

SECTION 1 - FACILITIES TO MAINTAIN PRODUCT TEMPERATURE

Sufficient hot-holding and cold-holding facilities shall comply with North Carolina and NSF standards (National Sanitation Foundation), and shall be designed, constructed and installed in conformance with the requirements of NSF standards. (UL Sanitation, ETL Sanitation listed equipment is considered equivalent to NSF standards).

REFRIGERATION FACILITIES SIZING AND DESIGN

Refrigeration facilities shall be adequate to provide for the proper storage, transportation, display, and service of potentially hazardous foods. Specific refrigeration needs are based upon the menu, number of meals, frequency of delivery, preparation in advance of service.

1. All potentially hazardous foods requiring refrigeration shall be kept at or below 45 °F except when being prepared or served.
2. Walk-in freezers shall be designed, constructed and maintained to keep frozen foods frozen. Temperature indicating devices will be required.

Point-of-use refrigerators should be provided at workstations for operations requiring preparation and handling of potentially hazardous foods. Refrigeration units, unless designed for such use, shall not be located directly adjacent to cooking equipment or other high heat producing equipment, which may tax the units cooling system.

SIZING CONSIDERATION FOR CALCULATING TOTAL REFRIGERATED STORAGE NEEDS INCLUDING WALK-INS AND REACH-INS

To plan reserve storage, the following will need to be considered: menu, type of service, number of meals per day, number of deliveries per week.

The following is a suggested formula to establish required reserve storage for walk-in refrigeration units. (Note: only 40% of any walk-in unit actual provides usable space):

Total Interior Storage Volume Needed:

$$\frac{\text{Vol. per meal (Cu. ft.)} \times \text{number of meals}}{40\% \text{ usable Space}}$$

Below are typical meal volumes for each of three types of refrigerated storage:

Meat and Poultry	=	.010 - .030 Cu. ft. per meal
Dairy	=	.007 - .015 Cu. ft. per meal
Vegetables and fruit	=	.020 - .040 Cu. ft. per meal

Thus for a restaurant serving 1000 meals between deliveries (assume a minimum of 4 day storage) the following storage capacities are needed:

Meat refrigerated storage	=	$\frac{.030 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.40}$	= 75 Cu. Ft.
Vegetable refrigerated storage	=	$\frac{.040 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.40}$	= 100 Cu. Ft.
Dairy refrigerated storage	=	$\frac{.015 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.40}$	= 37.5 Cu. Ft.

To calculate the interior storage space required for the above example in square feet, simply divide the cu. ft. (volume), in each case, by the height of the unit.

$$\text{Example for meat storage} = \frac{75 \text{ cu. ft.}}{6 \text{ ft. (height)}} = 12.5 \text{ sq. ft. of interior floor area would have to be}$$

provided to accommodate storage of meat for 1000 meals. To estimate total interior volume or space, add the requirements for each type of food. To convert interior measurements to exterior floor area simply multiply by 1.25. Thus, for meat storage, in the above example exterior floor area = 1.25 x 12.5 sq. ft., or 15.6 sq. ft. would be needed. (Refer to Appendix A-1 pages (A-1) 1 - 6 for Refrigerated Walk-In Storage Charts)

The following is a suggested formula to establish required reserve storage for reach-in refrigeration units. (Note: only 75% of any reach-in unit actually provides usable space):

Total Interior Storage Volume Needed:

$$\text{Vol. per meal (Cu. ft.)} \times \text{number of meals} \times 75\% \text{ usable Space}$$

Thus for a restaurant serving 1000 meals between deliveries (assume a minimum of 4-day storage) the following storage capacities are needed: (Refer to Appendix A-1 pages (A-1) 7 – 12 for Reach-In Refrigerated Storage Charts)

$$\text{Meat refrigerated storage} = \frac{.030 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.75} = 40 \text{ Cu. Ft. unit}$$

$$\text{Vegetable refrigerated storage} = \frac{.040 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.75} = 53 \text{ Cu. Ft. unit}$$

$$\text{Dairy refrigerated storage} = \frac{.015 \text{ cu. ft./meal} \times 1000 \text{ meals}}{.75} = 20 \text{ Cu. Ft. unit}$$

ADDITIONAL REQUIREMENTS FOR REFRIGERATED STORAGE FACILITIES

A. Shelving for walk-ins and reach-ins shall be NSF Standard #7 (for refrigeration use) listed or equivalent for use.

B. Interior finishes of walk-in and reach-in refrigeration units that comply with the requirements of NSF Standard #7 or equivalent would be acceptable except for galvanized metal, which is not recommended because of its tendency to rust.

All refrigeration units must have numerically scaled indicating thermometers accurate to $\pm 3^{\circ}\text{F}$ with the temperature-sensing unit located in the unit to measure air temperature in the warmest part. All such thermometers should have an externally mounted indicator to facilitate easy reading of the temperature of the unit.

C. Refrigerators and freezers shall be capable of maintaining appropriate temperatures when evaluated under test conditions specified under NSF Standard #7 or equivalent. Maximum operating temperature (cabinet air) shall be:

<u>Max. Compressor Type</u>	<u>Max. Temp</u>
Rapid Cool down	Food temp cooling from 140° F to 45° F within 4 hours
Refrigerated Buffet units	Cabinet air temp 33-41°F Food temp 45° F
Storage & display Refrigerators	Cabinet air temp 41°F
Storage & display Freezer	Cabinet air temp 0° F

- D.** Approved cove juncture base shall be around the interior.
- E.** Approved cove junction base shall be around the exterior.
- F.** Approved enclosure between the top of the unit and the ceiling will be required as per manufacturer specification.
- G.** Outside remote refrigeration units shall be for unopened standard packaged goods only. These units shall meet National Sanitation Foundation or equivalent.
- H.** If the walk-in floors are water-flushed for cleaning or receive the discharge of liquid waste or excessive melt water, the floors shall be non-absorbent (i.e. quarry tile or equal) with silicone or epoxy impregnated grout, sloped to drain outside of the box to a floor drain or trench drains located within 2 feet of the cooler door.
- I.** All walk-in units shall be constructed and installed in accordance with NSF standards, and the NSF "Manual on Sanitation Aspects of Installation of Food Service Equipment". (Refer to Appendix B for the NSF "Manual on Sanitation Aspects of Installation of Food Service Equipment".)
- J.** Walk-in units should contain moisture-proof lamps providing a minimum 10 foot candles of light at 30" above the floor.

HOT HOLDING AND REHEATING FACILITIES

The hot holding facilities must be capable of maintaining potentially hazardous foods at an internal temperature of 140° F or above during display or holding.

Reheating equipment must be capable of raising the internal temperature of potentially hazardous foods rapidly to at least 165° F. Appropriate product thermometers will be required to monitor temperature.

As recommended by the FDA microwave reheating of PHF's (Potentially Hazardous Foods) shall be at least 190° F.