

# HOW IMPORTANT IS THE COLD CHAIN?

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## Background

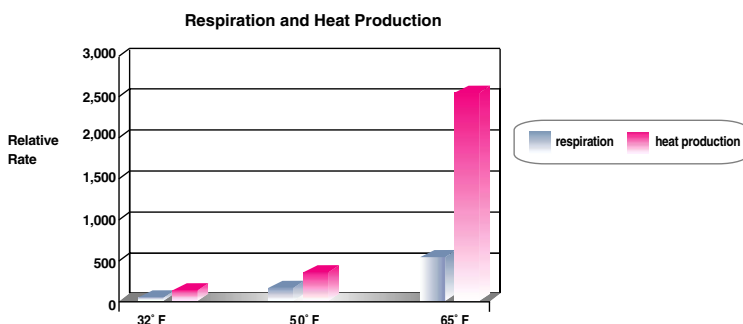
In the world of postharvest care and handling, temperature can be a matter of life and death for fresh cut flowers. Flowers respire faster at higher temperatures and water loss is increased. In fact, overall vase life can be shortened by any break in the cold chain during transit or storage. This research update discusses the most important environmental factor in care and handling of cut flowers: **temperature**.

### **What is the relationship between respiration and temperature?**

The graph below shows the relationship between respiration and temperature. Respiration is the utilization of food within a plant. As temperature increases, respiration also increases which in turn generates heat. In fact, if the cold chain is broken long enough to warm the flower to room temperature or above, the plant may continue to create heat through respiration even after it has been moved into the cooler.

### **How does temperature affect vase life?**

Rik van Gorsel and Marc Ravesloot (1994) conducted studies to determine the effects of cold chain breaks on vase life of various crops. They discovered that by subjecting asters, baby's breath, carnations, and chrysanthemums to high temperatures (68° F) for only 8 hours, vase life was decreased. Flowers exposed to 68° F for 8 to 40 hours showed a 30 - 40% decrease in vase life when compared to flowers held at a constant temperature of 46° F.



### **How much fluctuation is too much?**

Researchers Van Gorsel and Ravesloot (1994) also discovered that damage caused by cold chain breaks was worst when it occurred late in the supply chain. So even if the cold chain stays unbroken until delivery to a retail store, damage can still occur.

### **How to avoid cold chain breaks?**

Minimizing processing delays is always a key in avoiding temperature problems. Process flowers immediately upon arrival. Discuss cold chain with your fresh flower source so you can be sure that you start with the highest quality flowers possible. Manage your cooler temperature by checking your thermometer at least twice a day. Remember that first thing in the morning the cooler will be colder than at mid day after people have been in and out.

### **How does this affect the retail florist?**

Maintaining the cold chain will ensure that your customers have the freshest flowers possible. The optimal storage temperature for cut flowers is 34 - 38° F (except tropical flowers which should be stored at 55° F). The more you know about storage and temperature, the better equipped you will be to service your customers. Happy customers make repeat customers and fresh flowers make happy customers.

Literature Cited:

Staby, George. [www.chainoflifeflornetwork.org](http://www.chainoflifeflornetwork.org) 2004

Van Gorsel, R. and M. Ravesloot. 1994. Short interruptions of the cold chain reduce the vase life of aster ericoides, chrysanthemum, dianthus, and gypsophila cut flowers. HortScience 29(5):554.

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