions

The following advisory words are to be used as defined:

a. **MAY**: This is used to describe that the practice is encouraged and/or optional.

b. **SHALL**: This will mean that the practice is mandatory. A synonym for 'must'.

c. **SHOULD**: This means that the practice is recommended or strongly encouraged.

d. **MUST**: This means the practice is mandatory. A synonym for 'shall'.

0.5.2 Words and Phrase Definitions

The following words and phrases are to be used as defined:

Term	Definition
Active Frost	Condition when frost is forming. Active frost occurs when (1) the aircraft surface temperature is at or below the frost point, or (2) there is water in liquid form (e.g., dew) on the aircraft surface and the surface falls to/or below 0°C (frozen dew).
Anti-icing	Procedure by which fluid is applied to provide protection against the formation of frost or ice or the accumulation of snow or slush on treated surfaces of an aircraft for a limited period of time.
Anti-icing fluid	a. Mixture of water and Type I fluid; b. Premix Type I fluid; c. Type II or Type IV fluid; d. Mixture of water and Type II fluid, or Type IV fluid. **Note:** For deicing/anti-icing purposes in a one-step procedure, fluids in (a), (b) and (d) shall be heated to ensure a temperature of 60°C (140°F) minimum at the nozzle.
Anti-icing code	Report given to the flight crew/Pilot-in-Command that deicing/anti-icing has been carried out and the details of the anti-icing treatment that was applied. Also known as post-deicing/anti-icing report.
BRIX (degrees BRIX or °BRIX)	Unit of measurement of refraction. See also 'refraction' and 'refractometer'.
Certificate of Analysis	A document, issued by a manufacturer, attesting that a lot or batch of a product fulfils the manufacturer's sales specification requirements, listing the tests, the test requirements, the test results on that lot or batch, the lot or batch number and a date.
Certificate of Conformance	A document declaring that a product fulfils the requirements of a standard. Also known as certificate of conformity.
Check	The examination against a relevant standard by a trained and qualified person to ascertain satisfactory condition.
Chemical contamination	Condition when substances (chemicals) are present where they should not be or are at concentrations higher than they should be.
Clear ice	Ice difficult to detect visually. It is normally formed in the area of the wing fuel tanks, caused by cold-soaking. Clear ice may break loose during or after takeoff, and poses a hazard particularly to aircraft with rear mounted engines.

Term	Definition
Cold soaking	Ice can form on aircraft surfaces even when the outside air temperature (OAT) is well above 0°C (32°F). An aircraft equipped with wing fuel tanks may have fuel that is at a sufficiently low temperature such that it lowers the wing skin temperature to below the freezing point of water. The low temperature of the fuel may come from flying at a high altitude, where cold temperature prevails, for a period of time, or from fueling with cold fuel. This phenomenon is known as cold soaking. While on the ground, the cold-soaked aircraft will cause ice to form when water as rain or as vapor (humidity), comes in contact with cold-soaked surfaces.
Contamination	All forms of frozen or semi-frozen deposits on an aircraft, such as frost, snow, slush, or ice (also known as frozen contamination).
Contamination check	A check of aircraft surfaces and components for contamination to establish the need for deicing.
Deicing	Procedure by which frost, snow, slush, or ice are removed from an aircraft in order to provide clean surfaces and components.
Deicing/anti-icing	Combination of or referring to both of the procedures for ‘deicing’ and ‘anti-icing’. It may be performed in one or two steps.
Deicing Fluid	1. Heated mixture of water and Type I fluid; 2. Heated premix Type I fluid; 3. Heated Type II, Type III, or Type IV fluid; 4. Heated mixture of water and Type II, Type III, or Type IV fluid. **Note:** Unheated fluids are ineffective to deice.
Deicing Service Provider	The company responsible for the aircraft deicing/anti-icing operations on an airfield.
Deicing personnel	Groundcrew personnel with roles and responsibilities associated with aircraft ground icing operations.
Dewpoint	Temperature at which unsaturated air must be cooled to cause saturation with respect to liquid water. The moisture condenses to liquid water either on surfaces as dew or as tiny liquid droplets suspended in air.
Freezing drizzle	Fairly uniform precipitation composed exclusively of fine drops [diameter less than 0.5 mm (0.02 inch)] very close together which freeze upon impact with the ground or other exposed objects.
Freezing fog	A suspension of numerous very small water droplets which freeze upon impact with the ground or other exposed objects; generally reduces the horizontal visibility at the earth’s surface to less than 1 km (5/8 mile).
Freezing point	Temperature at which a liquid starts to become a solid.
Freezing point buffer	The difference between the outside air temperature (OAT) and the freezing point of the fluid used.
Freezing point buffer, negative	Condition when the freezing point of a deicing/anti-icing fluid is above the OAT.

Term	Definition
Frost/Hoar frost	Tiny ice crystal formed on a surface at or below the frost point. Frost generally occurs with clear skies at temperatures below freezing point. Frost can also occur from the freezing of dew.
Frost, local	The limited formation of frost in localised wing areas cooled by cold fuel or large masses of cold metal in the wings structure; this type of frost does not cover the entire wing.
Frost point	Temperature, at or below 0°C, at which air undersaturated with moisture must be cooled (at constant pressure) to cause saturation with respect to ice. The moisture directly deposits, without going through the liquid phase, as frost on exposed surfaces providing nucleation sites. The frost point is higher (warmer) than the dewpoint by about 10% at a given humidity level in air. Air temperature readings given by a thermometer are applicable to the height above ground of the thermometer itself. Because cool air sinks and the ground often cools very quickly, especially on clear nights, the ground temperature on clear, still nights is invariably lower than the temperature only a few feet higher. Thus, frost can form even when a thermometer gives a reading above freezing. The same happens with aircraft – frost can form on aircraft when the thermometer air temperature reading is above 0°C.
Freezing rain (light)	Precipitation of liquid water particles which freezes upon impact with the ground or other exposed objects, either in the form of drops of more than 0.5 mm (0.02 inch) or smaller drops which, in contrast to drizzle, are widely separated. Measured intensity of liquid water particles is up to 2.5 mm/h (0.10 in/h) or 25 grams/dm2/h with a maximum of 0.25 mm (0.01 in) in 6 minutes.
Freezing rain (moderate)	Precipitation of liquid water particles which freezes upon impact with the ground or other exposed objects. Moderate freezing rain may appear in the form of large drops or can appear to fall in sheets where individual drops are not identifiable. Moderate freezing rain has a measured intensity of between 0.10–0.30 inches/hour.
Freezing rain (heavy)	Precipitation of liquid water particles which freezes upon impact with the ground or other exposed objects. Heavy freezing rain can seem to fall in sheets and individual drops may not be identifiable. Heavy freezing rain has a measured intensity of more than 0.30 inches/hour.
Fuel frost	Frost, normally in the area of the wing fuel tanks, caused by the cold-soaking. Also known as non-environmental frost or cold-soaked fuel frost.
Groundcrew	Personnel with responsibilities for the handling, maintenance and servicing of an aircraft while on the ground, as well as the coordination of these activities.
Hail	Precipitation of small balls or pieces of ice with a diameter ranging from 5 to 50 mm (0.2 to >2.0 inches) falling either separately or agglomerated.
Highest On-Wing Viscosity (HOWV)	Highest viscosity of a thickened deicing/anti-icing fluid which is still aerodynamically acceptable.

Term	Definition
Hoarfrost	A synonym for frost. See frost/hoar frost.
Holdover Time (HOT)	Estimated time for which an anti-icing fluid will prevent the formation of frost or ice and the accumulation of snow on the treated surfaces of an aircraft.
Ice Pellets	Precipitation of transparent (grains of ice), or translucent (small hail) pellets of ice, which are spherical or irregular, and have a diameter of 5 mm (0.2 inch) or less. Ice pellets usually bounce when hitting hard ground.
Lowest On-Wing Viscosity (LOWV)	Lowest viscosity of a thickened deicing/anti-icing fluid for which the applicable holdover timetable can still be used.
Lowest Operational Use Temperature	The higher (warmer) of: a. The lowest temperature at which the fluid meets the aerodynamic acceptance test (according to AS5900) for a given type (high speed or low speed) of aircraft, or; b. The freezing point of the fluid plus the buffer of 10°C (18°F) for Type I fluid and 7°C (13°F) for Type II or IV fluids. The freezing point depressant concentration of the fluid must not exceed the highest freezing point depressant concentration (as measured by refractive index) at which the fluid met the aerodynamic acceptance test. For applicable values, refer to the fluid manufacturer's documentation.
Post-Deicing Check	A check by qualified ground personnel to ensure that all critical surfaces are free of adhering contamination after the deicing procedure has been completed.
Post-Deicing/Anti-icing Check	A check by qualified ground personnel to ensure that all critical surfaces are free of adhering contamination after the deicing/anti-icing has been completed.
Post-Deicing/ Anti-icing report	Report given to the flightcrew confirming that deicing/anti-icing has been carried out and the details of the deicing/anti-icing procedure that was applied. This is also known as the anti-icing code when an anti-icing treatment has been preformed.
Pre-Deicing Process	A process to remove large quantities of frozen contamination prior to the regular deicing/anti-icing process with the objective of reducing the quantity of deicing fluid to be used.
Pre-flight Contamination Check	A check performed by the flight crew or ground crew prior to departure to verify the presence of adhering contamination to establish the need for deicing/anti-icing. It may be part of the flight crew walk around before the flight.
Pre-take off Check	A check by the flight crew prior to takeoff and within holdover time. This check is normally conducted from inside the flightdeck. It is normally accomplished by a continuous assessment of the conditions that affect holdover time and includes an assessment and adjustment of holdover time.

Term	Definition
Pre-take off contamination check	A check of the critical surfaces for adhering contamination. This check is accomplished after the holdover time has been exceeded and must be completed within 5 minutes prior to the beginning of takeoff.
Proximity sensor	A proximity sensor is a safety feature on some models of deicing equipment, that upon activation disengages relevant systems, preventing equipment movement and damage from occurring due to physical contact between equipment components (e.g., spray nozzle, forced air nozzle, operator basket, etc.,) and aircraft surfaces. As a safety mechanism, the proximity sensor is designed to prevent damage from occurring to aircraft surfaces, normally while the equipment chassis is in a stationary position (not manoeuvring). Where equipped, the type of sensor used may vary by design, and may activate either by physical contact (e.g., a proximity switch with contact mechanism), or by non-physical activation (e.g., infrared, radar, etc.).
Qualified staff/ personnel	Trained staff who have passed theoretical and practical training tests and have been qualified for performing this type of job; refer to AS6286.
Quality assurance	Is process-oriented, and it focuses on preventing quality issues. It is a proactive approach. An audit is done to validate QA processes, the quality procedures to be followed (e.g., “documented”).
Quality control	Is product-oriented and focused on identifying quality issues in manufactured products and performance of service. It is a reactive approach. Inspections/checks/tests are done as part of the QC procedure, to verify the quality of the available procedures and operations. (e.g., “implemented”).
Refraction	The bending of light as it passes from one transparent substance into another. For solutions, the refraction will vary upon the concentration of the solute in the solvent. Using a calibration curve, it is possible to determine the concentration of the solute in the solvent. For example, for aqueous glycol solutions, it is possible to determine the concentration of the glycol in water by measuring refraction with a refractometer and comparing the result to the calibration curve. Refraction can be expressed as a dimensionless number (index of refraction) or as a scale of concentration, e.g., degrees Brix (°Brix), or freezing point (°C or °F). See also ‘refractometer’.
Refractive index	Unit of measurement of refraction expressed in the form of a dimensionless number. See also refraction and refractometer.
Refractometer	An instrument to measure refraction. Result of measurement with a refractometer can be expressed as a dimensionless number (index of refraction) or as a scale of concentration, e.g., degrees Brix (°Brix), or freezing point (°C or °F).
Residue/gel	A build-up of dried out thickened fluids typically found in aerodynamically quiet areas of the aircraft.

Term	Definition
Rime ice	Small, frozen, spherical water droplets, opaque/milky and granular in appearance, which looks similar to frost in a freezer; typically rime ice has low adhesion to the surface and its surrounding rime ice particles.
Slush	Slush is snow or ice that has been combined with water.
Snow	Snow is a precipitation of ice crystals, most of which are branched, star-shaped or mixed with unbranched crystals. At temperatures higher than -5°C (23°F), the crystals are generally agglomerated into snowflakes.
Snow grains	Precipitation of very small white and opaque particles of ice that are fairly flat or elongated with a diameter of less than 1 mm (0.04 inch); when snow grains hit hard ground, they do not bounce or shatter.
Snow pellets	Precipitation of white, opaque particles of ice; the particles are round or sometimes conical; their diameters range from approximately 2 to 5 mm (0.08 to 0.2 inch); they are brittle and easily crushed; they do bounce and may break upon contact with hard ground.
Storage tank	A vessel for the purpose of holding fluid that can be fixed, or mobile; includes rolling tanks (ISO tanks), totes, tank trucks, or drums.
Tactile check	Process by which a person touches specific aircraft surfaces. Tactile checks, under certain circumstances, may be the only way of confirming the critical surfaces of an aircraft are not contaminated. For some aircraft, tactile checks are mandatory as part of the deicing/anti-icing check process to ensure the critical surfaces are free of frozen contaminants.
Thickened fluid	A fluid that contains polymeric thickeners. AMS1428 Type II and IV fluids are thickened fluids; AMS1424 Type I fluids are not thickened.

0.5.3 Warnings

These are used throughout this manual and are items, which will result in: damage to equipment, personal injury and/or loss of life if not carefully followed.

0.5.4 Cautions

These are used throughout this manual and are items, which may result in: damage to equipment, personal injury or loss of life if not carefully followed.

0.5.5 Notes

These are items that are intended to further explain details and clarify by amplifying important information.

0.6 SAE PUBLICATIONS

SAE publications are available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (inside USA and Canada) or +1 724-776-4970 (outside USA), www.sae.org.

AMS1424	Fluid, Aircraft Deicing/Anti-Icing, SAE Type 1
AMS1424/1	Deicing/Anti-Icing Fluid, Aircraft SAE Type I Glycol (Conventional and Non-Conventional) Based
AMS1424/2	Deicing/Anti-Icing Fluid, Aircraft SAE Type I Non-Glycol Based
AMS1428	Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
AMS1428/1	Fluid, Aircraft Deicing/Anti-icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV
AMS1428/2	Fluid, Aircraft Deicing/Anti-Icing, Non-Newtonian (Pseudoplastic), SAE Types II, III, and IV Non-Glycol Based
ARP1971	Aircraft Deicing Vehicle – Self-Propelled
AS5116	Minimum Operational Performance Specification for Ground Ice Detection Systems
ARP5660	Deicing Facility Operational Procedures
AS5681	Minimum Operational Performance Specification for Remote On-Ground Ice Detection Systems
AS5900	Standard Test Method for Aerodynamic Acceptance of AMS1424 and AMS1428 Aircraft Deicing/Anti-icing Fluids
AIR6232	Aircraft Surface Coating Interaction with Aircraft Deicing/Anti-icing Fluids
AIR6284	Forced Air or Forced Air/Fluid Equipment for Removal of Frozen Contaminants
AS6286	Training and Qualification Program for Deicing/Anti-icing of Aircraft on the Ground
AS6332	Aircraft Ground Deicing/Anti-icing Quality Management
AS9968	Laboratory Viscosity Measurement of Thickened Aircraft Deicing/Anti-icing Fluids with the Brookfield LV Viscometer
AS6285	Aircraft Ground Deicing/Anti-Icing Processes

0.7 ADDITIONAL PUBLICATIONS

a. Aircraft Manufacturer Manuals

b. Aircraft Operator Manuals

c. FAA Holdover Time Guidelines' (annual publication)

1 ROLES AND RESPONSIBILITIES

This chapter documents the roles of all major stakeholders in the aircraft ground de-/anti-icing process.

1.1 PILOT-IN-COMMAND (PIC)

a. Ensuring that the aircraft has been deiced in accordance with the easyJet Operations Manuals. The PIC retains overall responsibility for ensuring that all surfaces and components of the aircraft are free from contamination.

b. The PIC has the ultimate responsibility for the aircraft and shall not commence take-off unless the external surfaces are clear of any deposit which might adversely affect performance and/or controllability except as permitted in the easyJet Operations Manuals.

c. When present, determining the need for de-/anti-icing.

d. Where contamination is present on one or more critical surfaces, the PIC shall have the aircraft deiced.

e. A PIC's decision to order deicing and/o anti-icing cannot be overruled or reduced to a lower level of protection.

1.2 DEICING SERVICE PROVIDER (DSP)

a. The Deicing Service Provider (DSP) is responsible for ensuring the deicing/ anti-icing operation shall maintain vehicles/equipment, fluids, training and procedures, in accordance with the latest edition of the relevant ISO specifications or IATA/SAE documents (IATA/SAE Documents can be found in the Abbreviations and Definitions section – IATA/SAE Helpful Documents) or the latest version of IATA/SAE Aircraft Ground Deicing/Anti-Icing Processes AS6285.

b. The DSP shall have the responsibility for:

   1. The safety and operability of the Designated Deicing Facilities.

   2. Aircraft Ground Deicing/Anti-icing Procedures.

c. The DSP shall have aircraft deicing/anti-icing procedures, including a quality control (QC) program. These procedures, which ensure compliance with the relevant regulations and global aircraft deicing standards such as AS6285, AS6286 and AS6332, shall cover all aspects of the aircraft ground deicing/anti-icing process including (but not limited to) instructions, tasks, responsibilities, authorizations and infrastructure for the deicing/anti-icing process as follows:

   1. Use of suitable deicing/anti-icing treatment method that meets the IATA/SAE Global Standards.

   2. Remote deicing/anti-icing instructions (when applicable).

   3. Sufficient number of trained and qualified deicing/anti-icing personnel.

4. Qualified staff to co-ordinate and supervise the deicing/anti-icing treatments.
5. Use of suitable deicing/anti-icing equipment meeting specification ARP1971.
6. Special handling procedures for Type II and Type IV deicing/ anti-icing fluids to maintain quality.
7. Post-deicing/anti-icing check (when applicable).
8. Protocol for communications with cockpit crew for both gate and remote locations (when applicable).
9. Communicating the post-deicing/anti-icing report/anti-icing code to the flight crew.
10. Documentation of all deicing/anti-icing treatments i.e. Audit trail either electronic or paper.
11. Personnel safety arrangements.
12. Provisions for tools and clothing for deicing/anti-icing personnel.
13. Environmental arrangements.
14. A quality control program.

d. The DSP should operate a “Safety Management System” which should contain the following items as minimum:

1. Safety Policy and Objectives
2. Safety Risk Management
3. Safety Assurance
4. Safety Promotion

e. The DSP’s “Safety Management System” should include, but not be limited to, the following procedural sections as minimum:

1. Data Collection (reactive, proactive and predictive)
2. Reporting (anonymous – confidential – identified, non-punitive – punitive & mandatory – voluntarily)
3. Risk Management (analyses, hazard classification and mitigation)
4. Corrective Action
5. Training (non-operational, operational and management staff)
6. Promotion (feedback, staff information and statistics)

f. Making the decision on whether or not to protect aircraft overnight and/or early deice.

g. Ensuring that there is a robust procedure in place for communicating successful completion of the deicing process between the deicing operator and the person passing the Post-Deicing/Anti-Icing Report/Anti-Icing Code.

Note: The deicing truck must not be used to deliver any paperwork to the crew via the cockpit window.

h. Ensuring that the Post-Deicing/Anti-Icing Report/Anti-Icing Code is not passed until all aircraft surfaces falling under the responsibility of the deicing company are clean in accordance with the clean aircraft concept.

i. Supplying event and fluid usage data to easyJet as per Chapter 9 of this Manual.

Note: Stations that use the AVTURA system do not have to supply the event and fluid usage data.

j. Determining the need for de-/anti-icing, when the Pilot-in-Command is not present by means of a contamination check. Under ground icing conditions this check is mandatory.

Note: Ground Icing conditions exist when the OAT (on ground and for take-off), is at or below 15°C, and visible moisture in any form is present (such as clouds, fog with visibility of one mile or less, rain, snow, sleet or ice crystals).

k. Maintaining adequate supervision of the personnel performing the spraying and/or post deicing checks to ensure that the quality of services provided is maintained. (As a guideline, easyJet anticipate that the quality of the work of all personnel performing spraying and/or post deicing inspections will be validated on a weekly basis).

l. Providing additional supervision of deicing personnel who have not carried out duties related to de-/anti-icing within a period of four months.

m. Ensuring that for personnel performing the actual deicing/anti-icing treatment on aircraft, practical training with the deicing/anti-icing equipment and an aircraft shall be included.

n. Ensuring that, prior to receiving final qualification, personnel performing deicing/anti-icing operations (driving and/or spraying) shall demonstrate competence in removing frozen contamination under operational conditions, to a suitably trained trainer or supervisor.

1.3 Personnel Performing the De-/Anti-icing Operation (DIO)

a. Ensuring that the task is performed in accordance with the requirements detailed in the latest edition of the easyJet Winter Operations Manual, the latest edition of the relevant ISO specifications, Aircraft Maintenance Manual, SAE documents (AMS 1424, AMS 1428, ARP 1971) or the IATA/ SAE Aircraft Ground Deicing/Anti-Icing Processes, AS6285 and all relevant and recent De-/Anti-icing SAE documentation.

b. Confirming with an Engineer or Pilot that the aircraft is in the correct configuration prior to commencement of treatment.

c. Treating the aircraft in such a manner that, by communicating the Post-Deicing/Anti-Icing Report/Anti-Icing Code to an easyJet representative, they are confirming that on completion of the de-/anti-icing process, the aircraft surfaces are clean in accordance with the clean aircraft concept. The areas treated will be confined to the following surfaces and components:

    1. Left and right wings including upper and lower wing surfaces, winglets and sharklets, ailerons, wing leading edge devices and flaps;
    2. Left and right horizontal stabiliser and elevator (upper and lower surfaces);
    3. Vertical stabilizer and rudder;
    4. Fuselage including the area forward of the front doors, and radome;
    5. Exterior of engine nacelles;
    6. Radome.

d. Advising the Pilot-in-Command or Engineer if there is a requirement for a more detailed inspection of confined areas in the surfaces treated, prior to communicating the post-deicing/anti-icing report.

e. Advising the Pilot-in-Command or Engineer if there is believed to be a risk that de-/anti-icing fluid may have been applied to Pitot Probes, static ports, brakes, landing gear or APU intake or that damage to the aircraft may have been caused.

f. If the deicing company is contracted to perform a post de-/anti-icing check, the DIO also conducts a general ground level check to ensure that surfaces and components visible from the ground are free from contamination.

g. Advising the Pilot-in-Command, easyJet representative and/or relevant airport authority, if aircraft damage was noticed or incurred whilst carrying out the de-/anti-icing process or post deicing check.

1.4 GROUND HANDLING PARTNER (GHP)

Deciding and communicating the order in which the easyJet aircraft requiring deicing are to be treated.

1.5 ENGINEER

Deicing parts of the aircraft which are not the responsibility of the deicing company.

1.6 AIRPORT OPERATIONS & CONTRACT MANAGER (AOCM)/ GROUND OPERATIONS MANAGER (GOM) RESPONSIBILITIES

a. Ensuring that the necessary infrastructure is in place at the stations under their control in order to maintain safe operations during ground icing conditions.

b. The station AOCM/GOM and Seasonal Readiness Manager are responsible for following up on all open audit findings that have not been signed off by the responsible DAQCP auditor.

c. Safety, operational and cost oversight of the deicing operation at their airports.

1.7 EASYJET GROUND OPS POLICY AND STANDARDS TEAM

a. Ensuring safety-critical information/updates are shared with relevant stakeholders, including – but not limited to – easyJet personnel and deicing service providers.

b. The content of this Manual.

c. Authorising and recording any differences to the responsibilities or lines of communication described in this manual, according to local contractual differences.

d. Coordinating the revision process for this section of the Manual.

e. Completing DAQCP audits in line with the DAQCP audit programme.

1.8 RESOLUTION OF DIFFERING VIEWS RELATING TO THE PRESENCE OF CONTAMINATION ON AIRCRAFT CRITICAL SURFACES

Where the Pilot-in-Command and deicing representative differ as to whether contamination is present on aircraft critical surfaces the deicing representative will perform a tactile check or contamination check of the affected area. This step should resolve any disagreement regarding adherence of contamination and the Pilot-in-Command will then take the action that they deem appropriate.

1.9 RESPONSIBILITIES RELATED TO POST-DE/ANTI-ICING CHECKS

easyJet's process for confirming that an aircraft critical surfaces are clear of contamination is based upon the following principles:

a. The final responsibility for ensuring that aircraft critical surfaces and components are clear of contamination lies with the Pilot-in-Command.

b. The post deicing check can only be verified by someone with access to points offering sufficient visibility of treated surfaces.

c. Communication of the post-deicing/anti-icing report, including the anti-icing code, when applicable, by the DIO/DIS to the Pilot-in-Command or easyJet Representative confirms that on completion of the de/anti icing treatment

the aircraft surfaces falling under the responsibility of the DIO are clean in accordance with the clean aircraft concept. If the DIO has any doubt they will request a more detailed inspection from the Engineer or flight crew.

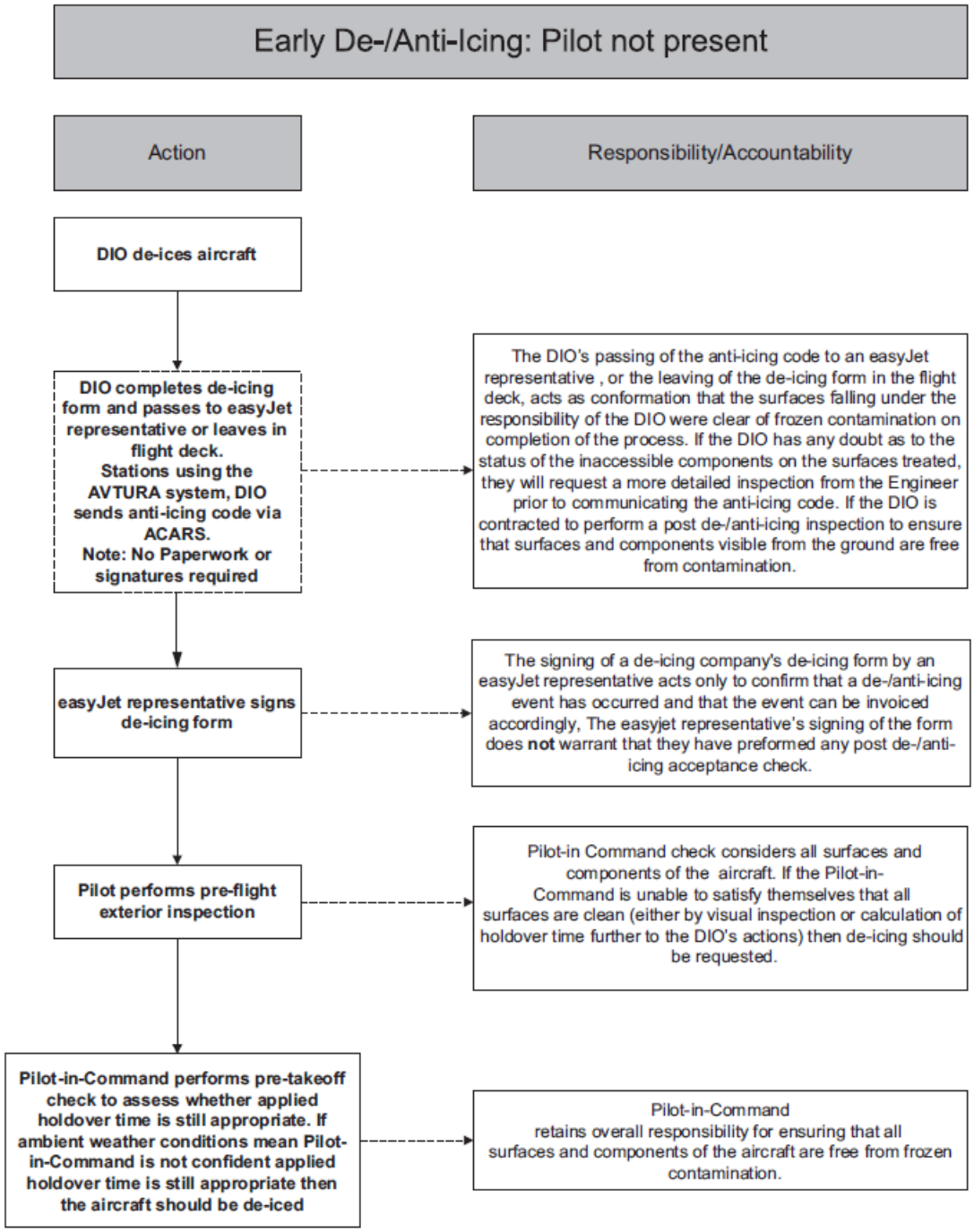
d. If the DIO/DIS is contracted to perform a post de-/anti-icing check, the DIO/DIS conducts a general ground level inspection to ensure that surfaces and components visible from the ground are free from contamination.

e. If the Pilot-in-Command is unable to confirm that all aircraft critical surfaces are clean then deicing should be requested.

f. If any ground crew involved in the turnaround has any doubt as to the presence of frozen contamination they should inform the Pilot-in-Command. The aircraft should not be permitted to depart until the aircraft has been checked and any critical surface contamination removed.

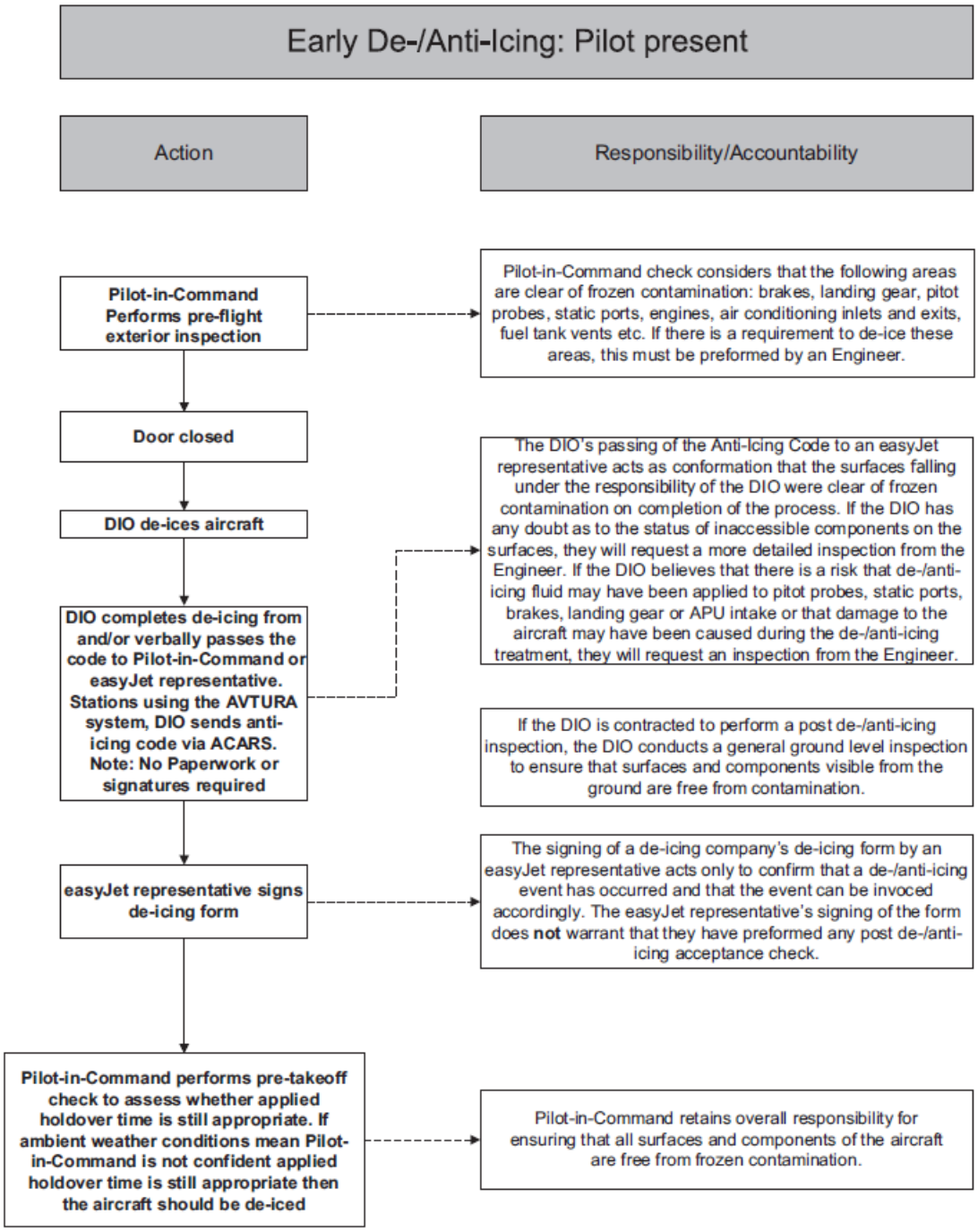
g. Specific responsibilities are dependent upon whether the Pilot-in-Command is present at the time of deicing and are given in the below flowcharts.

Figure 1 Post Deicing Responsibilities When the Flight Crew is NOT Present



DIO = De-icing Operator

Figure 1.2 Post Deicing Responsibilities When the Flight Crew is PRESENT



DIO = De-icing Operator

2 AIRCRAFT DEICING/ANTI-ICING METHODS

This section documents specific procedures for the operation of aircraft underground icing conditions, whether resulting from cold weather operations or cold soaked wing areas, to ensure that aircraft take-off without contamination adhering to surfaces. It is necessary to ensure that everyone involved in the operation understands their respective responsibilities and are properly trained and knowledgeable in their respective areas.

Failure to either identify the need to de-/anti-ice, or effectively confirm that the aircraft surfaces are clean for take-off could result in the loss of human life, or damage to an aircraft.

All Deicing Service Providers contracted to de-/anti-ice easyJet aircraft shall follow the SAE industry standards for the methods and procedures used in performing the treatments necessary for the proper deicing and anti-icing of aircraft on the ground using AMS 1424 and AMS 1428 qualified fluids (Type I, Type II and Type IV).

Deicing Service Providers shall hold as part of their in-house library all current SAE publications relevant to Aircraft Ground Deicing/Anti-Icing Processes.

2.1 CLEAN AIRCRAFT CONCEPT

a. easyJet follows the clean aircraft concept. This must be understood by all Service Providers as an important part for the safety of the flight.

b. A clean aircraft is considered to be either totally clean or cleaned and protected with deicing/anti-icing fluids that still protect the surface and are able to perform aerodynamically correct.

c. Contaminated fluid on the surface must not be misunderstood as a clean aircraft; this contamination must be removed. Under no circumstances shall an aircraft that has been anti-iced receive a further coating of anti-icing fluid directly on top of the contaminated film. If an additional treatment is required before flight, a complete deicing/anti-icing shall be performed. Ensuring that any residues from previous treatment are flushed off.

d. The aircraft must be completely clean of all frost, snow, slush or ice accumulations prior to departure with the exception of the following:

    1. A light coating of frost up to 3 mm in thickness may be present on wing lower surfaces in areas cold soaked by fuel.

    2. Thin hoar frost is acceptable on the upper surface of the fuselage provided all vents and ports are clear. (Thin hoar frost is a uniform white deposit of fine crystalline texture, which usually occurs on exposed surfaces on a cold and cloudless night, and which is thin enough to distinguish surface features underneath, such as paint lines, markings or lettering.)

    3. Frost is permitted on the engine cowls.

e. If contamination, other than hoar frost has accumulated on the exterior of the engine, these deposits must be removed.

f. Frost is permitted on the radome.

g. Contamination other than frost i.e. snow, slush and ice deposits shall be removed from the nose radome areas prior to departure, in order to prevent deposits from blowing back and obstructing the pilot's vision on take-off.

h. Whenever practical, cabin windows should be free of frozen contaminants. The cabin windows are an important part of the safe operation of an aircraft.

2.2 EASYJET REQUIREMENTS

The following requirements must be adhered to when providing service to easyJet aircraft:

2.2.1 Acetate and Formate Aircraft De/Anti-icing Fluids

a. easyJet do **not** permit the use of Acetate & Formate Aircraft Deicing Fluids on their aircraft.

b. Service Providers must ensure that Aircraft Deicing Fluids applied to the aircraft is glycol based and not an acetate and formate blend.

2.2.2 Hot Water

Hot water only shall **not** be used on easyJet aircraft as a deicing fluid.

2.2.3 Subcontracting of Services

a. Suppliers contracted for the provision of de-/anti-icing services to easyJet may delegate services to sub-contractors subject to receiving easyJet's consent, which shall not be unreasonably withheld.

b. The supplier contracted to easyJet remains responsible for the maintenance of standards, and must demonstrate effective management, oversight, and control of sub-contracted services.

c. In all cases where all or part of the de-/anti-icing services are sub-contracted and has been authorised by easyJet, a contract will be required between the sub-contracted company and easyJet.

d. In all cases where all or part of the deicing services are sub contracted, the sub-contracting company shall carryout quality compliance audits and have management oversight of the tasks carried out.

2.2.4 Passenger Boarding Steps

Passenger boarding steps should be removed from the aircraft before spraying deicing fluid onto the aircraft fuselage and or critical surfaces. This is to ensure that the steps are free from aircraft deicing fluid and are safe for ground crew and passenger to gain access to and from the aircraft.

2.3 FLUID HANDLING

2.3.1 Type I Fluids

Type I fluid is a mixture of glycol and water, orange in colour. This fluid, always applied hot, primarily serves as a deicing fluid, relying on heat and shear forces during application to remove ice, snow, or frost from the aircraft. Type I may be used as an anti-icing fluid during conditions of freezing precipitation. In extremely low temperatures, the only fluid option may be Type I fluids, and a one-step procedure is sometimes used despite the associated short Holdover Times. The freezing point of the Type I fluid mixture used for either one-step deicing/anti-icing or as a second step in the two-step procedure shall be at least 10°C (18°F) below the outside air temperature. In no case shall this temperature be lower than the LOUT.

Note: Information on the Guideline for the Application of SAE Type I Fluid can be found in Section 2.25.

2.3.2 Type II/IV Fluids

Type II and Type IV fluids are non-Newtonian pseudo plastic fluids which contain thickening agents which enables the fluid to form a thicker protective coating on external aircraft surfaces. This film has a longer holdover time, especially in conditions of freezing precipitation. Holdover times can also be increased by increasing the concentration of the fluids. Type II fluids are generally white/pale (Yellow) in colour. Type IV fluids are generally green in colour. The freezing point of Type II, III, IV fluids used for either one-step deicing/anti-icing or as the second step in a two-step procedure shall be at least 7 °C (13 °F) below OAT, and not lower than the aerodynamic acceptability lower limit of the fluid.

Note: Information on the Guideline for the Application of SAE Type II and Type IV Fluid can be found in Section 2.25 .

2.3.3 Lowest Operational Use Temperature (LOUT)

a. The Lowest Operational Use Temperature (LOUT) is the higher (warmer) of:

   1. The lowest temperature at which the fluid meets the aerodynamic acceptance test (according to AS5900) for a given type (high speed or low speed) of aircraft; or

   2. The freezing point of the fluid plus the buffer of 10 degrees Celsius for Type I fluid or 7 degrees Celsius for Type II or IV fluids.

b. For applicable values refer to the fluid manufacturer's documentation.

c. The deicing service provider is responsible to ensure that the OAT is at or warmer than the LOUT value for the fluids used. Simply put, if the OAT is at or warmer than the LOUT for the given fluid, the fluid is safe to use. The exception to this is that if the wing skin temperature is below the OAT, then the wing skin temperature must be at or warmer than the LOUT. Currently in easyJet operations, the only wing skin temperature reference available is the fuel temperature. The lowest indicated fuel temperature should be taken as the wing skin temperature.

   Note: If the Flight Crew are on board the aircraft, the deicing service provider should have a conversation with Flight Crew to ascertain the lowest indicated fuel temperature.

d. Any time the fuel temperature is below the OAT, the LOUT should be verified with the deicing service provider to ensure that it is at or below the fuel temperature. If that is not the case, the deicing service provider should be advised and they must not deice and/or anti-ice the aircraft until the fluid mix is adjusted so that the LOUT value is at or below the fuel temperature.

e. The LOUT of Type II and Type IV fluids at 100% concentration is at least -25°C.

2.3.4 Fluid Residue

a. Re-hydrated fluids could be formed when thickened de/anti-icing fluids remain inside structural and aerodynamically quiet areas. Over time, the glycol evaporates, leaving a residue of additives including the polymer thickeners. The Dry residue is almost invisible, but when it absorbs moisture it grows dramatically into a gel mass. This can then re-freeze into pieces of ice to form a gel-like paste (similar in appearance to wallpaper paste).

b. Radar Altimeter Antennas, pitot probes, static ports, and TAT probes are required to be clear of any re-hydrated fluid on departure and particular attention should be paid to this matter when completing the post deicing check and when carrying out the pre-departure walk-arounds on arrival and departure. Any re-hydrated fluid on any part of the aircraft should immediately be reported to the Pilot-in-Command.

c. The application of Type II, or Type IV fluid, especially when used in a one-step process or in the first step of a two-step process, may cause this build-up to occur especially in cavities, and gaps. Dried residues may rehydrate and freeze following a period of high humidity and/or rain conditions. This may impede flight control systems. These dried residues may require removal. The use of a heated mixture of Type I fluid/water for the first step of a two-step deicing/anti-icing process will minimise the formation of dried residues.

d. After frequent applications of deicing/anti-icing fluids it is advisable to inspect aerodynamically quiet areas and cavities for dried residues of thickened deicing/anti-icing fluid. For these inspections it may be necessary to open access panels. This inspection should be carried out by a suitably trained Engineer. Engineering companies should consult with easyJet for cleaning details and procedures.

e. Proper account should be taken of the possible side-effects of fluid use. Such effects may include, but are not necessarily limited to, dried and/or rehydrated residues and the removal of lubricants.

2.3.5 Fluid Quality Checking Process

a. Deicing Service Providers servicing easyJet aircraft shall comply with SAE Industry Standards in regards to fluid quality control and quality assurance. This is to ensure the highest quality standards for handling and storing aircraft deicing fluids.

b. AS6285 section 4.3 to fully covers industry fluid quality standards and processes and procedures.

Subjects covered as follows:

1. Fluid Quality Control Checks
2. Fluid Delivery/Acceptance Check
3. Fluid Sample Check Requirements
4. Daily Concentration Checks
5. Type I Fluid from Nozzles
6. Type I Fluid in Tanks
7. Type II, and IV Fluid
8. Check on Directly or Indirectly Heated Type II or IV Fluids
9. Fluid Check Methods
10. Visual Contamination Check
11. Refractive Index Check
12. pH Value Check
13. Field viscosity check
14. Laboratory viscosity test

15. Fluid Sampling Procedure for Type II, or Type IV Fluids
16. Method using a purpose built stand
17. Trash can method: items required
18. Procedure for nozzle sample
19. Sample Identification

c. In addition to AS6285, AS6286 shall also be followed as it covers the following subjects:

1. Fluid Storage
2. Fluid Handling
3. Fluid Transfer Systems
4. Application
5. Equipment
6. Heating
7. Fluid Sampling from a Storage Tank
8. Equipment
9. Using a Specialized Tank Device
10. Sampling
11. Using a Tank Sampling Valve
12. Sample Labelling Samples
13. Care of Fluid
14. Fluid Testing
15. Quality Assurance Checks
16. Periodic Testing
17. Concentration Checks
18. Fluid Blending
19. HOLDOVER TIME (HOT)
20. Type I Properties
21. Type II, and IV Properties
22. Precipitation Chart Use
23. BACKGROUND INFORMATION
24. Deicing/Anti-Icing Fluids
25. WSET/HHET/Holdover Time
26. Aerodynamic Acceptance
27. Material Compatibility and Other Tests

28. Non-Thickened Fluids
29. Thickened Fluids
30. Fluid Handling and Storage
31. Pumping and Heating
32. Storage Tanks
33. Field/Periodical Quality Testing of Fluids
34. Interpreting Deicing/Anti-Icing Fluid and Hold-Over-Time Tables (AMS1428/1 Only)
35. Type II/IV
36. Type I/II/IV Frost Holdover Time Table
37. Local Frost Prevention

Note: Under no circumstances shall inferior/degraded aircraft deicing fluid be sprayed on easyJet aircraft.

2.4 DETERMINING THE NEED TO DE-/ANTI-ICE

a. Snow and ice on an aircraft, especially on the wing and tail surfaces, may fatally reduce the aerodynamic performance. Consequently, all snow, ice or frost must be removed from aircraft critical surfaces before take-off.

b. When the Pilot-in-Command is present, the responsibility for determining the need for de-/anti-icing lies with the Pilot-in-Command.

c. When the Pilot-in-Command is not present, the responsibility for determining the need for de-/anti-icing lies with the Deicing Company.

d. Anti-icing treatments shall be also symmetrical and shall always cover the entire wing, the entire vertical stabilizer/rudder and horizontal stabilizer/elevator on both sides of the aircraft.

e. De-/anti-icing of the wings, horizontal stabilizer, vertical stabilizer, fuselage surfaces (including the area forward of the front doors) and exterior of the engine nacelles is performed by the DIO.

f. De-/anti-icing of all other components is to be performed by an Engineer.

g. The decision that deicing/anti-icing is required may be determined when one or more of the following circumstances is applicable:

1. An aircraft is parked overnight and subjected to ice or snow conditions
2. When ice has accumulated in flight (inflight ice)
3. During taxi to the gate occurring in icing and/or snow conditions
4. Following a check by the flight crew at a gate
5. As indicated by a check by a qualified deicing/anti-icing person
6. Active frozen or freezing falling precipitation is occurring

7. When cold soaked fuel has created ice or frost on critical surfaces or components
8. When aircraft has been deiced/anti-iced some time prior to flight crew arrival

h. A Contamination Check shall include all critical surfaces and components of the aircraft as indicated by the aircraft manufacturer and shall be performed from points offering sufficient visibility of these parts (e.g., from the deicing/anti-icing vehicle, or any other suitable means of access as necessary).

i. Any contamination found on the surfaces or components of the aircraft that are critical to safe flight shall be removed by a deicing treatment; this shall be followed by anti-icing treatment when required.

j. Where an aircraft has been deiced and/or anti-iced some time prior to the arrival of the flight crew, an additional Contamination Check shall be carried out prior to departure, in order to establish whether further treatment is required.

k. Requests for deicing/anti-icing shall specify the parts of the aircraft requiring treatment.

2.5 DE-/ANTI-ICING METHODS

2.5.1 Pre-Deicing Process to Be Done Prior to Deicing/Anti-Icing

a. Companies may employ a pre-deicing procedure prior to the main deicing process, in order to remove large amounts of frozen contamination (e.g., snow, slush, or ice), in order to reduce the quantity of glycol-based deicing fluid that is needed.

b. This pre-deicing process may be performed with various means (e.g., infrared technology, brooms, forced air, fluid injected into forced air, heat, heated fluids with negative buffer).

c. If the pre-deicing procedure is used, make sure that the subsequent deicing process removes all frozen contamination including the contamination that may have formed on surfaces and/or in cavities due to the pre-step process.

2.5.2 One-Step Ice Removal/Anti-icing

a. A one-step de-/anti-icing procedure can be used, with the de-/anti-icing fluid heated to a minimum temperature of 60°C at the nozzle.

b. After clearing the aircraft surfaces, the remaining fluid will give some anti-icing protection.

c. If the material fluid requiring removal freezes before it flows off the aircraft, it shows that an incorrect mixture of de-/anti-icing fluid was used. In this case, a higher concentration of de-/anti-icing fluid must be applied to obtain more protection.

d. The correct fluid concentration is chosen with regard to desired holdover time, dictated by OAT and weather conditions (see Section 2.25). The fluid used to deice the aircraft remains on the aircraft surfaces to provide limited anti-ice capability.

CAUTION 1: *Wing skin temperature may differ and in some cases may be lower than OAT. A mix with higher glycol concentration can be used under the latter condition to ensure a sufficient buffer.*

CAUTION 2: *The application of Type II or IV fluid, especially when used in a one-step procedure, may cause fluid to collect in aerodynamically quiet areas, cavities and gaps which can dry out and leave dried residues. Dried residues may rehydrate and freeze following a period of high humidity and/or rain conditions. This may impede flight control systems. These dried residues may require removal.*

Note 1: If a Type II or IV fluid is used in a one-step procedure, then an appropriate inspection and cleaning program shall be established. Whenever suitable, deice and anti-ice with only Type I.

Note 2: In order to detect dried residues, it may help to spray a water mist onto the affected surfaces. This causes the dried residues to rehydrate and swell into a gel.

Note 3: If removal of contamination is required on the lower side of the wings and the horizontal stabilizer and elevator, de/anti-icing fluid shall be applied sparingly to minimize fluid flow into drain holes. Whenever possible, use Type I only.

WARNING: **Hot water shall NOT be used on easyJet aircraft as a one-step process.**

2.5.3 Two-Step De/Anti-Icing When the First Step is Performed with Deicing Fluid

a. The correct fluid(s) shall be chosen with regard to OAT (see Section 2.25).

b. The second step is performed with anti-icing fluid to protect the surfaces. This fluid and its concentration are chosen with regard to desired holdover time, which is dictated by OAT and weather conditions (see Section 2.25).

c. The second step shall be performed before the first step fluid freezes if necessary area by area.

d. When treating composite surfaces, freezing may happen quickly.

e. It is the responsibility of the Deicing Service Provider to ensure that all frozen deposits have been removed from the treated surfaces, before applying the second step fluid.

f. Use a second step spraying technique to cover completely the first step fluid with a sufficient amount of second step fluid. For guidance on the amount of fluid refer to the fluid manufacturer's documentation.

g. Where re-freezing occurs following the initial treatment, both the first and second step must be repeated.

"Service providers shall ensure the first step fluid and the second step fluid used on aircraft are compatible. This can be accomplished by contacting the respective fluid manufacturer(s)".

CAUTION 1: *Wing skin temperature may differ and in some cases may be lower than OAT. A mix with higher glycol concentration can be used under these conditions to ensure a sufficient buffer.*

CAUTION 2: *The application of Type II, or Type IV fluid, especially when used in a one-step procedure or in the first step of a two-step procedure, may cause fluid to collect in aerodynamically quiet areas, cavities, and gaps, which can dry out and leave dried residues. Dried residues may rehydrate and freeze following a period of high humidity and/or rain conditions. This may impede flight control systems. These dried residues may require removal. The use of a heated mixture of Type I fluid/water for the first step of a two-step deicing/anti-icing process will minimise the formation of dried residues.*

WARNING: Hot water only shall NOT be used to clear contamination from easyJet aircraft.

h. If a Type II or Type IV fluid is used in the first step of a two-step process, then an appropriate inspection and cleaning program shall be established. Whenever suitable, deice and anti-ice with only Type I.

i. In order to detect dried residues, it may help to spray a water mist onto the affected surfaces. This causes the dried residues to rehydrate and swell into a gel.

j. Anti-icing of the lower side of the wings and/or horizontal stabilizer and elevator is normally not foreseen. However, if these surfaces must be deiced, the deicing fluid freezing point must be low enough to prevent refreezing.

k. With regard to holdover time provided by the applied fluid, the objective is that it is equal to or greater than the estimated time from the start of anti-icing to the start of take-off based on existing weather conditions.

l. Aircraft shall be treated symmetrically, that is, left hand and right hand side shall receive the same and complete treatment, even when only one side of the aircraft needs treatment. Anti-icing treatments shall always cover the entire wing, the entire vertical stabilizer/rudder and horizontal stabilizer/elevator on both sides of the aircraft.

WARNING: The aircraft is considered UNSAFE if this requirement is not met.

m. During anti-icing and deicing, the moveable surfaces shall be in a position as specified by the aircraft manufacturer.

n. On Remote Deicing Pads (CDF) engines shall remain running at idle or can be shut down during deicing/anti-icing operations. Air conditioning and/or APU bleed air shall be selected OFF, or as recommended by the airframe and engine manufacturer. Avoid spraying deicing/anti-icing fluid directly into the engine inlet core.

2.5.4 Anti-icing Fluid Application Strategy

a. The process of anti-icing should be continuous and as short as possible.

b. Anti-icing should be carried out as near to the departure time as possible in order to utilise available holdover time.

c. The anti-icing fluid shall be distributed uniformly and with sufficient thickness over all surfaces to which it is applied. In order to control the uniformity, all aircraft surfaces shall be visually checked during application of the fluid.

d. For a Type I fluid, a minimum of 1 litre/square metre shall be used, with a nozzle temperature of at least 60°C (140°F).

e. For Type II or Type IV fluids, (non-Newtonian fluids), a sufficient amount is indicated by fluid just beginning to run off of the leading and trailing edges of horizontal surfaces. Apply sufficient fluid to achieve an even, uniform layer, typically achieved by using 1 to 3 L/m2, depending on the type of non-Newtonian anti-icing fluid used.

f. For fluids which form a more static layer, the minimum quantity required will typically be 1 litre/square metre applied in an even layer across the surface.

g. For further guidance on the amount of fluid, refer to the fluid manufacturer's documentation.

h. Spray from the leading edge to the trailing edge on wings, horizontal and vertical stabilisers. The following surfaces shall be treated as specified by the aircraft manufacturer's documentation:

1. Wing upper surfaces including leading edges and upper control surfaces;
2. Wing tip devices;
3. Both sides of vertical stabilizer and rudder to receive anti-ice protection when freezing precipitation conditions exist;

4. Horizontal stabilizer upper surfaces including leading edges and elevator upper surfaces;

5. When necessary fuselage upper surfaces dependent upon the amount and type of freezing precipitation (this is especially important on centre-line engine aircrafts).

CAUTION: *Anti-icing fluids may not flow evenly over wing leading edges, horizontal and vertical stabilizers. These surfaces should be checked to ensure that they are properly coated with fluid.*

i. It is the responsibility of the Deicing Service Provider to ensure that the surfaces mentioned above are free of frost, snow, slush, or ice prior to the start of the anti-icing treatment and that on completion of the treatment these surfaces are fully covered with an adequate layer of anti-icing fluid.

Note: SAE Type II, III and IV fluids used for anti-icing purposes are normally applied unheated on clean aircraft surfaces, but they may be applied heated and diluted for a one-step procedure. Refer to the fluid manufacturer's recommendation.

CAUTION: *A deicing/anti-icing treatment should be continuous and as short as possible. If a treatment is interrupted (for example a truck running out of fluid), the cockpit crew shall be immediately informed stating:*

- *The reason for the interruption*
- *Actions to be taken (in consultation with the cockpit crew)*
- *Expected time of delay*

Before continuing the treatment:

- *Inform the cockpit crew*
- *Establish in consultation with the cockpit crew, the further treatment to be carried out, including any surfaces requiring re-treatment in relation to holdover time*

Carry out the treatment as agreed.

Note: Procedures in Anti-Icing Fluid Application Strategy should be followed if an anti-icing treatment is to be performed on the aircraft.

2.5.5 Clear Ice Precautions

a. Clear ice can form on aircraft surfaces below a layer of snow or slush. It is, therefore, important that surfaces are closely examined following each deicing procedure, in order to ensure that all deposits have been removed.

b. Significant deposits of clear ice can form in the vicinity of the fuel tanks, on wing upper surfaces as well as underwing.

c. Aircraft are most vulnerable with regard to this type of build-up when one or more of the following conditions exist:

1. Wing temperatures remain well below 0°C (32°F) during the turnaround/transit;
2. Ambient humidity is high and/or precipitation occurs while the aircraft is on the ground;
3. When frost or ice is present on lower surface of either wing;
4. Ambient temperatures between -2°C (28°F) and +15°C (59°F) are experienced, although clear ice may form at other temperatures if the other three conditions listed above exist.

CAUTION: *Clear ice formation is extremely difficult to detect. Therefore, when the above conditions prevail, or when there is otherwise any doubt that clear ice may have formed, a close examination shall be made visually and/or physically prior to departure, in order to ensure that surfaces are free of clear ice. If clear ice is believed to be present, deicing is required.*

Note: Low wing temperatures associated with this type of build-up normally occur when large quantities of cold fuel remain in wing tanks during the turnaround/transit and any subsequent refuelling is insufficient to cause a significant increase in fuel temperature.

2.5.6 Manual Removal of Snow

a. Snow must be removed from a parked aircraft regularly. This will ensure that a large quantity of snow will not collect and possibly freeze on the aircraft surface.

b. Where aircraft are laden with snow, brushing must be considered as the primary method of removing snow whenever conditions permit providing safety is not compromised.

CAUTION: *Extreme care must be exercised whenever manual methods are employed to protect the highly sensitive and often fragile sensors and navigational antennas. Where these are hidden by snow or other depths of contamination, deicing fluid is to be used to clear the contamination permitting visual location of these items. Only once these items are visible can mechanical snow removal commence. In the event that the locations of aerials or other vulnerable items are unknown, the Duty Engineer or Pilot-in-Command is to be contacted for advice on how to proceed.*

c. Pitot probes, static ports, angle of attack sensors and vortex generators are also vulnerable to damage when employing manual methods of removal.

d. When sweeping contamination off an aircraft, great care must be taken to use motions which pull contamination away from any openings and ensure that contamination is not forced into openings on the wings or stabilizers.

e. Soft bristled brushes may be used to remove contamination from aircraft surfaces to alleviate damage to the aircraft skin.

f. The brush that is employed to sweep contamination from the aircraft should not be used for any other purpose, e.g. to break ice or sweep snow from floors or other surfaces.

g. Soft bristled brushes are very useful in removing contamination from aircraft windows and/or other sensitive areas where the application of hot fluid is either best avoided or prohibited.

CAUTION: *Extra attention should be paid to safety when removing contamination with a soft bristled brush, especially when combined with the tendency to stretch the reach with a brush.*

Personnel must be certain that their working platform is safe to use and that relevant PPE i.e. harnesses are employed correctly. Slippery surfaces can make this exercise more dangerous than normal.

h. Forced air, if available, can avoid the need to manually remove snow from the aircraft as the forced air stream can be utilized to blow snow from the surfaces of the airframe.

Note: Clean surfaces after a manual deicing procedure shall **not** be considered as an anti-icing procedure.

2.6 AIRCRAFT REQUIREMENTS FOR DEICING/ANTI-ICING

Following the deicing/anti-icing procedures and prior to take-off, the critical aircraft surfaces shall be free of all frost, snow, slush, or ice accumulations in accordance with the following requirements:

2.6.1 Wings, Tails and Control Surfaces

Wings, tails and control surfaces shall be free of frost, snow, slush or ice unless the aircraft manufacturer and state regulatory authority permits that a coating of frost may be present on wing lower surfaces in areas cold soaked by fuel between forward and aft spars; and/or on upper wing surfaces within defined areas, in accordance with the aircraft manufacturer's published documentation.

Note: With the exception for frost due to cold-soaked fuel as mentioned above, and unless otherwise specified in this Manual or other aircraft manufacturer's documentation, contamination is not acceptable on: the upper or lower surfaces of the horizontal stabilizer and elevator/tab; strakes; inboard, outboard, upper, and lower surfaces of the wing and wing tip devices; and either side of the vertical stabilizer and rudder.

2.6.2 Pitot Tubes, Static Ports and All Other Air Data Sensing Devices

Pitot tubes, static ports and other air data sensing devices shall be free of frost, snow, slush, ice and fluid.

CAUTION: *Deicing/anti-icing fluid spray shall not be directed into the orifices of pitot tubes (heads), static ports/vents, or directly onto air stream direction detectors probes/angle of attack airflow sensors. This includes all openings.*

Note: Ice ridges can form on the nose of the fuselage while on the ground. These ridges will disrupt air flow into the pitot tubes and which can result in false measurements. All contamination shall be removed from this area.

2.6.3 Engines

Engine inlets (including the leading edge), exhaust, cooling intakes, control system probes and ports shall be free of frost, snow, slush, or ice. Engine fan blades, propellers (as appropriate) and spinner cones shall be free of frost, snow, slush, or ice and shall be free to rotate.

CAUTION: *All reasonable precautions shall be taken to minimize fluid entry into engines, APU, other intakes/outlets, and control surface cavities. Refer to manufacturer documentation. Deicing/anti-icing fluid spray shall not be directed into engine core or directly onto engine probes/sensors.*

2.6.4 Air Conditioning Inlets and Outlets

Air inlets, outlets, pressure-release valves and outflow valves shall be free of frost, snow, slush, or ice and shall be unobstructed.

2.6.5 Landing Gear and Landing Gear Doors

Landing gear and landing gear doors shall be unobstructed and free of frost, snow, slush or ice. Do not spray deicing/anti-icing fluids directly onto wiring harnesses and electrical components (receptacles, junction boxes, etc.,) brakes, wheels, exhausts or thrust reverser's.

2.6.6 Fuel Tank Vents

Fuel tank vents shall be free of frost, snow, slush, or ice.

2.6.7 Fuselage

The fuselage shall be free of ice, slush and snow. In accordance with the aircraft manufacturer's documentation, frost may be present on the fuselage for take-off within specified amounts provided that no other forms of contamination are present, and inlets, outlets and other devices (as identified by the aircraft manufacturer) are free of contamination.

2.6.8 Flight Deck Windows and Nose or Radome Area

Any significant deposits of frost, snow, slush, or ice on the windscreens or on areas forward of the windscreens shall be removed prior to departure. Heated flight deck windows will not normally require deicing. Any forward area from which fluid may flow back onto windscreens during taxi or subsequent take-off shall be free of fluid prior to departure.

Note: During falling precipitation, heated windows may cause liquid runoff, which can then result in the liquid refreezing and ice ridges forming. These will need to be removed prior to departure.

2.6.9 Dried Thickened Fluid Residues When the Aircraft Has Not Been Flown After Anti-Icing

Dried thickened-fluid (SAE Type II, or Type IV) residues can occur when surfaces have been deiced/anti-iced but the aircraft has not been flown and has not been subject to precipitation. The fluid may then have dried on the surfaces. In such situations, the aircraft must be checked for dried residues from thickened fluids and cleaned as necessary.

2.6.10 Special Maintenance Considerations

Proper account should be taken of the possible side-effects of fluid use. Such effects may include, but are not necessarily limited to, dried and/or rehydrated residues and the removal of lubricants. Refer to WOM section Repeated Application of Type II/IV De-/Anti-icing Fluids.

2.7 REMOVAL OF CONTAMINATION

2.7.1 Preparation

a. On gate contamination removal by deicing or other advanced technology methods may be completed prior to pilots boarding the aircraft. In this case the aircraft will not have been configured for deicing.

b. Once the pilots are on-board, the aircraft pilots should still inspect the aircraft to confirm whether or not the aircraft complies with the clean aircraft concept, or requires further deicing. In this case the aircraft will be configured for deicing.

c. In general, prior to the application of de/anti-icing fluids all doors and windows may be closed and all service vehicles/personnel should be clear to prevent:

   1. Galley floor areas being contaminated with slippery deicing fluids;
   2. Upholstery becoming soiled;
   3. Vehicles/personnel becoming contaminated with fluid.

d. However, when ramp activities have been completed and all doors, except the forward passenger door, are closed, it is permissible to start deicing/anti-icing surfaces well away from the open door, provided that:

   1. The Pilot-in-Command is informed and has agreed to this procedure before spraying;
   2. The passengers and staff will not be subjected to fluid overspray;
   3. Fuselage in the vicinity of the open door is not treated;
   4. Wind conditions are such that fluid or fluid overspray cannot reach the passenger door area.

This procedure is not permitted if passengers are boarding the aircraft via open stairs. At a remote deicing location, the aircraft can be de-/anti-iced with or without engines running.

2.7.2 Hazards During Deicing

a. Personal hazards:

1. We should all be aware of the potential effect on health of deicing and anti-icing fluids.
2. All deice fluids cause some irritation upon contact with the eyes or the skin.
3. Persons with sensitive skin may experience a reddening.
4. Although the irritation is described as “negligible”, chemical manufacturers recommend avoiding skin contact with deice fluids.
5. If contact is made wash the skin with warm water and soap. In case of eye contact, wash the eyes immediately.
6. Persons must stay clear of the dangerous areas in front of or in back of an engine and in the APU exhaust when they operate.

WARNING: Walking on the wings or the horizontal stabilizers is not permitted on easyJet aircraft. This can be a highly dangerous practice especially when ice or snow is adhered to the aircraft surfaces. Appropriate access equipment must be used at all times to carry out contamination checks.

b. Environmental hazards:

1. Deicing/anti-icing fluid is a chemical product with environmental impact.
2. During fluid handling, avoid any unnecessary spillage and comply with local environmental and health laws and the manufacturer’s safety data sheet.

c. Auxiliary Power Unit (APU):

1. Uncontained failures of the auxiliary power unit (APU) have occurred due to the ingestion of deicing fluid into the APU inlet while the APU was running.
2. Normal deicing spraying/deicing fluid mist will not lead to an uncontained APU failure, but a failure might be caused by neat deicing fluid entering the APU inlet as a result of misdirection through human error, or natural phenomena such as wind.
3. An uncontained failure of the turbine wheel of the APU may occur due to over speed and result in serious damage to the aircraft and could cause serious injury to ramp operatives, crew and passengers.

4. Deicing fluid may act as an additional fuel resulting in runaway acceleration leading to the failure.

d. Any incident relating to de-/anti-icing procedures should be reported to the operating crew, local engineering staff and the deicing service provider's local management, followed up by a Ground Safety Report in SafetyNet.

2.7.3 Contaminated Critical Surfaces

a. Since the temperature of the external surfaces of the aircraft can be below freezing, ice can occur and attach to the surface.

b. There can be clear ice below the layer of snow or slush, which is not easy to find.

c. Make sure that all contamination is removed from required aircraft critical surfaces after the de/anti-ice procedure.

d. It may be necessary to perform a tactile test.

e. Do not use hard or sharp tools to remove the ice from the aircraft surface.

2.7.4 Symmetrical Treatment

Aircraft should be treated symmetrically, that is, left-hand and right-hand side shall receive the same treatment, even when only one side of the aircraft is contaminated.

2.7.5 Application

a. Various fluid applications can be used to remove contaminants from the aircraft surfaces. See AS6285 section 5.4.

b. Apply the fluid at low angle to prevent damage to the aircraft surfaces.

c. Do not use a high pressure spray to blow the ice and snow off the aircraft surfaces.

d. For the best result in ice or snow removal, increase the temperature of the deicing fluid to a minimum temperature of 60°C, at the nozzle.

e. The upper temperature limit shall not exceed fluid and aircraft manufacturer’s recommendations.

f. A fine to medium spray is recommended to apply the fluid across a large area of ice or snow. This will cause the ice or snow to melt the fastest.

g. A solid flow of fluid is recommended to flush the ice or snow from the aircraft surfaces. Make sure the maximum force of the solid flow of fluid on the surfaces is not more than 10 psi on an area of 161.3 square centimetres. This will prevent damage to the surfaces.

h. Loose snow or slush may first be brushed off surfaces to reduce overall fluid consumption.

2.7.6 Wing Flaps

a. If the aircraft encounters severe icing conditions during approach, or lands on a runway contaminated with snow, slush or ice, the Pilot-in-Command will leave the flaps and slats extended when arriving on stand.

b. The Captain may also leave the flaps and slats extended where there is a possibly of being contaminated during the approach or landing.

c. Inspection of the flaps should be carried out by either the Pilot-in-Command or an Engineer.

d. Removal of contamination from the flaps should be carried out by the deicing service provider under supervision if requested.

e. Fluid should be sprayed at very low pressure in order to loosen the deposits. A brush can then be used to remove the deposits, together with as much of the deicing fluid as possible.

f. Care should be taken at all times when spraying in the wing flap area and would recommend that deicing operators are suitably trained to carry out this task.

g. Aircraft wing flaps should be treated symmetrically, that is, left-hand and right-hand side shall receive the same treatment, even when only one side of the aircraft is contaminated.

2.7.7 Wing and Tail Surfaces

a. Care must be taken when removing ice and snow from the wing and tail surfaces near the vortex generators, otherwise damage can be caused.

b. Do not push ice or snow into the openings around the flight control surfaces during the removal procedure.

c. Deicing/anti-icing fluid should be sprayed from the leading edge to the trailing edge of wings and horizontal stabilizers. Do not spray from the rear.

d. Wings, tail and control surfaces shall be free of ice, snow, slush, and frost except that a coating of frost may be present on wing lower surfaces in areas cold soaked by fuel between forward and aft spars in accordance with the aircraft manufacturer's published documentation.

Note 1: Landing gear and wheel bays shall be kept free from build-up of slush, ice, or accumulations of blown snow.

Note 2: When removing ice, snow, or slush from aircraft surfaces care shall be taken to prevent it entering and accumulating in auxiliary intakes or control surface hinge areas.

Note 3: Frost or any other contamination is not acceptable on the lower side of the horizontal stabilizer and elevator, unless specified otherwise in the AMM or other aircraft manufacturer's documentation.

2.7.8 Lower Wing Surface (Under Side of Wing) Deicing Procedures

a. Treatments must be symmetrical and may include flaps and lower surfaces.

b. Spray the affected areas with a heated fluid/water mixture suitable for a one-step procedure as required, and then spray the same areas under the other wing.

c. Both wings must be treated identically (same areas, same amount and type of fluid, same mixture strength), even if the frozen contamination is only present under one wing.

d. Holdover times do **not** apply to underwing treatments.

Note: Where Local Area Deicing or Underwing Only Deicing has been carried out the Type of Fluid used as well as the statement the Holdover Times does not apply shall be given to the Pilot-in-Command.

e. It is the responsibility of the Deicing Service Provider to ensure that the treatment is performed symmetrically and that on completion all frozen deposits (with the possible exception of frost, which may be allowed), have been removed.

f. When it is confirmed that the treated areas are clean, the following statement shall be given to the flight crew: "Underwing deicing only, holdover times do not apply".

CAUTION 1: *Underwing frost and ice are usually caused by very cold fuel in the wing tanks. A light coating of frost up to 3 mm in thickness may be present on wing lower surfaces in areas cold soaked by fuel, however any contamination outside of this must be removed.*

CAUTION 2: *Extra caution shall be taken when performing underwing deicing to ensure deicing fluid does not contaminate other parts of the aircraft such as landing gears, brakes and engines. If a ground nozzle is available on the deicing truck, this shall be used to perform this part of the treatment.*

2.7.9 Local Wing Frost Removal/Spot Deicing

a. For frost limited to small patches on the upper wing surface only, and where no precipitation is falling or expected, "local area" deicing may be carried out.

b. Spray the affected area with a suitable heated fluid/water mix, and then spray the same area on the other wing.

c. Both wings must be treated identically, even if the frost is only present on one wing.

d. The person releasing the aircraft must check that all frozen deposits have been removed, and then report details of the treatment to the Pilot-in-Command.

e. The frost removal may only be performed symmetrically.

f. Multiple frost patches may be treated. (One per wing and position symmetric to the opposite wing).

g. When no precipitation is falling or expected, and when there is no active frost a “local area” deicing may be carried out under the below mentioned or similar conditions.

h. In some cases a full or complete deicing is not necessary: when the presence of frost and/or ice is limited to localised areas on the surfaces of the aircraft and no holdover time is applicable, only the contaminated areas will require treatment. This type of contamination will generally be found on the wing and/or stabilizer leading edges or in patches on the wing and/or stabilizer upper surfaces. Spray the affected area(s) with a heated fluid/water mixture suitable for a one-step procedure. Both sides of the wing and/or stabilizer upper surfaces shall receive the same amount and type of fluid at the same concentration; the same area in the same location on each wing/stabilizer shall be sprayed including when conditions would not indicate the need for treatment of both wings/stabilizers.

i. It is the responsibility of the Deicing Service Provider to ensure that the treatment is performed symmetrically and that on completion all frozen deposits have been removed. After this check has confirmed that the areas are clean the following statement shall be given to the flight crew: “Local area deicing only. Holdover times do not apply”.

Note 1: Holdover times do not apply.

Note 2: Where Local Area Deicing or Underwing Only Deicing has been carried out the Type of Fluid used as well as the statement the Holdover Times does not apply shall be given to the Pilot-in-Command.

CAUTION: *Localised treatment is only permissible when deicing and when both wings are treated identically. When anti-icing is performed, the entire wing and/or entire horizontal stabiliser/elevator on both sides of the aircraft must be treated.*

2.7.10 Fuselage

Care shall be taken when removing ice and snow from the fuselage area where there are lights and antenna, otherwise damage can be caused.

2.7.11 Frozen Contamination on Nose Cone Forward of the Flight Deck Windows

a. Care shall be taken when removing ice and snow from the fuselage area where there are lights and antenna, otherwise damage can be caused.

WARNING: **Where possible Type II or Type IV fluids should not be sprayed forward of the front passenger door. The radome needs deicing in many cases and also anti-icing. Caution must be taken so that fluids would not flow in large**

quantities on the cockpit windows during take-off (if the radome has been treated). Static ports and pitot tubes may need inspection. Any contamination like, e.g., ice and drain off fluid, shall be removed from these areas.

If Type II, or Type IV fluid has been used, all traces of the fluid on the Nose Cone and flight deck windows shall be removed prior to departure, with particular attention paid to windows fitted with wipers. Thickened-fluid (Type II, or Type IV) can be removed by using a diluted Type I mixture, water (where it has been determined that refreezing will not occur), a manual method (ensuring that windscreen heat is turned off), or another cleaner as approved by the aircraft manufacturer.

Care should also be taken not to spray fluid directly at door seals, around door aperture as fluid may work its way into the door seals.

b. Diluted Type I fluids may be used to deice the radome and remove thickened fluids from the Cockpit Windows.

c. During falling precipitation, heated windows may cause liquid runoff to freeze near sensors, requiring deicing.

d. Soft bristled brushes or squeegees may also be used as an alternative if Type I fluid is not available.

e. Snow can also be removed by using forced air if available on the deicing rig.

f. When windscreens have inadvertently been contaminated with Type II or Type IV fluid during the deicing/anti-icing operation, they will require cleaning prior to departure (use of a low freezing point windscreen washing fluid is recommended when the OAT is at or below 0°C).

g. If Type II or Type IV fluids are the only alternative, all residual Type II or Type IV fluid must be totally removed prior to departure.

2.7.12 Pilots' Windshield and Passenger Windows

a. Avoid spraying thickened fluids (Type II or Type IV) near flight deck windows.

b. Soft bristled brooms/brushes and squeegees may be used to remove snow from this area using suitable access equipment (such as open basket deicing vehicle or cherry picker).

c. Diluted Type I fluids may be used to deice the radome and remove thickened fluids from flight deck windows.

d. Heated flight deck windows will normally not require deicing.

e. Where deicing is performed remotely (CDF) using thickened fluids it is recommended that contaminants forward of the front doors are removed prior to pushback to minimise the risk of thickened fluid flowing onto the windscreen.

Note: Fluid spray may be directed above the flight deck and cabin windows and allowed to flow over.

2.7.13 Ice Ridges

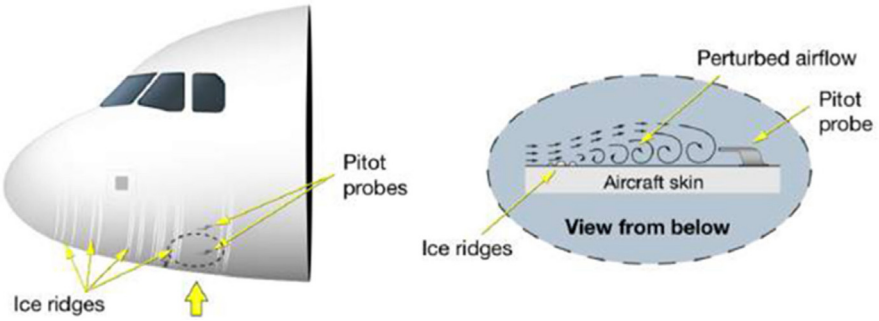
a. Ice ridges forming on the lower nose fuselage can be hazardous and shall be removed prior to flight.

b. Ice ridges can form largely as a result of ice accretion during a long stay in cold conditions or from melting ice from a heated windshield refreezing again in ridges on the lower fuselage.

c. If ice ridges are not removed it is possible that these may remain attached for the entire flight.

d. Ice ridges located forward of pitot probes and multifunction probes (on A350 & A380 aircraft) can cause perturbed airflow and can cause unreliable airspeed measurement.

Note: Ice ridges can form on the nose of the fuselage while on the ground. These ridges will disrupt air flow into the pitot tubes and which can result in false measurements. All contamination shall be removed from this area.



2.7.14 Engines and APU

a. Deposits of snow should be mechanically removed from engines prior to departure.

b. Any frozen deposits that may have bonded to either the lower surface of the intake or the fan blades.

c. These frozen deposits may be removed by hot air or other means recommended by the engine manufacturer.

d. Engine fan blades deicing falls under the responsibility of engineering.

e. Do not point a spray of deicing/anti-icing fluid directly into the following areas:

1. Inlet ducts for the engine or APU;
2. Exhausts;
3. Engine thrust reverses;
4. Engine;

5. Inlet probes attached to the strut;
6. Engine bleed air ducts;
7. The APU blow out panel;
8. Over wing emergency slide panels.

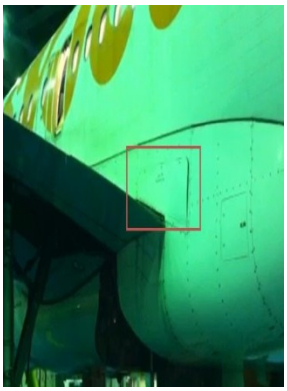
CAUTION: *Extreme caution should be taken when spraying in the APU area when deicing and anti-icing. Deicing fluid ingestion into the APU can cause considerable damage with serious consequences in regards to passenger environment and the safety of the aircraft.*

2.7.15 Over-Wing Emergency Slide Panels

Extreme caution should be taken when spraying in the Over-Wing Emergency Slide Panels area when de-/anti-icing as fluid can ingress into the emergency slides.

For clarity, the following photographs illustrate the position of the Over-Wing Emergency Slide Panels, APU Air Inlets, Tailpipe and Blow-Out Panel.

Over-Wing Emergency Slide Panels ▼



Airbus – APU Air Inlet ▼

Airbus – APU Tailpipe ▼

APU Blow-Out Panel ▼

2.7.16 Engine Inlets and Fan Blades, Aircraft Probes and Sensors, and Other External Aircraft Instruments

a. Engine inlets and fan blades, aircraft probes and sensors, and other external aircraft instruments need deicing in some cases.

b. Engine inlets can generally be cleaned with a brush or manually by hand.

c. Engine covers may be installed after engine shut down in order to minimize engine ice build-up.

d. Fan blades and the bottom of the engine air inlet needs to be deiced with hot air (noting manufacturer recommended temperature limits), or other means recommended by easyJet and the engine manufacturer.

WARNING: **No deicing fluid is to be sprayed into engines.**

e. Aircraft external instruments, probes, and sensors may need deicing and this should be performed in accordance with the aircraft manufacturer (e.g., aircraft own deicing system, manually or hot air).

Note: These tasks should only be performed by qualified Engineering Staff, with the exception of the use of hot air to remove contamination from engine fan blades. This task can be undertaken by an approved Deicing Service Provider with prior agreement from easyJet. It is the Deicing Service Provider's responsibility to ensure their staff are trained to carry out this task.

CAUTION: *When using hot air to remove fan blade contamination, under no circumstances should the engine fan blades be touched. If any contact is made, this must be reported to the Commander immediately.*

2.7.17 Air Conditioning Inlets and Outlets

Air inlets, outlets, pressure-release valves, and outflow valves shall be free of frost, snow, slush, or ice, and shall be unobstructed.

Note: These tasks should only be performed or supervised by Qualified Engineering Staff.

2.7.18 Removal of Contamination from Exterior of Engine Nacelles

a. Departure is not permitted if the engine nacelles are contaminated with ice, snow or slush. (A coating of frost on the engine nacelles is permitted).

b. Deposits of snow or slush shall be manually removed from the exterior of engine nacelles by using a soft brush.

c. Application of hot air or manual application of warm deicing fluid using a rag is also permissible as long as all excessive deicing fluid is removed. These methods are used only for removal of contamination from the exterior of engine nacelles and may be performed by appropriately trained personnel.

Note: Airbus A320 Family AMM states that the Hot Air Blower maximum operating temperature is 55 degrees Celsius (131°F).

d. Some residue fluid from deicing/anti icing the leading edge is likely to deposit onto the engine pylon area and top of the engine cowlings. This contamination can be manually removed with a cloth or soft brush.

2.7.19 Landing Gear and Landing Gear Doors

a. Removal of ice and snow from the landing gear is to be carried out by the use of a hot air blower.

b. In order to protect both the aircraft and personnel with hazards associated with the provision of hot air, reference should be made to engine manufacturer and/or operator instructions in regard to the maximum allowable temperature of the hot air.

c. Landing gear and landing gear doors shall be unobstructed and free of frost, snow, slush, or ice.

d. Do not spray deicing/anti-icing fluids directly onto wiring harnesses and electrical components (receptacles, junction boxes, etc.,) brakes, wheels, exhausts, or thrust reversers.

e. Do not spray deicing fluid directly onto wheels and brakes.

f. Remove all ice and snow from the landing gear; paying particular attention to uplocks, downlocks, sensors, door mechanisms, and steering systems.

Note 1: It may be possible to mechanically remove accumulations such as blown snow, however, where deposits have bonded to surfaces they can be removed by the application of hot air.

Note 2: Airbus A320 Family AMM states that the Hot Air Blower maximum operating temperature is 55 degrees Celsius (131°F).

2.7.20 Brakes

a. When deicing or anti-icing the aircraft, protect the wheels and brakes from fluid contamination by using the following methods:

1. Do not direct a spray of deicing or anti-icing fluids at the wheels or brakes.
2. Use suitable covers on the wheels and brakes when operationally feasible.
3. Ensure that the parking brake is applied to reduce incidental contamination of brake friction surfaces when operationally feasible.

2.7.21 Drains

Do not point a fluid spray at the waste water and condensation drain areas.

2.7.22 Fuel Tank Vents

Fuel tank vents shall be free of frost, snow, slush, or ice.

2.7.23 Doors

a. Deicing fluid shall **not** be sprayed into the door openings.

b. Do not open the cargo door if it is not necessary.

c. Care should also be taken not to spray aircraft deicing fluid directly at door seals, around door aperture as fluid may work its way into the door seals.

2.7.24 Miscellaneous

a. Extreme care is required when applying deicing/anti-icing fluid to an aircraft around the following areas:

1. Pitot probes;
2. Static ports;
3. TAT sensors;
4. Angle of Attack (AOA) sensors;
5. Aircraft doors/door seals;
6. Over Wing Emergency Slide Panels.

Note: Pitot tubes, static ports, and other air data sensing devices shall be free of frost, snow, slush, ice, and fluid.

b. Ensure that particular attention is paid to these areas during the arrival and departure walk-arounds to ensure that they are clear of deicing fluid or fluid residue.

c. Any blockages should immediately be reported to the Pilot-in-Command or Engineer.

d. Fluctuating and inaccurate airspeed and altimeter indications after take-off have been attributed to static ports obstructed by ice formed while the aircraft was on the ground.

e. Precipitation or water rundown after snow removal may freeze on or near the static ports. This may cause an ice build-up, which disturbs airflow over the static ports resulting in erroneous airspeed and altimeter readings, even when static ports appear to be clear.

f. Local engineering will assess the requirement for probes to be covered with protective blanks prior to deicing or anti-icing treatment.

2.7.25 Ground Service Equipment (GSE)

a. It may be operationally necessary to anti-/deice on stand with some GSE in position.

b. Appropriate steps must be taken to minimise/avoid spraying of such equipment, which may affect the timing/sequence of the deicing process.

c. Appropriate precautions must be taken to ensure safety is not compromised as a result of, for example, deicing fluid creating a slip hazard on steps.

2.8 OFF-GATE DE/ANTI-ICING PROCEDURES

2.8.1 Central Deicing Facilities/Remote Deicing/Anti-Icing

a. During off-gate deicing/anti-icing a two-way communication between pilot and deicing/anti-icing operator/supervisor/pad coordinator shall be established prior to the deicing/anti-icing treatment. This shall be done by VHF radio or alternatively message boards.

b. In case VHF is used, the registration of the aircraft should be used (instead of flight number) during all communications.

c. During 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, post-deicing/anti-icing report, Anti-Icing Code, etc.).

d. Contact with pilot may be closed after post-deicing/anti-icing report Anti-Icing Code and readiness for taxi-out has been announced.

e. When off-gate deicing/anti-icing area is entered by taxiing, a sufficient taxi and stopping guidance shall be arranged, or marshaller assistance shall be given.

f. In case radio contact must be established before entering the deicing/anti-icing area, the signs with clearly marked operation frequency must be visible from the cockpit before entering this area.

g. The deicing/anti-icing service provider, together with the airport authorities, must publish all necessary information about how to operate on the off-gate site by NOTAM or in the local AIP. This information has to include at least:

   1. The location of the deicing/anti-icing area;
   2. The standard taxi routing to the deicing/anti-icing area;
   3. The means to coordinate the deicing/anti-icing operation;
   4. The means to communicate before and during the deicing/anti-icing operation; and
   5. Information about taxi and stopping guidance.

h. The responsibility to determine the need for deicing/anti-icing is the responsibility of the easyJet Pilot-in-Command.

i. After treatment, the result shall be checked by a trained and qualified person and the Post-Deicing/Anti-Icing Report/Anti-Icing Code shall be given to the Pilot-in-Command, after which the Pilot-in-Command is responsible for the airworthiness of the aircraft.

2.8.2 Deicing Rig Movements

a. The procedure on where to park ground vehicles and when to move around the aircraft shall be in place.

b. The operation must have predetermined procedures established on how to move from one location to another, how to coordinate the operation, and how to communicate, etc.

c. There shall be no movement on the pad without a clear signal from the pad coordinator.

d. Deicing/anti-icing operation shall not be performed before the aircraft is ready and the Pilot-in-Command has given a go ahead.

2.8.3 Aircraft Throughput

GHPs, Deicing Service Providers and Airport Authorities, including ATC, should plan to maximise aircraft throughput to ensure minimum delays to aircraft departures.

2.8.4 Safety Areas

a. The remote area may be able to handle different size aircraft at different positions or the area is set with a predetermined A/C stand procedure.

b. As earlier mentioned, no movement shall be made on the pad without clearance from the pad coordinator.

c. The vehicles shall stand in a safety area before and after the deicing/anti-icing is performed. This area shall be of sufficient size and placed where there is no risk of interfering with nearby aircraft moving to and from the pad.

d. When deicing operations are performed simultaneously on nearby positions caution must be taken and the safety area should be of sufficient size to hinder the vehicles from colliding when positioning themselves inside the safety area.

e. The safety area can be positioned either on both sides of the aircraft or on the end of the pad from where the ground vehicles move in each case.

f. It is highly important to note that whenever giving the final release, the vehicle must be inside the safety area.

2.8.5 Pad Coordinator

a. The pad coordinator is responsible for the movement of aircraft and ground vehicles on the remote pad and no movement shall be made without the coordinator's clearance.

b. A remote area does not exclude the need for anti-icing even if the area is close to the runway. Whenever there is precipitation, some form of anti-icing shall be performed and as earlier noted Type I fluids have limited holdover times that may not be sufficient if the A/C needs to stand in line or hold before departure.

2.8.6 Theoretical and Practical Training

a. The procedure used for deicing and anti-icing at the remote area differs somewhat from a general gate deicing. The main difference is perhaps that the engines are running and additional procedures are required for the operation, such as added communication, safety area and positioning, coordination control, multiple vehicle deicing, etc.

b. All variations and differences from gate deicing must be included in both theoretical and practical training.

c. If a mix operation is common procedure, then it must be clear that the deicing operators are able to perform both duties and operate all equipment (if there are variations).

d. Precautions must be noted, such as jet blast, engine inlet suction, APU running, moving aircraft, etc.

Note 1: Operatives that are trained to carry out tasks on the Remote Deicing Pads shall receive annual recurrent training to ensure that they are fully conversant with the Pad's Safety and Standard Operating Procedures.

Note 2: Training programs shall follow the guidelines and recommendations published in AS6286.

2.8.7 Remote Pad Limitations

Certain limitations may apply, such as snow or ice in areas on the aircraft that is difficult (or comprises some hazard) to deice at the remote pad and needs to be pre cleaned before taxiing to the area.

2.8.8 Safety Precautions

a. The general safety concept while deicing/anti-icing aircraft with engines running is to avoid the engine inlet and exhaust (jet blast).

b. Specific procedures and equipment must be employed e.g., to enable effective 'front to rear' deicing of aircraft surfaces in accordance with safe operating practices as follows:

1. Always stay out of the jet blast area with the deicing/anti-icing equipment.
2. Always stay out of the engine ingestion area with the deicing/anti-icing equipment. Danger areas can vary depending on the type of the aircraft.
3. Never spray deicing/anti-icing fluid into the engine intake.

c. The equipment should be positioned in such a way that there is no danger of suction of foreign objects in the engines or that the jet blast could tilt the deicing vehicle or cause dangerous situations.

d. To avoid straying into the jet blast area it is highly recommended that the deicing vehicles used on Remote Deicing Pads/CDF are fitted with an 'anemometer' on the front of the vehicle with the reader positioned in the vehicle cab. This will ensure that the driver is aware of the jet blast speeds.

e. With proper movement and positioning of the vehicle and boom extension, the procedure can be safely performed with regards to the aircraft engine safety areas.

2.9 POST-DEICING/ANTI-ICING CHECK AND TRANSMISSION OF THE POST-DEICING/ANTI-ICING REPORT TO THE FLIGHT CREW

a. It shall be clearly defined which company is responsible for conducting the post-deicing/anti-icing check and providing the flight crew with the post-deicing/anti-icing report/anti-icing code.

b. If two different contracted companies are involved in the deicing/anti-icing treatment and post-deicing/anti-icing check, it must be ensured that the post-deicing/anti-icing communication is not given before the post-deicing/anti-icing check has been completed.

c. The company conducting the deicing/anti-icing treatment shall be responsible for the treatment and transmit all information about the treatment to the company conducting the post-deicing/anti-icing check.

d. The company conducting the post-deicing/anti-icing check shall have overall responsibility for the performance of the company conducting the deicing/anti-icing treatment.

e. An aircraft shall not be dispatched after a deicing/anti-icing treatment until the aircraft has received the following visual check by qualified personnel. This check shall include:

   1. Wings;
   2. Horizontal stabilizers (both lower and upper surfaces);
   3. Vertical stabiliser;
   4. Fuselage, even if not treated, (including pitot heads, static ports temperature, and angle of attack sensors); and
   5. Any other parts of the aircraft on which a deicing/anti-icing treatment was performed according to the requirements identified during the contamination check.

f. The post deicing/anti-icing check shall be performed from points offering sufficient visibility of all treated surfaces (e.g., from a deicing/anti-icing vehicle or other suitable means of access).

g. Any contamination found shall be removed by further deicing/anti-icing treatment, and the post deicing/anti-icing check shall be repeated.

h. Before take-off, the flight crew must ensure that they have received confirmation that this post deicing/anti-icing check has been accomplished.

i. A functional flight control check using an external observer may be required after deicing/anti-icing. This is particularly important in the case of an aircraft that has been subjected to an extreme ice or snow covering.

Note: During engine(s)-on deicing operations, the access/view to certain aircraft components is restricted and cannot be checked. These areas should be inspected during the pre-flight contamination check and if treatment is required, advise the deicing personnel for further coordination and removal.

j. When the deicing/anti-icing service provider performs the deicing/anti-icing treatment as well as the post deicing/anti-icing check, it may either be performed as a separate check or incorporated into the deicing/anti-icing operation as specified below. The deicing/anti-icing service provider shall specify the method used in his winter procedures, by customer where necessary:

1. As the deicing/anti-icing treatment progresses, the deicing/anti-icing sprayer will closely monitor the surfaces receiving treatment in order to ensure that all forms of frost, snow, slush, or ice (with the exception of cold-soaked fuel frost on the lower surface of wings and light frost on the fuselage, which may be allowed per the aircraft manufacturer and state regulatory authority) are removed and that upon completion of anti-icing treatment, these surfaces are fully covered with an adequate layer of anti-icing fluid as described in AS6286.
2. When the request for deicing/anti-icing did not specify the fuselage, a visual check of the fuselage shall be performed at this time, in order to confirm that it has remained free of contamination (with the possible exception of light frost, which may be allowed as per the aircraft manufacturer and state regulatory authority).
3. Any evidence of contamination that is outside the defined limits shall be reported to the flight crew immediately and be removed by further deicing/anti-icing treatment. Then the post deicing/anti-icing check shall be repeated.
4. Once the treatment has been completed, the Deicing Operator will conduct a close visual check of the surface where the treatment commenced, to ensure that it has remained free of contamination (this check is not required for ‘frost only’ conditions).

Note: Holdover Times should not be passed to crew as relevant tables may not be carried on-board the aircraft.

CAUTION: *For the avoidance of any doubt, holdover time begins on commencement of fluid application on a one step process and at the start of application of the second step on a two-step process. HOT for a particular type of precipitation does NOT start when the aircraft first experiences that type of precipitation.*

2.10 PRE-TAKE-OFF CHECK

a. After the proper inspections, deicing and anti-icing procedures and verifications, the aircraft is ready to taxi.

b. The Pilot-in-Command shall continually monitor the weather situation after the deicing/anti-icing treatment has been carried out. There can, however, be delays before take-off and the fluid may be contaminated during precipitation. In this case a pre-take-off check should be performed.

c. The Pilot-in-Command shall assess, prior to take-off, whether the applied holdover time is still appropriate and/or if untreated surfaces may have become contaminated. This check is normally performed from inside the flight deck as a visual check. If the visual check is insufficient a pre-take-off contamination check should be performed. This check shall be performed when the applied holdover time has been exceeded or the Pilot-in-Command cannot effectively assess the condition of the critical surfaces of the aircraft. This check is normally performed from outside the aircraft.

d. The alternate means of compliance to a pre-take-off contamination check is a complete deicing/anti-icing re-treatment of the aircraft.

e. The decision whether deicing/anti-icing is required shall be determined when one or more of the following circumstances is applicable:

   1. An aircraft is parked overnight and subjected to ice or snow conditions;
   2. When ice has accumulated in flight (in-flight ice);
   3. During taxi to the gate occurring in icing and/or snow conditions;
   4. Following an inspection or check by the flight crew at a gate;
   5. As indicated by a check by a qualified deicing/anti-icing person;
   6. Active frozen or freezing falling precipitation is occurring;
   7. When cold soaked fuel has created ice or frost on critical surfaces or components;
   8. When aircraft has been deiced/anti-iced some time prior to flight crew arrival.

f. A contamination check shall include all critical surfaces and components of the aircraft as indicated by the aircraft manufacturer and shall be performed from points offering sufficient visibility of these parts (e.g., from the deicing/anti-icing vehicle, or any other suitable means of access as necessary).

g. Any contamination found on the surfaces or components of the aircraft that are critical to safe flight shall be removed by a deicing treatment; this shall be followed by anti-icing treatment when required.

h. Where an aircraft has been deiced and/or anti-iced some time prior to the arrival of the flight crew, an additional 'contamination check' shall be carried out prior to departure, in order to establish whether further treatment is required.

i. Requests for deicing/anti-icing shall specify the parts of the aircraft requiring treatment.

j. The flight crew shall continually monitor the weather conditions after the deicing/anti-icing treatment.

k. Prior to take-off a flight crew member shall assess whether the applied holdover time is still appropriate and/or if untreated surfaces may have become contaminated. This check is normally performed from **inside** the flight deck.

2.11 PRE-TAKE-OFF CONTAMINATION CHECK

a. A 'pre-take-off contamination check' is a check of the critical surfaces for contamination.

b. This check shall be performed when the condition of the critical surfaces of the aircraft cannot be effectively assessed by a pre-take-off check or when the holdover time has been exceeded.

c. This check is normally performed **outside** of the aircraft.

d. The alternate means of compliance for a pre-take-off contamination check is to perform a complete deicing/anti-icing re-treatment of the aircraft.

2.12 FLIGHT CONTROL CHECK

A functional flight control check using an external observer may be required after deicing/anti-icing. This is particularly important in the case of an aircraft that has been subjected to an extreme ice or snow covering.

2.13 EMERGENCY RESPONSE

2.13.1 Emergency During De-/Anti-Icing

a. In the event of an emergency whilst deicing is being conducted on easyJet aircraft, ground/deicing personnel will be alerted by the Deicing VHF frequency or by the flashing of the nose wheel lights and/or any other exterior lights.

b. On seeing this emergency signal, all ground/deicing personnel are to move away from the aircraft to allow emergency vehicles to approach and should stand by to assist with passenger evacuation if required.

2.13.2 Emergency Procedures

a. Whether conducting deicing/anti-icing operations at a remote location or at a centralised deicing/anti-icing facility, local procedures shall be established to ensure that both aircraft and ground emergencies are handled safely, expeditiously, and are coordinated with the local emergency plan.

b. All personnel working on or around the centralised deicing/anti-icing facility or remote deicing pad location must be trained and fully aware of safety and emergency procedures.

2.14 Forced Air Deicing

a. At easyJet approved stations ONLY, forced air deicing equipment is used to facilitate contamination removal.

b. Forced air deicing utilises an air stream to help remove frozen accumulations from an aircraft with or without deicing fluid.

c. Forced air deicing has the advantage of reducing the total amount of glycol needed for deicing, providing economic and environmental benefits.

d. Forced air only (without fluid) may be especially helpful for removing frozen accumulations from night-stopping aircraft surfaces.

e. Forced air applications (with or without fluid) may not eliminate the need for conventional de/anti-icing procedures.

f. After a forced air application has occurred, conventional deicing may be needed to ensure complete contamination removal.

g. Holdover times are not associated with forced air deicing alone.

h. Hot Type I/Water Mix fluid may be injected into the forced air stream for deicing purposes.

i. Refer to SAE AIR 6284 for cautions and minimum requirements to be considered for this method.

2.15 Backpack Sprayers

a. ‘Backpack sprayers’ are designed to be used for the removal of frost and ice ridges from the underwing areas and areas of cold soaked fuel.

b. Type I fluid may be used mixed 50/50 with water that has been heated but reference must be made to fluid manufacturer’s specifications documents for details to ensure compliance with correct fluid temperatures guidelines.

c. Type I or fluid/water mixes shall not be used at temperatures below the applicable Lowest Operation Use Temperature (LOUT). Reference must be made to fluid manufacturer’s documents for details.

d. If the backpack sprayer is not internally heated, apply as soon as possible after heating to maximise the efficiency of the treatment. Any unused mix should be discarded afterwards. Do not attempt to reheat it.

e. All treatments must be symmetrical.

Note: Holdover Times do not apply.

2.16 FROSTBUSTER – FROST REMOVAL UNITS

a. FrostBuster units have been designed specifically to remove frost from aircraft critical surfaces and underwing areas, where appropriate access equipment is available.

b. FrostBuster units are unable to carry out a full de-/anti-ice treatment.

c. Frost contamination will generally be found on the wing and/or stabiliser leading edges or in patches on the wing and/or stabiliser upper surfaces.

d. Spray the affected area(s) with a heated fluid/water mixture suitable for a one-step procedure.

e. Both sides of the wing and/or stabilizer upper surfaces shall receive the same amount and type of fluid at the same concentration; the same area in the same location on each wing/stabilizer shall be sprayed including when conditions would not indicate the need for treatment of both wings/stabilizers.

f. It is the responsibility of the Deicing Service Provider to ensure that the treatment is performed symmetrically and that on completion all frozen deposits have been removed.

g. After this check has confirmed that the areas are clean the following statement shall be given to the flight crew: "Local area deicing only. Holdover times do not apply".

h. Type I fluid may be used mixed 50/50 with water that has been heated but reference must be made to fluid manufacturer's specifications documents for details to ensure compliance with correct fluid temperatures guidelines.

i. Type I or fluid/water mixes shall not be used at temperatures below the applicable Lowest Operation Use Temperature (LOUT). Reference must be made to fluid manufacturer's documents/for details.

2.17 AIRCRAFT IN HANGAR

a. Before moving an aircraft out of a warm hangar during icing conditions, the aircraft should be anti-iced to make it less possible that ice or snow will melt when it touches the warm aircraft and freeze again.

b. The aircraft should then be kept in the hangar until the surfaces are dry.

c. It will be necessary to check those areas where the water can collect and freeze.

2.18 Airports Where De-/anti-Icing Contract Services are Not in Place

Alternative procedures at airports where contract service agreements are not present. For example, a trained and qualified flight crew member or other appropriately qualified employee provides supervision and quality control during the deicing/anti-icing process and ensures contractor procedures meet easyJet's approved program standards.

2.19 Environmental Considerations

a. At many airports throughout the easyJet network environmental considerations have to be understood and complied with.

b. Deicing/anti-icing operations may be restricted/monitored by regulatory agencies.

c. Deicing Service Providers and GHPs should have knowledge of the airport's/airline's environmental compliance obligations.

d. The manner in which the deicing/anti-icing activities are carried out may determine whether or not the airline or airport meets its legal requirements.

e. Service Providers personnel should be able to identify the primary chemicals that make up the deicing/anti-icing fluid they are using.

f. The environmental impact of the fluid should be understood by Service Provider's personnel. Things to consider may include aquatic toxicity, biodegradability, biochemical oxygen demand, bacterial inhibition, etc.

g. The local person in the operation responsible for compliance with applicable regulations should understand the regulations that apply to deicing/anti-icing fluids or the specific chemicals being used. Some things that may be considered are data reporting requirements, monitoring requirements, storage requirements, and use restrictions.

h. Service Provider personnel should be able to identify the local person in the operation responsible for compliance with applicable regulations.

i. Service Provider personnel should know the airport's practices for collecting and disposing of spent aircraft deicing/anti-icing fluid, and should know how deicing/anti-icing operations need to be conducted to ensure alignment with the airport's practices.

2.20 Early Deicing

a. easyJet has a policy of early deicing for first wave aircraft whenever appropriate.

b. The early deicing process shall be agreed on an individual airport basis by the easyJet AOCM/GOM, prior to the commencement of the deicing season.

c. It is the responsibility of the Deicing Service Provider to make the decision on the day as to whether or not early deicing takes place, taking into account various factors, including, but not limited to:

   i. Contamination present on the aircraft

   ii. Outside Air Temperature

   iii. Current and forecasted weather conditions

   iv. Scheduled time of departure

   v. Fluid Holdover time, if applicable

d. If the decision is made to early deice, it is the responsibility of the provider to determine what parts of the aircraft will be treated and what fluid is used i.e., if the aircraft needs an anti-icing treatment after the deicing treatment.

e. easyJet do not set a minimum OAT at which early deicing shall take place. The decision shall be made on a daily basis by the deicing service provider using local knowledge and information.

CAUTION 1: *As the aircraft will not have been configured for deicing, extra care must be taken to ensure correct spraying techniques are adhered to and there is minimal fluid run down.*

CAUTION 2: *Passenger boarding steps should where possible be removed from the aircraft before spraying deicing fluid onto the aircraft fuselage and or critical surfaces. This is to ensure that the steps are free from aircraft deicing fluid and are safe for ground crew and passenger to gain access to and from the aircraft.*

CAUTION 3: *Extra caution shall be taken when performing underwing deicing as part of the early deicing process, to ensure deicing fluid does not contaminate other parts of the aircraft such as landing gears, brakes, and engines. If a ground nozzle is available on the deicing truck, this shall be used to perform this part of the treatment.*

2.21 OVERNIGHT PROTECTION

a. The decision to protect an aircraft overnight will be taken by the deicing service provider either prior to, or at the time of arrival of the last wave of flights returning at the end of the flying day, who will advise of the action that they intend to take.

b. The deicing contractor may subsequently revise the decision to suit changing ambient conditions at the time.

c. If the overnight protection turns out not to have been required for whatever reason (e.g. the predicted weather did not materialise or a weather warning was rescinded) the deicing operator should supply the AOCM/GOM with details of the weather warnings which led to the overnight protection taking place.

2.22 DOCUMENTATION

a. Each de-/anti-icing event is to be supported by documentation recording the following information:

1. Aircraft registration.
2. Flight number.
3. Weather conditions.
4. Date/time of operation.
5. Make and type of de-/anti-icing fluids used.
6. Deicing fluid temperature.
7. Deicing fluid/water mix.
8. Time holdover commenced.
9. Areas of aircraft de-/anti-iced.
10. Truck driver and operator identification.
11. Deicing equipment involved.
12. Quantity of fluids used.
13. Refractometer reading for fluid in use.
14. Fluid batch number.

b. Wherever possible easyJet also wishes to have recorded the following data for each event:

1. Outside air temperature at time of treatment.
2. Nature of contamination on aircraft.
3. Start/Finish time of treatment.
4. Originator of de-/anti-icing request (Pilot or Deicing Service Provider).
5. Purpose of treatment (deicing/anti-icing/overnight protection).

2.23 EQUIPMENT

a. The deicing company will use Type I, Type II or Type IV fluids which comply with the ISO and AMS standards detailed in the SAE Aircraft Ground Deicing/Anti-Icing Processes as per current relevant SAE documentation.

b. Equipment must be used according to the fluid and equipment manufacturer's guidelines.

c. Mechanical or equipment shear of the fluid can occur if the correct equipment is not used, this can affect the viscosity and holdover time.

d. A Hot Air Source is to be used to deice engine fan blades.

e. Should de-/anti-icing facilities become unavailable easyJet ICC should be informed as soon as it is known that the situation has or is likely to occur.

2.24 On-Time Performance (OTP)

a. We will **never** compromise safety to achieve an on-time departure.

b. Early departures are permitted at any time up to and including STD-25.

c. If the aircraft is safely boarded and loaded (with all checked bags) it may depart early in order to support OTP or to taxi to the Central Deicing Facility.

d. When deicing is required on stand after passengers have boarded, the target time for gate closure should be STD-25 for coached departures and STD-20 for non-coached departures.

2.25 Fluid Application Guidelines

Refer to local regulatory documents, such as the latest FAA/TC Holdover Time Guidelines (annual publication).

CAUTION: *Failure to follow proper fluid application guidance may result in reduced protection of uncertain duration.*

2.26 Anti-icing Fluid Failure Recognition

a. Anti-ice fluids are considered to have failed and to have lost their effectiveness when they become diluted with falling precipitation beyond their design.

b. When this occurs, the fluid begins to appear opaque rather than transparent and glossy and/or the inability to discern structural details (rivets, screws, seams) through the fluid becomes apparent.

c. The deicing/anti-icing fluid on aircraft surfaces should appear glossy, smooth, and wet. Frost, ice, or snow on top of the fluid must be assumed to be adhering to the aircraft and shall be removed before take-off.

d. Indications for loss of effectiveness of anti-icing fluid or contamination of aircraft surfaces include:

   i. Progressive surface freezing or snow accumulation.

   ii. Random snow or contaminant accumulation.

   iii. Dulling of surface reflectivity (loss of gloss) caused by the gradual deterioration of the fluid to slush.

e. The following figures 2.3 to 2.5 (Fluid Failure Process) can explain the aircraft protection and how fluid failure occurs theoretically:

Figure 2.3 Fluid Failure Process

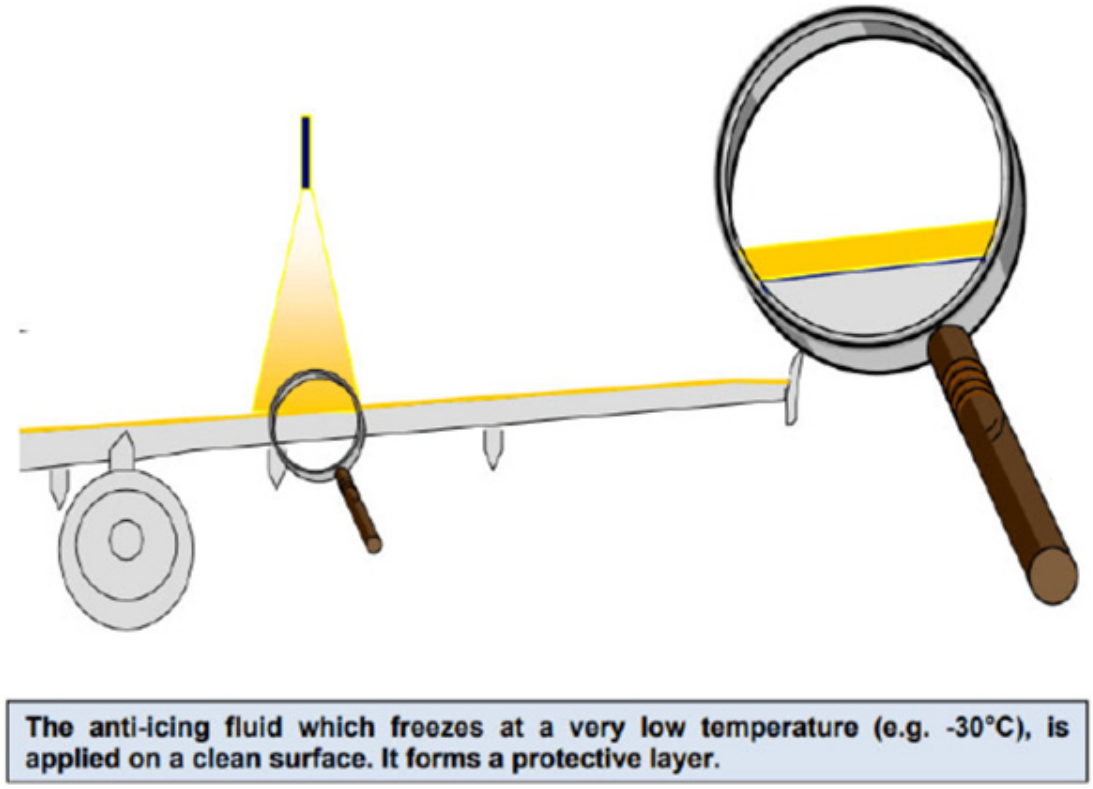


Figure 2.4 Fluid Failure Process

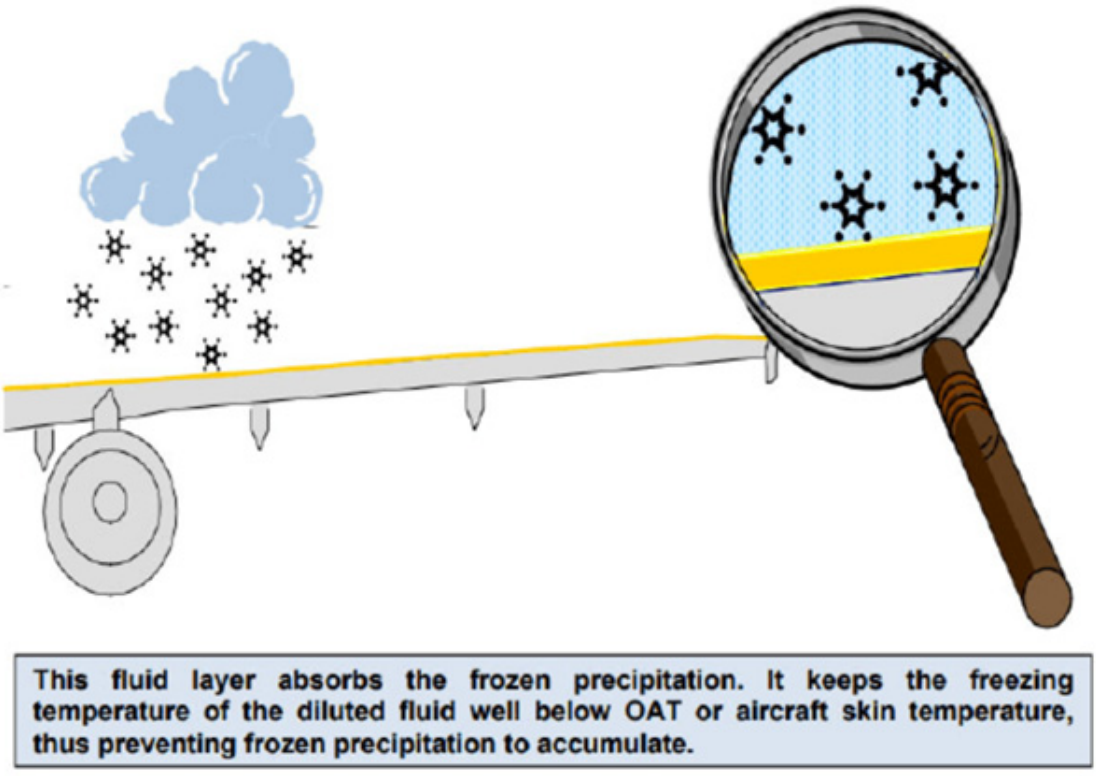
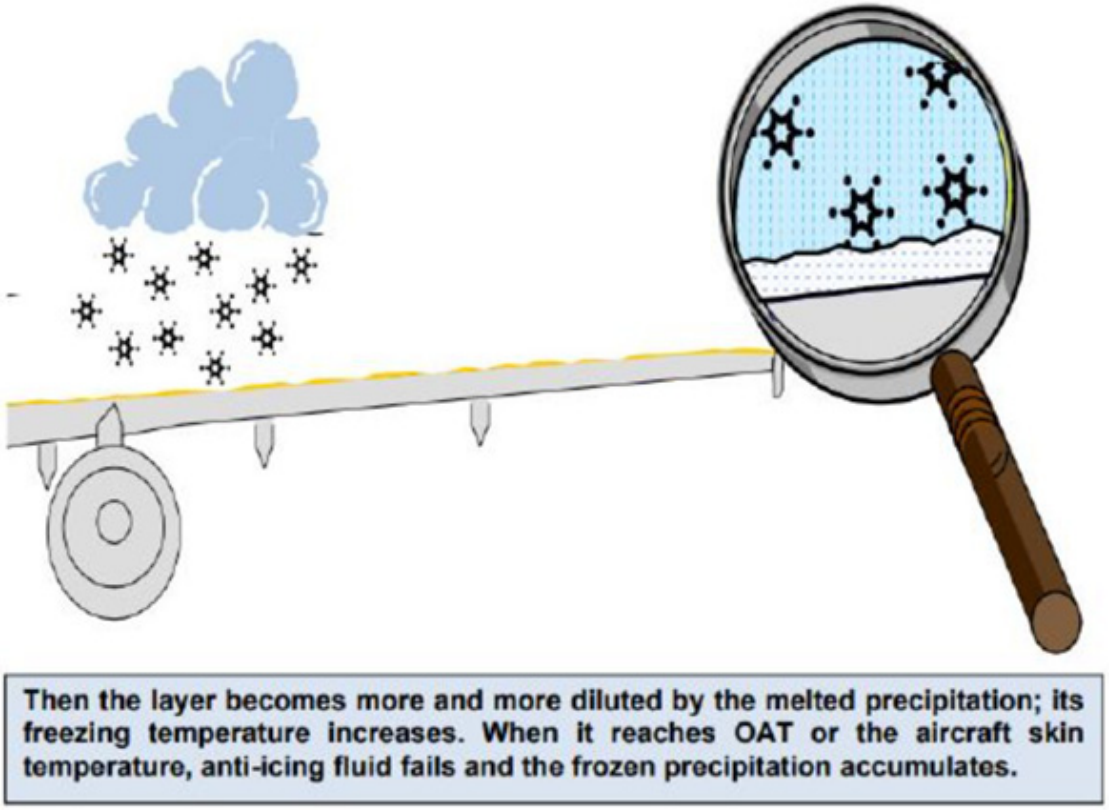
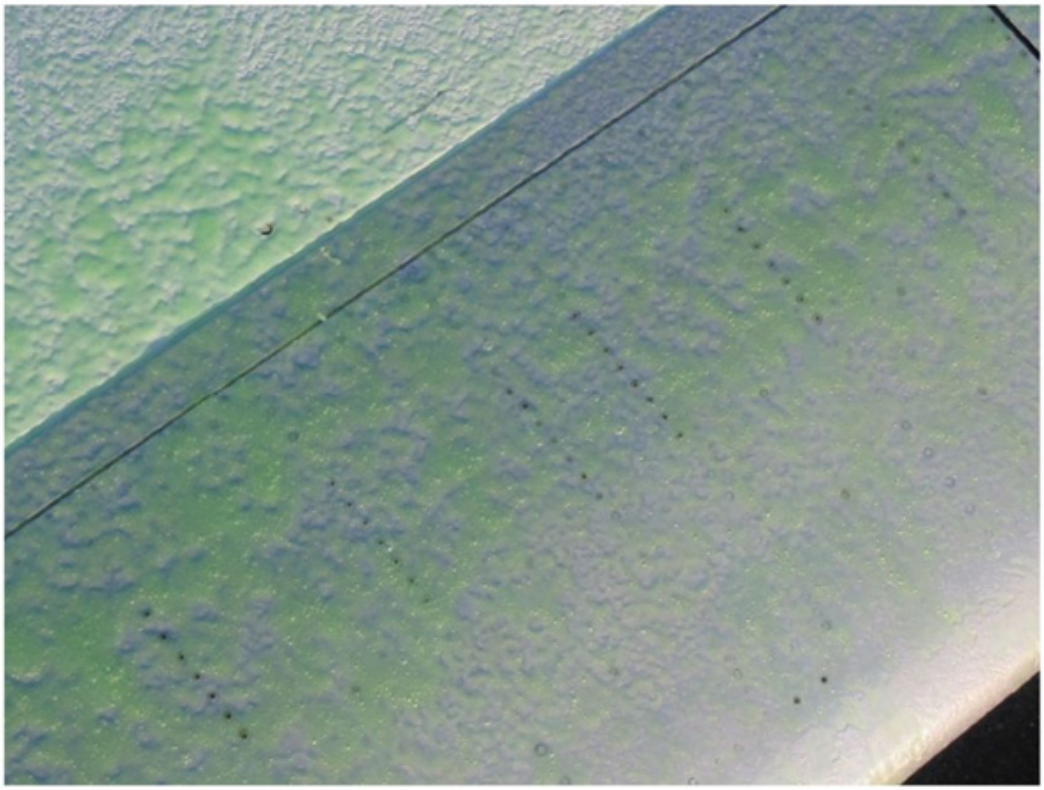


Figure 2.5 Fluid Failure Process



f. The following picture provides a real example of a failed Type IV anti-icing fluid:

Figure 2.6 Failed Type IV Fluid on Wing



Note: Figure 2.6 shows fluid which is not smooth or uniform, and is rough and blotchy. The fluid is becoming opaque and details such as rivets cannot be seen consistently through the fluid.

g. The following 3 images demonstrate progressive fluid failure in freezing rain and freezing drizzle. In these conditions, the change in appearance is subtle and the surface may still appear glossy and wet following failure.

Note: A tactile check may be required to confirm that clear ice is not present.

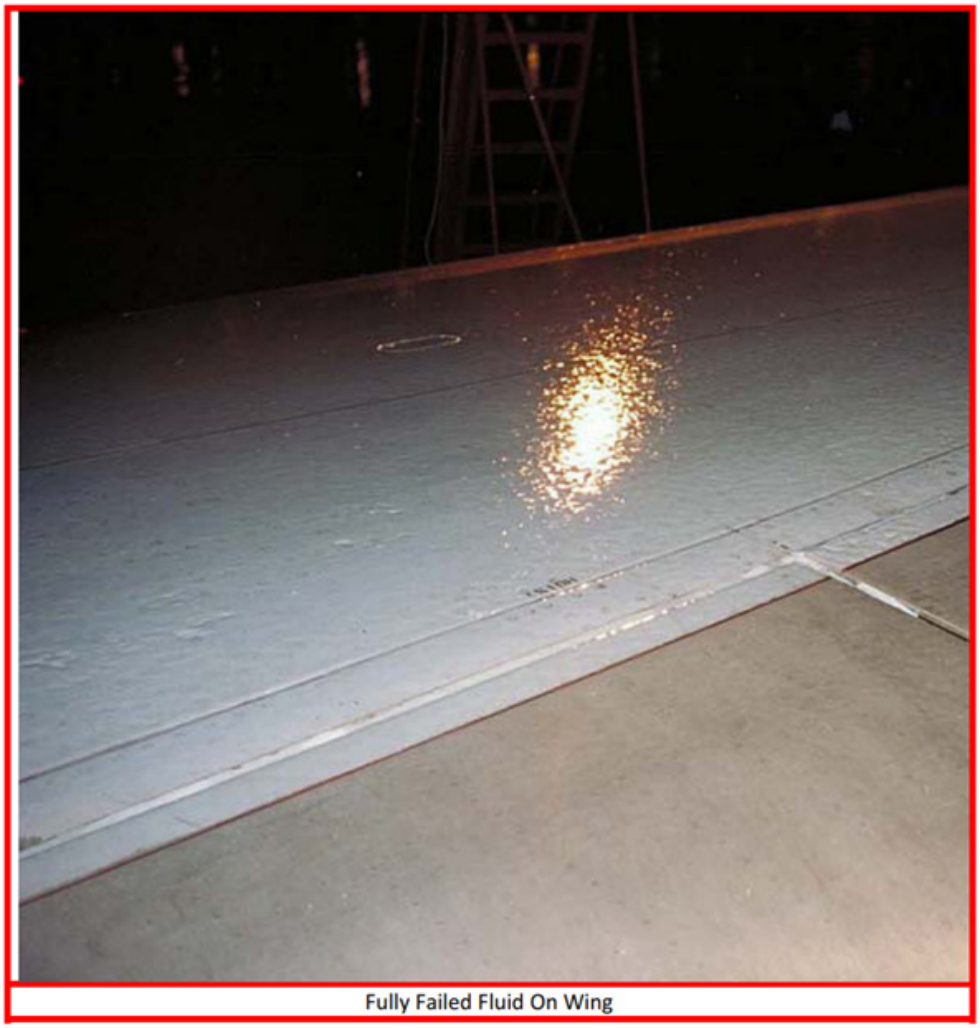
Figure 2.7

Fresh fluid on Wing – Fluid is not failed

Figure 2.8

Partially Failed Fluid On Wing

Figure 2.9



Fully Failed Fluid On Wing

3 COMMUNICATIONS

3.1 COMMUNICATION PROCEDURES

a. Persons communicating with the flight crew shall have a basic knowledge of the English language (operational level or equivalent according to the current version of the Training Document AS6286).

b. For local flights involving local flight and ground crews, local language may be used by them (see the current version of training document AS6286).

c. Communication between the flight crew and the deicing crew will usually be achieved using a combination of printed forms and verbal communication.

d. For treatments carried out after aircraft doors are closed, the use of flight interphone (headset) or VHF radio will usually be required.

e. Electronic message boards may also be used in 'off stand' situations.

Note: No flight crew communication is required and no holdover time applies if the aircraft is deiced using Type I for overnight frost in the absence of further precipitation or active frost.

3.2 COMMUNICATION PRIOR TO STARTING DEICING/ANTI-ICING TREATMENT

a. Before starting deicing/anti-icing, the flight crew shall be requested to confirm the treatment required (i.e. surfaces and components to be deiced, anti-icing requirements, plus any special deicing procedures).

b. Before fluid treatment starts, the flight crew shall be requested to configure the aircraft for deicing/anti-icing (surfaces, controls, and systems as per aircraft type requirements or recommended procedures). The deicing crew shall wait for confirmation that this has been completed before commencing the treatment.

CAUTION: *It is essential that the deicing crew receive confirmation from the flight crew that the aircraft has been successfully configured for deicing before commencing spraying. Failure to do so may result in fluid contamination of aircraft systems resulting in smell events and AOG of the aircraft.*

c. For treatments conducted without the flight crew present, suitably qualified personnel shall be nominated to confirm the treatment required (when applicable).

3.3 POST DEICING/ANTI-ICING COMMUNICATION

a. An aircraft shall not be dispatched for departure after a deicing/anti-icing operation until the flight crew has been notified of the type of deicing/anti-icing operation performed (i.e. the the post-deicing/anti-icing report).

b. The post-deicing/anti-icing report, including the anti-icing code, when applicable, shall be provided by qualified personnel upon completion of the treatment, indicating that:

1. The checked surfaces are free of frost, snow, slush, or ice;
2. Deicing/anti-icing is complete;
3. Equipment is cleared from the area; and
4. In addition, providing the necessary information for the flight crew to estimate the appropriate holdover time for the prevailing weather conditions when anti-icing fluid has been used.

c. When a treatment is interrupted for a significant period of time (e.g., truck runs out of fluid) the flight crew shall be informed stating the reason, the action to be taken and the estimated time delay.

d. When continuing the treatment, the previously treated surfaces must be fully deiced and anti-iced again, when the holdover time of the treatment from before the interruption is not sufficient.

3.4 POST-DEICING/ANTI-ICING REPORT/ANTI-ICING CODE

a. The following elements comprising the Post-Deicing/Anti-Icing Report/ Anti-Icing Code shall be recorded and be communicated to the flight crew by referring to the final step of the fluid deicing/anti-icing treatment procedure; it shall be provided in the sequence given below:

Note: This information shall **not** be communicated in circumstances where anti-icing holdover times do not apply, e.g. local frost prevention in cold-soaked wing areas, symmetrical local area deicing, or deicing of specific surfaces only (such as leading edges for removal of impact ice), etc. In these circumstances, upon completion of the treatment, the flight crew shall be provided with the deicing fluid type applied (e.g. “Type I”); a statement that holdover time does not apply (e.g. “no holdover time applies”); and confirmation that the post-deicing check has been completed (e.g. “post deicing check completed”).

1. The fluid type (i.e., Type I, II, or IV);
2. The fluid name (manufacturer and brand/trade name) of the Type II, III, or IV anti-icing fluid, if applicable;

   Note: Communication of this element is not required for Type I fluid.

3. The concentration of fluid (dilution) within the neat fluid/water mixture, expressed as a percentage by volume for Type II, or IV (i.e., 100% (“neat”) = 100% fluid, 75% = 75% fluid and 25% water, 50% = 50% fluid and 50% water);

   Note: Communication of this element is not required for Type I fluid.

4. The local time (hours and minutes), either:
   - For a one-step deicing/anti-icing operation: at the start of the final treatment; or
   - For a two-step deicing/anti-icing operation: at the start of the second step (anti-icing);
5. The date in the following format: day, month, year (DDMMMYY (e.g., 28JAN15 = January 28, 2015));

   Note: This element is required for record keeping and is optional for flight crew notification.

6. The statement, “Post-deicing/anti-icing check completed”.

b. The last step of a deicing/anti-icing procedure is the application of a mixture of 75% Type II fluid and 25% water, made by the Manufacturer as Brand X, commencing at 13:35 local time on 20 February 2016, is reported and recorded as follows:

TYPE II/MANUFACTURER, BRAND X/75%/1335/20FEB16/POST-DEICING/ ANTI-ICING CHECK COMPLETED

Note 1: For specific aircraft types, additional requirements exist, e.g., tactile checks for clear ice on wing surfaces. Additional confirmation for these checks may be required.

Note 2: An alternative means of visual communication of the Anti-Icing Code to the flight crew can be used (e.g., written on paper, EMBs, ACARS, EFBs, etc). If the post de/anti-icing report is passed electronically to the Flight Crew, i.e. via ACARS or EFBs, there is no requirement to give this information again verbally via VHF/ headset. However, VHF/headset communication must still be available in case of system failure, and must be used if the system transmitting data fails to provide Flight Crew with all necessary information of the de/anti-icing treatment.

Note 3: Aircraft onboard systems, available to assist flightcrew to determine holdover time, require a good coordination between service providers and aircraft operators to provide fluid information in advance or to inform the customers of any change of fluids prior the de/anti-icing operation.

3.5 POST-DEICING REPORT (DEICING TREATMENTS ONLY; ANTI-ICING HOLDOVER TIMES DO NOT APPLY)

After the completion of a deicing only procedure, where no anti-icing holdovertime is applicable, the company responsible for conducting the post-deicing check shall also provide the flightcrew with the post-deicing communication. The following elements shall be recorded and be communicated to the flightcrew as part of the post-deicing communication:

1. Deicing fluid type (i.e., Types I, II, III, or IV).
2. Statement that anti-icing holdover times do not apply.
3. The date in the following format: day, month, year (DDMMMYY format) (e.g., 28JAN15 = January 28, 2015).

   Note: This element is required for record keeping and is optional for flightcrew notification.

4. The statement “post-deicing check completed.”

3.6 ‘ALL CLEAR’ VERBAL NOTIFICATION

The flight crew shall receive a confirmation from the deicing crew that all deicing/ anti-icing operations are complete and that all personnel and equipment have been removed from the area before reconfiguring or moving the aircraft.

3.7 OFF-GATE COMMUNICATIONS

a. During deicing/anti-icing, a two-way communication between the flight crew and the deicing/anti-icing operator/supervisor must be established prior to the deicing/anti-icing treatment. This may be done either by interphone or by VHF radio.

b. Alternate means of communication may be the use of ACARS, EFBs, and EMBs.

c. In the event of conflict, verbal communication shall take precedence.

d. During treatment, all necessary information must be transmitted to the flight crew, including the beginning of treatment, treatment of the sections requiring de-activation of aircraft systems, the post-deicing/anti-icing report, etc., (using standardized deicing/anti-icing phraseology).

e. Communication contact with the flight crew may be concluded after transmission of the post-deicing/anti-icing report and readiness for taxi-out has been announced.

f. During deicing/anti-icing operations with engines running, both verbal and visual communications shall be utilized and positive control maintained during the deicing/anti-icing operation in accordance with ARP5660.

3.7.1 General Instructions

a. The deicing/anti-icing operator and/or airport authority must ensure that all necessary information regarding operation of the off-gate/CDF/DDF/ Remote Deicing Pad site is published and available to flight crews.

b. This information shall be included within the deicing/anti-icing operator's and/or airport authority's local procedures documentation and be made available to easyJet and flight crews (e.g. it can be included as part of flight release documentation, etc.).

c. This information should also be published in applicable aeronautical navigation documents/publications.

d. This information shall include, at a minimum the following:

1. The location of and standard taxi routing to, within, and from the deicing/anti-icing site;
2. The means by which to coordinate the deicing/anti-icing operation;
3. The means by which to communicate before, during, and after the deicing/anti-icing operation;
4. The means by which taxi-and-stop guidance is provided to the flight crew (e.g., VHF, EMB's, etc.).
5. Any unique requirements or procedural differences affecting the flight crew and/or flight crew/ground crew interface.

Note: Off gate deicing may be engines OFF, e.g. If operating under MEL relief for an unserviceable APU or APU bleed system, it is permissible to deice and /or anti-ice by shutting down an engine and deicing and/or anti-icing that side ("Engine – OFF side"). Once complete, the engine can be restarted and the opposite side shutdown for deicing and/or anti-icing. This procedure must be carefully coordinated with the service provider.

3.7.2 Responsibilities

a. The responsibility to conduct a Contamination Check before dispatch rests with trained and qualified personnel.

b. The results of the Contamination Check must be provided to the flight crew via verbal or visual (written or electronic) means.

c. Subsequently, the flight crew is responsible for acquiring the proper treatment.

d. After treatment, the treated surfaces and components must be checked by a trained and qualified personnel and the Post-Deicing/Anti-Icing Report/ Anti-Icing Code must be given to the flight crew.

e. Subsequently, the flight crew is responsible for the airworthiness of the aircraft.

3.7.3 Emergency During Remote Deicing

a. In the event of an emergency whilst deicing is being conducted on easyJet aircraft, ground/deicing personnel will be alerted by the Pilot-in-Command by use of the deicing VHF frequency or by the flashing of the nose wheel lights and/or any other exterior lights.

b. On seeing this signal, all ground/deicing personnel are to move away from the aircraft to allow emergency vehicles to approach and should stand by to assist with passenger evacuation if required.

3.7.4 Emergency Procedures for Remote Deicing

Whether conducting deicing/anti-icing operations at a remote location or at a centralized deicing/anti-icing facility, local procedures shall be established to ensure that both aircraft and ground emergencies are handled safely, expeditiously, and are coordinated with the local emergency plan.

3.8 SCRIPTS

a. Following standard communication terminology is recommended during off-gate deicing/anti-icing procedures:

- (DIO = Deicing/anti-icing operative)
- (DIS = Deicing/anti-icing supervisor)
- (PIC = Pilot-in-Command)

DIS/DIO: “Set parking-brake, confirm the aircraft is ready for treatment, inform on any special requests”.

After the aircraft is configured for treatment:

PIC: “Parking brake is set, you may begin treatment and observe…(any special requests like: ice under wing/flaps, clear-ice on top of wing, snow on fuselage, ice on landing-gear, anti-ice with Type IV fluid, etc.)”.

DIS/DIO: “The treatment will begin now…(special request given, like “ice under wing”, etc.) I will call you back when ready”.

Note: The Pilot-in-Command shall be advised when the deicing area is clear and the deicing equipment is back in the safe zones.

b. Only after all equipment is cleared from the aircraft and all checks are completed:

DIS/DIO: “Deicing/anti-icing completed, Anti-Icing Code is:..... (plus any additional info needed). I am disconnecting. Standby for clear signal at right/left and/or contact ground/tower for taxi clearance.”

PIC: “Deicing/anti-icing completed, Anti-Icing Code is.....”

Note: The Post-Deicing/Anti-Icing Report/Anti-Icing Code can be passed to the Pilot-in-Command by use of ACARS.

3.9 PHRASEOLOGY

a. Guidelines for establishing clear concise standardised communication and phraseology between aircraft flight and ground crews during aircraft deicing operations is contained in AS6285, section 8.6.

b. It is very important that both parties communicate fully about contact requirements, aircraft configuration, de/anti-icing treatment needed, and post deicing reporting requirements.

c. It is important that clear communications are passed to the deicing operative in regards to deicing treatment requirements.

d. The Pilot-in-Command must be specific in communicating the areas that require treating and any special requirements.

e. The Pilot-in-Command shall name the areas for treatment e.g. “Wings, Vertical and Horizontal Stabilizers, Fuselage”.

f. When cold soak areas are identified the deicing operatives must be advised that Local-Area-Deicing is required.

g. The Deicing Operative shall ask for clarification from the Pilot-in-Command if the treatment request is **not** clear and specific. Non-standard phraseology must not be used or accepted by either the Pilot in Command or Deicing Operative.

3.10 COMMUNICATION FOR PROXIMITY SENSOR ACTIVATION BY PHYSICAL CONTACT

a. An operational procedure shall be in place in circumstances where a proximity sensor on the deicing equipment is activated and/or comes into contact with an aircraft surface.

b. For equipment types furnished with a proximity sensor requiring physical contact in order to activate, and, in the event of sensor contact, the Pilot-in-Command shall be informed using the following phraseology:

Ground Crew to Flight Crew:

“A safety proximity sensor (identify location on the deicing equipment) has been activated on the (specify specific location on the aircraft). (Name third party title that performed inspection) has performed a visual inspection on the affected area. Provide results of the third party inspection (e.g., there is no visual damage detected or damage is suspected or present). Advise your intentions.”

c. The equipment involved shall remain in position until investigation can occur to inspect the affected area for damage.

d. A third party shall visually inspect the affected area for any signs of visual damage:

   1. If no visible damage is observed, the de/anti-icing process may continue at the discretion of the Pilot-in-Command in command.

   2. If damage is suspected or detected, the Pilot-in-Command in command shall be notified and the de/anti-icing process shall cease. Further inspection of the affected area should be performed by an individual deemed qualified under the air operators program to determine the aircraft's airworthiness.

   Note: By design, this type of proximity sensor normally will not cause damage to an aircraft surface if contact is made to a fixed aircraft surface, while the equipment chassis is stationary.

e. In certain circumstances however, damage may occur outside of the sensors design limitations. This includes but is not limited to:

   1. Contact with an aircraft surface while the equipment chassis is manoeuvring;

   2. Contact with an aircraft surface while the aircraft is manoeuvring;

   3. Contact with a moving/rotating aircraft surface (i.e., engine fan blade, etc.); and/or

   4. Contact is made or suspected to have been made between a component of the deicing vehicle and aircraft.

f. In these circumstances, the procedures mentioned above this note shall apply. Should a proximity sensor be activated, all pertinent and relevant details shall be documented, including (at a minimum):

   1. Date

   2. Time

   3. Vehicle operator name(s)

   4. Vehicle identification (e.g., number)

   5. Flight number

   6. Aircraft registration and/or air operator fleet identification (e.g., fin/ tail/ship number, etc.)

   7. Deicing location (e.g., bay or gate number)

   8. Location on the aircraft where the contact was made, including specifics (e.g., side, aircraft part, etc.)

   9. Proximity sensor location on the vehicle and point where the contact was made (e.g., nozzle, left side of sensor, etc.)

   10. Name and job title of the third party individual that performed inspection

11. Third party company name (not required if third party is from the de/anti-icing company)
12. Result of the third party inspection (e.g., no visual damage detected or damage suspected/present)

g. Ground crew involved in the de/anti-icing operation shall be trained on the operation of the proximity sensor (including equipment reactivation) and procedures in the event of contact.

h. In addition, for those personnel deemed qualified to perform the third party inspection, they shall also be trained on visual inspection requirements and procedures.

i. Flight crew should be trained on the purpose and functionality of a proximity sensor, and the specific company procedures and requirements in the event of contact.

Intentionally Blank

4 HOLDOVER TIMES

a. Holdover time is obtained by anti-icing fluids remaining on the aircraft surfaces.

b. With a one-step deicing/anti-icing process the holdover time begins at the start of the treatment.

c. With a two-step deicing/anti-icing process at the start of the second step (anti-icing).

d. Holdover time will have effectively expired when frozen deposits start to form/accumulate on treated aircraft surfaces.

e. Due to their properties, Type I heat transfer and the thin liquid wetting film, provides limited holdover time, especially in conditions of freezing precipitation. With this type of fluid no additional holdover time would be provided by increasing the concentration of the fluid in the fluid/water mixture.

f. Type II, and IV fluids contain a pseudo plastic thickening agent, which enables the fluid to form a thicker liquid wetting film on external aircraft surfaces. This film provides a longer holdover time especially in conditions of freezing precipitation. With this type of fluid, additional holdover time will be provided by increasing the concentration of the fluid/water mixture, with a maximum holdover time available typically from undiluted fluid.

g. Holdover time guidelines give an indication as to the time frame of protection that could reasonably be expected under conditions of precipitation. However, due to the many variables that can influence holdover time, these times should not be considered as minima or maxima as the actual time of protection may be extended or reduced, depending upon the particular conditions existing at the time such as strong winds, jet blast, etc. Aircraft surfaces with steeper angles (e.g., vertical stabilizer, deployed flaps, etc.) might also have an effect on holdover times that needs to be considered.

h. Holdover time guidelines are established and published by the FAA and TC.

i. The responsibility for the application of holdover time data remains with the user.

CAUTION 1: *Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce holdover time below the lowest time stated in the range. Holdover time may also be reduced when aircraft skin temperature is lower than OAT. Therefore, the indicated times should be used only in conjunction with a pre-take-off check.*

CAUTION 2: *Surface coatings, including but not limited to waxes, are currently available that may be identified as ice phobic or hydrophobic, enhance the appearance of aircraft external surfaces, and/or lead to fuel savings. Since these coatings may affect the fluid wetting*

capability and the resulting fluid thickness of deicing/anti-icing fluids, they have the potential to affect holdover time and aerodynamics. Test all surface coatings against AIR6232 to ensure they do not interfere with the performance of deicing/anti-icing fluids. For more information, consult the fluid and aircraft manufacturers.

5 STAFF TRAINING AND QUALIFICATION

a. easyJet require that all de-/anti-icing personnel employed on easyJet de-/anti-icing operations have received initial and yearly refresher training to a standard of at least that described under the SAE AS6286, Training and Qualification Program for Deicing/Anti-icing of Aircraft on the Ground, and in accordance with easyJet requirements.

b. The scope of training should be adjusted according to local demands.

c. There are a wide variety of winter seasons and differences of the involvement between deicing operators and the level and length of training should therefore be adjusted accordingly. However, the minimum level of training shall be covered in all cases.

d. As a rule of thumb, each hour of classroom training should at least equal the same amount (or include more) of practical training wherever this is relevant.

e. Both basic and recurrent practical training shall be performed and documented periodically.

f. For personnel performing the actual deicing/anti-icing treatment on aircraft, practical training with the deicing/anti-icing equipment shall be included.

g. Training subjects shall include, but are not limited to, the following (when applicable):

1. Effects of frost, ice, snow, and slush on aircraft performance.
2. Basic characteristics of aircraft deicing/anti-icing fluids.
3. General techniques for removing deposits of frost, ice, slush, and snow from aircraft surfaces and for anti-icing.
4. Deicing/anti-icing procedures in general and specific measures to be performed on aircraft types operated by easyJet.
5. Types of checks required.
6. Deicing/anti-icing equipment and facilities operating procedures including actual operation.
7. Safety precautions.
8. Emergency procedures.
9. Fluid application and limitations of holdover time tables.
10. Pre/post deicing/anti-icing check procedures.
11. Anti-Icing Code and communication procedures.
12. Deicing of Airbus A320 family aircraft.
13. Special provisions and procedures for contract deicing/anti-icing (if applicable).
14. Environmental considerations, e.g. where to deice, spill reporting, hazardous waste control and fluid reclamation and recycling.

15. Electrical Wiring Interconnect System (EWIS) training as mandated by EASA legislation.
16. New procedures and development, lessons learned from previous winters.
17. Recency issues must also be addressed by either practical refresher training or additional supervision. This should be carried out in addition to the normal recurrent training for personnel who have not carried out duties related to de-/anti-icing for a period of 4 months.
18. The use of holdover times (dispatcher, ground).
19. Responsibilities (dispatcher, ground).

h. Companies providing deicing/anti-icing services shall have both a Qualification Programme and a Quality Assurance Programme to monitor and maintain an acceptable level of competence.

i. Whilst easyJet do not specifically provide any Winter training, Service Providers can find a Winter Readiness guidance module on the Connected Portal, which gives an overview of Winter Operations and de/anti-icing and can be used to support training programs.

j. Water (including heated/hot water) may be used by deicing providers for training purposes ONLY and under the following conditions:

1. Prior approval has been granted by the Seasonal Readiness Manager. Approval shall be obtained via email and will only need to be requested once at the start of the Winter season.
2. Approval has been granted from ICC. In order to obtain this, a request for approval shall be sent with a minimum of 24 hours' notice to the following emails: easyops@easyjet.com; soo@easyjet.com; delivery@easyjet.com
3. Outside air temperature is greater than 6°C and no contamination is present on the aircraft.
4. Minimum fuel temperature of the aircraft being used is above 0°C. This information can be obtained by speaking with the Flight deck.

Note: Activity can be cancelled at any time pending operational requirements. Agreed times of activity and agreed aircraft must not be deviated from unless authorised by ICC.

6 QUALITY

6.1 GENERAL

a. All Deicing Service Providers providing deicing/anti-icing services shall have a Quality Program.

b. The purpose of the Quality Program is to ensure that deicing/anti-icing of aircraft on the ground is accomplished in accordance with regulatory requirements and guidance, industry standards and the operator's program.

c. To verify effectiveness of the deicing/anti-icing of aircraft on the ground, the Quality Program should include both Quality Assurance (QA) and Quality Control (QC) processes and procedures.

6.2 QUALITY ASSURANCE

a. To meet Quality Assurance (QA) requirements, a company must provide evidence that it follows the rules and instructions in any specific field correctly and that it has a proper and efficient Quality Control Program.

b. Quality Assurance is confirmed by auditing.

c. Sometimes 'Audit Pools' are formed so that companies are not audited several times on the same process by different entities; for example: IATA's Deicing/Anti-icing Quality Control Pool (DAQCP).

d. All companies should have a Quality Assurance Program in place.

e. Quality assurance programs shall follow the standards published in AS6332.

6.3 STATION QUALITY CONTROL PROGRAM

A Quality Control Program shall cover all aspects of aircraft ground deicing/ anti-icing and shall include, but is not limited to, the following checks:

a. Procedures and instructions up-to-date.

b. Responsibilities and tasks clearly defined and up-to-date.

c. Communication procedures/protocols up-to-date.

d. All personnel trained and qualified.

e. The quality of deicing/anti-icing fluid from all storage tanks, all equipment tanks and all spray nozzles are within limits.

f. Correct and safe functioning of deicing/anti-icing spray equipment.

g. Correct and safe functioning of (remote/centralized) deicing/anti-icing facility if applicable.

h. Reporting methods and reports up-to-date.

Note 1: Prior to the start of each winter, perform all above listed checks.

Note 2: During each winter season perform quality control checks on deicing/ anti-icing fluids from all spray nozzles at operational settings on a regular basis and file test results till the start of the next winter period.

6.4 FLUID QUALITY CONTROL CHECKS

See Section 2.3.5 of this Manual.

6.5 IATA DE-/ANTI-ICING QUALITY CONTROL POOL

a. easyJet (EZY, EZS and EJU) is member of the IATA Deicing and Anti-icing Quality Control Pool (DAQCP).

b. This pool ensures that all pool member airlines' deicing and anti-icing service providers at cold weather stations are audited yearly.

c. The station's AOCM/GOM and the Seasonal Readiness Manager are responsible for following up on all open audit findings that have not been signed off by the responsible DAQCP auditor.

d. The decision in regards to the safety of the station and the continuation of the station's winter operation shall be made by the Seasonal Readiness Manager and the Head of Ground Ops Policy & Standards depending on the severity of the audit finding/findings.

e. All DAQCP audits and their results are records in a tracker that is available internally on easyJet's G drive and Readiness SharePoint site.

f. Access to the DAQCP Extranet is granted to:

   1. easyJet DAQCP Representative
   2. easyJet DAQCP Auditors
   3. Nominated Person Ground Operations
   4. ICC
   5. Flight Ops Safety Captain

g. easyJet will conduct oversight audits on the contracted fluid laboratory to ensure compliance with AS9968, in line with the Departmental Quality System.

6.6 EASYJET MANUAL QUALITY CHECKS

Before the publication of this Manual, a check will be performed by the Ground Ops Quality & Safety Team to verify the quality against other operational manuals, including – but not limited to – GHM, GOMM and OM-A.

7 AIRPORT WINTER SNOW PLANS

a. Airport operators shall adhere to EASA ADR.OPS.B.035 ‘Operations in Winter Conditions’ when it comes to Snow Plans.

b. An airport operator shall, when the airport is expected to operate in conditions when snow, slush or ice may accumulate on the movement area, develop and implement a snow plan.

c. AOCM/GOMs shall ensure that stations have in place “Snow Plans” or equivalent which are appropriate to the airport and anticipated climatic conditions.

d. Airport Snow Plans shall be reviewed, updated, tested and reviewed again prior to the winter season to ensure that the plan is still fit for purpose.

e. There also needs to be clear understanding of roles and responsibilities and an agreed activation plan that airlines and service providers are aware of.

f. Contact list and phone numbers shall be correct and up to date and distributed to the necessary areas.

g. Table top exercises shall also be carried out with all interested areas to confirm understanding of Snow Plan processes and procedures and their role within it.

h. Both ground and work surfaces on equipment will become particularly hazardous during periods of ground icing conditions. The use of de/ anti-icing fluid can add to the slippery conditions on the ground.

i. When ground icing conditions are predicted, special preparations of the equipment will be necessary to ensure their functionality and safety of operation.

j. Whenever possible, snow and ice formations on equipment and work surfaces should be removed prior to the start of operations.

k. The safety of passenger walkways should be assured prior to use.

l. Staff should allow more time for activities, drive more slowly, and allow a greater distance to stop equipment.

m. Prior to all aircraft movements, passenger boarding/disembarking, or other ground handling activities, handling agents should ensure (in consultation with the airport authority as appropriate) that the taxiway, apron, manoeuvring areas and equipment (e.g. steps) are in a suitable condition to allow a safe operation.

n. If apron conditions are hazardous, the GHP/deicing service provider shall contact the competent authority to mitigate the hazard. In the event the hazard cannot be mitigated, affected operations should be suspended.

o. Appropriate additional precautions (e.g. additional supervision of passenger boarding routes, and passenger announcements) should be considered. If a safe operation cannot be confidently assured, the operation should be stopped, and easyJet ICC advised.

CAUTION: *Extreme caution shall be observed when aircraft are parked outside normal parking positions (e.g. cluster parking), in particular in winter conditions when stand/taxiway markings are not visible due to contamination (snow, ice, etc.).*

7.1 STAND SNOW AND ICE CLEARANCE

a. It is extremely important that airports that experience adverse weather through the winter period have suitable winter plans in place prior to the commencement of the winter season.

b. During snow periods it is essential that stands are accessible and workable.

c. Personnel and vehicles must be able to operate in a safe working area around the aircraft.

d. Access roadways to stands must be treated/deiced by the airport authority prior to use.

e. The airport authority must be advised of roads and or stands in a dangerous condition.

f. During periods when Ramp areas become or are expected to become contaminated with ice and/or snow agreed stand clearance plans should be activated. These plans, which must be a part of the overall station winter snow plan, must identify what action is required and who is accountable for ensuring that the action is carried out.

7.1.1 Aircraft Stands

a. Stands must be clear of ice and snow to give safe movement and access for airport personnel, vehicles, passengers, and airline staff i.e. flight and cabin crew.

b. Stands should have holding bins/aviation grit bins with useable quantities of aviation grit or deicing crystals. These bins should be strategically placed for use by personnel working on and around the stands. These items can be used to ensure personnel or passenger walkways and work areas are clear of snow and ice.

c. Stands should be checked before use to assess usability.

d. Ground handling companies should advise airport authorities of the condition of the stand and request necessary clearance.

e. Stands can be categorised in the following way:

Green	Useable	Useable, no attention required, remain vigilant. (Stand has patches of snow and ice but does not impede the safe handling/turn-round of the aircraft).

Amber	Usable with caution	Useable with caution – attention required. (Stand requires snow or ice removal prior to being used or stand can after some attention be at least made Amber status).
Red	Unusable	The stand requires making safe.

f. The head of the stand should also be clear of snow and ice as not to impede aircraft push back or arrival functions.

g. Snow may be removed from the centre line to ensure that the line is clearly visible to flight Crews.

h. Clearing centre lines only does not make the stand safe to work ground handling wise unless the stand falls into the Green or Amber category.

i. Procedures should be in place as part of the airport winter plan to be able to remove snow from stands where considerable accumulation occurs.

j. Snow should be preferably removed to snow dumps away from useable stands.

k. The snow plan should also include a process via which aircraft can be pushed to the centre line in order to permit stands to be cleared.

7.2 GROUND EQUIPMENT

a. Ground equipment should be cleared of snow and ice prior to use to ensure the equipment can be used in a safe and controlled manner.

b. Ground equipment after use should be parked in a safe and orderly manner to avoid accidents/injuries.

c. Aircraft passenger steps must be cleared of all snow and ice prior to use.

d. Under no circumstances should steps be used for passengers if steps are slippery or in a dangerous condition.

e. All stand access steps must be cleared of snow and ice prior to use.

7.3 SELF-HELP EQUIPMENT

Self-help equipment such as shovels, brooms, grit or deicing crystals spreaders should be made available by the Airport Authority and positioned on aircraft stands to allow personnel to make work areas safe, free from snow and ice.

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8 SEVERE WINTER WEATHER CONDITIONS

8.1 GENERAL

a. It is very important that throughout the winter period, all cold weather stations have processes and procedures in place that protect aircraft that are night stopping. Not following procedures can potentially lead to damage to aircraft systems and aircraft becoming unserviceable.

b. In freezing conditions, below 0°C, draining and purging of the potable water system must take place after aircraft arrival. When these services are needed, the following must be adhered to;

1. The draining service must only be completed on the request of the Engineer in charge of the aircraft, as they must arrange for the system to be purged;
2. The Engineer in charge of the aircraft will coordinate the draining service, to ensure the requirements of the AMM are met;
3. After the draining service has taken place, the drain valves must be left OPEN.

CAUTION: *Not following the above procedures can lead to damage to the aircraft piping system, resulting in the system and aircraft becoming unserviceable.*

Note 1: Ground Crew must NOT attempt to drain or purge the potable water and waste system prior to the request of the Engineer and without the Engineer present;

Note 2: Exceptions to the above may apply in case the aircraft is powered up and heated, however this decision will still sit with the Engineer in charge of the aircraft.

8.2 OTHER SEVERE WEATHER CONDITIONS

a. The safety of airport ground handling operations can also be impacted by other severe weather conditions which include – but not limited to:

1. High winds;
2. Flooding;
3. Thunderstorms and lightning;
4. Low visibility.

b. At all times it is a requirement that handling suppliers and airport operators take appropriate precautions to ensure a safe operation.

c. Detailed guidance and recommendations are contained within easyJet Ground Handling Manual Section 3.3 – Adverse Weather Conditions, and if in doubt, this document should be considered as industry best practice.

d. Further guidance regarding wind limitations can also be found in easyJet Ground Handling Manual Section 3.3 – Adverse Weather Conditions.

9 REPORTING AND DELAY CODES

9.1 DEICING EQUIPMENT – SERVICEABILITY AND REPORTING

a. Deicing rig failures which impact the easyJet operation should be advised to easyJet via the responsible AOCM/GOM.

b. The type of deicing rig and the nature of the failure should be identified.

c. Deicing suppliers are required to provide a current calibration certificate for each deicing vehicle to be used on easyJet aircraft prior to the start of winter operations confirming the accuracy of the fluid usage figures to be reported.

9.2 REPORTING (DEICING FLUID DATA SUBMISSION)

a. Once the deicing season has commenced at an airport, the deicing supplier is to submit a weekly report of the number of deicing events performed and the quantity of deicing fluid used.

Note 1: AVTURA Stations do not have to submit a weekly report.

Note 2: Deicing suppliers interested in using the AVTURA D-ICE system should contact the easyJet Readiness Manager for further information.

b. For suppliers who do not use the AVTURA system, the report is to be submitted no later than Tuesday of each week for the previous Monday to Sunday, using the following Microsoft Excel form, to the following email address:

deicing@easyjet.com

Example of Weekly Report

IMPORTANT FORMAT

Date Format: DD/MM/YYYY
Flight Number Format: EZY-1234
File Format: Excel

Registration Format: G-EZAB (valid fleet registration)

Complete EITHER Section A OR Section B
- **Section A:** Mix and number of litres for each fluid type
- **Section B:** Total litres of each fluid type + total litres of water

				Section A						Section B			
Airport	Date	Aircraft Reg	Flight No.	Type 1 Mix %	Type 1 No. of litres	Type 2 Mix %	Type 2 No. of litres	Type 4 Mix %	Type 4 No. of litres	Type 1 No. of litres	Type 2 No. of litres	Type 4 No. of litres	Water No. of litres
ZZZ	22/07/2015	G-EZTT	EZY-7652	75	108								
ZZZ	23/07/2015	G-EZAO	EZY-7990								108		36
ZZZ	24/07/2015	G-EZDZ	EZY-7991			40	155						

9.3 DELAY CODING DURING DEICING OPERATIONS

34	Servicing Equipment, lack of or breakdown, lack of staff.	Lack of steps/airbridge, staff to operate them or pathing personnel, delaying boarding or disembarkation. Lack of a pushback tug or pushback driver/team to operate it. Lack of/breakdown of deicing rig or deicing staff. Lack of pigs, cones or toilet & water servicing. Removal of GPU prior to requirement. Awaiting headset person in excess of 60 seconds from Dispatcher leaving flight deck. *For lack of loading equipment use 32, for lack of loading staff use 32, for lack of fuel bowser or fueller use 36.*

75	Deicing of aircraft.	Removal of ice and/or snow from aircraft excluding unserviceability of equipment. *For removal of ice and/or snow from the airport, use code 76.* *For removal of ice from engine fan blades, use code 78.* *For lack of or breakdown of deicing equipment or lack of staff to operate it, use code 34.*
76	Removal of Snow, Ice, Water, or Sand from Airport.	Removal of snow, ice, water or sand from the runway, ramp, taxiways or passenger walkways. *For removal of snow/ice from the aircraft use code 75.* *For removal of ice from engine fan blades, use code 78.*
78	Fan Blade Deicing.	Removal of ice from engine fan blades. **WARNING: Code 75 must not be used for fan-blade deicing delays.**