

## Quality of Cold: What it Means and Why it Matters.



Protecting the Nation's Vaccine Supply.

The PHCbi brand vaccine, pharmaceutical and medical product storage line offers a range of pharmaceutical refrigerators and freezers that include undercounter, freestanding models and combination refrigerator/freezer cabinets.



# Vaccine potency relies on protection against temperature extremes through proper storage at every level of the cold chain.<sup>1</sup>

The CDC Vaccine Storage and Handling Toolkit provides guidance to help improve the safety of vaccines.

According to the Center for Disease Control and Prevention (CDC), only the use of purpose-built or pharmaceutical-grade refrigerators and freezers are recommended for the storage of vaccines and other pharmaceuticals.<sup>1</sup> The guidelines do not, however, extend to the performance standards of products marketed as purpose-built or pharmaceutical-grade. To fill this gap and ensure that storage products meet the qualifications for safe vaccine storage, the CDC-sponsored NSF/ANSI standard (NSF 456) was released in 2021. The standard outlines the importance of ensuring protection from freezing, tight temperature uniformity, rapid recovery following door openings and other requirements essential to continued vaccine viability.



*MPR-N250FH-PA  
Pharmaceutical Refrigerator  
with Freezer*



*MPR-1412R-PA  
Pharmaceutical Refrigerator*



# Vaccine Cold Chain Management

The NSF 456 standard for vaccine storage helps tighten cold chain management by ensuring the use of high performance refrigeration systems with electronic temperature controls that provide precise cabinet temperature needed for specific vaccines.

The storage and handling of vaccines is the only step within cold chain management that can be controlled by pharmacies, clinics, hospitals, public health institutions, veterinary clinics and other facilities. Though storage is one small part of the vaccine cold chain, proper end storage and handling is crucial to the continued efficacy of vaccines.



MPR-722R-PA  
Laboratory Refrigerator



MPR-N450FH-PA  
Biomedical Refrigerator with Freezer

The PHCbi brand *Quality of Cold* is driven by the accuracy, temperature uniformity, recovery and ambient tolerance of our refrigerators and freezers.



PR-L5181W-PA  
Undercounter Refrigerator



1

Vaccine  
Manufacturer



2

Vaccine  
Distribution



3

Arrival at  
Provider Facility



4

Storage and Handling  
at Provider Facility



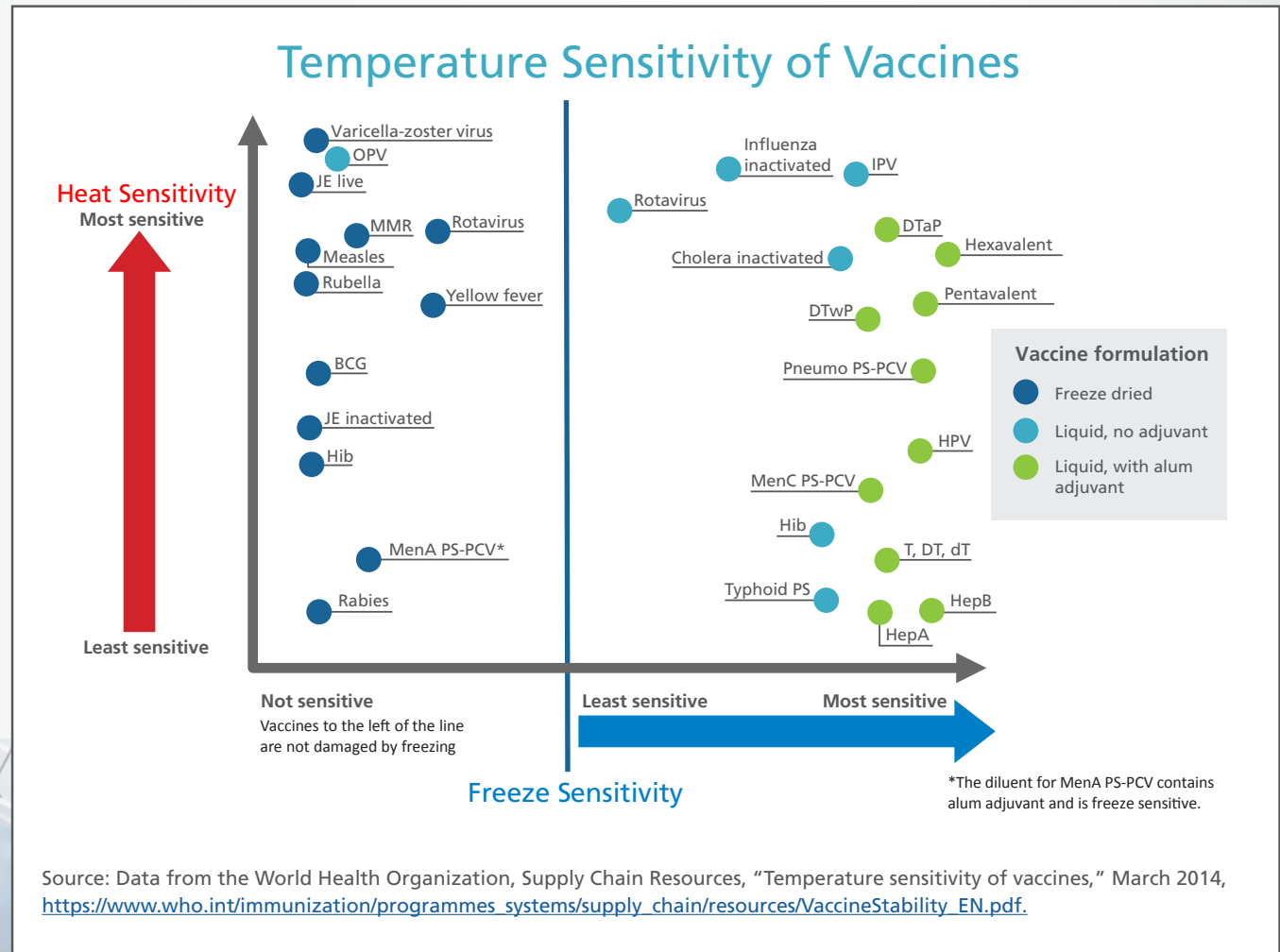
5

Public  
Administration

# While the focus of temperature control is often on overheating, vaccines can be just as susceptible to freezing risks.

In 2021 and 2022, global leaders pledged to share 870 million additional COVID-19 vaccines in support of global equitable access. Though the threat of freezing is often overlooked, of the COVID-19 vaccines currently approved for emergency use worldwide only two can be frozen.<sup>2</sup>

Missing or insufficient temperature control and logistical problems in the cold chain result in an estimated global vaccine wastage rate as high as 50% across all vaccine types, according to the World Health Organization (WHO).<sup>3</sup>



Source: Data from the World Health Organization, Supply Chain Resources, "Temperature sensitivity of vaccines," March 2014, [https://www.who.int/immunization/programmes\\_systems/supply\\_chain/resources/VaccineStability\\_EN.pdf](https://www.who.int/immunization/programmes_systems/supply_chain/resources/VaccineStability_EN.pdf).



# Our pharmacy storage cabinets are designed to meet current CDC pharmacy guidelines and new vaccine storage standards.

Dedicated equipment for vaccine storage is the only way to ensure cold chain performance. While frozen products typically tolerate a broader temperature environment, refrigerated products must be kept from warming up or freezing.

It is this quality of cold that characterizes the PHCbi brand pharmacy storage line as a reliable and safe commitment for the protection of the vaccine supply.

Use of non-compliant household or domestic refrigerators for pharmaceutical storage is unsafe and costly. It creates liabilities for any audited dispensing pharmacy or health agency that cannot assure the efficacy of vaccines associated with federally funded programs or other public health initiatives.



We offer a wide range of ENERGY STAR® Certified high performance preservation products. View all certified laboratory grade, biomedical refrigerators and freezers at: <https://www.energystar.gov/productfinder/product/certified-lab-grade-refrigeration/results>.



## Proper Vaccine Storage Essentials:

- Protection from freezing
- Temperature control accuracy
- Interior temperature uniformity
- Quick recovery
- Resistance to high ambient temperature



MEETS  
CDC PHARMACY  
RECOMMENDATION



MEETS  
CDC VACCINE STORAGE  
RECOMMENDATION

# It's the *Quality of Cold* that assures a safe storage environment.

Quality of Cold is based on temperature control accuracy, interior temperature uniformity, temperature recovery and tolerance for high ambient temperatures and voltage fluctuations.

**ACCURACY** PHCbi brand refrigerators are factory pre-set at 5°C (41°F) to assure interior storage temperature is sufficiently above the risk point of temperature-sensitive vaccines and other water-based pharmaceuticals.

**UNIFORMITY** Quality of cold starts with interior temperature uniformity, which assures safety of stored products regardless of location within the refrigerator.

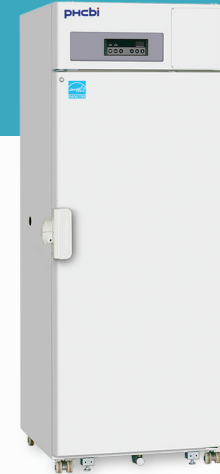
**RECOVERY** MPR Series refrigerators have reserve refrigeration capacity to restore the internal temperature to setpoint following door openings. Positive airflow systems eliminate the potential for inadvertent freezing when full refrigeration power is applied.

**AMBIENT TOLERANCE** PHCbi brand refrigerators and freezers are designed to maintain the quality of cold in warm ambient conditions where temperature recovery, tolerance for brown-out electrical supply on hot days and busy door opening traffic are common.

PHCbi brand refrigerators and freezers are engineered from the inside out to create, maintain and restore precise temperatures. Such precision and quality of cold cannot be found in household or commercial cabinets.



MPR-N450FH-PA  
Combo Refrigerator/  
Freezer



MDF-U731M-PA  
-30°C Manual Defrost  
Biomedical Freezer



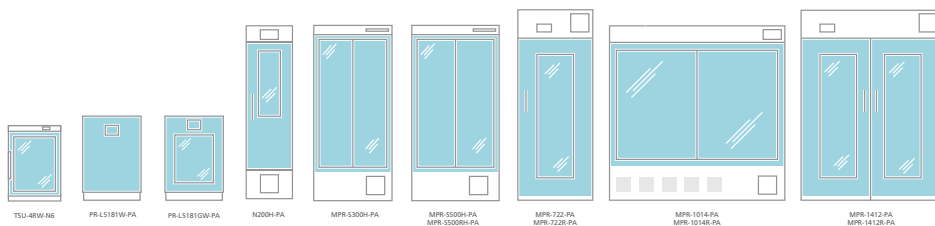
MPR-S300H-PA  
Pharmaceutical  
Refrigerator



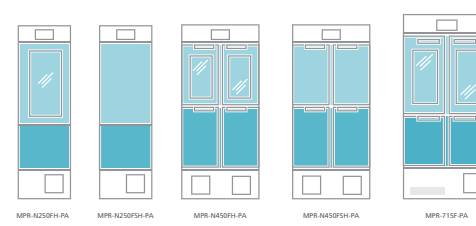
PF-L5181W-PA  
Undercounter Freezer

PF-L5181W-PA  
Undercounter Freezer

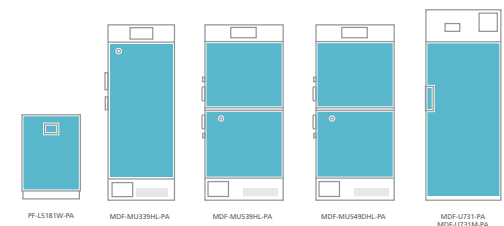
## REFRIGERATORS



## COMBO



## FREEZERS



- 1) "Vaccine Storage and Handling Toolkit," Center for Disease Control and Prevention (CDC), March 2021, 8, <https://www.cdc.gov/vaccines/hcp/admin/storage/toolkit/index.html>.
- 2) "Status of COVID-19 Vaccines within WHO EUL-OQ Evaluation Process," WHO, June 2021.
- 3) "Why Optimized cold-chains could save a billion COVID vaccines," UN Environment Programme, 26 June 2020, <https://www.unep.org/news-and-stories/story/why-optimized-cold-chains-could-save-billion-covid-vaccines>.



#### About PHC Corporation of North America

PHC Corporation of North America is a leader in laboratory equipment for biopharmaceutical, life sciences, academic, healthcare and government markets. The company is operated as a subsidiary of PHC Holdings Corporation, Tokyo, Japan, which is a global healthcare company involved in the three core businesses of Medical Devices, Healthcare IT and Life Sciences. Product lines under the new PHCbi brand include the space saving and energy efficient VIP® ECO, TwinGuard® and VIP Series ultra-low temperature freezers, cryogenic and biomedical freezers, pharmacy and high performance refrigerators, cell culture CO<sub>2</sub> and multigas incubators, programmable heated and refrigerated microbiological incubators and Drosophila/Plant Growth Chambers. For more information, please call PHC Corporation of North America at 800-858-8442, email [info@us.phchd.com](mailto:info@us.phchd.com) or visit <http://www.phchd.com/us/biomedical>.



PHC Corporation of North America  
1300 Michael Drive, Suite A, Wood Dale, IL 60191  
Toll Free USA (800) 858-8442, Fax (630) 238-0074  
[www.phchd.com/us/biomedical](http://www.phchd.com/us/biomedical)

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For more information about PHCbi brand freezers and refrigerators for safe vaccine storage, visit <https://www.phchd.com/us/biomedical/vaccine-storage> or [contact your local PHCbi brand sales representative](#).