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 coolant packs (in the freezer) to stabilize the temperatures and minimize temperature excursions that can impact vaccine potency. The addition of water bottles in the refrigerator (not coolant packs) reduces the risk of freezing due to the significant latent heat released from water prior to freezing
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 type of 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.

Using a separate refrigerator and freezer helps reduce the risk of vaccine loss and minimizes wear on vital components like compressors and condensers. Most importantly, separating the refrigerator and freezer eliminates the troublesome cold air tug-of-war so common to combined units (and so harmful to vaccine viability).

**Household vs. Biomedical-grade**
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 separate refrigerator and freezers 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 separate freezer for your frozen vaccine.
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.

<table>
<thead>
<tr>
<th>Refrigerator:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Add the number of doses on hand (current inventory) from your last order form.</td>
</tr>
<tr>
<td>Public vaccine</td>
</tr>
<tr>
<td>Private vaccine</td>
</tr>
<tr>
<td>Total doses</td>
</tr>
<tr>
<td>Multiply (max inventory)</td>
</tr>
<tr>
<td>Maximum doses</td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Max. Doses</th>
<th>Minimum Cubic Ft.</th>
</tr>
</thead>
<tbody>
<tr>
<td>2,000+ doses</td>
<td>may need more than one refrigerator</td>
</tr>
<tr>
<td>1000 – 2000</td>
<td>40 cu. ft.</td>
</tr>
<tr>
<td>900 – 1000</td>
<td>36 cu. ft.</td>
</tr>
<tr>
<td>701 – 800</td>
<td>17 – 19.5 cu. ft.</td>
</tr>
<tr>
<td>400 – 700</td>
<td>11 – 16.7 cu. ft.</td>
</tr>
<tr>
<td>100 – 399</td>
<td>4.9 – 6.1 cu. ft.</td>
</tr>
</tbody>
</table>

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 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.

Manufacturers to Consider

Panasonic Biomedical
www.sanyobiomedical.com

Follett
www.follettice.com

Helmer
www.helmerinc.com

Thermo Scientific
www.thermo.com

Lab Research Products
www.labresprod.com

Fisher Scientific
www.fishersci.com

Norlake Scientific
www.norlake.com

Migali Scientific
www.migaliscientific.com
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

Ace Laboratory Systems
www.acelabsystems.com

Lab X
www.labx.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 specialties.

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.

Popular units in this category include:

- **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](http://www.migaliscientific.com/product/4-3-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage)


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. For example, Sanyo produces very large, vaccine/blood refrigerators (see first picture above) but they also produce more moderately priced under-counter models ideally suited for small clinics.

Popular units in this category include:

- **Panasonic MPR-721 & MDF-U334-PA**: Large Capacity Laboratory Refrigerator and Freezer.  
  [us.panasonic-healthcare.com/productmpr-721/](us.panasonic-healthcare.com/productmpr-721/)

- **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](www.migaliscientific.com/product/4-3-cuft-glass-door-pharmacy-refrigerator/?cat=vaccine-storage)

- **Helmer Scientific iLR120 & iLF120**: Laboratory Refrigerator and Freezer.  

- **Follett REF20-LB & FZR20-LB**: Medical-grade Refrigerator and Freezer.  
**Full-size, Combined Refrigerator and Freezer**

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.

**Popular units in this category include:**


- **Migali EVOX-RF:** Vaccine Storage Dual Temperature Refrigerator/Freezer. [www.migaliscientific.com/product/dual-temperature-refrigeratorfreezer/?cat=vaccine-storage](http://www.migaliscientific.com/product/dual-temperature-refrigeratorfreezer/?cat=vaccine-storage)


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. Whichever type you choose, it’s a smart investment that will add another layer of protection to your vaccine management practice.


FridgeFreeze: Portable vaccine refrigerators and freezers. [www.fridgefreeze.com](http://www.fridgefreeze.com)

Roemer Industries: Portable medical refrigerator and freezers. [www.roemerindustries.com](http://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+Products
Duracell Powersource 1800
http://www.duracellpower.com/backup-power/

Goal Zero Yeti 1250