



## UCAR™ Aircraft Deicing and Anti-Icing Fluids Sampling Guidelines

### Introduction

It is important to take samples in such a way that they will be representative. Much money and effort is spent analyzing samples. If the sample is not representative, this money and effort will be wasted. Even worse, incorrect decisions may be made upon results from an unrepresentative sample.

### Objective

This report intends to provide guidelines on the sampling of UCAR™ Aircraft Deicing and Anti-Icing fluids at airports, namely from delivery tank trucks, storage tanks, truck tanks and truck nozzles.

This sampling guideline is appropriate for sampling all UCAR™ Aircraft Deicing and Anti-Icing fluids.

### Safety Precautions

#### SDS

Before sampling, please consult the appropriate Safety Data Sheet (SDS).

#### Personal Protection

- Wear safety glasses with side shields, monogoggles, or a face shield.
- Wear long insulated rubber gloves (hot fluid can cause severe burns).
- Wear safety anti-slip boots.
- Wear hearing protection. Noise levels can be high near aircraft or de- /anti-icing trucks.

#### Special Hazards at Airports

In addition to protecting yourself from hazards due to the chemical itself (see MSDS), high temperature of fluids, and noise from trucks and aircraft, be sure to:

- Be aware of movements of trucks and aircraft
- Avoid jet blast and propellers
- Always tell the truck operator or pilot if you are taking samples so you can avoid:
  - Movement of the truck or aircraft
  - Activation of booms, slats, flaps, etc.
  - Unexpected flow of deicing/anti-icing fluid from the nozzle

Sampling is like swimming. **Don't do it alone.** Always have someone with you and be aware of your presence and actions.

### Equipment

1. 500mL or 1000mL wide-mouth high-density polyethylene bottles. Those manufactured by Nalgene (part number 2104-0016 for 500mL; part number 2104-0032 for 1000mL) are satisfactory and available from Fisher Scientific (call (800) 876-0442). The 500mL size is large enough for Dow to perform the basic product specification tests in the aircraft deicing fluids laboratory. Do **not** use glass or plastic-coated glass bottles, as they may break. Never use food containers. The bottles must be pre-labeled with appropriate hazard information (use GHS-compliant labels), and pre-numbered. Cover the label with clear adhesive tape to prevent fluid drips from streaking the label. Polyester film, cat. no. F13453-0020, made by Bel-Art Products of Pequannock, NJ 07440 is satisfactory (available from Fisher Scientific, cat. no. 18867C).

2. Lab book and pen.
3. Pail to collect fluid to be discarded.
4. Paper towels.
5. Plastic pan to capture nozzle samples.
6. Zone sampler (3-inch, stainless steel), currently available from:  
R.S. Lee Company, Adams MA, (413) 770-1960  
American Petroleum Services, Miami FL, 305-477-8677  
Channel Supplies, Kerrville TX, 830-792-5538

### **Sampling of Delivery Tank Trucks**

1. Ask the truck driver to open the valve and collect about 4 liters, or enough fluid to completely flush the line between the tank itself and the valve. The first few liters are often not representative.
2. Dispose of the line flush in an appropriate manner.
3. Collect the sample directly from the valve.
4. Record in the lab book: date, place, airline, truck number, product name, your name and bottle number. Also include this information on the sample bottle label.

### **Loading a Truck with UCAR™ Aircraft Deicing or Anti-Icing Fluid**

Whenever a truck is loading for the first time with UCAR™ Aircraft Deicing or Anti-Icing Fluid, steps must be taken to prevent contamination from the fluid which was previously contained in the truck tank, pump and lines. It is recommended to:

1. Empty the tank completely by opening the drain valve at the bottom of the tank into an environmentally acceptable area.
2. With the valve open, rinse the tank with fresh water.
3. Close the valve and add enough water to start the pump.
4. Pump water through the line and nozzle.
5. Reopen the drain valve and let the liquid drain out completely.
6. Close the valve and add a small amount of fluid.
7. Flush the pump and line with this fluid.
8. Open the drain valve and dispose of this fluid in an appropriate manner.
9. Repeat steps 5, 6, 7 and 8 one more time; then go to step 10.
10. Add fluid to the tank and run a refractive index test. Verify that refractive index (equivalently Brix) is within specification and that the fluid is the correct color and substantially free from suspended matter. If it is an anti-icing fluid, you may also perform the viscosity field test.

### **Sampling a Truck Tank from the Top**

This procedure can be potentially hazardous, as one has to climb on the truck to sample and the sample may be hot.

- Be extremely careful as you climb on the truck.
- If the fluid is cold and if the level is near the top, wear protective gloves and plunge the bottle about 10 cm below the surface to let it fill. If the liquid is hot, if you cannot see the liquid level clearly, or if the level is low, use a zone sampler. If you do not have a zone sampler, do not attempt sampling from the top. Sample instead from the bottom drain valve (see below).
- Do not use a portable pump or any other pump to get fluid from the tank, as the effect of the pump is unknown and the pump may be contaminated.
- Record in the lab book: date, place, airline, truck number, truck manufacturer, truck model, product name, your name, bottle number, and where it was sampled (top of tank). Include this information on the sample bottle label as well.

## Product Information

### **Sampling a Truck Tank from the Bottom**

- Place the plastic pail underneath the bottom drain valve.
- Collect enough to flush the line from the tank to the drain valve (about 10 liters or more) and discard appropriately. The first few liters are often not representative.
- Collect about 0.5 liters in the pan.
- Pour in the sample bottle.
- Record in the log book: date, place, airline, truck number, truck manufacturer, truck model, product name, your name, bottle number, and where the sample came from (bottom of tank). Include this information on the sample bottle label as well.

### **Sampling from the Nozzle**

- Wear monogoggles or a face shield for nozzle sampling.
- Do not attempt to sample directly from the nozzle into the sample bottle. This can cause excessive shear of the fluid which will permanently degrade viscosity.
- Do not pressurize the conduit to the nozzle until after it has been removed from its cradle. Most accidents occur as the nozzle is removed from or replaced on the cradle with pressure on. It is possible for the trigger or valve to be accidentally opened, causing high-pressure (sometimes hot) fluid to flow.
- Flush the nozzle and line (about 30 liters or more).
- Place a plastic pan or metal pan about 2-5 meters from the nozzle. Preferably rest the pan on a fixed object so that it will not move as the fluid hits it.
- Spray a few liters in the pan using the settings normally used to spray an aircraft.
- Pour into the sample bottle and discard the excess in an appropriate way.
- Record in the lab book: date, place, airline, truck number, truck manufacturer, truck model, product name, your name, bottle number, and where it was sampled (nozzle). Include this information on the sample bottle label as well.

### **Sampling from Storage Tanks**

It is particularly difficult to get representative samples from storage tanks, as there may be layering. Ideally, one should sample from the top and bottom using a zone sampler. Depending on the configuration of the tank, this is not always possible.

- When sampling from the bottom, try to find the valve at the lowest point. Flush a few liters and take the sample directly into the bottle if possible. Dispose of the excess fluid separately.
- Sampling from the top can be hazardous, particularly if the tank is covered by ice and does not have a guardrail. Do **not** attempt to sample from the top of a tank if it is not safe.
- The anti-icing truck fill location is usually a good point to sample as it is representative of what goes in the anti-icing trucks. Let several liters flow before taking a sample to make sure the dispensing hose was not contaminated with ice, snow, or dirt. Dispose of the excess fluid appropriately.
- Record in lab book: date, place, airline, storage tank number, product name, your name, bottle number, and where it was sampled (top of tank, discharge valve, bottom of tank, etc.).

### **Disposal of Excess Sample**

A few suggestions:

- Ask airline personnel for the environmentally acceptable and safe disposal method.
- Some airlines have special recovery systems for spent deicing/anti-icing fluid.
- Some airlines will allow you to discard the excess anti-icing fluid in antifreeze collection bins.

### **Clean-up**

- Always clean up the site and equipment before leaving.

### Shipping Samples

- UCAR™ Aircraft Deicing and Anti-Icing Fluids are classified as non-hazardous for shipping purposes. They may be shipped by air when using appropriate containers.
- Fill out the shipping label. Make sure to include the airline/company, city, date, and the number of sample enclosed when filling out the label.
- Always include an SDS with the shipping container.
- If samples are going to Dow, ship them to:  
The Dow Chemical Company  
Attn: Aircraft Deicing Laboratory – 1712 Building  
633 Washington St.  
Midland, MI 48674  
USA

Should you have any questions regarding this guideline, please call your Dow sales representative.

### Storage of Samples

Those wishing to store samples must keep them in the dark to prevent ultraviolet light degradation.

#### For More Information

Email: [dowcig@dow.com](mailto:dowcig@dow.com)  
North America: toll-free 1-800-447-4369  
fax 1-989-832-1465  
Europe: toll-free +800 3 694 6367  
call +31 11567 2626  
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<http://www.dow.com>

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