

# FAA HOLDOVER TIME GUIDELINES



## WINTER 2016-2017 ADDENDUM 1: Sept. 30, 2016

**The information contained in this document provides supplemental information to the official FAA Holdover Time Guidelines for the 2016-2017 winter season. The information in this document must be used in conjunction with the official FAA Holdover Time Guidelines Original Issue document and with the FAA N 8900 series notice “Revised FAA-Approved Deicing Program Updates, Winter 2016-2017.”**

Questions concerning FAA aircraft ground de/anti-icing requirements or Flight Standards policies should be addressed to [charles.j.enders@faa.gov](mailto:charles.j.enders@faa.gov) or 202-267-4557.

Questions on the technical content of the holdover time tables should be addressed to [warren.underwood@faa.gov](mailto:warren.underwood@faa.gov) or 404-305-6652.

Questions regarding editorial content or web access issues should be addressed to [sung.shin@faa.gov](mailto:sung.shin@faa.gov) or 202-267-8086.

**ADDENDUM 1****SAE TYPE II AND TYPE IV SNOW HOLDOVER TIMES BELOW -14 °C (7 °F)****PURPOSE**

- This addendum has been created to communicate changes to the SAE Type II and Type IV snow, snow grain and snow pellet holdover times (HOTs) at outside air temperatures below -14 °C (7 °F). These changes are optional; the HOTs published in the Original Issue document are more conservative and can continue to be used if preferred by the operator.

**BACKGROUND**

- Preliminary research conducted in the winter of 2014-2015 indicated that some SAE Type II and Type IV fluids do not meet the published HOTs for temperatures below -14 °C (7 °F) in snow conditions. Further research was required to confirm and assess the magnitude of the associated potential safety risk.
- Additional research was carried out in the winter of 2015-2016. The additional research confirmed that many SAE Type II and Type IV fluids do not meet the published HOTs in these conditions. Consequently, as a safety measure, FAA published the 2016-2017 HOT Guidelines with reduced HOTs for all SAE Type II and Type IV fluids.

**SUBSEQUENT DEVELOPMENTS**

- Feedback from operators has indicated the new HOTs will have a significant impact on certain operations. As a result, further analysis was carried out. This analysis examined the performance of ethylene glycol (EG) vs. propylene glycol (PG) based fluids and the theoretical performance of fluids at -18 °C (0 °F).
- The analysis determined that the historic snow HOTs (those published in the 2015-2016 HOT Guidelines) can be retained for:
  - SAE Type IV EG based fluids in the below -14 °C (7 °F) to lowest operational use temperature (LOUT) temperature band; and
  - SAE Type II and Type IV PG based fluids in the below -14 to -18 °C (below 7 to 0 °F) temperature band.
- These changes are interim. Additional analysis and/or research will be carried out to determine appropriate long term solutions.

**GUIDANCE**

- The tables on the following pages provide the updated HOTs for the conditions described above. The tables include:
  - Table EG: Updated snow HOTs for Type IV EG fluids for temperatures below -14 °C (7 °F).
  - Table PG: Updated snow HOTs for Type II and Type IV PG fluids for temperatures below -14 to -18 °C (below 7 to 0 °F).
  - Table EG-90%: Updated snow HOTs for Type IV EG fluids for temperatures below -14 °C (7 °F), adjusted to 90% of standard HOTs (for use when flaps/slats are deployed prior to de/anti-icing).
  - Table PG-90%: Updated snow HOTs for Type II and Type IV PG fluids for temperatures below -14 to -18 °C (below 7 to 0 °F), adjusted to 90% of standard HOTs (for use when flaps/slats are deployed prior to de/anti-icing).
- Note: Refer to the fluid-specific HOT Table in the document *FAA Holdover Time Guidelines Winter 2016-2017 Original Issue: August 5, 2016* for the LOUT of each fluid. This information is also provided in Table 8 of the same document.
- Note: Table 8 in the document *FAA Holdover Time Guidelines Winter 2016-2017 Original Issue: August 5, 2016* provides the glycol base information for each fluid. If the fluid base is unknown, assume it is propylene glycol for the purpose of determining HOTs.

**TABLE EG. HOLDOVER TIME GUIDELINES FOR  
SAE TYPE IV ETHYLENE GLYCOL BASED FLUIDS<sup>9</sup>  
IN SNOW, SNOW GRAINS OR SNOW PELLETS BELOW -14 °C (7 °F) TO LOUT**

Outside Air Temperature <sup>1</sup>		Type IV Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours:minutes)													
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets <sup>2</sup>			Freezing Drizzle <sup>4</sup>	Light Freezing Rain	Rain on Cold Soaked Wing <sup>5</sup>	Other <sup>6</sup>						
		Very Light <sup>3</sup>		Light <sup>3</sup>	Moderate											
-3 and above	27 and above	100/0	Refer to holdover times provided in the appropriate fluid-specific or generic holdover time table published in the document <i>FAA Holdover Time Guidelines Winter 2016-2017</i> Original Issue: August 5, 2016													
		75/25														
		50/50														
below -3 to -14	below 27 to 7	100/0														
		75/25														
below -14 to LOUT <sup>8</sup>	below 7 to LOUT <sup>8</sup>	100/0								0:40-0:50	0:30-0:40	0:15-0:30	CAUTION: No holdover time guidelines exist			

THE RESPONSIBILITY FOR THE APPLICATION OF THESE DATA REMAINS WITH THE USER.

- 1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 7) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 6 provides allowance times for ice pellets and small hail).
- 7 No holdover time guidelines exist for this condition below -10 °C (14 °F).
- 8 Refer to the fluid-specific holdover time (HOT) table in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* for the LOUT of each fluid. This information is also provided in Table 8 of the same document. If the LOUT is unknown, no holdover times exist below -22.5 °C (-8.5 °F).
- 9 Table 8 in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* provides the glycol base information for each fluid. If the fluid base is unknown, assume it is propylene glycol for the purpose of determining holdover times.

**CAUTIONS:**

- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce HOT below the lowest time stated in the range. HOT may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures.

**TABLE PG. HOLDOVER TIME GUIDELINES FOR  
SAE TYPE II AND TYPE IV PROPYLENE GLYCOL BASED FLUIDS<sup>9</sup>  
IN SNOW, SNOW GRAINS OR SNOW PELLETS BELOW -14 °C (7 °F) TO LOUT**

Outside Air Temperature <sup>1</sup>		Type II/IV Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours:minutes)							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets <sup>2</sup>			Freezing Drizzle <sup>4</sup>	Light Freezing Rain	Rain on Cold Soaked Wing <sup>5</sup>	Other <sup>6</sup>
				Very Light <sup>3</sup>	Light <sup>3</sup>	Moderate				
-3 and above	27 and above	100/0	Refer to holdover times provided in the appropriate fluid-specific or generic holdover time table published in the document <i>FAA Holdover Time Guidelines Winter 2016-2017</i> <i>Original Issue: August 5, 2016</i>							
		75/25								
		50/50								
below -3 to -14	below 27 to 7	100/0	CAUTION: No holdover time guidelines exist							
		75/25								
below -14 to -18	below 7 to 0	100/0	0:40-0:50	0:30-0:40	0:15-0:30	CAUTION: No holdover time guidelines exist				
below -18 to LOUT <sup>8</sup>	below 0 to LOUT <sup>8</sup>	100/0	0:20-0:25	0:10-0:20	0:08-0:10					

THE RESPONSIBILITY FOR THE APPLICATION OF THESE DATA REMAINS WITH THE USER.

- 1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type II/IV fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 7) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 6 provides allowance times for ice pellets and small hail).
- 7 No holdover time guidelines exist for this condition below -10 °C (14 °F).
- 8 Refer to the fluid-specific holdover time (HOT) table in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* for the LOUT of each fluid. This information is also provided in Table 8 of the same document. If the LOUT is unknown, no holdover times exist below -22.5 °C (-8.5 °F).
- 9 Table 8 in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* provides the glycol base information for each fluid. If the fluid base is unknown, assume it is propylene glycol for the purpose of determining holdover times.

**CAUTIONS:**

- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce HOT below the lowest time stated in the range. HOT may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures.

**THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING**

**TABLE EG-90%. 90 PERCENT ADJUSTED HOLDOVER TIME GUIDELINES FOR  
SAE TYPE IV ETHYLENE GLYCOL BASED FLUIDS<sup>9</sup>  
IN SNOW, SNOW GRAINS OR SNOW PELLETS BELOW -14 °C (7 °F) TO LOU**

Outside Air Temperature <sup>1</sup>		Type IV Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours:minutes)							
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets <sup>2</sup>			Freezing Drizzle <sup>4</sup>	Light Freezing Rain	Rain on Cold Soaked Wing <sup>5</sup>	Other <sup>6</sup>
				Very Light <sup>3</sup>	Light <sup>3</sup>	Moderate				
-3 and above	27 and above	100/0	Refer to holdover times provided in the appropriate fluid-specific or generic holdover time table published in the document <i>FAA Holdover Time Guidelines Winter 2016-2017</i> <i>Original Issue: August 5, 2016</i>						CAUTION: No holdover time guidelines exist	
		75/25								
		50/50								
below -3 to -14	below 27 to 7	100/0								
		75/25								
below -14 to LOU <sup>8</sup>	below 7 to LOU <sup>8</sup>	100/0	0:36-0:45	0:27-0:36	0:14-0:27					

THE RESPONSIBILITY FOR THE APPLICATION OF THESE DATA REMAINS WITH THE USER.

- 1 Ensure that the lowest operational use temperature (LOUT) is respected. Consider use of Type I fluid when Type IV fluid cannot be used.
- 2 To determine snowfall intensity, the Snowfall Intensities as a Function of Prevailing Visibility table (Table 7) is required.
- 3 Use light freezing rain holdover times in conditions of very light or light snow mixed with light rain.
- 4 Use light freezing rain holdover times if positive identification of freezing drizzle is not possible.
- 5 No holdover time guidelines exist for this condition for 0 °C (32 °F) and below.
- 6 Heavy snow, ice pellets, moderate and heavy freezing rain, small hail and hail (Table 6 provides allowance times for ice pellets and small hail).
- 7 No holdover time guidelines exist for this condition below -10 °C (14 °F).
- 8 Refer to the fluid-specific holdover time (HOT) table in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* for the LOU of each fluid. This information is also provided in Table 8 of the same document. If the LOU is unknown, no holdover times exist below -22.5 °C (-8.5 °F).
- 9 Table 8 in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* provides the glycol base information for each fluid. If the fluid base is unknown, assume it is propylene glycol for the purpose of determining holdover times.

**CAUTIONS:**

- The time of protection will be shortened in heavy weather conditions. Heavy precipitation rates or high moisture content, high wind velocity, or jet blast may reduce HOT below the lowest time stated in the range. HOT may be reduced when aircraft skin temperature is lower than outside air temperature.
- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures.

**THIS TABLE IS FOR USE WHEN FLAPS/SLATS ARE DEPLOYED PRIOR TO DE/ANTI-ICING**

**TABLE PG-90%. 90 PERCENT ADJUSTED HOLDOVER TIME GUIDELINES FOR SAE TYPE II AND TYPE IV PROPYLENE GLYCOL BASED FLUIDS<sup>9</sup> IN SNOW, SNOW GRAINS OR SNOW PELLETS BELOW -14 °C (7 °F) TO LOUT**

Outside Air Temperature <sup>1</sup>		Type II/IV Fluid Concentration Neat-Fluid/Water (Volume %/Volume %)	Approximate Holdover Times Under Various Weather Conditions (hours:minutes)											
Degrees Celsius	Degrees Fahrenheit		Freezing Fog or Ice Crystals	Snow, Snow Grains or Snow Pellets <sup>2</sup>		Freezing Drizzle <sup>4</sup>	Light Freezing Rain	Rain on Cold Soaked Wing <sup>5</sup>	Other <sup>6</sup>					
				Very Light <sup>3</sup>	Light <sup>3</sup>	Moderate								
-3 and above	27 and above	100/0	Refer to holdover times provided in the appropriate fluid-specific or generic holdover time table published in the document <i>FAA Holdover Time Guidelines Winter 2016-2017</i> Original Issue: August 5, 2016											
		75/25												
		50/50												
below -3 to -14	below 27 to 7	100/0							0:36-0:45	0:27-0:36	0:14-0:27			
		75/25												
below -14 to -18	below 7 to 0	100/0	0:18-0:23	0:09-0:18	0:07-0:09									
below -18 to LOUT <sup>8</sup>	Below 0 to LOUT <sup>8</sup>	100/0												

**CAUTION:**  
No holdover time guidelines exist

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- 9 Table 8 in the document *FAA Holdover Time Guidelines Winter 2016-2017, Original Issue: August 5, 2016* provides the glycol base information for each fluid. If the fluid base is unknown, assume it is propylene glycol for the purpose of determining holdover times.

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- Fluids used during ground de/anti-icing do not provide in-flight icing protection.
- This table is for departure planning only and should be used in conjunction with pretakeoff check procedures.