For many bulk solids food manufacturing applications, sanitary handling and processing equipment is critical to ensure consumer safety. This article explains the industry standards used to design sanitary processing equipment and what to look for when purchasing sanitary equipment for your plant.

Selecting sanitary bulk solids handling and processing equipment can be challenging and confusing. For manufacturers and processors working with sensitive materials, such as high-value dairy and food powders, product safety is a key factor in the success or failure of the operation, and equipment design plays an important role.

For equipment to be considered sanitary, all product contact surfaces must be readily cleanable by either mechanical or manual cleaning. While not all food manufacturing processes require processing equipment that meets sanitary standards, it can still be beneficial.

Sanitary processing equipment is essential for:
- infant formula
- milk powder (condensed milk, creamer, evaporated milk, milk permeate powder, dry buttermilk, milk protein concentrate, milk protein isolate)
- whey powders (lactose, whey powder, whey protein concentrate, whey protein isolate)
- cellulose
- cheese powders
- powdered eggs

Sanitary processing equipment is beneficial for:
- cereal
- ready-to-eat products
- seasonings
- flour
- sugar
- salt

The three main points to keep in mind when selecting sanitary processing equipment are to educate yourself, be aware of marketing tactics, and work with experienced professionals.

Educate yourself

The first step in your search for sanitary processing equipment is to educate yourself about current (and potential future) sanitary standards. This will help you better understand your needs and know what to look for when you begin shopping for equipment. The two leading bodies in the US for dairy processing equipment standards and regulation are 3-A Sanitary Standards Inc. (3-A SSI) and the USDA Agricultural Marketing Service (AMS) Dairy Grading Branch.

3-A SSI is an independent corporation that promotes food safety by developing design and manufacturing standards for sanitary food processing equipment and systems. 3-A sanitary standards are written and maintained by volunteers from three interest groups: equipment manufacturers, processors (equipment end-users), and state and federal regulatory sanitarians. The standards are equipment-type specific, and 3-A SSI currently maintains dozens of standards in a range of general categories, including vessels, valves and fittings, pumps and mixers, and conveyors and feeders. However, many equipment types (butterfly valves, for example) aren’t currently covered by a 3-A standard. You can find more information about the equipment types covered by 3-A standards as well as links to purchase the standards at www.3-a.org.

For equipment types that are covered by a 3-A standard, suppliers can apply for a license authorizing the supplier to display the 3-A symbol on the equipment and in marketing materials for the equipment. For a supplier to receive a 3-A symbol authorization, a credentialed independent inspector must complete a third-party verification inspection of the equipment and determine that the equipment complies with the applicable 3-A standard.

3-A does publish a general requirements sanitary standard but doesn’t offer an associated 3-A symbol authorization. The general requirements standard is used primarily as a base for the other 3-A standards.
and accepted practices and as a reference to maintain consistency with general material and construction requirements. While the general requirements standard does provide good guidance for building sanitary equipment, a supplier can’t advertise that the equipment conforms to 3-A standards if the equipment doesn’t fit the scope of an equipment-specific 3-A standard.

The USDA AMS Dairy Grading Branch uses the 3-A standards when inspecting equipment types that meet the scope of a 3-A standard. For equipment types that don’t meet the scope of a 3-A standard, inspectors reference USDA Guidelines for the Sanitary Design and Fabrication of Dairy Processing Equipment. This document covers all general requirements and can apply to any type of processing equipment. The document is available for free download at www.ams.usda.gov.

Be aware of marketing tactics

When you research different sanitary processing equipment, don’t trust everything you read. Equipment suppliers use many tactics that may misrepresent their credentials and mislead consumers. Suppliers that hold a 3-A symbol authorization for their equipment are instructed in proper marketing techniques by 3-A SSI’s Manual for Third Party Certification (TPV). This manual gives suppliers very clear instructions for proper marketing techniques for non-equipment display of the 3-A symbol, which is a registered trademark.

The following sections from Appendix 2, Exhibit 1 of the manual outline the proper way to market equipment that meets the requirements of 3-A sanitary standards. Beware of marketing material that doesn’t follow these instructions.

4.1. References to “3-A” or “3-A Standards” or similar references in promotional materials are not substitutes for 3-A symbol authorization display on equipment. Advertising references are informational and not proof of 3-A symbol authorization. The licensee is solely responsible for assuring the completeness and the veracity of all non-equipment references.

4.2. 3-A SSI does not “approve,” “certify,” “rate,” or “endorse” the design, construction, or use of the equipment, and the licensee should not make such references. In non-equipment references, a licensee may state that the items for which 3-A symbol authorization has been granted meet the requirements of the respective 3-A sanitary standard, hold 3-A symbol authorization, or similar.

4.3. For non-equipment use and display, the 3-A symbol must be reproduced in accordance with one of the formats specified by 3-A SSI for equipment display, except that, for non-equipment use and display, licensees are encouraged, but not required, to show the full 3-A sanitary standard hyphenated standard number and revision number immediately below the 3-A symbol as required on equipment.

4.4. The 3-A symbol should never appear more prominently in any advertising or packaging than the name of the licensee holding the authorization.

4.5. Do not use the 3-A symbol or reference 3-A symbol authorization on company stationery, business cards or signs, or within Internet domain names or company names. Use of these references on such materials could incorrectly imply more than a third-party authorization or relationship between the licensee and 3-A SSI or incorrectly imply that all products you manufacture have been authorized by 3-A SSI.

4.6. If you use a 3-A symbol on your website, you must ensure that visitors to your website are able to clearly identify which of your products have been

To meet 3-A sanitary standards, all product contact surfaces on equipment must be smooth and measure a maximum surface roughness average (Ra) of 32 microinches (0.8 microns), which is equivalent to a number 4 finish.
authorized by 3-A SSI to use and display the 3-A symbol which have not.

4.7. References to 3-A symbol authorization can be made only when you are authorized by 3-A SSI to use the 3-A symbol on your equipment.

4.8. If 3-A symbol authorization is expired or withdrawn for any reason, all material that refers to your authorization must be immediately removed from distribution, and further use of the 3-A symbol must be discontinued.

4.9. If some products appearing in a website, brochure, ad, or catalog are authorized to use and display the 3-A symbol but others are not, the licensee must ensure the wording and placement of 3-A symbol references make it clear which products are, in fact, authorized by 3-A SSI and which are not. Do not use the 3-A symbol in general advertising or promotional material to suggest that non-authorized products have, in fact, been authorized.

4.10. Do not state a link between 3-A symbol authorization and any other organization. For example, statements such as “Meets USDA/3-A Criteria,” or “Conforms to FDA/USDA/3-A Standards Criteria” or similar descriptions are inappropriate.

The USDA AMS shares these instructions regarding marketing equipment that meets the USDA Dairy Equipment Guidelines. Unfortunately, marketing material that violates one or more of these guidelines is all too common.

The key points to keep in mind when conducting your equipment search are:

• Remember that the standards only apply to specific equipment; 3-A SSI and USDA don’t “certify” manufacturers

• Beware of broad claims and improper terms as previously discussed

• If a supplier has a 3-A symbol authorization or USDA acceptance certificate, make sure the exact model and any options you’re considering are included in the scope of the certificate

• If a supplier claims that its equipment meets 3-A standards but there is no applicable 3-A standard for that equipment type, the supplier doesn’t understand the scope of the standards.

Always verify a supplier’s claims before making your purchase. If you see the 3-A symbol with the applicable standard number, as shown in Figure 1, or if the marketing material includes the statements “meets 3-A standard” or “USDA dairy accepted,” the supplier likely knows the requirements of the standards and its license. Remember, 3-A SSI doesn’t “approve,” “certify,” “rate,” or “endorse” equipment designs, so be wary of marketing material that includes such claims, as shown in Figure 2. You can verify equipment authorization by searching all current 3-A symbol holders and their symbol authorizations on the 3-A website 2 or by asking the supplier for a copy of the 3-A symbol authorization or USDA dairy equipment acceptance certificate.

Work with professionals
Working with experienced, knowledgeable professionals is the best way to ensure that the equipment you purchase is designed and built with efficiency and product safety in mind. Just because a supplier claims that its bulk solids processing equipment is sanitary doesn’t mean the equipment meets industry standards. Be sure to work with an equipment supplier that fully understands the 3-A standards and how construction materials, design,
surface finishes, and fabrication techniques combine to make equipment and systems hygienic and easy to clean.

Many suppliers are well-versed in dairy industry equipment standards but don’t hold 3-A symbol authorization or USDA acceptance. This doesn’t necessarily mean the suppliers don’t build high-quality sanitary equipment. Maintaining 3-A symbol authorization or USDA acceptance may not be economical for a supplier with low-volume sales. In any case, make sure your supplier guarantees in writing that the equipment you purchase will be built according to the applicable standards and that the supplier will fix any nonconformance you or regulatory inspectors may find.

References

For further reading
Find more information on this topic in articles listed under “Sanitary handling & processing” in Powder and Bulk Engineering’s article index in the December 2017 issue or the Article Archive on PBE’s website, www.powderbulk.com. (All articles listed in the archive are available for free download to registered users.)

Scott Lodermeier handles component sales and project management at Powder Process-Solutions (slodermeier@powder-solutions.com). He holds an AAS degree in engineering drafting and design from Dunwoody College of Technology in Minneapolis, MN, and has 16 years of experience in sanitary equipment design in the dairy and food processing industries.