



The Requirements

Often the most expensive part of VFC participation, selecting your vaccine storage units must be done with care. The CDC and Oregon VFC highly recommend purchasing separate, biomedical-grade units rather than a household-style combination unit. **Dorm-style or bar-style refrigerator/freezers are not allowed for ANY type of vaccine storage.**

As required by the CDC and Oregon VFC program, any unit carrying VFC vaccine must have the following:

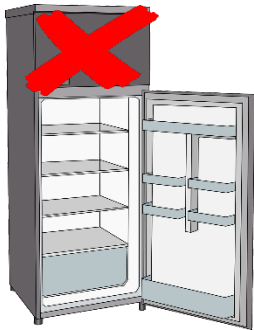
1. Enough room to store the year's largest inventory without crowding
2. Enough room to store water bottles (in the refrigerator) and frozen water bottles (in the freezer) to stabilize the temperatures and minimize temperature excursions that can impact vaccine potency.
3. A calibrated thermometer centrally located in each storage unit
4. The ability to reliably maintain the appropriate vaccine storage temperatures year-round
5. A unit dedicated to the storage of vaccines only. Food and beverages must NOT be stored in a vaccine storage unit. This practice results in frequent door opening and temperature destabilization

Dorm-style & Bar-style (not allowed)

Small, single-door combined units should never be used for any vaccine storage. The freezer compartment is incapable of maintaining temperatures appropriate for varicella and zoster vaccine storage. Furthermore, cold air from the freezer compartment is often vented down into the main compartment causing unstable and inconsistent refrigerator temperatures.



Combined household (not recommended)



If you are currently using a household combination refrigerator/freezer, we strongly recommend you upgrade to a biomedical-grade unit. If upgrade isn't possible, consider purchasing a separate countertop freezer and only using the main section of the household refrigerator.

According to studies conducted by National Institute of Standards and Technology (NIST), household style units are less capable of maintaining proper storage temperatures in both the refrigerator and freezer compartments. This is because cold air from the freezer blows directly into the refrigerator compartment and onto the sensitive vaccine. By far, the best practice is to choose a separate refrigerator and freezer purpose-built for the precise storage of vaccines. If you choose to use a household-style unit, it's recommended that you use only the refrigerator section and purchase a small countertop freezer for your frozen vaccine.

Built-in digital data loggers

Some refrigerator and freezer manufacturers include built-in digital loggers with their units. Unless these loggers meet VFC logger requirements, they should not be used for vaccine monitoring. All official temperature readings must only be taken from your VFC-approved, calibrated digital data logger/backup logger.

Choosing the right sized unit

Below are a few handy steps* for determining the ideal refrigerator size for your clinic:

- 1 Estimate the maximum number of doses of publicly-provided vaccine and privately purchased vaccine that will be in your refrigerator.

Refrigerator:	
Add the number of doses <i>on hand (current inventory)</i> from your last order form.	
Public vaccine	_____
Private vaccine	+ _____
Total doses	= _____
Multiply (max inventory)	x 1.25
Maximum doses	= _____

- 2 Match your maximum doses with the minimum cubic feet needed to safely store your vaccine.

Max. Doses	Minimum Cubic Ft.
2,000+ doses	may need more than one refrigerator
1000 – 2000	40 cu. ft
900 – 1000	36 cu. ft.
801 - 900	21 - 23 cu. ft
701 - 800	17 - 19.5 cu. ft.
400 – 700	11 - 16.7 cu. ft.
100 - 399	4.9 - 6.1 cu. ft.

- 3 Using this refrigerator and freezer guide as a reference, search for a storage unit that's properly sized and meets all VFC requirements. Whenever possible, choose biomedical-grade over household style units.

*Thanks to California's eziz.org for developing the original sizing guide above.

A Brief Disclaimer

As a state agency, we can't endorse any specific brand or product. The terms & conditions of your purchase are between you and your vendor.

Equipment Options

With the above guidelines in mind, we have compiled a short list of equipment options that meet or exceed Oregon VFC and CDC requirements. The list covers a wide range of price points and configurations to fit any clinic's size or budget. This guide is far from exhaustive and is only meant as an overview (with examples) of the *types* of storage units to consider during your search.

As always, the Oregon Immunization Program is here to help. Don't hesitate to contact our VFC health educators with any questions you have about these requirements or the storage options you are considering.

Used and refurbished equipment

There are several used and remanufactured equipment vendors online. Prices are often 30-50% off retail. Also consider calling your manufacture of choice and asking about less expensive used units. Helmer, for example, has a rotating inventory of scratch and dent units that come with a much lower price tag and full warranty. As with any large purchase, only buy from reputable vendors and get all guarantees in writing.

Alliance Analytical
www.aaisolutions.com

Lab X
www.labx.com

Ace Laboratory Systems
www.ancelabsystems.com

Labequip
www.labequip.com/

Biomedical-grade equipment repair

If your biomedical-grade refrigerator or freezer malfunctions, call your manufacturer to check on warranty status. The manufacturer should also have a list of local repair shops authorized to work on your equipment. If the manufacturer is unhelpful, try contacting one of these Oregon repair companies. All of their websites list medical equipment repair as a specialty.

Portland Metro:
Commercial Refrigeration
503-234-6445
www.cri-pdx.com

Permacold Engineering Inc.
503-249-8322
<http://www.permacold.com/>

Dial Service Co.
503-777-4011
www.dialrefrigeration.com/index.html

Oregon Coast:
WiLDE Refrigeration Inc.
541-265-3255
www.wilderefrigeration.com

Salem:
West Coast Mechanical
503-315-2277
www.westcoast-mc.com/services/refrigeration

Under-counter refrigerators and freezers

Under-counter refrigerators and freezers are an excellent choice for clinics with limited space. Benefits of under-counter units include:

- **Lower risk:** Separate compressors and condensers decrease the risk of a total vaccine loss that might occur in a single combined unit.
- **Flexibility:** Small and easy to relocate, under-counter units can be positioned in multiple ways depending on the need.
- **No cold air vent:** Traditional combined units use a cold air vent to blow frozen air into the refrigerator compartment. Separate units mean separate compressors and no need for cold air venting.
- **Cost effective:** If a clinic is looking to add to its existing refrigerator or freezer capacity, this option allows for the purchase of only what is needed. A single under-counter refrigerator or freezer might negate the need to buy a larger, more expensive replacement unit.



Manufacturers to consider in this category:

- **Migali Scientific G-U1RG-ADA & EVOX-U1F:** Vaccine Storage Upright Refrigerator and Freezer. www.migaliscientific.com/product/4-3-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage
- **Helmer Scientific iLR105 & iLF105:** Under-counter Laboratory Refrigerator and Freezer. www.helmerinc.com/products/ilr105-undercounter-laboratory-refrigerator.html
- **Follett REF5P & ZR5P:** Under-counter Medical-grade Refrigerator and Freezer. <https://www.follettice.com/healthcare/precision-undercounter-refrigerators-and-freezers/page.aspx?id=4466>

Full-size, stand-alone refrigerators and freezers

Biomedical-grade refrigerators and freezers are considered the best, most secure option for vaccine storage. As with most “gold-standard” products, they require a larger investment and are most often found in health departments, laboratories and hospitals. However, many of the biologic-grade manufacturers also produce refrigerators and freezers in an array of sizes and price points.



Manufacturers to consider in this category:

- **PHCBI MPR-721 & MDF-U334:** Large Capacity Laboratory Refrigerator and Freezer. <https://www.phchd.com/us/biomedical/preservation>
- **Magali Scientific EVOX-1RG & EVOX-1F:** Vaccine Storage, Under-counter Refrigerator and Freezer. www.migaliscientific.com/product/4-3-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage
- **Helmer Scientific iLR120 & iLF120:** Laboratory Refrigerator and Freezer. www.helmerinc.com/products/ilr120-laboratory-refrigerator.html

- **Follett REF20-LB & FZR20-LB:** Medical-grade Refrigerator and Freezer.
www.follettice.com/products/medical-grade-refrigeration/upright/upright-medical-grade-refrigerator-models/page.aspx?id=1708
- **TempArmour Refrigerators:** PCM chest-style refrigerators.
<https://www.temparmour.com/>

Full-size, combined refrigerator-freezers

While they look similar to household combination units, biomedical-grade combination units are far superior for vaccine storage in several important ways:

- Separate refrigeration systems for the refrigerator and freezer
- Improved cabinet insulation to avoid hot and cold spots.
- Built-in, digital temperature display
- Built to industrial standards and warranted for industrial use
- Fan-forced air circulation delivers quick temperature recovery

Biomedical-grade, combination units are ideal for clinics wanting a best-practice storage solution in a compact package.

Manufacturers to consider in this category:

- **PHCBI MPR-414F:** Pharmaceutical Refrigerator with Freezer.
<https://www.phchd.com/us/biomedical/preservation/Refrigerator-and-Freezer-Combo/mpr-414f>
- **Migali EVOX-RF:** Vaccine Storage Dual Temperature Refrigerator/Freezer.
www.migaliscientific.com/product/dual-temperature-refrigeratorfreezer/?cat=vaccine-storage
- **Jewett PRF17-1B:** Dual-Temperature Refrigerator/Freezer.
www.thermoscientific.com/en/product/jewett-dual-temperature-refrigerator-freezers.html

Extras

This section was created to showcase additional equipment, add-ons and services you might consider when assessing your vaccine storage and monitoring needs.

Portable cold storage

These 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 propriety cooling packs/phase change panels. Whichever type you choose, it's a smart investment that will add another layer of protection to your vaccine management practice.



Edgestar: Portable fridge/freezer with 12V DC.

<https://www.edgestar.com/outdoor-portable-fridge-freezers/>

Vericor: Portable “Cool Cube” transport system.

www.vericor.com/cool-cube-vaccine-transport-coolers



TempArmour: Portable vaccine carrier.

https://www.temparmour.com/vaccine_carrier

FridgeFreeze: Portable vaccine refrigerators and freezers.

www.fridgefreeze.com

cSafe: Bio-medical refrigerator and freezer carrier.

www.csafeglobal.com/products



Roemer Industries: Portable medical refrigerator and freezers.

www.roemerindustries.com

Emergency battery backup

Other than a generator, one of the best ways to buy time during an emergency is through the use of a battery backup. Ideally, these would be used in combination with an alarm system as a way to add 2-4 hours to your response window.



Medi+Back-up Power Systems

<http://www.mediproducts.net/products-refrigeration/>

Xantrex Powerhub 1800

<http://www.xantrex.com/power-products/backup-power/xpower-powerhub-1800.aspx>

Goal Zero Yeti 1400 Lithium Portable Power Station

<http://www.goalzero.com/p/424/Goal-Zero-Yeti-1400-Lithium-Portable-Power-Station>

EATON 9PX USP

<https://eaton-upssystems.com/eaton-9px-ups/>