

# GUIDE TO: SANITARY DESIGN for Custom Vessels



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Processors serving hygienic industries have varying degrees of compliance requirements for custom vessel solutions, depending on the application.

In this guide, basic, mid- and high-level sanitary designs are represented, offering a reference baseline for your sanitary vessel needs.

These vessels, in different finishing stages, measure 17.34 RA on the pickle passivation sample (left) and 7.92 RA after pickle passivation and electropolishing (right).



#### **CLEANABILITY**

All sanitary levels are suitable for caustic sanitation. The difference between the cleanability criteria is the degree of automation. Basic level cleaning is a manual process. The mid-level sanitary design vessel may feature removable components for cleaning, and the high-level sanitary design vessel may feature an automatic spray system.

#### **COMPOSITION & CHEMICAL FINISH**

While the base material for sanitary tank design is 304 or 316 stainless material, the mechanical and chemical finish defines each design level. The base-level sanitary design finish is pickle passivated inside and out. The mid-level sanitary design is mechanically finished to greater than 32RA and either pickle passivated or nitric passivated. High-level sanitary designs are polished to a specific RA designation lower than 32RA, and are nitric passivated and electropolished. All finishes remove free iron and clean the manufacturing processes from the material. Compliance requirements often specify the types of sanitary finishes.

INDUSTRY ACRONYMS		INDUSTRY ACRONYMS
,	ASME	American Society of Mechanical Engineers
(	CIP	Clean in Place
(	СОР	Clean out of Place
I	EP	Electropolished
I	ID	Inside Diameter
(	OD	Outside Diameter
ł	Pickled	Pickle Passivated
I	RA	Roughness Average (Measurement)

#### SANITARY COMPLIANCE STANDARDS

3-A Sanitary Design Standards regulate the design criteria for processing equipment in the food and drug industries. Design details include surface finish requirements, weld quality, approved gaskets and o-rings, sanitary connections, and construction materials. A 3A certificate is proof of FDA compliance.

Apache manufactures vessels to 3-A sanitary guidelines; however, a third-party inspector is required to certify equipment.

ASME U and UM Codes are required standards by the American Society of Mechanical Engineers. The ASME standards regulate the design of boilers and pressure vessels in the United States, including evaporators, columns, heat exchangers and condensers.

Apache is an ASME manufacturer and provides full traceability to materials, procedures, welders, testing, and turn-over documentation of the vessel.

Bio Processing Equipment (BPE) is a standard within ASME that drives equipment design for the bioprocessing, pharmaceutical and other hygienic product industries. It covers materials, design, fabrication, inspection, testing and certification.

Apache's manufacturing practices comply with the ASME BPE standard.

### **COMPARE 3 SANITARY LEVELS**





Canadian Registration Number (CRN) is issued by each province or territory of Canada for the design and manufacture of boilers, pressure vessels and fittings to be shipped for use in Canada. It is important to note that each province and territory has unique application criteria for CRN.

Apache is also experienced with CRN / Canadian compliance and can facilitate design registration across all provinces.

Pressure Equipment Directives (PED) applies to the design, manufacture, and conformity of pressure vessels, with maximum pressure greater than 0.5 BAR including vessel, piping, safety, and pressure accessories that are exported for use in Europe. The qualifying vessel is marked with a CE stamp.

Apache can design and manufacture to PED standards and holds CE certifications.

### DELIVERY & COST

Many general vessel needs can be met by a stock tank offering. Even with modifications to stock tanks, the price point is lower than a custom vessel solution with relatively fast availability and delivery.

Custom vessels are designed for specific processing and production requirements. The most extended lead times for a custom vessel may be the CRN or PED approval process and the availability of some special components. The required compliance criteria drives some of the costing on the vessel. However, with an experienced manufacturing partner, delivery, cost, and compliance approvals can be managed to provide the end-user with quality equipment that provides efficient and effective long-term service at high value.



# **About Apache Stainless**

Apache Stainless Equipment Corporation is a manufacturer of stainless equipment for hygienic industries including, beverage, biotechnology, pharmaceutical, cannabinoid, food processing, and life science industries.

A dedicated quality control and compliance team directs all tests, certifications, and documents for all standards. Apache has been ASME certified for over 40 years.

As a 100% employee-owned company, Apache's culture exemplifies continuous improvement, efficiency, innovation, and commitment to our customer.

Marketing/Resources/3 Levels Sanitary Design





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