

## A Guide to Stainless Steel Process Piping and Process Piping Installation

### Definition

In the manufacturing facilities of the chemical, pharmaceutical, food and beverage, dairy and other processing industries, process piping connects the reactor vessels (pressure vessels for example), mixing and storage tanks. The term process piping generally refers to piping systems that convey fluids under pressure or vacuum. It is a complex arrangement of pipes, valves, support clamps, other related components and control instrumentation. A&B Process Systems designs, fabricates and installs stainless steel process piping systems for the various processing industries, to incorporate the custom designed reactor vessels and tanks.

### Design

There are many factors involved in the design of a piping system. Basic factors such as the design pressure, design temperature and the minimum temperature must always be considered. In addition it is important to be aware of several external factors, including wind, earthquake, vibration, impact, thermal expansion and contraction, atmospheric condensation and icing. Stainless steel CIP/SIP units are now widely used in the processing industries and the design of the associated stainless piping system can be a critical factor in providing maximum cleanliness. A&B Process Systems has extensive experience in the design of the stainless piping systems that serve the reactor vessels, mixing and storage tanks and the CIP/SIP units.

### Requirements

The requirements for the fabrication, assembly and erection of process piping systems are governed by ASME code B31-3. This code is also an ANSI standard and a subset of the ASME code for pressure piping. It covers the qualification of welding procedures and the training of the welders. Details for preheating the piping and for heat-treatments after welding are given in this code, as are specifications for bending and forming the piping. The final inspection can involve visual tests, pressure testing, radiography and liquid penetration tests. Stainless steel piping can be installed using manual TIG welding techniques or a combination of orbital and TIG welding. The high purity piping systems, frequently required in the pharmaceutical and bio-pharmaceutical industries, are installed using orbital welding techniques under a stringent protocol. At their facilities in Stratford, Wisconsin and on their field installation teams, A&B's welding personnel have been trained in all of the required procedures for welding, bending and forming stainless steel piping. The company has a team of QA/QC professionals available to ensure that procedures are followed and the necessary documentation is completed.

### Process Piping Installation

The installed process piping system must be self-draining or pitched to drain points and should avoid obvious sections in which fluid flow is restricted. The pipes should be adequately supported to ensure that they remain in position and correctly aligned. For a stainless steel piping system these support clamps should be fabricated from the same stainless steel to avoid corrosion problems.



A&B Process Systems is well versed in all the pitfalls associated with the fabrication and installation of process piping. The company can reference numerous jobs involving process piping and high purity piping across a variety of process industries including Fortune 500 manufacturers. These references are a direct result of the expertise of the engineers, welders, fitters, installation teams, QA/QC professionals and project managers - at A&B Process Systems and it is this “depth of people resources” that sets the company apart from the competition.

### Vendor Partnering

The successful installation of any stainless steel process piping system requires a partnership between the customer and vendor. Both provide critical members of the project team and both should be involved in the specification process and in identifying possible pitfalls. It is evident that clear and open lines of communication should be established at the outset, with fairness and respect from both parties. A&B Process Systems has recognized the importance of “vendor partnering” and strive to make this their approach to all customers.