Critical Surface Contamination (Pass 70 %)

1. Frost, ice or snow on top of de-icing or anti-icing fluids:

    a) is not considered as adhering to the aircraft and a take off may be made.
    b) must be considered as adhering to the aircraft and a take off should not be attempted.
    c) is only considered as adhering to the aircraft when Vr speeds are below 100 kt.
    d) is not considered as adhering if the aircraft has been de-iced and then anti-iced.

2. Where conditions are such that frost, ice or snow may reasonably be expected to adhere to the aircraft, no person shall take off or attempt to take off in an aircraft unless:

    a) it has been de iced.
    b) it has been inspected immediately prior to take off to determine whether any frost, ice or snow is adhering to any of its critical surfaces.
    c) its skin temperature is warm enough to ensure that adhering frost, ice or snow will slide off on take off.
    d) its power and runway length are sufficient to allow acceleration to Vr plus 10% before rotation.

3. Prior to take off, the PIC cannot confirm that the aircraft is "clean". Take off:

    a) may be commenced provided the maximum holdover time has not been exceeded.
    b) may be commenced provided the anti ice fluid used was of the type that prevents ice or snow from sticking to the critical surfaces.
    c) may be commenced provided the amount of frost, ice, or snow does not exceed that specified in the company operations manual.
    d) must not be attempted until confirmation is obtained that the aircraft is clean.

4. The only positive assurance that an aircraft is "clean" prior to take off can be achieved by:

    a) confirmation from the crew chief that the fluid used has the required holdover time.
    b) ensuring the aircraft is not subjected to excessive ground delays.
    c) close inspection by the PIC or designated flight crew member.
    d) ensuring take-off is within the applicable holdover time table.

5. Who may inspect an aircraft immediately prior to take off to determine whether any frost, ice or snow is adhering to any of its critical surfaces? The PIC and:

    A. a flight crew member of the aircraft designated by the PIC to carry out the inspection.
    B. the operations officer.
    C. the deicing crew.
    D. a person designated by the operator who has received the required surface contamination training.
    E. any Aircraft Maintenance Engineer.

    a) A, B, C, D, E.
    b) A, B, C, D.
    c) A, B, C.
    d) A, D.

6. When a crew member of an aircraft observes frost, ice or snow adhering to the wings of an aircraft before take-off. The crew member:

    a) shall immediately report that observation to the PIC.
    b) need not report that observation if the aircraft has recently been de iced.
    c) shall immediately report that observation to the designated crew member.
    d) unless designated, need not report that observation.

7. Before commencing take off the PIC is advised that there is frost, ice or snow adhering to the wings of the aircraft. The PIC:

    a) may take off without a further wing inspection if the aircraft has been recently de iced.
    b) shall request a go/no go decision from company operations.
    c) shall request the deicing crew to inspect the wings before take off.
    d) or another flight crew member designated by the PIC shall inspect the wings before take off.

8. No person shall commence a flight in an aircraft:

    a) unless it has been de iced if frost, ice, or snow conditions exist.
    b) unless assured that adhering frost, ice or snow will slide off on take off.
    c) if frost, ice, or snow is adhering to any of its critical surfaces.
    d) if frost, ice, or snow adhering to the critical surfaces cannot be removed on take off by the aircraft deicing systems.

9. An air carrier shall provide training to crew members on the adverse effects of aircraft surface contamination:

    a) biannually.
    b) on initial hiring and annually.
    c) biennially.
    d) on initial hiring only.

10. The PIC notes that frost caused by cold soaked fuel is adhering to the underside of the wings. Take off may:

    a) not be attempted until the aeroplane is de iced.
    b) not be attempted under any circumstances as the frost, if removed, will quickly reform.
    c) be made at the discretion of the PIC.
    d) be made provided it is conducted in accordance with the aircraft manufacturer's instruction.

11. Who may inspect an aircraft immediately prior to take off to determine whether any frost, ice or snow is adhering to any of its critical surfaces?

    a) The PIC.
    b) A flight crew member of the aircraft who is designated by the PIC.
    c) A person designated by the operator of the aircraft who has received the required surface contamination training.
    d) All of the above.

12. Aircraft certified for flight in known icing conditions have been designed and have demonstrated system capability of providing adequate protection against the adverse effects of airframe icing:

    a) both in flight and on the ground.
    b) in flight only.
    c) on the ground only.
    d) under all inflight icing conditions.

13. Aircraft performance may be seriously affected by frost, ice or snow on the wings and control surfaces primarily because of the:

    a) increase in gross weight.
    b) disruption of smooth airflow.
    c) strong possibility that the control hinges will freeze.
    d) adverse movement of the C of G.

14. Contamination on an aircraft wing is dangerous primarily because:

    a) the aircraft may become airborne in ground effect but be unable to climb.
    b) drag will prevent the aircraft accelerating to take off speed.
    c) its weight will cause the centre of pressure to move forward and reduce the rate of climb.
    d) all of the above factors.

15. Frost, ice or snow formation on the leading edge and upper surface of a wing, having a thickness and surface roughness similar to medium or coarse sandpaper, can reduce the wing lift by as much as ____ and increase drag by as much as ____.

    a) 10%, 20%.
    b) 30%, 40%.
    c) 50%, 75%.
    d) 75%, 100%.

16. The adverse effects of frost, ice or snow on aircraft include:

    a) decreased thrust and lift, and increased drag and stall speed.
    b) trim changes and altered stall characteristics.
    c) altered handling qualities.
    d) all of the above.

17. The use of SAE Types II and IV fluids could cause significant performance degradation for aeroplanes with rotation speeds:

    a) of 85 kt to 100 kt only.
    b) of 85 kt and below only.
    c) above 100 kt.
    d) of 100 kt and below.

18. Undiluted propylene glycol at temperatures less than -10°C is quite viscous and may produce a reduction in lift of approximately:

    a) 10%.
    b) 20%.
    c) 30%.
    d) 40%.

19. After extended flight at a temperature of -20°C, an aircraft arrives for a quick turn around at an aerodrome where the temperature and dew point are 10°C and 9°C respectively. The pilot could expect :

    a) blockage of the fuel vent system.
    b) ice formation over the entire wing surface.
    c) no adverse problems.
    d) frost to form in the area of the wing fuel tanks.

20. After extended flight at a temperature of -20°C, an aircraft arrives for a quick turn around at an aerodrome where there is light drizzle with a temperature of +8°C. The pilot could expect:

    a) no adverse problems.
    b) ice to form on top of the wing in the area of the fuel tanks.
    c) frost to form on top of the wing in the area of the fuel tanks.
    d) ice to form on the bottom of the wing and frost to form on the top.

21. A very critical cold soaking phenomenon situation arises at aerodromes where there is:

    a) drizzle with an ambient temperature around +15°C.
    b) rain with an aircraft skin temperature of +8°C.
    c) dry snow with an aircraft skin temperature between +8°C and +14°C.
    d) wet snow with an ambient temperature around 0°C.

22. Holdover time is:

    a) a fixed time for fluid breakdown specified by the manufacturer.
    b) a fixed time for fluid breakdown specified by the ISO and SAE standards.
    c) the estimated time that an application of deicing/anti icing fluid is effective in preventing frost, ice or snow from adhering to treated surfaces.
    d) the estimated time to fluid shear from the aircraft surfaces.

23. Pure 100% ethylene glycol should not be used for deicing in non precipitation conditions because:

    a) the freezing point is higher than fluids with a proper glycol/water ratio.
    b) this fluid is highly corrosive unless diluted with water.
    c) undiluted, it is highly flammable.
    d) it could cause a loss of efficiency of the lifting surfaces due to its higher viscosity.

24. The reason deicing fluid acts as an anti icing fluid for a very limited time is because:

a) it does not mix well with water.
b) it mixes well with water.
c) it has a relatively high viscosity.
d) the FPD has a relatively high freezing point.

25. The heating of freezing point depressant (FPD) fluids:

a) decreases their deicing effectiveness.
b) increases their deicing effectiveness.
c) has no effect on their deicing effectiveness.
d) has no effect on their anti icing effectiveness.

26. SAE Type II and Type IV anti icing fluids:

a) do not affect the lift of the wing.
b) are contaminants and are designed to flow off on take off.
c) reduce surface friction and decrease drag.
d) change the angle of attack required for lift off.

27. The performance of SAE Type II anti icing fluid applied with improper equipment may be reduced by at least:

a) 80% to 90%.
b) 50% to 80%.
c) 30% to 40%.
d) 20% to 60%.

28. The use of SAE Type II and Type IV anti icing fluids are recommended for aircraft with rotation speeds above:

a) 75 kt.
b) 85 kt.
c) 95 kt.
d) 100 kt.

29. The acceptable Decision Criteria Times are the:

a) median times in the holdover tables.
b) times shown in the Ground Icing Operations Standard.
c) shortest time within the applicable holdover timetable cell.
d) longest time within the applicable holdover timetable cell.

30. A Type II fluid has met an acceptance test down to -42ºC. The reported freezing point as measured by the deicing operator is -40ºC. The OAT is -35ºC. Calculate the Lowest Operational Use Temperature (LOUT).

    a) -33ºC.
    b) -35ºC.
    c) -40ºC.
    d) -42ºC.

31. Refer to Appendix: SAE Type I Fluid Holdover Times (Table 1). Moderate snow is falling and the reported outside air temperature is 5°C. Your aircraft is de iced and anti iced with SAE Type I fluid. What is the minimum holdover time you could expect?

    a) 5 minutes.
    b) 6 minutes.
    c) 8 minutes.
    d) 11 minutes.

32. Refer to Appendix: SAE Type IV fluid Holdover Times (Table 3). Light freezing rain is falling with an OAT of 0°C and a 50/50 mixture of SAE Type IV fluid is used. What is the acceptable Decision Criteria Time for these weather conditions?

    a) 5 minutes.
    b) 10 minutes.
    c) 15 minutes.
    d) 30 minutes.

33. Refer to Appendix: Snow Visibility vs Snowfall Intensity Chart (Table 4). The daytime visibility in snowfall is 1/2 of a statute mile and the temperature is -8 C. The snowfall rate that will be used to determine which HOT table value is appropriate for the fluid in use is

    a) light.
    b) moderate.
    c) heavy.
    d) very heavy.

34. Cold snow is falling onto a cold wing and swirling across the surface. A tactile inspection reveals the snow is not sticking to the surface. Under these conditions:

    a) anti-icing fluid should be applied to the critical surfaces.
    b) Deicing fluid should be applied to the critical surfaces.
    c) the pilot may assume the accumulated snow will blow off on take-off.
    d) the application of deicing or anti-icing fluid may not be prudent.

35. When deicing an aircraft, it is important to know:

    a) the kind of contamination.
    b) the concentration is correct for the conditions.
    c) the recommended holdover times and keep track of the time.
    d) all of the above.

36. The areas that should be de iced or anti iced first are:

    a) the engine ducts.
    b) the tailplane.
    c) the fuselage top.
    d) surfaces that are visible from the cockpit.

37. When deicing windows:

    a) spray the fuselage above the windows and allow the fluid to flow down.
    b) use only hot water to avoid damage from the deicing fluid.
    c) spray directly on the windows and allow the fluid to flow down.
    d) use anti icing fluid as it is the only approved de icer for windows.

38. Holdover times for FPD fluids should be considered:

    a) as guidelines only, unless the Operator's Ground Icing Operations Program allows otherwise.
    b) valid only for the 100% concentration time in the holdover tables.
    c) valid for the longest times shown on the holdover tables.
    d) guidelines in all cases.

39. Holdover time is calculated as beginning at the:

    a) start of the final application of deicing/anti icing fluid and ending when the fluid shears on take off.
    b) end of the final application of deicing/anti icing fluid and ending when the fluid shears on take off.
    c) end of the final application of deicing/anti icing fluid and expiring when the fluid is no longer effective.
    d) start of the final application of deicing/anti icing fluid and expiring when the fluid is no longer effective.

40. Pure propylene glycol fluids:

    a) may be used in non precipitation conditions.
    b) are not to be used in non precipitation conditions.
    c) are not to be used in precipitation conditions.
    d) are applied heated as the second step in the two step process.

41. Which statement is correct regarding the inspection of the critical surfaces immediately before take-off during conditions of heavy snow?

    a) The inspection is required irrespective of the elapsed time since anti-icing.
    b) Take-off must be initiated within 15 minutes of the inspection.
    c) The inspection is not required where the operator is using a program in accordance with the Ground Icing Operations Standard.
    d) The inspection is not required where a remote deicing facility is used and the take-off is initiated within the holdover time.

42. Which statement is correct regarding take-off after holdover times have been exceeded?

    a) Operations must cease immediately.
    b) Inspections are not required after deicing at a Central De-ice Facility.
    c) There must be at least 5 minutes of holdover time remaining after the pre-take-off inspection.
    d) Take-off must be within 5 minutes of completion of the pre-take-off inspection.