Maintaining a Healthy and Efficient Ultra Low Temperature Fleet Care and Feeding

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Care And Feeding
Installation Considerations

• Install unit in a level area, with a minimum of 8” of space on the top and sides and 6” in the back. Use the standoffs provided.

• Do not install directly under air conditioning ducts.

• Do not stack boxes next to or on top of ULT.

• Give them space, let them breathe!
Installation Considerations

- Make sure the unit is plugged into a dedicated circuit, with appropriate line voltage and capacity.
- Supply voltage must be within +/- 10% of freezer rated voltage.
- Ensure that the room they are installed in stays within a reasonable range of temperature (15°C – 32°C).
Cleaning Filter and Condenser

Unrestricted airflow is critical for proper operation of a ULT

Filters and condensers should be regularly inspected for dirt and dust

Vacuum the condenser, filters can be vacuumed or washed in mild soap and water then air dried
Door Gaskets

- Good seals help insure product protection
- Minimizes ambient temperature and humidity migration to the interior
  - Benefit: Less frost builds up on the inner doors and interior of the unit
- Provides an energy efficient thermal barrier to keep cold air in and room temperature out.
- Reduces maintenance, because less frost buildup
- Seals should be inspected regularly to check for any tears, pulling away from frame or ice/frost build up
- Frost and ice should be removed from around gaskets and packed between folds of gasket
- Do not use a sharp object that can puncture or dislodge the gasket.
Removing Frost And Ice

The #1 Action You Can Take

Stay Ahead of Frost and Ice!

The formation of frost is unavoidable

If not removed, frost will ultimately turn to ice, making it much harder to remove

Accumulation of ice on gaskets and sealing surfaces will prevent proper sealing, making the situation much worse!

Buildup of ice on interior walls will insulate the unit, reducing ability to respond and perform

Regularly wiping off frost from sealing surfaces with a soft cloth, will slow down the formation of ice, greatly extending time between defrosts
What is PEP and What Does it Do?

PEP stands for pressure equalization port

When you open the door of an upright ULT, the cold air (100C differential) dumps out of the ULT and is replaced by warm moist air. When you close the door, the air compresses and creates a vacuum, preventing the door from opening.

The PEP is a one way valve that opens and allows the vacuum to be relieved (can take around a minute)

Frost will condense on the inner door and eventually build up a cone of frost/ice that needs to be removed.
Defrosting Your Freezer

- ULT’s should be placed on a regular defrosting maintenance schedule. We recommend once per year. That can vary depending on daily maintenance practices.

- Need to maintain a spare ULT for offloading samples.

- Samples will need to be removed from unit to be defrosted.

- Shut down unit, open inner and outer doors, allowing to warm up and ice to melt. Place absorbent pads around base of unit to prevent slip hazards.

- Unit should be thoroughly dried before placing back into service.

- Allow unit to pull down to operating temperature prior to reloading samples (12 hours).
Best practices
Keep Organized!

• Just like your office, if the samples in a ULT are not organized, they will be difficult to find, wasting time and creating inefficiencies.
• Poor organization of samples also results in inefficient use of precious and expensive lab space.
• Ultimately, poor organization results in excessive stress on the ULT, which can limit life of operating components and jeopardize sample integrity.
• Use racks and boxes, bar coded tubes, bar code readers, inventory management systems to make sure you know where your samples are.
• The quicker you can locate the samples, the less time freezer doors are open, minimizing frost buildup and putting less stress on the ULT.
General Organization

- Develop some method of mapping and tracking sample location.
- Have a plan PRIOR to opening door of ULT. Have a list of what you want to remove from unit.
- Minimize door opening frequency and time of door opening.
- Keep unit full.
  - The more full a unit is, the less air displacement during a door opening.
  - Utilize racks and bins to maximize sample storage, reduce air space and efficiently manage sample inventory.
Loading of Samples

It is best to “pre-cool” samples prior to loading into a ULT. Samples can be conditioned in -20°C units, cold rooms or through other methods.

When loading multiple samples, they should be loaded one shelf at a time maximum, allowing the ULT to attain operating temperature prior to loading the next batch of samples.
Fleet Management Strategies

Keep Your Fleet Fresh and at Optimum Efficiency

- Have an established retirement and replacement program. 10 years is a good benchmark.
- Consider cost of ownership. Older units use more energy. Older units will require more repair. Parts become obsolete.
- Take advantage of promos, trade in programs, standardization programs.
12 Point Checklist

- Inspect door gaskets for ice buildup
  - score card rating (red = needed near term; orange = frost ice accumulation is greater than normal; green = interior frost/ice is normal or minimal)
- Inspect door latches for latch loosening
- Ensure freezers don’t move upon door opening
- Check storage organization, use of labeled containers, tracking system to prevent long door openings and lost samples
- Check inner doors for good functioning
- Ensure software updated to latest version
- Check battery for full charge and voltage
- Check compressor deck for indication of insulation degradation
- Ensure units have updated door ramps
- Ensure active Preventative Maintenance program written and in place
- Check filter/condenser cleanliness
- Download and analyze unit operation history data including: Ambient conditions, voltage/power fluctuations, usage trends, % run time, leak check trending
An Ounce of Prevention Means…

- Equipment longevity
- Reduced service issues
- Increased energy efficiency
- Cost savings
- Peace of mind and sample protection
Thank You!