

CHESTERTON MECHANICAL SEAL PIPING PLANS

SINGLE SEAL

PIPING PLAN 2 Pump Jacket

- Use with single seal or dual seal to control seal chamber temperature
- Maintains or elevates box temperature to prevent product solidification with polymers, resins, tars
- Lowers seal chamber temperature in hot environments
- Common heat transfer fluids:
 - Water
 - Thermal oils
 - Steam
- Close tolerance throat bushing is required for optimum efficiency

PIPING PLAN 11 Discharge Recirculation

- Use with single seal or dual seal
- Increases circulation
- Increases pressure in seal chamber
- Clean fluids only
 - Solids can erode seal
- An orifice can be used to reduce flow and pressure

PIPING PLAN 12 Discharge Recirculation with Strainer

- Use with single seal
- Cools seal
- Increases pressure in seal chamber
 - Throat bushing optional
- Clean fluids only
 - Solids can erode seal
 - Solids can clog seal when bushing is used
- An orifice can be used to reduce flow and pressure

PIPING PLAN 13 Suction Recirculation

- Vents air and prevents dry run
- Prevents clogging
- Lowers pressure in seal chamber
- Cools seal
- Reduces seal generated heat
- Use caution with low vapor pressure liquids

PIPING PLAN 14 Suction and Discharge Recirculation (Vertical)

- Vents air and prevents dry run
- Use with single seal or dual seal
- Prevents clogging
- Cools seal
- Promotes flow
- Reduces seal generated heat
- Use caution with low vapor pressure liquids

PIPING PLAN 21 Cooled Discharge Recirculation

- Use with a single seal
- Cools hot, volatile fluids
- Cools seal
- Increases seal chamber pressure
- An orifice can be used to control flow and reduce pressure
- Use with close tolerance throat/restriction bushing

PIPING PLAN 23 Cooled Seal Recirculation

- Use with a single seal and pump mechanism
- Minimizes heat exchanger size and coolant water usage
- Cools seal while pumping hot and/or volatile fluids
- Use with close tolerance throat/restriction bushing
- Venting is important

PIPING PLAN 31 Discharge Recirculation with Cyclone Separator

- Use with a single seal where fluid contains some abrasives
- Cools seal
- Increases seal chamber pressure
- Density of solids must be significantly greater than fluid
- Use caution with high viscosity fluids
- Requires pressure differential
- Will not remove micron size particles

PIPING PLAN 32 Clean Flush

- Use with a single seal
- Provides clean fluid to seal
- Prevents clogging
- Acceptable flush fluids
 - Clean, compatible fluid
 - Water, if compatible
 - Clean product
 - Downstream additive
 - Carrier solvent

PIPING PLAN 33H SpiralTrac™ Version D Type I

- Use with a single seal
- Removes solids
- Seal runs in clean fluid
- Prevents clogging
- Removes vapor from seal chamber
- Prevents dry running
- No flush required

PIPING PLAN 33S SpiralTrac™ Version F Type S

- Use with a single seal
- Removes solids
- Seal runs in clean fluid
- Prevents clogging
- Prevents dry running

PIPING PLAN 41 Cooled Discharge Recirculation with Cyclone Separator

- Use with a single seal where fluid contains some abrasives
- Cools seal
- Increases seal chamber pressure
- Supplies cleaner fluid
- Reduces logging potential
- Density of solids must be significantly greater than fluid
- Use caution with high viscosity fluids
- Requires pressure differential
- Will not remove micron size particles

DUAL SEAL

PIPING PLAN 52 Circulation with External Buffer Fluid Tank

- Use with a dual seal
- Low pressure buffer fluid, 10 psig (0.7 bar g) minimum
- Buffer fluid should be clean, compatible and lubricating
- Buffer fluid pressure lower than seal chamber pressure
- Seal venting is important
- Use long sweeps in tubing bends

PIPING PLAN 53A Circulation with Pressurized External Barrier Fluid Tank

- Use with a dual seal
- Pressurize barrier fluid 15 - 30 psig (1 - 2 bar g) over maximum seal chamber pressure
- Barrier fluid should be clean, compatible and lubricating
- Provides clean fluid to the inboard seal faces
- Use long sweeps in tubing bends

PIPING PLAN 53B Closed Loop with Heat Exchanger and Accumulator

- Use with dual seals
- Optional thermocouple
- No foaming
- Heat is removed by an air-cooled or water-cooled heat exchanger
- Accumulator sizing crucial
- Maintains constant pressure on the circulation system

PIPING PLAN 53C Heat Exchanger and Piston Accumulator

- Optional thermocouple
- No foaming
- Heat is removed by an air-cooled or water-cooled heat exchanger
- Tracks product pressure in seal chamber
- Maintains constant pressure on the circulation system

PIPING PLAN 53P Circulation with Pressurized External Barrier Fluid Tank

- Maintains constant pressure and liquid supply to the dual seal
- External water pressure is set at 30 psig (2 bar g) over maximum seal chamber pressure
- Initial tank level is set through the external water pressure line
- Pressurize tank to 25 psig (1.7 bar g) over maximum seal chamber pressure with a regulated gas pad, then isolate gas pressure
- Tank is then charged with regulated external water pressure
- System operates with a constant external water pressure

PIPING PLAN 54DM Circulation with Pressurized External Barrier Fluid Source and Flow Guardian™ DP50

- Use with a dual seal
- Pressurize barrier fluid 15 - 30 psig (1 - 2 bar g) over maximum seal chamber pressure
- DP50 provides inboard seal leak detection, pressure regulation and flow control
- Barrier fluid should be clean, compatible and lubricating
- Provides clean fluid to inboard seal faces

QUENCH

PIPING PLAN 62 Quench

- Use with a single seal
- Prevents coking, crystallization
- Low pressure only
- Cleans atmospheric side of seal faces
- Common quench fluids:
 - steam
 - water
 - nitrogen

PIPING PLAN 74 Externally Supplied Barrier Gas

- Use with a non-volatile gas
- Provide gas at 25 psig (1.7 bar g) above seal chamber pressure
- Venting of the seal chamber may be required prior to start-up
- Use Nitrogen, Carbon Dioxide or Compressed Air
- Zero emissions and leakage to atmosphere

