# REFRIGERATION RULES

## Extending vase life creates cold hard cash.

By Marcy Britigan

Shrink your shrink and expand the vase life of cut flowers by maintaining optimal cooler conditions. Because temperature is so vital, it's easy to overlook the importance of humidity, air circulation and the type of cooler. The proper conditions can make your flowers look cool and fresh instead of hot and wilted.

### LOW TEMPS MAKE FLOWERS TEMPTING

Low temperatures minimize respiration and enable flowers to maintain their natural food source for a longer time (*see refrigeration reference*).

Lower temperatures also contribute to more vivid flower color, help reduce the effects of ethylene gas and retard normal aging. Improper refrigeration is a major contributor to flower deterioration.

### HUMIDITY INCREASES LONGEVITY

Relative humidity is equally important to maintaining cut flower integrity. A high relative humidity level (*see refrigeration reference*) helps flowers retain their moisture, resulting in a fresher-looking product and extended vase life.

Low-humidity coolers dehydrate flowers, accelerate aging and reduce flower life.


This refrigerator, from MEI, LaGrange Park, Ill., has a high gloss interior that is cold- and moisture-resistant.

### AVOIDING HOT SPOTS

Good air circulation at a low velocity prevents hot spots and assures a constant temperature throughout a cooler. Do not place flowers where they will be in direct contact with air exiting the evaporative coil (pre-cooling and dry storage, where product is boxed, are exceptions).

### NO FOOD COOLERS, PLEASE

Don't assume a cooler marketed for flowers has been engineered specifically for flowers. Some reconditioned commercial food/beverage coolers are marketed for flowers but do not meet cut flower refrigeration specifications. Although food/beverage coolers can deliver the desired temperature, they have a higher air velocity, which means they cool faster. Also, food/beverage coolers are not typically humidity sensitive. Humidity levels are set by the manufacturer and cannot easily be corrected in the store. However, a high air velocity can be modified in the store.

The relative humidity in floral coolers is controlled by the refrigeration system. Relative humidity can't be achieved by adding humidity controls or misting systems, which were recently introduced to the industry. Both options increase cost; neither fix the problem. Misting may create an environment in which bacteria and botrytis can thrive.

In food and beverage coolers, the coil capacity is matched in BTUs to the compressor capacity to deliver a +/-12F temperature differential. This high temperature differential results in low humidity.

To meet your objective and enjoy a 3-to-1 return on investment (which research shows you can achieve), be sure the design of your reach-in or walk-in floral systems combine all the proper elements:

- It delivers a 36F (2C) operating temperature;
- offers a 5-degree temperature differential (TD);
- and provides 95 percent relative humidity.

### REFRIGERATION REFERENCE

Here's a guide to definitions and optimal operating conditions for flower coolers:

#### Definitive degrees

32F (0C)—Dry storage (boxed)
36F (2C)—General storage
45F (7C)—Tropicals

#### The RH Factor

Optimal Relative Humidity—95%
Minimum acceptable Relative Humidity—80%

#### Circulating criteria

Low velocity. Velocity is measured in cubic feet per minute.

#### Cooler clarifiers

**BTU:** British Thermal Unit. A BTU is the amount of heat required to raise the temperature of one pound of water by one degree Fahrenheit. This indicates box load or the capacity of an evaporative coil.

**Box load:** The BTUs required to hold temperature sufficiently. An undersized unit will have insufficient capacity, will run constantly and may not hold temperature. An oversized unit will cycle infrequently and may not maintain optimal temperature and humidity levels.

**CFM:** Cubic feet per minute, which denotes air velocity.

**Fin:** Aluminum sheets that are the conduit for creating even cooling. A coil with increased fin surface will deliver a more balanced, gentle cooling system. Look for 50 percent to 100 percent more fin surface.

**HP:** Horse power. This figure denotes compressor size, which is selected after box load is determined.

**TD:** Temperature Differential.

**Transpiration:** To give off vapor containing waste products through plant tissue.

**Velocity:** The speed or rate of action. Air velocity is a critical component in designing a floral refrigeration system. A low CFM ratio provides even, gentle cooling and prevents hot spots.