

Beer

Revised 2018

Storage Conditions

	Pasteurized	Non-Pasteurized	
	Packaged	Packaged	Kegs
Temperature	40°F (4.4°C)	38°F (3.3°C)	38°F (3.3°C)
Relative Humidity	65% or less	65% or less	
Approximate Storage Period, from time of packaging	8-12 weeks	8-12 weeks	6 weeks

Pasteurized

The ideal temperature for the storage of most pasteurized beer in bottles or cans is a minimum of 40°F (4.4°C). The storage temperature should never exceed 60°F (16°C).

Bottled beer is sensitive to direct sunlight as well as certain types of artificial light, including fluorescent light sources. Potential damage to beer products as a result of over-exposure to light sources includes oxidation, cloudiness and/or a "musky" flavor. As a result, it is recommended that bottled beer be kept in dark storage conditions.

Most beer will become cloudy and unattractive if held at storage conditions too cold. It is estimated that the critical cold-sensitivity temperature is approximately 35°F (2°C) but this lower quality threshold depends on the beer formula. As a result, the manufacturer should be consulted with regard to minimum temperatures for storage, along with accurate duration of holding or maximum storage period.

Packaged and keg beer should not be allowed to freeze. It is estimated that most beer products will freeze at approximately 30°F (-1°C), depending upon beer formula. It is important to have an even temperature around each case of bottled or canned beer so that undue variations of cold do not cause cloudiness.

Non-Pasteurized

Most draft (keg) beer and some brands (Coors, Millers, Imports) of packaged beers are **not** pasteurized. The objective behind avoiding the pasteurization process is to avoid the heat associated with flash

pasteurization. Heat is believed to induce or accelerate the flavor and physical changes in the product, and inhibits or alters the natural aging process. The avoidance of heat is usually extended to include refrigerated transportation, storage and, in some rare cases, in-package refrigerated maturation (aging). Non-pasteurized beers are expected to be of commercial sterility quality and do **not** require refrigeration for microbiological stability purposes. However, refrigeration is desirable for flavor and physical stability purposes to overcome the same chemical forces active in pasteurized products. As a result, most non-pasteurized beer products are stored and transported under refrigeration.

Non-pasteurized beer systems have the following standards:

Process	Temperature Range
Packaging	32 to 36°F (0 to 2.2°C)
Shipping Load Out	32 to 38°F (0 to 3.3°C)
Transportation, En Route	33 to 60°F (0.6 to 15.6°C)
Distributor Processing or Warehousing-Acceptance	33 to 38°F (0.6 to 3.3°C)
Maintained Temperature	33 to 38°F (0.6 to 3.3°C)
Delivery to Retailer	<60°F (<15.6°C)
Retailer	<45°F (<7.2°C)
Shelf Life - Packaged Beer, Pasteurized and Non Pasteurized	60-90 days (from time of packaging)
Shelf Life - Keg Beer	45 days (from time of racking)

Environmental conditions of humidity, radiation, sanitation, vibration, uniform temperature, air circulation, and stock rotation apply equally to unpasteurized and pasteurized beers.

The un-pasteurized beers normally retain natural biochemical components in an active state whose effects on beer aging are controlled or reduced in direct relation to the temperature of the product. As a result, the lower the storage temperature the slower the rate of change, thereby resulting in longer product stability.

Handling

Low relative humidity should be maintained so that fiber and chipboard packaging materials do not absorb moisture and weaken the strength of the packaging materials during stacking and handling throughout distribution. However, in high humidity areas, beer should be stored no less than 3°F (1.6°C) over the dew point. This is recommended to minimize moisture absorption into the packaging materials when removing product from cold storage to ambient air.

Pallets or skids simplify handling and storage. Air space must be left between loaded pallets or skids to permit free air circulation. Most cases of bottles and/or cans cannot be stacked more than 3 pallets high

(12 layers each). It is recommended that at least 2 feet between stacks and walls be maintained for proper air flow. A brick or row pallet pattern should be used to provide stability and an even distribution of weight.

The exterior case surfaces of pallets of canned beer should be periodically examined for any evidence of leakage. If any wet cases are observed, all cases wet with product should be removed from the pallet. There should be no attempt to segregate non-leaking cans or bottles from the wet cases and return them to usable inventory. Experience with canned beer, especially beer packaged in aluminum cans, indicate that leakage occurring during the distribution and/or storage can result in secondary corrosion, which causes outside-in perforations initiating a leakage/corrosion/leakage cycle which ultimately causes very high levels of leakage.

It is important to allow space for rotation of stock. It is imperative that the older beer always be removed first. Provide floor plan of storage room and mark the various bays in order to keep a systematic record of the beer movements. Also, keep a record of the age code on the various lots. Each carload or truckload shipment to cold storage may comprise an individual lot.

NOTE: In order to store beer in a refrigerated warehouse, some states require a license. Contact your state Alcoholic Beverage and Tobacco office for details.

WFLO is indebted to Mike Babb, Seibel Institute of Technology, Chicago, Illinois, and Dr. Stephen Neel, World Food Logistics Organization, for review and revision of this topic.