Sanitary Systems Design:
Bulk Material Handling Compliance & Accountability

Optimal Compliance Contribution (OCC):
Without question, it is possible, with two different bulk material handling systems, each placed into perfectly matching sanitary applications, performing the same mechanical function, and each having achieved compliance, for one to have a significantly more positive effect on product safety and on the process operation’s optimal compliance contribution than the other.

Clearly, there are relative levels of sanitary compliance. But, for processing operations where reliable, repeatable compliance cannot be compromised, and achieving that compliance requires accountability, the process-specific construction of National Bulk Equipment (NBE) sanitary bulk material handling systems will provide improved product safety, and greater overall compliance contribution when compared to a re-purposed, general industrial equipment design.

There are typically four primary areas of equipment design and construction to be considered when assessing the advantages of genuine, sanitary bulk material handling equipment versus general industrial units that are often force fit into sanitary applications. Those four areas of equipment design and construction are:

- Materials of Construction
- Cleanability
- Contaminant Abatement
- Accessibility

Within each of these four areas of sanitary assessment are multiple application-specific, compliance-ready features that should be present to better qualify bulk material handling equipment as sanitary.

Materials of Construction
Industry guidelines, third-party standards, and government regulations make reference to sanitary equipment materials of construction, such as: ‘adequately cleanable’, ‘compatible’, ‘non-toxic’, or ‘appropriate’. With such vague direction, it’s common for borderline sanitary equipment to be in use despite the negative effects it may have, like: missed cleaning time targets, increased consumables use, slow validation and inspection, and greater risk of product contamination by microbes, allergen residues, and proteins associated with gluten.

To ensure an optimal compliance contribution is achieved from NBE sanitary bulk material handling equipment, NBE equipment construction begins from an application-specific, sanitary design. NBE sanitary equipment is then constructed using only process-appropriate materials and compliance-oriented workmanship.

Remove Contaminants: Start at the Source
Preventing contaminants from entering into sanitary product should, by itself, be sufficient reason to integrate process-specific equipment into sanitary applications.

Contaminants can take many forms: from metal fragments and glass shards, to machine lubricants, fuels, cleaning fluids, and process material residue. When material handling equipment, originally intended for non-sanitary use, is re-purposed into a sanitary application; this process-inappropriate equipment can, itself, become a primary source of contaminants.
The process-specific design of NBE sanitary bulk material handling equipment represents a comprehensive approach to the successful abatement of contaminants in sanitary bulk material handling, including:

- Round framework beams used to eliminate material accumulation and pooling of liquids. And, round cross members angled away from product contact areas to move material and liquid away from product and speed drainage and drying.
- To also prevent material build-up and liquid pooling, internal angles and corners are cut out from the framework. And, flat surfaces are turned, at least, 45° to horizontal, and angled away from product contact areas.
- Even in direct product contact areas, attention has been given to integrate material release openings into the structure to facilitate removal of material residue out of product contact areas.
- Control enclosures are suspended away from the equipment framework within a laser-cut enclosure inset where four, highly polished, precision stand-offs suspend the enclosure away from the framework. This design eliminates internal angles that could collect contaminants, and simplifies cleaning, validation, and inspection. The enclosure top, angled at 45° to horizontal, prevents liquid pooling and directs material removal away from product contact areas.

Cleanability: Value, Risk, and Outcome

The application-specific construction of NBE sanitary bulk material handling equipment eliminates the added costs and hindrances to cleanability that processing operations have had to tolerate from re-purposed, general industrial equipment designs. Of course, general industrial equipment can be thoroughly cleaned, but with every cleaning event comes greater costs for labor, consumables, and energy; and greater risk of contamination and inspection failure.

NBE sanitary bulk material handling systems are designed to address specific product risk assessments and reduce those costs and risks by means of proactive, intentional construction methods, including:

- All welded seams are continuous welds. The weld seams in product contact and adjacent areas are also ground smooth to a No. 4 finish to eliminate pits, dimples, and crevices. Product contact weld seams are hand-burnished to remove any metal residue or impurities. This provides a visual monitoring standard to speed inspection prior to start-up, and, aids in gross soil removal and resistance to microbial build-up during operation and cleaning.
- To minimize accumulation of food particles, dirt, or other organic matter; and therefore, reduce the opportunity for growth of microorganisms, the utility lines and hoses on NBE sanitary systems are left unbundled, but contained in a non-obstructive raceway. This design enables fast and thorough cleanability of utility line surfaces; promotes material release; eliminates re-cleaning; and aids validation and inspection.
- One-piece, laser-cut, component frame construction offers significant cleanability and sanitary operating advantages over the tubular framework of general industrial designs. The NBE one-piece component frame eliminates the internal angles, corners, and welded seams of tubular framework construction that may accumulate contaminants.

Accessibility: Securing the Safety of Personnel and Product

Regardless of the application, sanitary or general industrial, the protection of personnel is the first priority of machine design. Beyond typical designs, NBE sanitary designs ensure worker safety and functional performance while still fulfilling product safety requirements. The application-specific design of NBE sanitary material handling systems enables access to enclosed and guarded areas while protecting operations, maintenance, and inspection personnel. Accessible design improves cleanability. Improved cleanability increases product safety.