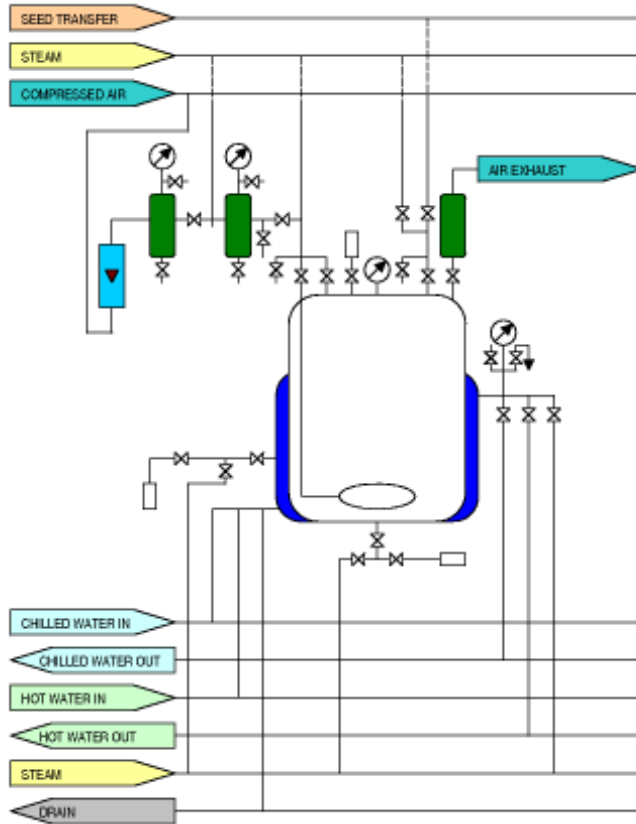


## FERMENTOR PIPING ARRANGEMENT FOR STERILIZATION-IN-PLACE



We design, manufacture & install complete modular piping systems for in-situ steam sterilization of fermentors.

Fermentors are prone to chronic contamination-related problems arising out of some or all of the following inconsistencies during various stages of project execution :-

1. Faulty design of the fermentor vessel
2. Faulty in-situ steam sterilization piping arrangement
3. Improper design, selection, manufacture, installation &/or operations of fittings & instruments
4. Faulty SOP's / noncompliance to SOP's

Of the above, design of in-situ sterilization piping is the most overlooked part of fermentation plant design. It is, however, the most important aspect, since it has the greatest impact on the success or failure of the fermentation plant.

We deliver properly designed piping systems for aseptic fermentation operations, with sterile sections & steam locking arrangements to facilitate long-term contamination-free performance of the fermentor.

Proper sizing & selection of valves & fittings, internal finish, bleeders & drains, elbows &

bends, condensate hold-up sites, bottlenecks, dead-ends, instrument locations, layout & orientation are some of the important factors considered by us while designing the piping arrangement.

We can take up the above work by itself or in conjunction with some or all of the following activities :-

- Design of complete fermentation plants, including culture laboratories & utility services
- Design of large scale submerged fermentors & associated sterile/non-sterile equipments
- Prevention & control of contamination
- Design of fed batch, repeated (cyclic) fed batch, & continuous (chemostat) fermentation systems
- Design of automatic aseptic feed dosing systems with feed flow measurement for fed batch fermentations
- Design of appropriate process control instrumentation systems for various fermentation parameters
- Design of automatic media sterilization, either in-situ or external (i.e. through continuous media sterilizer)
- Design of air filtration systems
- Troubleshooting of fermentation processes from laboratory to commercial scale
- Planning of plant revamps including phasing out of outdated equipments & induction of new equipments
- Planning & supervising periodic maintenance shutdowns (total or partial shutdowns) in existing plants

*Manufactured in India by :-*

### NAVIN PROCESS SYSTEMS

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