

3-A[®] Sanitary Standard for Transportation Tank Vents, Number 95-00

*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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Disclaimers

3-A Sanitary Standards, Inc. (3-A SSI) and collaborating organizations do not assume or undertake to discharge all or any responsibilities of manufacturers or any other user of 3-A Sanitary Standards or 3-A Accepted Practices. 3-A SSI is not responsible to any individual, organization or entity for the use of 3-A Standards and 3-A Accepted Practices. It is the science-based opinions, professional findings of volunteer experts and consensus that provides the sanitary (hygienic) criteria included in 3-A documents.

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

3-A Sanitary Standards, Inc., its employees and its volunteer committees shall not incur any obligation or liability for damages, including consequential damages, arising out of or in connection with the development, use, interpretation of, and reliance upon this 3-A Standard.

Drawings and illustrations contained herein are to assist in understanding the criteria in this 3-A Standard. Drawings and illustrations are not intended to show all variations of the equipment or system nor are they to exclude alternate methods meeting this standard. Drawings and illustrations are non-normative.

Foreword

This 3-A Standard is to establish minimum sanitary (hygienic) requirements for Transportation Tank Vents. 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), United States Food and Drug Administration (USFDA), 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 3-A SSI, 6888 Elm Street, Suite 2D, McLean, VA 22101-3829 USA. By fax: 703-761-6284. By e-mail to: 3-ainfo@3-a.org.

A SCOPE

- A1 This 3-A Sanitary Standard covers the sanitary aspects of pressure vents, vacuum vents, surge valves and atmospheric vents used on transportation tanks. The vent begins at the fitting where the vent attaches to the tank and ends where air or pressure is expelled to the atmosphere or taken into the transportation tank from the atmosphere.
- A2 In order to conform to this 3-A Sanitary Standard, pressure vents, vacuum vents, surge valve and atmospheric vents shall conform to the following criteria for design, materials of construction, fabrication techniques and installation, as appropriate, and the current revisions or editions of all referenced documents cited herein.

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>
18-	Multiple-Use Rubber and Rubber-Like Materials
20-	Multiple-Use Plastic Materials
33-	Metal Tubing
63-	Sanitary Fittings

B3 Other References and Standard

<u>Ref. No.</u>	<u>Title</u>
1.	American Society of Mechanical Engineers (ASME) B46.1 - <i>Surface Texture Waviness and Lay</i> . Available from the American Society of Mechanical Engineers, Three Park Ave., New York, NY 10016-5990, Phone: (212) 705-7722 or at http://www.asme.org
2.	AWS/ANSI D18.1 – <i>Specification for Welding of Austenitic Stainless Steel Tube and Pipe Systems in Sanitary (Hygienic) Applications</i> . Published by American Welding Society, 550 N.W. LeJeune Rd., Miami FL, Phone: (800) 443-3953, www.aws.org
3.	<i>Advanced Materials and Processes</i> , 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
4.	AMS-S-13165, <i>Shot Peening of Metal Parts</i> . SAE International, 400 Commonwealth Dr., Warrendale, PA 15096-0001, Internet: http://www.sae.org
5.	SAE AMS 2406, <i>Chromium Plating (Electrodeposited)</i> . SAE-AMS QQ-N-290A, Nickel Plating (Electrodeposited). SAE International, 400 Commonwealth Dr., Warrendale, PA 15096-0001, Internet: http://www.sae.org
6.	<i>AIST Stainless Steels: A Steel Products Manual</i> , Association for Iron & Steel Technology, 186 Thorn Hill Road, Warrendale, PA 15086, Phone: (724) 814 3000, Internet: www.aist.org
7.	<i>Steel Casting Handbook, Supplement 2</i> , 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

8. 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, Internet: <http://www.gpoaccess.gov/cfr/index.html>
9. EHEDG Guideline 9 – *Welding Stainless Steel to Meet Hygienic Requirements*. European Hygienic Engineering & Design Group. Published by EHEDG, www.ehedg.org
10. 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>
11. 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
12. 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>
13. ASTM Specifications for Wrought Grades A-276, A-582, 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-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).
- C1.2 *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 *Cleanable or Cleanability*: The suitability of materials of construction, design and fabrication required to assure that the equipment can be freed from soil.
- C3 *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.

C4 Fittings

- C4.1 *Manually Cleaned Fittings*: Removable joint fittings of which the design requires dismantling for manual cleaning.
- C5 *Inspectable*: Designed, fabricated and installed to make product contact surfaces available for close visual observation.
- C6 *Nontoxic Materials*: Substances, which under the conditions of their use, are in compliance with applicable requirements of the FDA.
- C7 *Product*: Milk, milk products or other related products.
- C8 *Readily Removable*: Designed, fabricated, and installed to be quickly separated from the equipment, with or without the use of simple hand tools.

- C9 *Roughness Average (R_a):* An arithmetical mean of the absolute values of the surface profile departure within a sampling length. (Refer to B3, Reference No. 1.)
- C10 *Simple Hand Tools:* A screwdriver, wrench, mallet, or readily available dedicated tool(s) normally used by operating and cleaning personnel.
- C11 *Soil:* Unwanted organic residue or inorganic matter.
- C12 *Solution:* Water or any mixture of cleaning agents, sanitizers and water used for flushing, cleaning, rinsing, or sanitizing.
- C13 *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 B3, Reference No. 2.)
- C14 **Surfaces**
- C14.1 *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.
- C14.2 *Nonproduct Contact Surfaces:* All 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, open packages, or the product contact surfaces of package components.
- C15 **Surface Modification** (Refer to B3, Reference No. 3)
- 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 B3, Reference No. 4)
 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 B3, Reference. No. 5}, gold plating)
 3. Thermal spraying (e.g., flame, plasma, arc spray)
 4. Physical vapor deposition
 5. Chemical vapor deposition
- C16 **Vents**
- C16.1 *Atmospheric Vent:* Device that maintains atmospheric pressure within the tank while preventing contamination and splash-out of product contained in the tank. This may be done by use of baffles or other means.