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Liquid Polymer System Installations - What you need to know!

Polymer Systems - Safety First!

- Mark, label, and indicate all hazardous areas for mechanical and electrical devices and system operations.
- Leakproof, welded SS piping, flanged or Tri-Clamp fittings or PVC socket weld fittings, minimize threaded connections.
- Include drip trays, drains and flushing lines.
- Install pressure relief, check valves and backflow devices.
- Ensure easy access to components for maintenance and operational functions.
- Read all safety instructions, manuals, detailed documentation, and drawings before startup.
- Schedule operator training before startup and commissioning.

Neat Polymer Storage Vessels

- Adequately sized for bulk delivery, determine load quantity, delivery time, (days) and ensure enough onsite operational capacity before next scheduled delivery.
- To ensure adequate mixer sizing, we suggest oversize by 30-50% from suppliers' theoretical calculations; they are often undersized.
- Use Dual Hydrofoil propellers, with a diameter ratio of 1/3 the tank diameter; our standard is a four-bladed design.
- Bottom mixer .5 - 1.5 from the tank bottom, upper prop mounted between 1.5 – 2 prop diameters above.
- Provide structurally certified mixer bridge.
- Use FRP where economically feasible, provides excellent corrosion resistance.
- Cylindrical baffled tanks are best, rectangular designs, create dead space, baffles typically $1/12^{th}$ to $1/18^{th}$ tank diameter, do not flush mount to tank sidewall if possible.
- Provide Seismic calculations and details.
- Adequately size, fill, drain, outlet, and overflow nozzles (side mount), discharge the overflow pipe to an oil-filled container, to prevent air ingress in the tank.
- Provide adequately sized vent c/w desiccant filter.
- Install level indication and overflow prevention instrumentation, with a secondary backup, i.e., float ball or capacitance type device.
- Ensure there is adequate freeboard in the tank; we suggest 1 meter (20%) above the tank working volume.
- OHSA standard ladders, cages, handrails, and non-slip tank covers.
- Provide 400-micron bag filter or strainer on the tank outlet, 400-to capture and prevent gels for plugging downstream components.

Liquid Polymer Systems

- SS, Viton, PVC are the primary materials used with emulsions.
- Progressive Cavity pumps are most favourable.
- Leakproof, SS welded, flanged and Tri-camp construction.
- High Shear, off-the-shelf multi-stage or horizontal mix pumps provide exceptional results.
- Dual dilution design allows initial high ratio mixing of water and polymer, with adequately sized static mixer on system outlet.
- Check valves on water and dual poppet check valves on polymer lines.
- Use a Back flow preventer on water lines.
- Program pre- and post-purge sequence in the programming operation; this will prevent build up in piping and components.

Application Tanks

- Liquid polymer systems generally require a single tank with no agitation.
- Recommend 30 minutes of ageing.
- Ensure the tank is adequately sized, determine large volume downtime capacity.
- Poly tanks are well suited for liquid polymer applications; Consider Optional FRP or SS.
- Provide Seismic calculations and details.
- Provide adequate tank ventilation protection.
- Provide adequate overflow nozzle size (side mount).
- Inlet and outlet connections 180 ^{o}, prevent short-circuiting of polymer from inlet to outlet.
- Tangential inlet and or installing and inverted cones in the tank will reduce the polymer's short-circuiting.

Process Feed Pumps w/ Post Dilution

- Most widely used – Progressive Cavity, our standard is WANGEN.
- Alternate pump recommendations are Hose or Rotary Lobe.
- Emulsion Polymer SS/Viton, mechanical seals are standard, packing is optional.
- Shaft speeds 450 rpm max. & flooded suction.
- Double Pin Cardan joint shaft connections provide extended maintenance benefits.
- All welded TSSA piping (recommended) and or socked weld PVC.
- Provide adequate and properly sized piping supports.
- Post dilution systems require an adequately sized static mixer,
- Ensure and install quality check valves, back & pressure relief valves and backflow preventers.

Tanks with Agitators

- Consider a 1:1 height-to-diameter (working volume) tank ratio for the best mixing geometry
- If the above ratio is not an option, taller and smaller diameter tanks provide suitable mixing.
- Center-mount mixers with 3 or 4 baffles in the tank will provide excellent polymer mixing.

For Information, call KGO Group Ltd. - 905.847.1544.