

OEM Design Guide

Back to the Basics for Fresh-Cut Processing Equipment

Rooted in the 10-Principles of Sanitary Design, this guideline is designed to provide a common ground for processors and OEMs(Original Equipment Manufacturers) as an additional tool in design and fabrication of equipment for the fresh-cut produce industry. Although processors may have varying guidelines, it is encouraged to consider these points throughout design and fabrication.

Sanitary Operational Performance

Sanitary Operational Performance is assurance of food safety in normal operations, such as processing, sanitation and maintenance. The equipment will not contribute to unsanitary conditions nor promote harborage and growth of bacteria if properly designed and maintained.

1	Food contact materials meet the FDA criteria for surfaces that are non-reactive, non-corrosive, non-contaminating, non-absorbent and cleanable.
2	Product area (Zone 1) disassembly is conducted with no hand-tools for sanitation and/or maintenance purposes.
3	All removable components/covers have a designated place for cleaning and sanitizing.
4	Equipment markings (Serial #) can be easily wiped clean. No cut-outs, laminations, or rivets are present.
5	A 'how-to-clean' guide has been developed by the manufacturer.

Fabricated Weldments

Fabricated weldments are critical to ensure the main support structure for equipment is cleanable as desired. The main components in weldments are sheet metal, welds, surface finishes, and corners/bends.

6	Weldments are designed so there are no areas for moisture or debris to collect.
7	Fabricated components are paint/coating-free.
8	Product area (Zone 1) Stainless surfaces are equivalent to a 2B mill-rolled finish, non-grained.
9	Corners are formed (non-welded) with a large radius to facilitate cleaning. (3/16" minimum, 1" preferred)
10	All joints and welds are free of pitting and are smooth (use cotton-ball test).
11	Weldments are free of skip welds and/or over-lapping welded laminations.
12	Piano hinges, knurling, braided covers, and socket head cap screws are not used.
13	Equipment design provides 18" clearance to the floor for Zone 1 surfaces.
14	Equipment legs and footings are thread-less and easy to clean.

Component Fasteners

Fasteners are what temporarily (or permanently) hold pieces together. These are nuts, bolts, acorn nuts, etc. and should not be installed in locations that can contribute to harborage and contamination.

15	Product area surfaces (Zone 1) are free of bolts, nuts, or other fasteners.
16	Horizontal surfaces are free of recessed fasteners (e.g. Allen heads, Phillips screw heads, etc.) in all other zones.
17	Loctite, Anti-Seize and other lubricants meet applicable approval standards (Food Grade) depending on installation zone.

Drive Components

Drive components are responsible for making the equipment move. From motors to gearboxes, there is the potential for hard to reach areas and pinch points with a fine-line between safety and access for sanitation.

18	Motors, gearboxes, and bearings are located away from the product zone, mounted on stand-offs.
19	All motors, drives, control boxes, and other sensitive pieces of equipment are IP69K. Appropriate drainage is in place to account for condensation.
20	All faceplates on gauges/sensors/sight glasses are made of shatterproof material.
21	Carry/idler/return rollers on conveyors are solid or slides rather than hollow rollers.
22	Pulleys are machined Stainless Steel.
23	Sprockets are held to the shaft in a manner that allows for proper cleaning either in or out of place.

Belting

There are many versions and preferences for belting. Think of the intended use accompanied with maintenance and sanitation required frequencies.

24	Solid and endless conveyor belting material is preferred, no cloth-backed belting or lacing is present.
25	Quick-release mechanisms and belt-lifters are provided for cleaning. (One lifter per 6 ft. is recommended)
26	Modular belting is used in non-food contact areas or in areas where solid belting will not allow.

Motor Controls and Electrical

With electrical, comes cords which need to provide power to equipment. These wires and cords should be routed and installed in a sanitary manner, not contributing to potential contamination.

27	Slope-top enclosures which are NEMA 4X are stand-off mounted (>1") with cable penetrations from bottom of panel.
28	Wire and cording is routed and mounted using sanitary stand-off wire routing looms or clips.
29	Sensors and their connectors are IP69K, mounted out of Zone 1.

Process Piping

How does the water get circulated to and in the equipment and processing facility? Just as important as the wash system itself, process piping can present specific challenges in cleaning and accessibility.

30	The piping system is free of dead legs greater than two pipe diameters and can be cleaned via CIP or COP means.
31	All process piping is purge-welded and smooth on the interior and exterior.
32	A clear, 12" section (minimum) of piping has been installed in order to ensure visual cleanliness is maintained.
33	All sections of piping can be disassembled without tools into discrete sections that allow line-of-sight sanitation/inspection.
34	Piping has minimal use of threaded connections/adapters or slip connections with external hose clamps.

Air/Pneumatics

Air and pneumatics can help reduce the presence of hydraulics in some situations. It is important to ensure a clean air supply in addition to properly maintaining the use of air in any processing facility.

35	Compressed air directly applied to product or product contact surfaces is to be filtered to a minimum of 0.3 microns.
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