

3-A[®] Accepted Practices for Permanently Installed Product and Solution Pipelines and Cleaning Systems Used in Milk and Milk Product Processing Plants, Number 605-04

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)

It is the purpose of the IAFIS, IAFP, USPHS, and DIC in connection with the development of the 3-A Sanitary Standards program to allow and encourage full freedom for inventive genius or new developments. Practices for permanently installed product and solution pipelines and cleaning systems specifications heretofore or hereafter developed which so differ in design, materials, and construction, or otherwise, as not to conform to the following practices but which in the manufacturer's or fabricator's opinion, are equivalent or better may be submitted for joint consideration of the IAFIS, IAFPS, USPHS and DIC at any time. NOTE: Use current revisions of 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	B	DEFINITIONS
A1	These 3-A Accepted Practices provide for the installation and mechanical cleaning and sanitizing of rigid pipelines used for milk and milk processing systems in which the connections are welded or are provided with permanently installed CIP fittings. These 3-A Accepted Practices also specify materials, fabrication and other requirements for the rigid cleaning solution lines and for the mechanical cleaning (CIP) unit which circulates the pre-rinse, rinse, cleaning solutions and post-rinse liquids used for cleaning and sanitizing the product pipelines and process equipment. The mechanical cleaning and sanitizing of individual items of equipment may be found in the 3-A Sanitary Standards covering the specific equipment. This practice does not pertain to cleaning systems used on dairy farms, nor to large diameter piping used for conveying dry product in milk drying or instantizing systems. (See Appendix, Section P for an example of a mechanical (CIP) cleaning unit.)	B1	<i>CIP (Cleaned-In-Place)/Mechanical Cleaning:</i> Shall denote cleaning solely by circulation and/or flowing chemical detergent solutions and water rinses onto and over the surfaces to be cleaned, by mechanical means.
		B2	Pipelines
		B2.1	<i>Permanently Installed Product Pipelines:</i> Shall mean rigid pipelines which have welded joints or permanently installed CIP fittings and are designed for CIP cleaning and which are used for milk and milk products
		B2.2	<i>Permanently Installed Solution Pipelines:</i> Shall mean rigid pipelines which have welded joints or have permanently installed CIP type fittings and are used exclusively for the supply and recirculation of cleaning and/or sanitizing solutions, except those used to supply concentrated cleaning and/or sanitizing materials to the point of use.
		B3	<i>Permanently Installed CIP Fittings:</i> Shall mean welded or gasketed fittings designed

- for CIP cleaning which form substantially smooth, flush interior surfaces.
- B4 *Product*: Shall mean milk and milk products.
- B5 *Product Contact Surfaces*: Shall mean all surfaces that are exposed to the product or from which liquids may drain, drop, or be drawn into the product.
- B6 *Solutions*: Shall mean those solutions used for flushing, cleaning, rinsing, and sanitizing.
- B7 *Solution Contact Surfaces*: Shall mean the interior surfaces of the system which are used exclusively for supply and recirculation of cleaning and/or sanitizing solutions, except those used to supply concentrated cleaning and/or sanitizing materials to the point of use.
- B8 *Nonproduct Contact Surfaces*: Shall mean all other exposed surfaces.
- B9 **Mechanical Cleaning (CIP) Unit**
- B9.1 *Mechanical Cleaning (CIP) Unit*: Shall mean equipment assembled as a unit dedicated to and used exclusively for supply and recirculation of cleaning and/or sanitizing solutions. This equipment may include but is not limited to the following:
- B9.1.1 *Solution Pump(s)*;
- B9.1.2 *Solution Tank(s)*;
- B9.1.3 *Solution Supply and Return Valve(s) and Valve Manifold(s)*;
- B9.1.4 *Fittings*;
- B9.1.5 *Solution Contact Heat Exchanger(s) or Steam Injector(s)*;
- B9.1.6 *Instrument Fitting(s) and*;
- B9.1.7 *Strainers*.
- B9.2 The mechanical cleaning (CIP) unit does not
- include utility piping.
- B10 Tungsten Inert Gas (TIG) Method: Shall mean electric welding with a tungsten electrode shielded by an inert gas, to produce a butt fusion weld.
- B11 *Non CIP Appurtenances*: Shall mean those appurtenances such as plug valves, sample cocks, instrument fittings, pumps and parts having the same functional purposes and not designed for mechanical cleaning.
- B12 *Utility Piping*: Shall mean other system service piping such as the steam supply line up to and including the steam supply valve; chemical injection lines up to and including the chemical shut-off device; water supply lines up to and including the water shut-off valve.
- C **MATERIALS**
- C1 The materials of equipment included in the product and solution pipelines and mechanical cleaning units for which there are applicable 3-A Sanitary Standards or Accepted Practices shall comply with the material criteria of the applicable Standards or Practices.
- C2 All other product and solution contact surfaces shall be of stainless steel of the American Iron and Steel Institute (AISI) 300 Series¹ or corresponding Alloy Cast Institute (ACI)² types (See Appendix, Section I.), 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, or heat-resistant glass piping, except that:
- C2.1 Rubber and rubber-like materials may be used for gaskets, seals and short take-down jumpers.

¹ The data for this series are contained in the AISI Steel Products Manual, Stainless & Heat Resisting Steels, December 1974, Table 2-1, pp. 18-20. Available from the Iron and Steel Society, 186 Thorn Hill Road, Warrendale, PA 15086 (724) 776-9460.

² Alloy Casting Institute Division, Steel Founders Society of America, Cast Metal Federation Bldg., 455 State St., Des Plaines, IL 60016 (708) 299-9160

- C2.2 Rubber and rubber-like materials shall comply with the applicable provisions of the 3-A Standards for Rubber and Rubber-Like Materials Used as Product Contact Surfaces in Dairy Equipment, Number 18-.
- C2.3 Plastic materials may be used for gaskets, seals, sight ports and short take-down jumpers.
- C2.4 Plastic materials shall comply with the applicable provisions of the 3-A Standards for Multiple-Use Plastic Materials Used as Product Contact Surfaces for Dairy Equipment, Number 20-.
- C.3 Utility piping need not be stainless steel
- C.4 Paper gaskets shall not be used.
- D FABRICATION**
- D1 The fabrication criteria of equipment included in the permanently installed product and solution pipelines for which there are applicable 3-A Sanitary Standards or Accepted Practices shall be those of the applicable 3-A Sanitary Standard or Accepted Practice.
- D2 All other 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 J.)
- D3 All solution contact surfaces shall be at least as smooth as a No. 4 ground finish on stainless steel sheets, except for those of castings for solution heat exchanger(s)/steam injector(s) and pumps. This does not preclude the use of a No. 2B finish for solution contact surfaces.
- D3.1 The solution contact surfaces of castings for heat exchangers(s)/steam injector(s) and for pumps shall be at least as smooth as ACI Surface Indicator Scale SIS- I . (See Appendix, Section M.)
- D4 Product lines shall comply with the provisions of 3-A Standards for Polished Metal Tubing for Dairy Products, Number 33-.
- D5 Product and solution lines and equipment shall have permanently installed CIP fittings or welded joints. Gasketed CIP fittings shall be readily demountable for inspection.
- D6 Welded joins shall be smooth and free from pits, folds, crevices, cracks, inclusions, or other defects. (See Section G.)
- D7 Removable fittings may be used with or without gaskets and shall be of such design as to form substantially flush interior joints.
- D7.1 Gaskets, when used, shall be self-positioning and form a substantially flush interior joint.
- D8 Power operated solution valves shall have an open space of at least 1 in. (25 mm), clear for inspection, between the actuator and the valve.
- D9 Non CIP appurtenances, such as plug valves, instrument fittings, sample cocks, pumps and parts having the same functional purposes which have product or solution contact surfaces shall be readily demountable and easily disassembled for manual cleaning and sanitizing.
- D10 Radii**
- D10.1 All internal angles of 135° or less on product contact and solution contact surfaces shall have minimum radii of 1/4 in. (6 mm) except that:
- D10.1.1 The radii in gasket retaining grooves except for those for standard 1/4 in (6 mm) and smaller O-Rings, shall be not less than 1/8 in. (3 mm).
- D10.1.2 Smaller radii may be used when they are required for essential functional reasons, such as those in pump impellers. In no case shall radii be less than 1/32 in. (1 mm). The angle must be readily accessible for cleaning and inspection.