

# PROCESS PIPING

Everything You Need & Should Know



**BASE**  
CONSTRUCTION INC.

# Process Piping

## Everything You Need & Should Know

Process piping is an effective method of conveying raw materials in various industrial and manufacturing facilities. A process piping system is different from a traditional plumbing system meant to transport waste materials. When implementing a process piping system in your facility, it's important to understand key considerations and choose the best materials to ensure optimal performance.

### What is Process Piping?

Process piping is a specific method for converting gases, liquids, chemicals, and other raw materials into physical products. Process piping refers to any pipes that are not part of a building's mechanical structure and are instead used in the production process. For instance, the pipes used to transport ingredients such as flour, yeast, salt, and water in bread baking can be considered the components of a process piping system. Put simply, pipes used to distribute materials other than water can be categorized as process piping systems.

Process piping creates a safe and effective way of moving gases and fluids in a facility. Although process piping systems may look similar to plumbing systems, the materials used in process piping are selected based on the fluids being conveyed.

### How Does Process Piping Differ From Regular Plumbing Systems?

While process piping and plumbing may share several similarities, the primary distinction lies in their purpose. Determining which system a pipe belongs to often involves checking where the fluid goes and what the pipe is connected to.

- **Process piping** involves the movement of gases, chemicals, water, and other fluids in support of a manufacturing or production operation.
- **Plumbing systems** bring water into a building and ensure there is a safe passageway for water and waste materials to exit a facility.

### Plumbing

Plumbing systems must adhere to various industry standards, codes, and regulations. Before plumbing systems can be installed and maintained, they require all necessary inspections, fees, and permits. These strict codes and laws narrow material choices for plumbing systems. Because of this, plumbing pipes are commonly made of plastic or copper based on corrosion factors, pressure, and other application requirements.

Plumbing makes up an important part of a facility's mechanical structure. The most common applications of plumbing systems include:

- Waste removal
- Heating and cooling
- Conveying drinkable water

## Process Piping

Process piping does not have strict laws and regulations like plumbing systems. This is because the main purpose of process plumbing is not to fulfill building services but to support a specific operation such as refining petroleum or chemical manufacturing.

Instead of being governed by municipal codes, process piping systems are regulated by engineering standards. Process piping systems tend to fall under American Society of Civil and Mechanical Engineers (ASCE) guidelines in many buildings. Unlike a plumbing system, process piping is not part of the building's mechanical design. However, this does not mean process piping systems are free from federal regulation. Process piping systems must adhere to OSHA standards to ensure safe operation, and some process piping systems may need initial permits, inspections, and approval.

Process piping, unlike plumbing, offers a wider selection of construction materials. Factories are free to choose the best material based on the budget, intended usage, and the type of fluids being conveyed. Process piping may be used in a variety of industrial applications such as:

- Filtering
- Pressurization and depressurization
- Mixing and separating fluids
- Starting and stopping fluid movement

## What Is Involved in Process Piping?

There are several things to consider in process piping to ensure materials are transported safely and efficiently. Constructing a process piping system usually involves:

- **Pipe routing design and implementation.** The piping system should be designed to effectively and efficiently convey materials to the proper location within the facility. All pipes and components must also be properly implemented.
- **Design support and installation.** It is important to work with professionals who can provide design support and installation services for your process piping system.
- **Piping and instrumentation diagram (P&ID) creation and implementation.** P&IDs map the components and piping present in the system, offering a graphical representation of all schematics, details, and more.
- **Material selection.** Materials should be chosen based on the type of materials to be transported.

- **Manual and control valve selection.** These valves are important when regulating flow and pressure in the piping system.
- **Installation.** Work with a partner with experience in installing these systems to ensure optimal efficiency and effectiveness.
- **Testing.** The system must undergo rigorous testing for functionality and safety.
- **Painting and labeling.** This is crucial for differentiating and indicating the different piping throughout your system.
- **Insulation and heat tracing.** This may be required to maintain specific temperatures of the piping and its contents.

There are many components in process piping systems, including separators, pressure hoses, filters, gaskets, flanges, and more. These components are placed in the system to control, separate, distribute, and stop the conveyance of materials. At Base Construction, we can provide all of the above-mentioned services to ensure the best possible process piping system for your facility.

## What Are the Best Process Piping Materials?

The ability of the pipe to withstand the properties of the fluid it is transporting is essential. For instance, ammonia and salt water can corrode the pipe, and therefore, the piping should be constructed with materials resistant to corrosion. Other factors to consider include material and pressure.

The most common materials include:

- **Plastic.** Various plastic materials can be used, such as PVC, PTFE, polypropylene, and many more. Depending on the plastic chosen, the process piping can be temperature and corrosion-resistant.
- **Steel or steel alloys.** The durability of steel and its ability to withstand high pressures makes it ideal for transporting high-pressure materials. Common material options include various grades of stainless steel and carbon steel.
- **Lined pipe.** Lined pipe is affordable, durable, and resistant to corrosion and high temperatures.
- **Non-ferrous materials.** Aluminum, brass, and copper are ideal for conveying high-pressure, corrosive materials.

Apart from steel, cast iron, and brass/copper materials, process piping systems come in standard sizes with different wall thicknesses and weights. Any pipe up to 12 inches is sized according to inside diameter, whereas pipes above 12 inches are sized with outside diameter. There are two systems to designate wall thickness: the older system, which characterizes them as standard, extra strong, and double extra strong, and the newer method, which uses schedule numbers, such as 10, 20, 30, and so on.

## Where Is Process Piping Found?

Process piping has many different applications. If a facility deals with gases, slurries, liquids, or fine particles, it relies on process piping to convey these materials. In many of these operations, process piping enables the mixing and separation of fluids, filtration, pressurization and depressurization, and fluid flow regulation in the pipe.

Process piping systems are found where mixing or separation of fluids is necessary. This includes various industries such as:

- Water treatment
- Pet food processing
- Chemical processing
- Breweries
- Pharmaceutical
- Food and beverage

In these and many more industrial processes, process piping enables:

- Regulation of fluid flow
- Mixing or separation of fluids
- Pressurization or depressurization of fluids
- Filtration

## Process Piping Services at Base Construction

Our team at Base Construction has over 90 years of overall experience in process piping. We have successfully completed more than 5,000 projects, maintaining a positive attitude and providing safety, quality craftsmanship, and complete customer satisfaction to every project. We are licensed to operate in California, and we maintain professional associations in the ASME. We are also OSHA and PSM-trained, and we have an impressive safety record.

At Base Construction, we are dedicated to safe practices in the workplace to reduce the number of hazardous incidents in processing facilities. For this reason, we stay up-to-date on our OSHA and other certifications and best practices.

We work in all industrial facilities with pipes to convey materials used in the production process. Your company will benefit from our specialty, general, industry-specific, and site-specific safety services. For more information about our process piping capabilities, or to get started on your ideal solution, [contact us](#) or [request a quote](#) today.