

3-A® Sanitary Standards for Shear Mixers, Mixers, and Agitators, Number 73-01

*Standards Developing Organizations
3-A Sanitary Standards, Inc. (3-A SSI)
In Collaboration With
United States Public Health Service (USPHS)/
United States Food and Drug Administration (USFDA)
United States Department of Agriculture (USDA)
European Hygienic Engineering & Design Group (EHEDG)*

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Foreword

This 3-A Standard is to establish minimum sanitary (hygienic) requirements for Shear Mixers, Mixers, and Agitators. Standard English is the official language of 3-A Sanitary Standards and 3-A Accepted Practices.

This 3-A Standard is for voluntary use by directly and materially affected organizations such as equipment and machinery fabricators, processors, regulatory agencies and by 3-A Sanitary Standards, Inc. to assure adequate public health protection exist for the devices and covered products. 3-A Sanitary Standards, Inc. use these documents as the source for sanitary criteria as part of 3-A Symbol authorization.

This 3-A Standard was developed jointly by 3-A Sanitary Standards, Inc. (3-A SSI), the United States Public Health Service (USPHS), the United States Department of Agriculture – Dairy Programs (USDA), and the European Hygienic Engineering & Design Group (EHEDG).

It is our purpose to encourage inventive genius and provide a forum to discuss new developments. Suggestions for improvement and new technology are welcome any time for consideration by the 3-A Sanitary Standards Committees. Please forward comments to the 3-A SSI, 1451 Dolley Madison Boulevard, Suite 210, McLean, VA 22101-3850, USA. By fax: 703-761-6284. By e-mail to: 3-ainfo@3-a.org.

A SCOPE

A1 These standards cover the sanitary aspects of agitators, mixers and shear mixers used for combining and/or mixing, either liquids or liquids with solid products. Specifically included are batch mixers immersed into the product. Shear mixers, mixers, and agitators may be of the top, side or bottom entry types. These standards do not include the vessel in which the agitator, mixer or shear mixer is used.

A2 In order to conform to these 3-A Sanitary Standards, shear mixers, mixers, and agitators shall conform to the following design, material, and fabrication criteria.

B DEFINITIONS

B1 *Product*: Shall mean milk and milk products with or without other edible nondairy ingredients.

B2 *Shear Mixers, Mixers, and Agitators (hereinafter referred to as Mixing Device)*: Shall mean equipment which blends, disperses, emulsifies, hydrates, dissolves, mixes or agitates in some form by immersion into the product. The mixing device's head components may consist of mixing impellers, rotors, stators, propellers, serrated disks, or a combination thereof.

B3 *Readily or Easily Removable*: Shall mean quickly separated from the equipment with the use of simple hand tools.

B4 *Simple Hand Tools*: Shall mean implements normally used by operating and cleaning personnel such as a screwdriver, wrench or hammer.

B5 Surfaces

B5.1 *Product Contact Surfaces*: Shall mean all surfaces which are exposed to the product and surfaces from which liquids may drain, drop, diffuse or be drawn into the product.

B5.2 *Nonproduct Contact Surfaces*: Shall mean all other exposed surfaces.

B6 Cleaning

B6.1 *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.

B6.2 *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.

B7 Surface Modification¹

B7.1 *Surface Treatments*: Shall mean a process whereby chemical compositions or mechanical properties of the existing surface are altered. There is no appreciable, typically less than 1 µm, build-up of new material or removal of existing material.

B7.1.1 Surface treatments include:

1. Mechanical (polishing)
2. Electropolishing

C MATERIALS

C1 Metals

C1.1 Product contact surfaces shall be of stainless steel of the American Iron and Steel Institute (AISI) 300 Series² or corresponding Alloy Cast Institute (ACI) types³ (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:

¹ Additional information on surface modification is contained in *Advanced Materials and Processes*, Volume 137(1), "Coatings and Coating Practices" by H. Herman, "Surface Modification" by F. A. Smidt. ASM International, Materials Park, OH 44073 (216) 338-5151.

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

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