# Required Refrigerator and Freezer Specifications

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## Overview

All NCIP participants must ensure their vaccine storage units meet the following specifications to guarantee the proper maintenance of vaccine temperature conditions. These units must be stand-alone refrigerators and freezers dedicated solely to vaccine storage.

## Storage Unit Requirements

### Key Requirements for Vaccine Storage Units:

- **Dedicated Use:** Storage units must be used exclusively for vaccines.
- **Temperature Range Compliance**:
    - **Refrigerators**: Must maintain a constant temperature between 2°C and 8°C (36°F to 46°F) for refrigerated vaccines.
    - **Freezers**: Must maintain a constant temperature between -15°C and -50°C (5°F to -58°F) for frozen vaccines.
- **Sufficient Capacity**: Units must have enough space to store the largest anticipated vaccine inventory for the year, without overcrowding. This includes space for water bottles in the refrigerator and frozen coolant packs in the freezer to stabilize temperatures.
- **Year-Round Temperature Reliability**: Units must be capable of reliably maintaining the required temperatures throughout the year.
- **Location**: Storage units should be placed in a well-ventilated room with at least 4 inches of space from the wall.
- **Warning Signs**: Post clear "DO NOT UNPLUG" signs at electrical outlets, on storage units, and circuit breakers to prevent accidental disconnection by staff, custodians, or maintenance personnel.

## Refrigerator Requirements

The preferred refrigerator for vaccine storage is a stand-alone pharmaceutical grade or purpose-built unit designed for the precise storage of sensitive biologics. These refrigerators are the most secure option for vaccine storage.

Pharmacy-grade under the counter units and full-sized units are allowed for vaccine storage.

### Key characteristics of the ideal unit include:

- **Consistent Temperature Maintenance**: Must reliably maintain temperatures between 2°C and 8°C (36°F to 46°F).
- **Fan Forced Air Circulation**: Ensures uniform temperature throughout the unit.
- **Microprocessor or Digital Thermostat**: Preferred for greater accuracy and stability.
- **Stable Performance**: Designed to handle ambient temperature fluctuations without compromising vaccine storage conditions.
- **Probe Port**: To allow monitoring equipment to be safely connected.

## Freezer Requirements

The preferred freezer for vaccine storage is a stand-alone pharmaceutical-grade or purpose-built unit designed for the precise storage of sensitive biologics. These freezers are engineered to maintain stable temperatures required for vaccine preservation.

### Types of Acceptable Freezers:

- **Manual Defrost Freezers**: These freezers require manual intervention to remove frost buildup but can effectively maintain the necessary temperature range.

- **Auto-Defrost (Frost-Free) Freezers**: These freezers automatically defrost at regular intervals. While this feature can be convenient, it can sometimes lead to temperature fluctuations during the defrost cycle. **Verify with the manufacturer** that the freezer will maintain the required temperature range (between -15°C and -50°C or 5°F to -58°F) even during the defrost cycle.

    - If purchasing a frost-free freezer, ensure that it can maintain in-range temperatures even when defrosting, as some models may temporarily exceed the -15°C minimum during these cycles.

    - A unit advertised as **-20°C capable** should be able to consistently maintain temperatures between **-15°C and -50°C**, including during defrost cycles.

### Determining Freezer Size:

The **size of the freezer** required depends on the **enrollment population** and how frequently the NCIP participant orders vaccines. The following **Ordering Tiers** help determine the appropriate freezer size based on ordering frequency:

*Table 1.1 Vaccine Ordering Tier and Frequency Guide*

| Ordering Tier | |
|---|---|
| **Doses Per Year** | **Order Frequency** |
| 6,000 doses or more | Monthly |
| 800 to 5,999 doses | Bi-monthly (every other month) |
| 200 to 799 doses | Quarterly (every three months) |
| 199 doses or less | As Needed |

# Purchasing New Vaccine Storage Units

## Step 1: Assess Storage Needs

- The first step in purchasing a freezer is assessing the **clinical space available** and understanding the **workflow characteristics** of the practice.
- **Larger Practices**: Should consider a **main storage area** with smaller units placed in the clinical area for easier access.

## Step 2: Choose the Right Unit

- Stand-alone freezers can be purchased from **local retail stores** that sell general refrigeration units.
- **Pharmacy-grade units** or purpose-built freezer models may take longer to acquire, but they are specifically designed for storing sensitive biologics like vaccines. These models often require service by **commercial refrigeration technicians**.

## Step 3: Check Warranty & Service Options

- Be sure to **check the warranty** of the freezer before purchasing, as it may include restrictions on approved service providers. Most pharmacy-grade freezers should be serviced by **certified refrigeration technicians**.

# Vaccine Storage Capacity and Equipment Guide

*Table 2.1 Refrigerated and Freezer Vaccine Storage Capacity*

| Total Clients | Refrigerator Stand alone or pharmacy grade | Maximum Doses Refrigerator | Freezer Stand alone or pharmacy grade | Maximum Doses Freezer |
|---|---|---|---|---|
| Less than 50 Clients | 4 to 6 cubic ft | Up to 200 doses | 1.5 to 1.8 cubic ft | Up to 100 doses |
| Less than 300 Clients | 8 to 11 cubic ft | 200 to 400 doses | 2 to 2.5 cubic ft | Up to 200 doses |
| Less than 700 Clients | 15 to 25 cubic ft | 400 to 900 doses | 3 to 7 cubic ft | 201 to 500 doses |
| 700 + Clients | Multiple units | 900 to 2,000 doses | 7.1 to 15 cubic ft | 501 to 6,000 doses |

*Table 2.2 Recommended Refrigerator Models with Electronic Microprocessors (2°C to 8°C)*

| Refrigerator product name/model numbers | Manufacturer Website |
|---|---|
| Accucold Pharmacy & Vaccine Refrigerators | www.accucold.com |
| AccuVax Vaccine Management System | trumedsystems.com/products/accuvax/ |
| American Biotech Pharmacy Refrigerator Series | americanbiotechsupply.com |
| CliniCool Silver Series Pharmacy/Vaccine Refrigerators | www.labrepco.com |

| | |
|---|---|
| Migali Scientific Pharmacy/Vaccine Storage Refrigerator Evolution & Genesis Series | www.migaliscientific.com |
| Powers Scientific, Inc. Lab Single-Door, Pharmacy & 2-8°C Constant Temperature Refrigerators | powersscientific.com |
| So-Low Laboratory & Pharmacy 2°C to 8°C Refrigerator Models & Chromatography Refrigerator Models | so-low.com |
| TemPure Scientific Refrigerator 2°C to 8°C Models | tempurescientific.com |
| Thermo Scientific TSX Series High-Performance Pharmacy Refrigerators | thermoscientific.com |

*Table 2.3 Freezer models that maintain an optimum of at least -20°C:*

| **Freezer product name/model numbers** | **Manufacturer/Supplier Website** |
|---|---|
| Accucold Pharmacy & Vaccine Freezers | www.accucold.com |
| AccuVax Vaccine Management System | trumedsystems.com/products/accuvax/ |
| CliniCool Silver Series Pharmacy/Vaccine Freezers | labrepco.com |
| EdgeStar Freezer 1.1 Cubic ft. CMF151L-1 | edgestar.com |
| Futura Silver Series Laboratory Freezers | labrepco.com |
| Helmer i.Series & Horizon Series Laboratory Freezers | helmerinc.com |
| So-Low Laboratory Freezers | so-low.com |
| Thermo Scientific Forma High-Performance Auto Defrost Lab Freezers, Jewett<br><br>High-Performance Lab Freezers, PL6500 Lab Freezers, ES Series Lab Freezers | thermoscientific.com |

*Table 2.4 Additional Manufacturer and Supplier Information*

| **Manufacturer/Supplier** | **Website** | **Manufacturer/Supplier** | **Website** |
|---|---|---|---|
| Accucold | accucold.com | Marvel Scientific | marvelscientific.com |
| Aegis Scientific | aegisfridge.com | Migali Scientific | migaliscientific.com |
| American Biotech | americanbiotechsupply.com | PHCbi | phchd.com/apac/biomedical |
| Compact Appliance | compactappliance.com | So-Low | so-low.com |
| Fisher Scientific | fishersci.com | Summit Appliance | summitappliance.com |
| Helmer | helmerinc.com | Thermo Scientific | thermoscientific.com |

| | | | |
|---|---|---|---|
| K2 Scientific | k2sci.com | VWR International | vwr.com |

**Note:** The manufacturers and suppliers listed in *Table 2.4* offer units that are preset to specific temperatures suitable for vaccine storage. NCIP does not recommend a particular supplier but encourages you to compare options for the best fit and value for your facility. Prior to purchase, ensure that the unit will reliably maintain the temperature range required for vaccine storage: **Refrigerators**: 2°C to 8°C (with a set point between 4°C or 5°C)/**Freezers**: -20°C (-4°F), with a maximum temperature of -15°C (5°F)

For assistance, contact the NCIR Help Desk by

Phone: 1.877.USE.NCIR (873-6247)

Email: ncirhelp@dhhs.nc.gov