

3-A[®] Accepted Practices for Farm Milk Cooling and Storage Systems, Number 611-00

Formulated by
International Association of Food Industry Suppliers (IAFIS)
International Association for Food Protection (IAFP)
United States Public Health Service (USPHS)
The Dairy Industry Committee (DIC)
The Farm Industry Committee (FIC)

It is the purpose of the IAFIS, IAFP, USPHS, DIC, and FIC in connection with the development of the 3-A Sanitary Standards Program to allow and encourage full freedom for inventive genius or new developments. Farm milk cooling and storage system specifications heretofore or hereafter developed which so differ in design, materials, and fabrication or otherwise as not to conform to the following standards but which, in the fabricator's opinion, are equivalent or better, may be submitted for the joint consideration of the IAFIS, IAFP, USPHS, DIC and FIC at any time. **NOTE:** Use current revisions or editions of all referenced documents cited herein. Standard English is the official language of 3-A Sanitary Standards and 3-A Accepted Practices.

A SCOPE

A1 These 3-A Accepted Practices shall pertain to equipment used for farm milk cooling and storage systems. These systems shall begin at the inlet of the heat exchanger and end with the milk storage vessel from which the raw milk is removed from the dairy farm.

A2 In order to conform with these 3-A Accepted Practices, farm milk cooling and storage systems shall comply with the following design, material, fabrication, cooling and installation criteria.

B DEFINITIONS

B1 *Product:* Shall mean milk.

B2 Surfaces

B2.1 *Product Contact Surfaces:* Shall mean all surfaces which are exposed to the product and surfaces from which liquids may drain, drop, or be drawn into the product.

B2.2 *Nonproduct Contact Surfaces:* Shall mean all other exposed surfaces.

B3 Cleaning

B3.1 *Mechanical Cleaning or Mechanically Cleaned:* Shall mean soil removal by impingement, circulation or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned by mechanical means in

equipment or systems specifically designed for this purpose.

B3.2 *Manual (COP) Cleaning:* Shall mean soil removal when the equipment is partially or totally disassembled. Soil removal is effected with chemical solutions and water rinses with the assistance of one or a combination of brushes, nonmetallic scouring pads and scrapers, high or low pressure hoses and tank(s) which may be fitted with recirculating pump(s), and with all cleaning aids manipulated by hand.

B4 *Safe Water:* Shall mean water from a supply properly located, protected and operated and shall be of a safe, sanitary quality. The water shall meet the standards prescribed in the National Primary Drinking Water Regulation of the Environmental Protection Agency (EPA) as referenced in The Code of Federal Regulations¹ (CFR), Title 40, Parts 141, 142 and 143. (Information also available from the Environmental Protection Agency (EPA) Drinking Water Hot Line - 800-426-4791.)

B5 *Milk Transfer Line:* A pipe which performs the single function of transporting milk.

B6 *Precooling:* Shall be the partial cooling of milk in a plate or tubular heat exchanger before the

¹ For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (202) 512-1800.

milk enters the cooling tank.

B7 *Instant Cooling:* Shall be the cooling of milk to storage temperature in a plate or tubular heat exchanger before the milk enters the storage or cooling tank.

B8 *Coolant (Cooling Media):* Shall be the recirculated cold water which is used in coolers and heat exchangers, and shall include those systems in which a nontoxic freezing-point depressant is used, is from a safe source and is protected from contamination.

B9 *Simple Hand Tools:* Shall mean implements normally used by operating and cleaning personnel such as a screwdriver, wrench or hammer.

C MATERIALS

C1 The materials of product contact surfaces of equipment included in the farm milk cooling and storage systems for which there are 3-A Sanitary Standards or 3-A Accepted Practices shall comply with the material criteria of the applicable standards or accepted practices.

C2 Product contact surfaces shall be of stainless steel of the American Iron and Steel Institute (AISI) 300 Series² or corresponding Alloy Cast Institute³ (ACI) types (See Appendix, Section G.), or metal which under conditions of intended use is at least as corrosion resistant as stainless steel of the foregoing types, and is nontoxic and nonabsorbent, except that:

C2.1 Rubber and rubber-like materials may be used for sealing applications, O-rings, drip deflectors and parts having the same functional purposes. (Also see C1 herein.)

C2.2 Rubber and rubber-like materials when used for the above specified application(s) shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Rubber and Rubber-Like Materials Used as Product Contact

Surfaces in Dairy Equipment, Number 18-.

C2.3 Plastic materials may be used for drip shields, O-rings, seals, gaskets and parts having the same functional purpose or for protective caps for sanitary tubing, fittings or vents. (Also see C1 herein.)

C2.4 Plastic materials when used for the above specified applications shall comply with the applicable provisions of the 3-A Sanitary Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-.

C2.5 Rubber and rubber-like materials and plastic materials having product contact surfaces shall be of such composition as to retain their surface and conformational characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C2.6 The final bond and residual adhesive, if used, on bonded rubber and rubber-like materials and bonded plastic materials shall be nontoxic⁴.

C2.7 Bonded rubber and rubber-like materials and bonded plastic materials having product contact surfaces shall be of such composition as to retain their surface and conformation characteristics when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.

C3 All nonproduct contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion resistant. If coated, the coating used shall adhere. All nonproduct contact surfaces shall be relatively nonabsorbent, durable, and cleanable. Parts removable for cleaning having both product contact and nonproduct contact surfaces shall not be painted.

²The data for this series are contained in the *AISI Steel Products Manual, Stainless & Heat Resisting Steels*, November 1990, Table 2-1, pp. 17-20. Available from the American Iron and Steel Society, 186 Thorn Hill Road, Warrendale, PA 15086 (724) 776-1535.

³Steel Founders Society of America, Cast Metal Federation Building, 455 State Street, Des Plaines, IL 60016 (708) 299-9160.

⁴Adhesives shall comply with 21 CFR 175 - Indirect Food Additives: Adhesives and Components of Coatings. Document for sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402 (202) 512-1800.

- D FABRICATION** in. (6.35 mm) O-rings shall not be less than 3/32 in. (2.38 mm) .
- D1** The fabrication criteria of equipment included in the farm milk cooling and storage system for which there are 3-A Sanitary Standards or 3-A Accepted Practices shall be those of the applicable standards or accepted practices. Other equipment shall conform to the following fabrication criteria.
- D2 Surface Texture**
- D2.1** All product contact surfaces shall have a finish at least as smooth as a No. 4 ground finish on stainless steel sheets and be free of imperfections such as pits, folds and crevices in the final fabricated form. (See Appendix, Section H.) The measuring rod of an immersion type measuring device may have a dull finish to facilitate reading.
- D3 Gaskets**
- D3.1** Gaskets having a product contact surface shall be removable or bonded.
- D3.2** Bonded rubber and rubber-like materials and bonded plastic materials having product contact surface shall be bonded in a manner that the bond is continuous and mechanically sound so that when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment, the rubber and rubber-like material or the plastic material does not separate from the base material to which it is bonded.
- D3.3** Grooves in gaskets shall be no deeper than their width.
- D3.4** Gasket grooves or gasket retaining grooves in product contact surfaces for removable gaskets shall not exceed 1/4 in. (6.35 mm) in depth or be less than 1/4 in. (6.35 mm) wide except those for standard O-rings smaller than 1/4 in. (6.35 mm), and those provided for in Sections D5 and D6.
- D4 Radii**
- D4.1** All internal angles of 135° or less on product contact surfaces, shall have radii of not less than 1/4 in. (6.35 mm) except:
- D4.1.1** Those provided for in Section D6 and D7.
- D4.1.2** The minimum radii in grooves for standard 1/4 in. (6.35 mm) O-rings shall not be less than 3/32 in. (2.38 mm) .
- D4.1.3** The minimum radii in grooves for standard 1/8 in. (3.18 mm) O-rings shall be not less than 1/32 in. (0.794 mm).
- D4.1.4** Radii smaller than 1/4 in. (6.35 mm) may be used when they are required for essential functional reasons, such as O-ring grooves. In no case shall such radii be less than 1/32 in. (0.794 mm).
- D5** All tubing shall conform with the applicable provisions for welded sanitary product pipelines found in the 3-A Accepted Practices for Permanently Installed Product and Solution Pipelines and Cleaning Systems Used in Milk and Milk Product Processing Plants, Number 605- and with the 3-A Sanitary Standards for Polished Metal Tubing for Dairy Products, Number 33-.
- D6** All sanitary fittings and connections shall conform with the applicable provisions of the 3-A Sanitary Standards for Sanitary Fittings for Milk and Milk Products, Number 63-. (Also see D1.)
- D7** All sensor connections having product contact surfaces shall conform to the 3-A Sanitary Standards for Sensor and Sensor Fittings and Connections Used on Milk and Milk Products Equipment, Number 74-. (Also see D1 herein.)
- D8** Pressurized air, if used, shall be produced in accordance with applicable provisions of the 3-A Accepted Practices for Supplying Air Under Pressure in Contact with Milk, Milk Products, and Product Contact Surfaces, Number 604-.
- D9** All permanent joints in metallic product contact surfaces shall be continuously welded.
- D10** Farm milk cooling and storage systems that are to be mechanically cleaned shall be designed so that the product contact surfaces of the milk system and all nonremovable appurtenances thereto can be mechanically cleaned and are accessible for inspection.
- D11** Product contact surfaces not designed to be mechanically cleaned shall be easily accessible for cleaning, and inspection either when in an assembled position or when removed. Demountable parts shall be readily removable using simple hand tools.