



National TAB

Project: Altium Packaging - Cooling Water System (Lenexa, KS)

Phase 6-Wheel System TAB Summary

TAB was completed for the Wheel system which consists of two chilled water pumps, two process water pumps, 1 Water cooled chiller, and flow to terminal devices (packaging machines)

For the process water loop TAB was completed by setting the pump total flows via the triple duty valves since the process pumps do not run off a VFD. Once total flows were set Bypass valves on the headers were set based on connected flow calculation. $\text{Bypass flow} = \text{Pump rated flow} - \text{Machine design flow total}$. Once the header bypass valves were set, Machine bypass valves were set to match the machine design flow. After all bypass valves were set, final pump performance was documented and listed in the following report. It is recommended that for the most optimal system performance that when a process machine flow is opened that the corresponding bypass valve gets closed to push the flow through the machine.

TAB was completed for the Chilled water loop by setting the pump to run at 60Hz constantly. Once at a constant speed all machine bypass valves were set to a minimum flow setpoint to prevent stagnant water in the lines. The pump control pressure setpoint was set by Replicating a worst-case scenario which is having flow to four machines with the pump at 60hz and recording the Differential pressure of 64.4 and making this the control setpoint. Final pump performance was then recorded and included in the report below. The control system was tested by closing off the machines one at a time and verifying the pump slows down.