

3-A[®] Sanitary Standards for Italian-Type Pasta Filata Style Cheese Cookers, 70-02

Standards Developing Organizations

3-A Sanitary Standards, Inc. (3-A SSI)

In Collaboration With

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United States Food and Drug Administration (USFDA)

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Disclaimers

3-A Sanitary Standards and 3-A Accepted Practices are developed through the efforts of experts, working on a volunteer basis, using science-based information and their professional experiences to reach consensus decisions on the sanitary (hygienic) criteria in these 3-A documents.

3-A SSI, its employees and its volunteer committees/working groups shall not incur any obligation or liability for damages, including consequential damages, arising from or in connection with the development, use, interpretation, or reliance upon this 3-A Sanitary Standard.

3-A Sanitary Standards and 3-A Accepted Practices do not include provisions for mechanical, electrical, or personnel safety. Such safety criteria are established by government regulations and other standards development organizations (SDOs). Other SDO standards may be referenced.

Drawings and illustrations contained herein are examples to assist in understanding the criteria in this 3-A Sanitary Standard. Appendix drawings and illustrations are not intended to show all variations of the equipment or system nor are they exclusive of alternate approved methods. Appendix drawings and illustrations are non-normative.

Foreword

This 3-A Sanitary Standard is to establish minimum sanitary (hygienic) requirements for Italian-Type Pasta Filata Style Cheese Cookers.

This 3-A Sanitary Standard is for use on a voluntary basis by directly and materially affected organizations such as equipment and machinery fabricators, processors, regulatory agencies and by other SDOs to assure adequate public health protections exist for the equipment or systems and covered products. 3-A SSI uses these documents as its source of sanitary criteria for 3-A Symbol authorization.

This 3-A Sanitary Standard was developed jointly by 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 intent to encourage inventive genius and provide a forum to discuss new developments. Suggestions for improvement and new technology are welcome at any time for consideration by 3-A SSI. Please forward comments to the 3-A Secretary, 6888 Elm Street, Suite 2D; McLean, VA 22101-3829, USA or by fax: 703-761-6284, or by e-mail to: 3-a-info@3-a.org.

A SCOPE

- A1 This 3-A Sanitary Standard covers the sanitary aspects of pasta filata style cheese cookers. The cookers covered by this standard may include unitized sections that act as receiving reservoirs, pre-heat or cooking sections (direct or indirect), integral heating media systems, stretcher sections, discharge reservoirs and discharge ports. The cookers shall begin at the point where cheese curd is introduced and shall terminate at the point where cooked and stretched cheese is discharged. With regard to the use of steam, hot water, or other forms of heating media, the cookers shall begin and end at the manufacturer's supplied fittings. (Cheese dicers, mills, cyclones or similar appurtenances attached to the receiving reservoir are not covered by these standards.)
- A2 In order to conform to this 3-A Sanitary Standards, Italian-type pasta filata style cheese cookers shall conform to the following design, material, and fabrication criteria.

B NORMATIVE REFERENCES

- B1 The following listed 3-A Sanitary Standards, 3-A Accepted Practices and other documents shall be considered as Normative References and the provisions of the referenced documents shall apply to this Standard without further reference in this document unless necessary to describe special considerations.

B2 3-A Sanitary Standards

<u>Doc. No.</u>	<u>Title (3-A Sanitary Standards for :)</u>
02-	Centrifugal and Positive Rotary Pumps
11-	Plate-Type Heat Exchangers
12-	Tubular Heat Exchangers
18-	Multiple-Use Rubber and Rubber-Like Materials
20-	Multiple-Use Plastic Materials
33-	Metal Tubing
51-	Plug-Type Valves
53-	Compression-Type Valves
55-	Boot Seal-Type Valves
57-	Disc-Type Valves
58-	Vacuum Breakers and Check Valves
61-	Steam Injection Heaters
63-	Sanitary Fittings
65-	Sight & Light Windows and Sight Indicators in Contact With Product
68-	Ball-Type Valves

- 73- Shear Mixers, Mixers, and Agitators
- 74- Sensors and Sensor Fittings and Connections Used on Equipment
- 78- Spray Cleaning Devices Intended to Remain in Place
- 88- Machine Leveling Feet and Supports

B3 3-A Accepted Practices

Doc. No. Title (3-A Accepted Practice for :)

- 609- Method of Producing Steam of Culinary Quality
- 605- Permanently Installed Product and Solution Pipelines and Cleaning Systems

B4 Other References and Standards

Ref. No. Title

1. AWS/ANSI D18.1 – Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications.

AWS D18.2 – Guide to Weld Discoloration Levels on Inside of Austenitic Stainless Steel Tube (ANSI Approved)

AWS D18.3/D18.3M - Specification for Welding of Tanks, Vessels, and Other Equipment in Sanitary (Hygienic) Applications (ANSI Approved)

Published by American Welding Society, 550 N.W. LeJeune Rd., Miami FL, Phone: (800) 443-3953, www.aws.org.
2. SAE-AMS-QQ-C-320, *Chromium Plating (Electrodeposited)*. SAE-AMS QQ-N-290A, Nickel Plating (Electrodeposited). Society of Automotive Engineers (AWS), 400 Commonwealth Dr., Warrendale, PA 15096-0001, Internet: <http://www.sae.org>
3. AMS-S-13165, *Shot Peening of Metal Parts*. Society of Automotive Engineers (AWS), 400 Commonwealth Dr., Warrendale, PA 15096-0001, Internet: <http://www.sae.org>
4. *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, Phone: (216) 338-5151, Internet <http://asminternational.org>
5. AIST *Stainless Steels: A Steel Products Manual*, Association for Iron & Steel Technology, 186 Thorn Hill Road, Warrendale, PA 15086, Phone: (724) 814 3000, Internet: www.aist.org
6. *Steel Casting Handbook, Supplement 2*, Steel Founders Society of America, 780 McArdle Dr., Unit G, Crystal Lake, IL 60014, Phone: (815) 455-8240, Fax: (815)

455-8241, Internet: www.sfsa.org

7. The Code of Federal Regulations (CFR), Title 21, Parts 175 – Indirect Food Additives: Adhesives and Components of Coatings. For sale by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402, Phone: (202) 512-1800 or at <http://www.gpoaccess.gov/cfr/index.html>.
8. *Machinery's Handbook*, published by Industrial Press Inc., 200 Madison Avenue, New York, NY 10157, Phone: (888) 528-7852, Internet: <http://new.industrialpress.com>
9. EHEDG Guideline 2, *A Method for Assessing the In-Place Cleanability of Food Processing Equipment*. European Hygienic Engineering & Design Group. Published by EHEDG, www.ehedg.org
10. Doc. 35 – Hygienic Welding of Stainless Steel Tubing in the Food Processing Industry. European Hygienic Engineering & Design Group. Published by EHEDG, www.ehedg.org
11. Aerospace Standard (AS) 568, Aerospace Size Standards for O-rings, published by SAE, 400 Commonwealth Drive, Warrendale, PA 15086, Phone: (724)-776-4841, Internet: <http://www.sae.org>
12. ISO 3601-1:2002: *Fluid Power Systems, Sealing Devices – O-Rings – Part 1: Inside diameters, cross-sections, tolerances and size identification code*, The International Organization for Standardization (ISO), 1 ch. de la Voie-Creuse, Postale 56, CH -1211, Geneva 20, Switzerland, Phone: +41-22-749-01-11, Internet: www.iso.org
13. ASTM specifications for Cast Grades A351/A351M, A743/A743M and A744/A744M. Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, Phone: (610) 832-9500 or at <http://www.astm.org>
14. ASTM specifications for Wrought Grades A 182, A240, A 270, A 276, A 312, and A 666. Available from ASTM, 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, Phone: (610) 832-9500 or at <http://www.astm.org>

C DEFINITIONS

C1 Cleaning

- C1.1 *Clean-in-Place (CIP) Cleaning*. (CIP—previously referred to as mechanical cleaning.): The removal of soil from product contact surfaces in their process position by circulating, spraying, or flowing chemical solutions and water rinses onto and over the surfaces to be cleaned. Components of the equipment, which are not designed to be cleaned in place, are removed from the equipment to be COP or manually cleaned.
- C1.2 *Clean-Out-of-Place (COP)*: Removal of soil when the equipment is partially or totally disassembled. Soil removal is effected by circulating chemical solutions and water rinses in a wash tank, which may be fitted with circulating pump(s).

- C1.3 *Manual Cleaning:* Removal of soil 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, and high or low pressure hoses, with cleaning aids manipulated by hand.
- C2 *Corrosion Resistant:* A surface or material which has the property to retain its original surface characteristics for its predicted service period, when exposed to the conditions encountered in the environment of intended use, including contact with product, cleaning and sanitizing chemicals, steam, or sterilization compounds or solutions.
- C3 *Italian-Type Pasta Filata Style Cheese Cookers (referred to hereafter as a cooker):* Equipment in which products are elevated in temperature and physically manipulated to impart a stretch characteristic and finished texture common to Italian-type pasta filata style cheeses.
- C3.1 This definition shall also include: Italian-type cheese cooker/mixer, Italian cheese cooker/mixer/stretcher, Italian cheese stretcher/cooker and other common names for similar devices.
- C4 *Inspectable:* Designed, fabricated and installed to make product contact surfaces available for close visual observation.
- C5 *Nontoxic Materials:* Substances, which under the conditions of their use, are in compliance with applicable requirements of the FDA.
- C6 *Interference Fit:* A force or shrink fit of mating parts which, when assembled, results in an interference under all conditions of intended use that permits no clearance for the migration of liquids.
- C7 *Product:* Cheese, cheese curd, cheese mat derived from milk and milk products, and also whey/heating media which contacts the cheese, cheese curd, or cheese mat, or other food products and additives.
- C8 *Readily Accessible:* A location that can be safely reached by personnel from the floor, other permanent work area or stable platform (permanent or moveable).
- C9 *Readily Removable:* Designed, fabricated, and installed to be quickly separated from the equipment with or without the use of simple hand tools.
- C10 *Sanitizing or Sanitization:* A process applied to a clean surface which is capable of reducing the numbers of the most resistant human pathogens by at least 5 log₁₀ reductions (99.999%) to 7 log₁₀ reductions (99.99999%) by applying hot water, hot air, or steam, or by applying an EPA-registered sanitizer according to label directions. Sanitizing may be effected by mechanical or manual methods.
- C11 *Simple Hand Tools:* A screwdriver, wrench, mallet, or readily available dedicated tool(s) normally used by operating and cleaning personnel.
- C12 *Soil:* Unwanted organic residue or inorganic matter.

C13 *Solution:* Water or any mixture of cleaning agents, sanitizers and water used for flushing, cleaning, rinsing, or sanitizing.

C14 *Substantially Flush:* Mating surfaces or other juxtaposed surfaces that are not more than 1/32 in. (0.794 mm) off-set from each other, except for pipeline and tubular piping welds which must meet AWS/ANSI D18.1. (Refer to B4, Reference No. 1.)

C15 **Surface Modification** (Refer to B4, Reference No. 2)

C15.1 *Surface Treatments:* Processes where chemical composition or mechanical properties of the existing surface are altered. There is no appreciable build-up of new material or removal of existing material.

C15.1.1 Surface treatments include:

1. Mechanical (grinding, polishing, shot peening) (Refer to B4, Reference No. 3)
2. Thermal (surface hardening laser, electron beam)
3. Diffusion (carburizing, nitriding)
4. Chemical (etching, oxidation, passivation)
5. Ion Implantation
6. Electropolishing

C15.2 *Coatings, Overlays and Encapsulations:* A process where a different material is deposited to create a product contact surface. There is a build-up of new material. The coating, overlay, or encapsulation material does not alter the physical properties of the substrate.

C15.2.1 Coating processes include:

1. Chemical (conversion coatings except anodizing)
2. Engineering Plating (e.g., Electrodeposition) {Refer to B4, Reference. No. 4}, gold plating
3. Thermal spraying (e.g., flame, plasma, arc spray)
4. Physical Vapor Deposition
5. Chemical Vapor Deposition

C16 **Surfaces**

C16.1 *Product Contact Surfaces:* All surfaces which are exposed to the product and surfaces from which splashed product, liquids or material may drain, drop, diffuse or be drawn into the product or onto product contact surfaces.

C16.2 *Nonproduct Contact Surfaces:* All other exposed surfaces from which splashed product, liquids, or other materials cannot drain, drop, diffuse or be drawn into or onto the product, product contact surfaces.

D MATERIALS

D1 Product Contact Surfaces

All 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 including cleaning and sanitization.

D1.1 Metals

D1.1.1 Product contact surfaces shall be of stainless steel of the Association for Iron and Steel Technology (AIST) 300 Series, excluding 301, 302, and 303 (Refer to B4, Reference No. 5) or corresponding Alloy Cast Institute (ACI) types (Refer to B4, Reference No. 6) or metal which under conditions of intended use is at least as corrosion resistant as 304 stainless steel, and is nontoxic and nonabsorbent. (Refer to Appendix, Section F.) Where welding is involved, the carbon content of the stainless steel shall not exceed 0.08%.

D1.1.1.1 Alloys containing lead, leachable copper, or other toxic materials shall not be used.

D1.1.2 Augers, auger troughs and auger components, hoppers, baffles, bodies and discharge ports may be made of other nontoxic metal(s) that have their product contact surfaces modified by coating(s).

D1.2 Nonmetals

D1.2.1 Rubber and rubber-like materials may be used for seals, o-rings, gaskets and guides and when used for the specified application(s), shall conform to the applicable provisions of 3-A Sanitary Standard, Number 18-.

D1.2.2 Plastic materials may be used for baffles, bearings, caps, chutes, discharge ports, extrusion ports, gaskets, guide rails, knives, seals, cooker bodies, covers, augers, direct reading gauge tubes and coatings, and when used for the above-specified application(s), shall conform to the applicable provisions of 3-A Sanitary Standard, Number 20-.

D1.2.2.1 Plastic materials may also be used as coatings for hoppers, augers, auger troughs, auger supports, water troughs, baffles, dividers, discharge reservoirs, discharge ports, and cut-off devices.

D1.2.3 Adhesives used for bonding rubber and rubber-like materials and bonding plastic materials shall be nontoxic. Adhesives shall comply with 21 CFR 175 - Indirect Food Additives: Adhesives and Components of Coatings (Refer to B4, Reference No.7).