

De-Ice De-Ice Baby: Cold Weather Opsicles

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In the Northern Hemisphere the winter season is well and truly upon us, which means various extra things to think about – like different procedures, low visibility challenges, cold temperature corrections, where you left the other glove, and of course de-icing!

So, to help you out if you aren't so familiar with all things Winter Ops we have put together a little series of **Opsicles** - Refreshing bits of ops info, just for members.

Winter Opsicle #1: De-Ice De-Ice Baby

Most operators we've met apply a **"Keep it clean, keep it safe!"** policy meaning *don't risk it; if there is anything on the airplane get it off before you take-off.*

There are some caveats to this – less than **3mm of frost on the underside of the wing** around the fuel tanks is generally acceptable. If you don't have a tiny frost ruler to hand then a general rule of thumb is clear paint markings showing through means it's ok. A light dusting of hoarfrost on the fuselage is also fine (if your manual says so).

The areas where **anything is unacceptable** are your **critical surfaces** – the upper surface of the wings, horizontal stabilisers, leading edge devices... Basically any lift and/or control surface on the aircraft. If you've ever done a Winter Ops Refresher you probably know this statistic off-by-heart but *"a very small amount of roughness, in thickness as low as 0.40mm (1/64in) can disrupt the airflow and lead to severe lift loss..."*



Icicles on leading edge: not good. Frost around fuel take: might be ok.

So keeping it clean seems like a good rule. Alas, a rule not all follow...

The trouble is, it can get confusing (no, that crew in the video weren't confused, just negligent). But when you are out there, under pressure, managing a bigger and more complex workload, it can quickly get complicated especially when you throw in some **variable weather conditions** to the mix, and some **different mixtures into your HOT calculations**.

So our **Winter Opsicle #1** is a handy guide to help with just that.

What's in them?

De-Ice De-Ice Baby is looking at de-icing/anti-icing. It comes in three parts, and you can download all, none, just one depending on what you find helpful.

- **A De-Icing Decision Process** checklist - to help you determine whether or not to consider de-icing/anti-icing.
- **Caution: Hot Stuff** - a sort of FAQ on Holdover Times.
- **Too HOT to Handle** - a generic guide on what HOT to expect.

None of these are designed to be used in place of official (and possibly much more accurate) documents and manuals, but we do hope they will provide some refresher info on things to think about during the winter season.

Over the winter season, we'll try and post more so you can **build up your own Winter and Cold**

Weather Ops Pack.

DE-ICE DE-ICE BABY

Too HOT to Handle

We said it once, we'll say it again - these are just to give an idea of **What's HOT and what's not**. Always use official tables, and preferably ones specific to the fluid type.

Here is a space to write where your **proper official manuals** can be found so you know where to look on the day:

My official manuals that I use during operations are in:

DE-ICE DE-ICE BABY

CAUTION: HOT STUFF

Working out your Holdover Time is enough to freeze anyone's brain. So we have made you an easy "What do I need to do?" De-icing/Anti-icing guide.

First up, answer the questions below, then take a look at our handy HOTs to be expected table. Word of caution though - these are generic guidelines and not official docs so always use those!

SNOWFALL INTENSITY vs VISIBILITY

	TEMP (C)	VISIBILITY (MILES/ METERS)			
		HEAVY	MODERATE	LIGHT	VERY LIGHT
NIGHT TIME	ABOVE	1.5	1.5 - 3.0	3.0 - 5.0	5.0
	BELOW	1.5	1.5 - 3.0	3.0 - 5.0	5.0
LIGHT TIME	ABOVE	1.5	1.5 - 3.0	3.0 - 5.0	5.0
	BELOW	1.5	1.5 - 3.0	3.0 - 5.0	5.0

HOT TABLES

TYPE I GENERIC

OUT (C)	TYPE I CRYSTALLINE SNOW GRAINS OR PELLETS	VERY LIGHT	LIGHT	MODERATE	FALLING PRECIP	HEAVY	WIND
-2" and above	10-12	10	10-15	10-15	10-15	10-15	2-5
-2" to -4"	8-10	10	10-15	10-15	10-15	10-15	2-5
-4" to -10"	6-10	10	10-15	10-15	10-15	10-15	2-5
below -10"	6-8	10	10-15	10-15	10-15	10-15	2-5

WIPE

DO I NEED TO DE-ICE OR ANTI-ICE?
De-icing is all about clearing off anything cold currently stuck to your aircraft. Check the critical surfaces of your aircraft. Most types allow for less than 30min of frost on the underside of the wing, around the fuel tank. Anything else - you need to De-ice.
Anti-ice is about stopping stuff from sticking to it before take-off so in this case, **check the weather** and then move onto the next question.

IS THERE PRECIPITATION?
Precipitation means anything outside that could turn into ice and stick to your wing.

WILL IT STICK?
To work out if it will stick, you'll want to check the outside temperature too - that means the **temperature of the air**, but also whether you might have **cold soaked wings**.

WHAT SORT OF PRECIPITATION?
The sort of precipitation is important. You are going to need to know the **type of cold stuff, and cold it is**, to determine your HOT. Sometimes there are different types - use the worst one (FZFG or FZRA if they are present). **Remember** There might be some precipitation which your aircraft is not approved to operate in.

SNOW CLUE?
Use a **Visibility to Snowfall intensity table** to work out whether snow is heavy, moderate, light or very light. Or make your FO stand outside and time how long it takes for them to turn into a snowman.

WHAT WEATHER?
Don't forget the forecast. Use the ATIS, use your eyeballs, and make sure you consider what might start falling to the sides before your take-off time. If in-doubt, **always use the worst case weather HOT**.

WHAT HOT?
You're going to see a minimum and a maximum. **Always use the minimum** and if you exceed that, then do an inspection. The tables are just to give an idea - use official ones for your fluid type.

DE-ICE DE-ICE BABY

DE-ICING DECISION PROCESS

ANYTIME ON THE GROUND

Are your critical surfaces contaminated/ likely to get contaminated? **CONSIDER DE-ICING / ANTI-ICING**

TAXI / APPROACHING TIME FOR TAKE-OFF

Has there been any FZFG or precipitation since the START of the FINAL application? **Next question...**

Have reports of suspected contamination on the aircraft been received? **CONSIDER DE-ICING / ANTI-ICING**

Has the MINIMUM HOT been exceeded? **Next question...**

Was Type I only used? Or Was Type II, III or IV used, but had a short MINIMUM holdover time?

CONSIDER DE-ICING / ANTI-ICING **CONSIDER A PRE-TAKEOFF CONTAMINATION INSPECTION (PCI)**

Is the anti-icing fluid showing signs of fluid failure? **CONSIDER DE-ICING / ANTI-ICING**

REMEMBER: Keep it clean to keep it safe!

GO FLY

If you're an OPSGROUP member you can click on each thumbnail to head to the Opsicle PDF download page.

Further reading

There is a huge amount of info out there (from more official sources) including:

- This very informative AOPA article on all things ice.
- This FAA Guide for Pilots on de-icing big aircraft.
- This EASA Safety Bulletin on proper de-icing procedures.
- This Airbus Manual on Getting to Grips with Cold Weather Ops.