



*Louisiana Vaccines for Children Program
Refrigerator and Freezer Guide*

July 1, 2023 – June 30, 2024

**Louisiana Department of Health
Office of Public Health
Immunization Program**

General Requirements

The Centers for Disease Control and Prevention (CDC) and the Louisiana Vaccines for Children (VFC) Program within the state Department of Health, Office of Public Health, Immunization Program *require* the following for any refrigerator or freezer used for vaccine storage:

- Maintain required vaccine-storage temperatures year-round.
 - **Refrigerator:** 36° to 46° F (2° to 8° C)
 - **Freezer:** -58° to 5° F (-50° to -15° C)
- Have sufficient room across the unit to store current stock as well as any additional stock acquired during peak season without overcrowding.
- Monitor the temperature using a *digital data-logger* (DDL) thermometer with the following features:

Required

- Temperature probe
- Active temperature display that can be easily read from the outside of the unit
- Capacity for continuous monitoring and recording capabilities where the data can be routinely downloaded

Recommended

- Alarm for out-of-range temperatures
- Current, minimum, and maximum temperatures display
- Low battery indicator
- Accuracy of +/- 1°F (0.5°C)
- Memory storage of at least 4,000 readings
- User programmable logging interval (or reading rate) recommended at a maximum time interval of every 30 minutes
- Use of a probe that best reflects the temperature of the vaccine (such as a buffered probe)

Likewise, CDC and the Louisiana VFC Program *recommend* the following for any refrigerator or freezer used for vaccine storage:

- Be dedicated to vaccine storage only. Food and beverages should not be stored in a vaccine-storage unit because this practice results in frequent opening of the door and destabilization of the temperature.
- Be frost-free with an automatic defrost cycle if regular manual defrosting cannot be assured.

Biologic-Grade Refrigerators and Freezers Recommended

CDC and the Louisiana VFC Program *strongly recommend* that clinics purchase *biologic-grade* refrigerator and freezer units for vaccine storage. These units are available in different models (standalone refrigerator and freezer, combination refrigerator/freezer, doorless/vending-style) and are designed specifically for storage of biological products such as vaccines.

Whether undercounter or full-size, biologic-grade refrigerators and freezers are considered the best, most secure option for vaccine storage. These “gold-standard” vaccine units are most often found in health departments, laboratories, central pharmacies, and hospitals. Manufacturers in this category offer a range of sizes and options to fit any provider’s needs.

CDC has identified the following common characteristics of biologic-grade vaccine-storage units:

- Microprocessor-based temperature control with a digital temperature sensor (thermocouple, resistance temperature detector (RTD), or thermistor)
- Digital temperature display and settings
- Fan-forced air circulation (powerful fans or multiple cool-air vents inside the unit promote temperature uniformity and fast temperature recovery)
- Temperature alarms
- Security measures (e.g., temperature set-point security)
- Maintain a tightly-controlled, uniform temperature throughout the entire storage cavity (suitable for vaccine storage, with no special measures required)

Manufacturers and Vendors

Providers have many options when it comes to purchasing biologic-grade vaccine-storage units. The following are examples of manufacturers and vendors:

PHC: <http://www.phchd.com/us/biomedical>

Follett: <http://www.follettice.com>

Helmer Scientific: <http://www.helmerinc.com>

ThermoFisher Scientific: <http://www.thermofisher.com/us/en/home.html>

Lab Research Products: <http://www.labresprod.com>

Migali Scientific: <http://migaliscientific.com>

Fisher Scientific: <http://www.fishersci.com>

LABRepCo: <http://www.labrepco.com>

TruMed Systems (AccuVax): <http://www.accuvax.com>

Used and Refurbished Refrigerators and Freezers

There are several online vendors offering used and refurbished equipment at prices often 30-50% off the regular retail price. An additional option is to call a manufacturer of choice and ask about used or “scratch and dent” items.

If considering a used and refurbished vaccine-storage unit, providers are advised to ask the vendor pertinent questions, choose only reputable brands, and obtain guarantees in writing.

American Laboratory Trading: <http://www.americanlaboratorytrading.com>

Ace Laboratory Systems: <http://www.ancelabsystems.com>

LabX: <http://www.labx.com>

Labcold: <https://www.labcold.com>

Equipment Options

Based on the above common characteristics, the following is a brief list of biologic-grade refrigerator and freezer options that meet or exceed CDC and Louisiana VFC Program requirements and/or recommendations. This list is by no means exhaustive and merely provides examples of vaccine-storage units to consider when purchasing.

Disclaimer

*As a state-government entity, the Louisiana VFC Program does **not** endorse any specific brand or product. The terms and conditions of a purchase are ultimately between a provider and its vendor.*

Biologic-grade Undercounter Refrigerators and Freezers



Biologic-grade undercounter refrigerators and freezers are an excellent choice for those providers with limited space. Not to be confused with dormitory-style refrigerators (see below), biologic-grade undercounter refrigerators and freezers are high-quality, standalone units that allow for “best practice” vaccine storage in a small space.

The following are examples of undercounter biologic-grade units.

PHCbi Undercounter Lab Refrigerator (TSU-4RW-N6)



Features:

- Convenient glass door provides visibility into the interior of the unit to avoid unnecessary door openings
- Automatic defrost function
- Strict temperature control keeps stored product within the CDC recommended 2°C to 8°C temperature range, and a uniformity of $\pm 3^{\circ}\text{C}$, for optimal vaccine storage
- Microprocessor with LED display includes comprehensive setpoint, alarm, and monitoring functions

For more information, visit: <http://www.phchd.com/us/biomedical>

PHCbi ENERGY STAR Certified Undercounter Medical Freezer (PF-L5181W-PA)



Features:

- High-temperature, low-temperature, door-open, and power-failure (optional) remote alarms
- Solid insulated door

- Forced air circulation in cabinet
- Manual defrost system prevents temperature deviations common in devices containing an auto defrost cycle
- Microprocessor LED temperature display
- Temperature range -25°C to -15°C with uniformity of $\pm 5^{\circ}\text{C}$
- Key lock

For more information, visit: <http://www.phchd.com/us/biomedical>

Biologic-grade Full-sized Refrigerators and Freezers

For those providers with enough space for full-sized biologic-grade refrigerators and freezers, the following are examples of units that are currently available from manufacturers.

Follett REF-20LB Upright Laboratory and Pharmacy Refrigerators



Features:

- Custom-designed, modular refrigeration system with microprocessor controller provides a $\pm 1^{\circ}\text{C}$ ($\pm 1.8^{\circ}\text{F}$) performance throughout
- Industry-exclusive plenum air distribution delivers cold air at six different levels
- Auto-evaporating condensate
- Easy-to-read LCD shows temperature and provides navigation to feature programming
- High/low-temperature, door-open, power-failure, low-battery alarms
- Full stainless steel interior and exterior provide outstanding resistance to rust and corrosion

For more information, visit: <http://www.follettice.com>

Helmer Horizon Series™ HLF120-GX Upright Laboratory Freezer



Features:

- Temperature controller with built-in alarms and continuous temperature monitoring
- Powerful forced-air refrigeration system provides excellent temperature uniformity and quick recovery
- Temperature range of -30°C to -15°C, with a set point of -30°C
- Quick recovery after door openings
- Programmable electrical defrost

For more information, visit: <http://www.helmerinc.com>

LABRepCo CliniCool® Silver Series 9.2 Cu. Ft. Dual Temperature Medical Refrigerator and Freezer



Features:

- Manual defrost freezer / cycle defrost refrigerator
- Microprocessor temperature controller
- Digital temperature display

- Audible and visual high and low temperature alarms, refrigerator and freezer
- Remote alarm contacts, refrigerator and freezer
- Adjustable operating temperature range: Refrigerator: 36°F to 46°F (2°C to 8°C); Freezer: 5°F to -13°F (-15°C to -25°C)
- Digital data logger meets CDC requirements, with two buffered probes, 3-year certificate of calibration, minimum/maximum memory, °F/°C switchable

For more information, visit: <http://www.labrepc.com>

TruMed® Systems AccuVax® Vaccine Management System



Features:

- Doorless/vending-style design with multiple temperature sensors
- Automatically checks vaccine errors before dispensing and locks down expired and recalled vaccines to eliminate administration errors
- Stores both refrigerated and frozen vaccine in the same unit
- Automatically separates vaccine inventory by VFC and private
- Automatically rotates vaccine inventory by expiration date
- Built-in power backup maintains temperatures consistent for at least 8 hours in the event of a power outage

For more information, visit: <http://www.accuvax.com>

Standard Refrigerators and Freezers



These are the units found in home and appliance stores. Higher-end models are sometimes referred to as “commercial-grade” and are most often used in the foodservice industry. While not ideal for vaccine storage, CDC and the Louisiana VFC Program still accept them, and many providers use this type of unit due to its affordability and availability.

Standalone Refrigerator and Freezer Requirement for Standard Units: The Louisiana VFC Program *requires* that, if a provider uses standard refrigerators and freezers for storing VFC vaccine, the refrigerator and freezer be separate, standalone units. The National Institute for Standards and Technology (NIST) has determined that the freezer section of standard combination units is **not** capable of reliably maintaining appropriate frozen vaccine storage temperatures. Providers who have a standard combination unit may still store vaccine in the refrigerator component only and must use a standalone freezer for storing frozen vaccine. Use of the freezer compartment of a standard combination unit is, therefore, **not** allowed.

If a provider chooses standard standalone units, some *essential* features to look for are:

- Dedication to a single temperature range
- Automatic defrost
- Fully adjustable shelves
- Ample room to store *all* vaccine on the middle 2-3 shelves
- Ability to maintain required temperature ranges

Some *recommended* features include:

- Locks on the outside of the doors
- Digital thermostat controls
- Forced air circulation
- Alarm on door to detect door ajar
- Battery or generator back-up in case of power failure

Warning

Never store freeze-sensitive vaccines near the cold-air vent in refrigerators. It is common for air to blow out of the vents at below freezing temperatures.

Dormitory-Style Refrigerators



A dormitory-style (or bar-style) refrigerator is defined as a combination refrigerator/freezer unit that is outfitted with one exterior door and an evaporator plate (cooling coil), which is usually located inside an icemaker compartment (freezer) within the refrigerator.

CDC and the Louisiana VFC Program prohibit the use of dormitory-style units for storage of VFC vaccines. The freezer compartment in this type of unit is incapable of maintaining temperatures cold enough to store MMRV, varicella, and zoster vaccines. If attempts are made to cool the freezer compartment to the appropriate temperature, the temperature in the refrigerator compartment will fall below the required range, potentially freezing the refrigerated vaccines.

Portable Refrigerators and Freezers



Portable refrigerators and freezers are excellent options for emergency storage, long-distance transport, or use during day clinics in the field. Some units use electricity to run a cooling system, while others use advanced insulation combined with appropriate cooling packs. Whichever type a provider chooses will add another layer of protection to a vaccine-management practice.

Portable-unit manufacturers include the following:

VeriCor: <http://www.vericormed.com>

CSafe: <http://www.csafeglobal.com>

FridgeFreeze: <http://www.fridgefreeze.com>

Roemer Industries: <http://www.roemerindustries.com>

Additional Equipment

The following are additional equipment a provider may consider when assessing its vaccine-storage needs.

Alarm Telephone Dialers



These devices, though a relatively old technology, may be useful to providers with limited internet connectivity or recurrent power outages. They are sold by several manufacturers in varied models, styles, and prices to choose from.

Alarm telephone dialers are designed to call pre-determined telephone numbers when temperatures go out of range and are a simple and reliable alarm option, provided the system is accurate.

Maintaining a temperature reading that mirrors a current calibrated continuous-monitoring DDL is imperative to the usefulness of a dialer.

Providers have many options when it comes to purchasing dialers. The following are examples of manufacturers:

Sensaphone: <http://www.sensaphone.com>

Dickson: <http://www.dicksondata.com>

United Security Products: <http://www.unitedsecurity.com>

Security Product Solutions: <http://www.securityproductsolutions.com>

Emergency Power Generators



Disruption in the power supply is one of the most frequent causes of costly vaccine loss, since it does not take long for a refrigerator or freezer to warm up due to a power outage and thus compromise vaccine integrity. Healthcare providers (especially those in rural or coastal areas, or those storing large vaccine inventories) should seriously consider having an emergency power generator in place should an emergency occur. If a provider already has such a unit in place, it must make sure a vaccine refrigerator and freezer are connected to that power circuit.

According to CDC, emergency power generators should be tested quarterly and receive maintenance at least annually (check manufacturer specifications for test procedures and maintenance schedules). In addition, sufficient fuel should be kept on hand to continuously run the generator for at least 72 hours.¹

There are many manufacturers and vendors selling generators. Below are a few examples:

Generac: <http://www.generac.com>

Cummins: <https://www.cummins.com/generators-power-systems>

Kohler: <http://www.kohlerpower.com/en/residential/generators>

Briggs & Stratton: http://www.briggsandstratton.com/na/en_us/buying-guides.html

Louisiana VFC Program Contact Information

For more information on vaccine-storage refrigerators and freezers, or any other matter concerning VFC requirements or recommendations, please contact the Louisiana VFC Program at (504) 568-2600.

¹Centers for Disease Control and Prevention. *Vaccine Storage & Handling Toolkit*, <http://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/storage-handling-toolkit.pdf>.