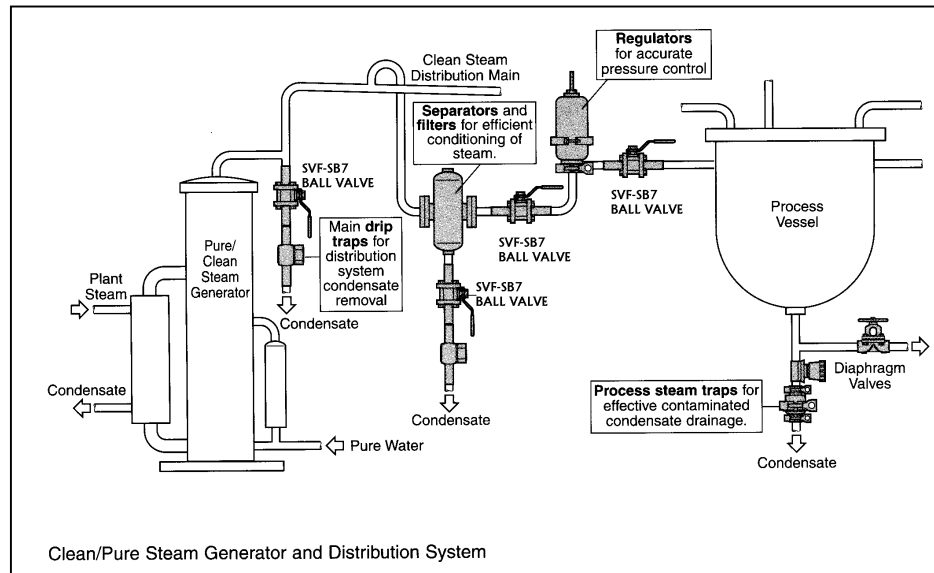


Typical Steam Systems Using CleanFLOW Valves

SVF, CleanFLOW, high purity ball valves are the valve of choice in critical steam service throughout the pharmaceutical industry.

Following are a few of the most common systems where high purity valves are used.

The overall requirements of a “clean” steam system can be very simply stated:

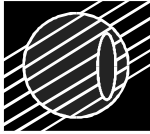


“It is essential that the steam delivered to the point of use is of the correct quality and purity for the process”.

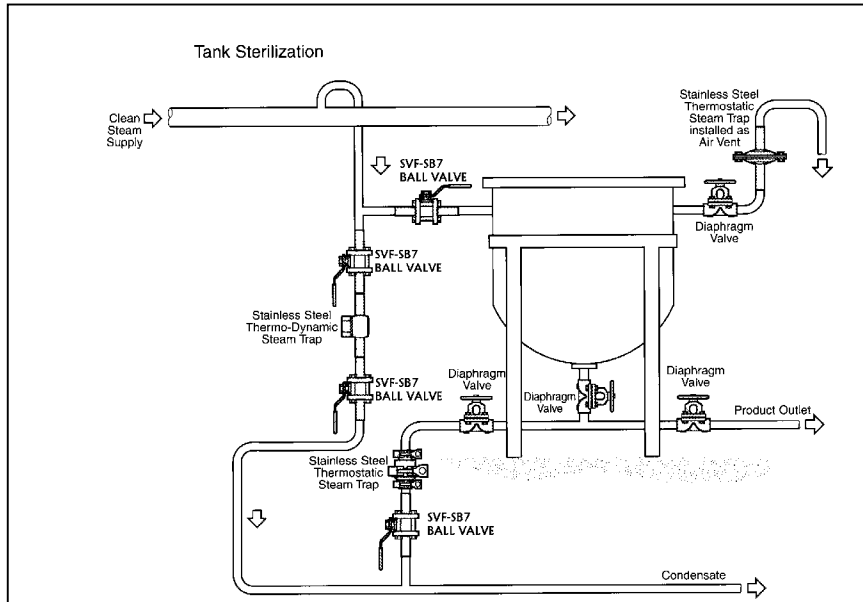
In order to achieve this end goal there are three key areas of design, which must be considered once the requirement for clean steam, has been identified.

- Point of Use
- Distribution
- Production

Design and operation of equipment, piping and components in all these areas will influence the quality of the final process and products.

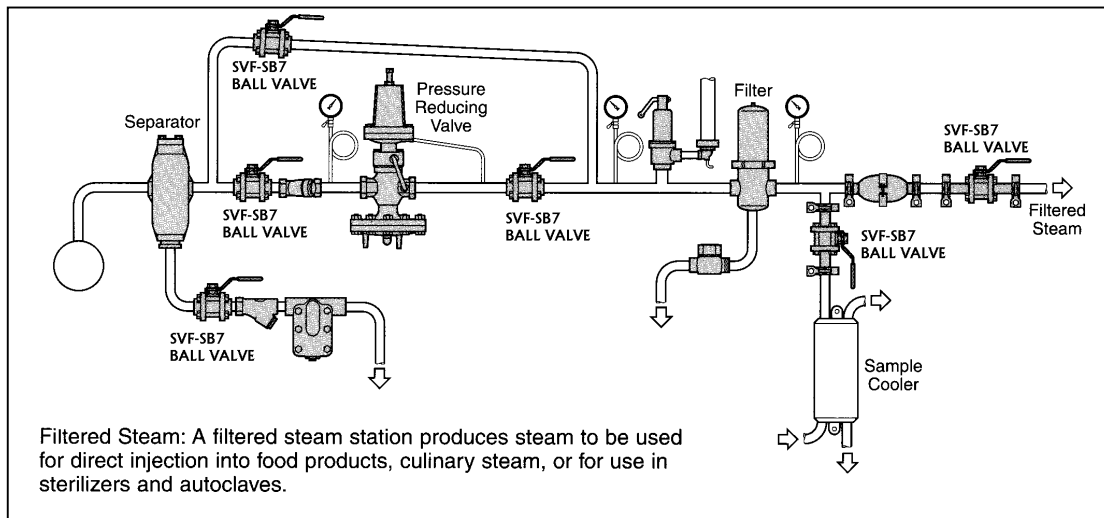


Specific Requirements of “Clean” Steam Systems

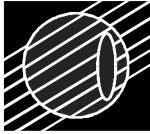


Clean or pure steam produced from water of very high purity is highly corrosive or “ion hungry”. The corrosive nature becomes more pronounced as the concentration of dissolved ions decreases with the resistivity approaching the theoretical maximum of 18.25 megohm/cm at 25 degrees C. In order to recover a more natural ionic balance it will attack

many of the materials commonly used in pipe work systems. To combat this, pipe work, fittings, valves and associated equipment such as traps, must be constructed from corrosion resistant materials.

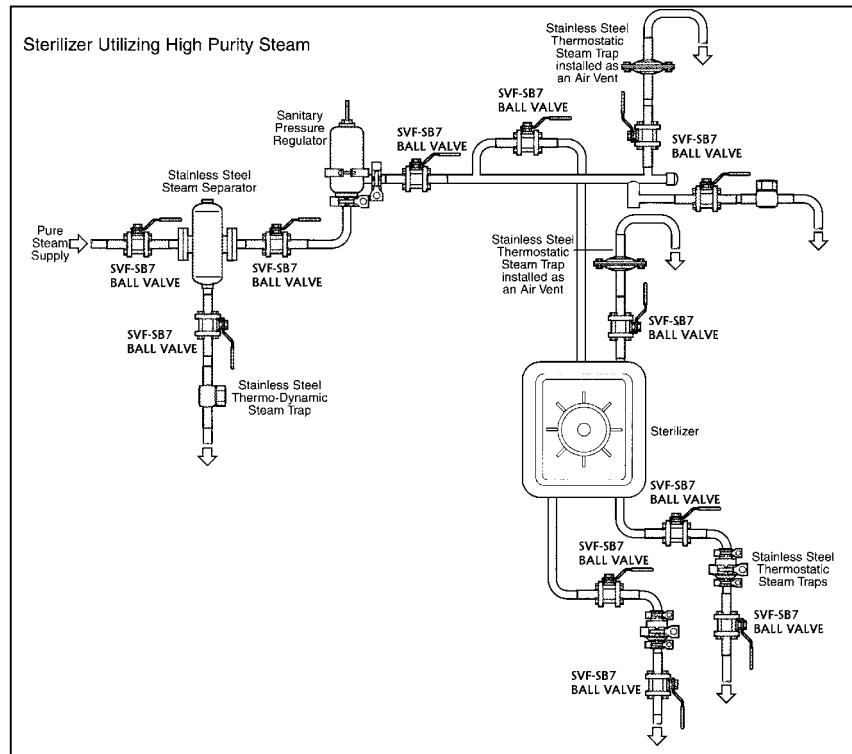


A common problem encountered on clean and pure steam systems in the pharmaceutical industry is that of rouging, which is fine rusting of pipes and system components. This is encountered most frequently when low-grade stainless steels are used, and further corrosion due to galvanic effects can occur where dissimilar alloys are present in the same system.



Unless care is taken with material selection throughout the system, corrosion can become a major problem in terms of:

- a) Contaminating the system with products of corrosion, which are undesirable or even potentially dangerous to the process or product.
- b) Severely reduce the life of the system components, increasing maintenance, material replacement, system downtime and other costs.



In order to prevent these problems, austenitic stainless steel should be used throughout the system (never lower than grade AISI 304). For severe duty the recommended material is AISI 316 or 316L or better and passivated to further enhance corrosion resistance.

In summary, 316 or 316L stainless steel is essential in pure steam systems from its production at the generator right through to the steam traps. Not only will inferior materials corrode and fail prematurely, they will also lead to contamination of the system as a whole.

316L Specifications for Clean Steam Applications-*CleanFLOW*

High Purity Ball Valves ½” thru 4” ASME BPE 1997 SD.3.7.9.

- **Body Materials** – 316L Stainless Steel ASTM A351 CF3M.
- **Ball Materials** – 316L Stainless Steel ASTM A479 or ASTM A351 CF3M.
- **End Connections**
 - Clamp style – 316L Stainless Steel A351 CF3M
 - Extended Butt weld (ETO) - 316L ASTM A-270,
Chemical composition and dimensions per ASME BPE 1997
- **Stem** – 316L Stainless Steel ASTM A479, Live-loaded, Blowout proof design