Excerpt from ASHRAE Handbook

“Because of the low temperatures within freezer facilities, contraction of structural members in this space will be substantially greater than the surrounding ambient and or cooler facilities. Therefore contraction joints must be properly designed to prevent structural damage during the facility temperature pull down.

The first stage of the temperature reduction should be from ambient to 35 degrees F at whatever rate of reduction is achievable with the refrigeration system. The room should then be held at that temperature until it is dry. Finishes are especially subject to damage when temperatures are lowered rapidly. Concrete should be fully cured before the room is refrigerated. (If the room is airtight, swinging doors should be partially open during temperature pull down to relieve the internal pressure caused by the cooling of the air, and or vents should be provided.)

The concrete slab will contract during pull down, causing slab-wall joints, contraction joints and other construction joints to open. At the end of the holding period at 35 degrees F., any required caulking should be done.

Gradually lowering the temperature is designed to eliminate problems stemming from temperature changes, while at the same time withdrawing construction moisture and testing the vapor barrier.

Seventy-two hours is the average time for achieving this condition. There are other indicators to watch that may be useful to properly time pull down, such as observing the rate of frost formation on the coils or measuring the rate of moisture removal by capturing the condensation during defrost.

After the refrigerated room is dry, the temperature can then be reduced at whatever rate is achievable with the refrigeration equipment until the operating temperature is reached. Rates of 10 degrees F per day have been used in the past, but care must be taken to insure that all the construction moisture had been removed in the previous steps. Faster rates are possible without damage with proper care and monitoring.