

3-A[®] Sanitary Standards for Plug-Type Valves for Milk and Milk Products, Number 51-01

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. Plug-type valves specifications heretofore or hereafter developed which so differ in design, material, construction, or otherwise, as not to conform with the following standards, but which in the manufacturer's or fabricators opinion are equivalent or better may be submitted for the joint consideration of IAFIS, IAFP, USPHS, and DIC at any time. The 3-A Sanitary Standards and 3-A Accepted Practices provide hygienic criteria applicable to equipment and systems used to produce, process, and package milk, milk products, and other perishable foods or comestible products. Standard English is the official language of 3-A Sanitary Standards and 3-A Accepted Practices.

A SCOPE

A1 These standards cover the sanitary aspects of plug-type valves used on processing equipment and on equipment and lines which hold or convey milk or milk products. These standards do not pertain to thermoplastic plug-type valves which are covered by current 3-A Sanitary Standards for Plastic Plug-Type Valves for Milk and Milk Products, Number 52-.

A2 In order to conform to these 3-A Sanitary Standards, plug-type valves shall comply with the following in design, material and fabrication criteria and the applicable documents referenced herein.¹

B DEFINITIONS

B1 *Product*: Shall mean milk and milk products.

B2 *Plug-Type Valve*: Shall mean a two-ported or three-ported valve consisting of a plug with either two or three passageways that is rotated inside a body with either two or three ports to stop, direct, or throttle flow.

¹ Use current revisions or editions of all referenced documents cited herein.

B3 Surfaces

B3.1 *Product Contact Surfaces*: Shall mean all surfaces that are exposed to the product or from which liquid may drain, drop or be drawn into the product.

B3.2 *Nonproduct Contact Surfaces*: Shall mean all other exposed surfaces.

B4 *Electrodeposition*: Shall mean coated to specific dimensions or processed to specific dimensions after coating.²

C MATERIALS

C1 Metals

C1.1 Product contact surfaces shall be of stainless steel of the American Iron and Steel Institute (AISI) 300 Series³ or corresponding Alloy

² Federal Specification #QQ-C-320B for Chromium Plating (Electrodeposited), June 1954 with Amendment 4 on April 10, 1987. Federal Specification #QQ-N-290A for Nickel Plating (Electrodeposited), November 12, 1971. Available from the General Services Administration, Federal Supply Services Bureau, Specification Section, 470 East L-Enfant Plaza, Suite 8100, Washington, DC 20407 (202) 755-0325.

³ The data for this series are contained in the *AISI Steel Products Manual, Stainless & Heat Resisting Steels*, November

- Cast Institute (ACI) types⁴ (See Appendix, Section E), 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:
- C1.2 Valve bodies or valve plugs made of materials provided for in C1 may be covered with an electrodeposited coating of chromium.
- C1.3 Valve bodies or valve-plugs may be made of nontoxic, corrosion-resistant stainless metal (400 series stainless steel or equivalent) or these materials covered with an electrodeposited coating of chromium.
- C1.4 Valve-plug cores, if completely covered may be made of metal, plastic or rubber or rubber-like materials.
- C2 Nonmetals**
- C2.1 Rubber and rubber-like materials may be used for gaskets, O-rings, seals, valve-plug coverings and parts having the same functional purposes.
- C2.2 Rubber and rubber-like materials, when used, shall conform to the applicable provisions of 3A 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 gaskets, valve-plugs, valve-plug coverings, O-rings, seals and parts used in similar applications having the same functional purposes.
- C2.4 Plastic materials, when used, shall conform to the applicable provisions of 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 Bonded rubber and rubber-like materials and bonded plastic materials having product contact surfaces that are a bonded coating or a covering shall be of such composition as to retain their surface and conformation characteristic when exposed to the conditions encountered in the environment of intended use and in cleaning and bactericidal treatment.
- C2.7 The final bond and residual adhesive, if used, on bonded rubber and rubber-like materials and bonded plastic materials shall be nontoxic.⁵
- C3 Nonproduct Contact Surfaces**
- C3.1 All nonproduct contact surfaces shall be of corrosion-resistant material or material that is rendered corrosion resistant. 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.
- D FABRICATION**
- D1 Surface Texture**
- D1.1 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 F.)

1990, Table 2-1, pp. 17-20. Available from the American Iron and Steel Society, 186 Thorn Hill Rd., Warrendale, PA 15086 (724) 776-1535.

⁴ Steel Founders Society of America, Cast Metal Federation Building, 455 State Street, Des Plaines, IL 60016 (708) 299-9160.

⁵ Adhesives 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.

- D2 Permanent Joints**
- D2.1 All permanent joints in metallic product contact surfaces shall be continuously welded. Welded areas on product contact surfaces shall be 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.
- D3 Coatings**
- D3.1 The minimum thickness of an electrodeposited coating shall not be less than 0.0002 in. (0.005 mm) for all product contact surfaces when used on stainless steel. When these surfaces are other than stainless steel, the thickness of an electrodeposited coating shall not be less than 0.002 in. (0.05 mm).
- D4 Cleaning and Inspectability**
- D4.1 Product contact surfaces shall be easily accessible for cleaning and inspection either when in an assembled position or when removed. Removable parts shall be demountable by hand or by using simple hand tools, used by operating or cleaning personnel.
- D5 Draining**
- D5.1 Product contact surfaces which are not self-draining shall be constructed so that they can be readily and easily opened and drained.
- D6 Gaskets**
- D6.1 Gaskets having a product contact surface shall be removable or bonded.
- D6.2 Bonded rubber and rubber-like materials and bonded plastic materials having product contact surfaces 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.
- D6.3 Grooves in gaskets shall be no deeper than their width.
- D6.4 Gasket grooves or gasket retaining grooves in product contact surfaces for removable gaskets shall not exceed 1/4 in. (6 mm) in depth or be less than 1/4 in. (6 mm) wide except those for standard O-rings smaller than 1/4 in. (6 mm).
- D7 Radii**
- D7.1 All internal angles of 135 degrees or less on product contact surfaces, shall have radii of not less than 1/8 in. (3 mm) except that:
- D7.1.1 Smaller radii may be used when they are required or essential functional reasons, such as those in flat sealing surfaces. In no case shall such radii be less than 1/32 in. (1 mm).
- D7.1.2 The radii in gasket grooves, gasket retaining grooves or grooves in gaskets, shall not be less than 1/8 in. (3 mm) except for those for standard 1/4 in. (6 mm) and smaller O-rings.
- D7.1.3 The radii in grooves for standard 1/4 in. (6 mm) O-rings shall not be less than 3/32 in. (2 mm) and for standard 1/8 in. (3 mm) O-rings shall be not less than 1/32 in. (1 mm).
- D8 Threads**
- D8.1 There shall be no threads on product contact surfaces.
- D9 Fittings and Valves**
- D9.1 Plain end valve fittings for use in welded sanitary pipelines shall conform to the provisions of these standards with respect to material, finish and construction. The inside diameter of the butt welding ends shall be the same as that of the part to which it is to be welded.
- D10 Powered Valve Actuators**
- D10.1 Valves with powered actuators shall have an open space of at least 1 in. (25 mm), clear for inspection, between the actuator and the valve.