

GUIDELINES FOR SANITARY DESIGN AND CONSTRUCTION OF MILK PRODUCTS PLANTS

(rev. 10-20-2011)

The outline below lists sanitary requirements and standards of construction applicable to milk products plants. It is intended only as a guideline to assist with understanding the need for sanitary design when construction of a milk product plant is being considered. For comprehensive information on requirements, those specified by Food and Agricultural Code (FAC) sections 33701-34091, and applicable sections of Title 3, Division 2, Chapter 1 of the California Code of Regulations (CCR) should be referred to.

A milk products plant is any place in which a person engages in the business of handling, receiving, manufacturing, freezing, processing, or packaging milk, or any product of milk or engages in the business of manufacturing, freezing, or processing imitation ice cream or imitation ice milk. However, "milk products plant" does not include any retail establishment which packages dairy products in the presence of the consumer (FA C section 32513).

SUBMISSION OF PLANS

In accordance with section 33731 of the FAC, no new milk products plant shall be constructed nor shall extensive repairs be made to any existing milk products plant unless plans or specifications which show in detail the nature of the construction or alteration have been submitted to the director and unless the plans and specifications have received the director's approval in writing.

The following items are considered to show in detail the nature of the construction:

- a. Two complete and legible sets of plans that are drawn to scale. Upon approval, one set of plans will be stamped approved and returned to the plant. The other set of plans may also be retained by the plant provided they are accessible to the Dairy Foods Specialist upon request.
- b. FAC section 33780 states that no equipment or apparatus shall be installed or maintained in a manner to prevent thorough and adequate cleaning of walls and floors. Therefore, plans shall include the placement of equipment in relation to walls and floor drains
- c. Also recommended are diagrams showing the interconnection and flow for water supplies, milk handling and processing lines and any clean-in-place (CIP) systems, and specification of elevations and floor slope.
- d. An equipment list by make and model, including confirmation that proposed equipment is constructed to 3-A sanitary standards, and authorized by 3-A SSI certification. Otherwise, proposed equipment manufacturer's specification sheets are requested.
- e. An interior finish schedule.
- f. Plans should also indicate compliance with the following requirements in items 1 through 16 below.

1. FLOOR.

- a. The floor shall be constructed of concrete or other impervious material which is acceptable to the director. It shall be so constructed as to be watertight and so sloped that all drainage will flow to one or more points of drainage. The floors shall be readily cleanable (FAC 33767).
- b. The floor material, finish and construction methods should be provided in detail
- c. The finish on the floor and walls should be suitable for being wet mopped or hosed down during cleanup operations.
- d. The wall and floor juncture must prevent moisture penetrating the wall structure. A cove of at least 2 inches radius is recommended at the junction of floor and walls for ease of cleaning. Where standard tile base is used the cove may be less than 2 inch radius.

2. WALLS

- a. Tight, sound, and cleanable walls and ceilings shall be provided. The walls shall be constructed of nonabsorbent material, acceptable to the director, sufficiently above the floor to take care of any splash and to prevent the flowing or seepage of water or other fluids underneath or between the wall and the floor or supporting members (FAC 33776). Examples of suitable materials include:
 1. Smooth-finish cement plaster over galvanized metal lath, or masonry.
 2. Tile
 3. FRP type sliding with no exposed cracks or crevices
 4. Metal with welded seams
 5. Other material approved by the Director.
- b. Wood frame walls are recommended to be constructed on a concrete curb not less than 8" above the finished floor level. For masonry construction the curb may be just high enough to provide the required cove. The height of curb when needed at doorway should be 3" to form a threshold.
- c. On wood frame walls, a key-way should be provided in top edge of the curb to permit wall-surfacing material to extend about 1" below the sill and form a tight bond with the curb.

3. CEILINGS

- a. Only tight, sound and cleanable materials are permitted.
- b. Ceiling height should be not less than 8' from finished floor at the lowest point.
- c. Ceilings should be light in color.

4. FLOOR DRAINS

- a. Floor drains shall be provided which are properly trapped to exclude odors and connected to a sewer line that will convey refuse milk, water, and sewage away to a point at least 100 feet distant from the milk products plant (FAC 33768).
- b. Drains and lines should be not less than 2" in diameter and comply with the Uniform Plumbing Code.
- c. Floor drains or sewage drains with exposed pipes within any product processing or packaging room or any room where processing or clean packaging equipment is handled or kept shall be constructed in a leak-proof manner (CCR 587).
 - Screw-joint pipe and no-hub-band joints, when correctly installed, are considered leak-proof.
 - Pipe supports shall be installed to maintain pipe alignment.

- Bell-hub joints shall be completely enclosed with a metal sheathing sloped sufficiently toward an outlet in the sheathing at floor level to readily detect leakage in the drainage or sewer pipe, and shall be of such construction as to permit removal of the sheathing for repairing any leakage that might occur in the drainage or sewer pipe line, or sealed in a manner acceptable to the Department.

5. LIGHT

- a. There shall be sufficient light in each room equivalent to not less than one 50-watt electric light per 100 square feet of floor area, reasonably and efficiently distributed (FAC 33775).

6. VENTILATION

- a. All rooms shall be adequately ventilated (FAC 33775). Ventilation should prevent condensation of moisture on walls or ceiling and prevent the accumulation of stale air.
- b. If a gravity system is used low vents should be provided, not less than 1 square inch in size for each square foot area in the room, together with a top vent sufficient in size to assure adequate air movement. Low vents should be screened with the bottom surface of vents sloping toward the inside floor.
- c. If a forced draft system is used it is preferable to force filtered clean air into the room.
- d. Cross ventilation is desirable when low vents are used.

7. WATER

- a. Section 622 of the California Code of Regulations (CCR) regarding dairies and milk products plants, states no cross-connections may be installed between a safe water supply and any unsafe or questionable water supply. Submerged inlets into an unsafe or questionable water supply must be avoided unless such submerged inlets are installed in a manner to prevent back siphonage.
- b. Hot and cold running water should be provided at wash sinks. A hose bib and hose(s) of sufficient in length to reach all areas of the milk products plant should be provided.
- c. The water supply must be potable and abundant.

8. EQUIPMENT WASHING AND SANITIZING

- a. All equipment that come into contact with milk or its products must be thoroughly washed and sanitized. This can be achieved by adequate cleaning in place methods or see part (b)
- b. At a minimum a two-compartment wash sink and drain board sufficient in size to permit the submerging of the largest piece of equipment to be washed, must be provided.

9. HAND WASHING FACILITIES

- a. Section 623 of the CCR states no employee of any dairy or milk products plant shall resume work after using the toilet room without having washed his hands.
- b. Hand washing facilities shall be provided convenient to the processing room.
- c. Hand washing facilities shall be provided in all toilets.

10. WINDOWS

- FAC section 33774 states all openings into any milk products plant shall be effectively protected against flies and insects.

11. DOORS AND DOOR OPENINGS

- a. FAC section 33774 states all openings into any milk products plant shall be effectively protected against flies and insects and doors shall be self-closing.
- b. Plant doors to the outside should open outward; double-acting doors are acceptable.
- c. Doors should be so placed that they center over the threshold.
- d. Inside doors may be screened in part except when undesirable odors from any source exist, or where dust or other air-borne contamination may constitute a hazard to sanitation.
- e. Doorjamb and casings should not extend below 6" from the floor. The bottom of the jamb should be cut at a right angle but beveled inward and upward on a 45 degree angle. When the space below the jamb is filled with cement plaster the bevel cut will form a plaster key.
- f. The height of curb when needed at doorway should be 3" to form a threshold. This recommendation could be mitigated if the area outside the clean room is sloped to a trapped drain, with appropriate impervious floor construction. The curb could also be ramped either side to facilitate the use of a wheeled trolley.
- g. The door finish must be waterproof, including the bottom. Steel or fiberglass with a light colored two pack epoxy finish would be acceptable.

12. METAL RACKS:

- a. Metal racks or shelves of sufficient size for the storage of process equipment should be provided when the operation warrants one. Stainless steel is recommended.

13. DRY GOODS STORAGE

- a. A dry goods store, cabinet or shelves should be provided for storage of supplies.
- b. Supplies should be protected from insects, vermin, splash, condensation or any other contamination.

14. EQUIPMENT INSTALLATION

- a. FAC section 33780 states no equipment or apparatus shall be installed or maintained in such manner so as to prevent thorough and adequate cleaning of walls and floors.
- b. This is deemed to be satisfied when
 - Equipment is elevated 3" (more recommended for large equipment) above floor on capped pipe or metal legs.
 - Equipment should not be located closer than one foot from walls unless it is mounted on casters and is readily movable for cleaning under and around. A three foot unimpaired working space is recommended in front of freezers and other process equipment. Equipment may be flashed to the wall if sealed in a tight, seamless manner.

15. RESTROOM FACILITIES

- a. FAC section 33777 states a suitable toilet, with self-closing door, and lavatory facilities, soap, and clean towels shall be provided for employees. A toilet shall not communicate directly with any room which is used for handling milk or its products or with any room which is used for the washing, sterilizing, and storage of containers and supplies.
- b. The toilet room should be fly-proof.

- c. The toilet room and vestibule should be vented independently to the outside atmosphere.

16. VERMIN EXCLUSION

- a. As stated in FAC section 33774 all openings into any milk products plant shall be effectively protected against flies and insects.
- b. FAC section 32734 requires that inspection procedures of milk products plants include sanitation inspections of all facilities, handling practices, and surroundings to ensure adequate sanitation.
- c. The above are deemed to be satisfied when:
 - Surroundings are designed to eliminate rodent and insect harborages.
 - Buildings should be constructed so as to prevent entrance of insects and rodents.
 - Air curtain devices when provided on exterior doors, must be permanently wired and installed so that the device will automatically operate whenever the door opens and meet NSF performance standards.
 - Self-closing devices on exterior doors are recommended.
 - All operable windows must be screened with not less than 16 mesh screening.