



TEMPERATURE CONTROLLERS... PORTABLE CHILLERS... CENTRAL CHILLERS... PUMP TANK STATIONS... TOWER SYSTEMS...

SUBJECT: RECOMMENDING AND SELECTING A PUMP

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Selecting a pump for process flow is critical for effective heat transfer and for getting the most out of **ADVANTAGE** equipment.

To optimize system performance, systems should be designed with a low pressure drop in the flow delivery system so that adequate pressure is available to deliver high flow and turbulent conditions in the process. This is accomplished in practice by having properly sized delivery piping systems that keep water velocities between 5 and 7 feet per second and pressure losses to less than 3 psi per 100' of run. It is also important to minimize the use of unnecessary tees, elbows, valves, and other high pressure drop causing components such as quick connect fittings.

Laminar and turbulent flow conditions can exist in a process. It is important for proper heat transfer that turbulent flow exist through the process while laminar flow is acceptable and desirable in the delivery system. See FYI #7-A-156 for more information on Turbulent vs Laminar flow.

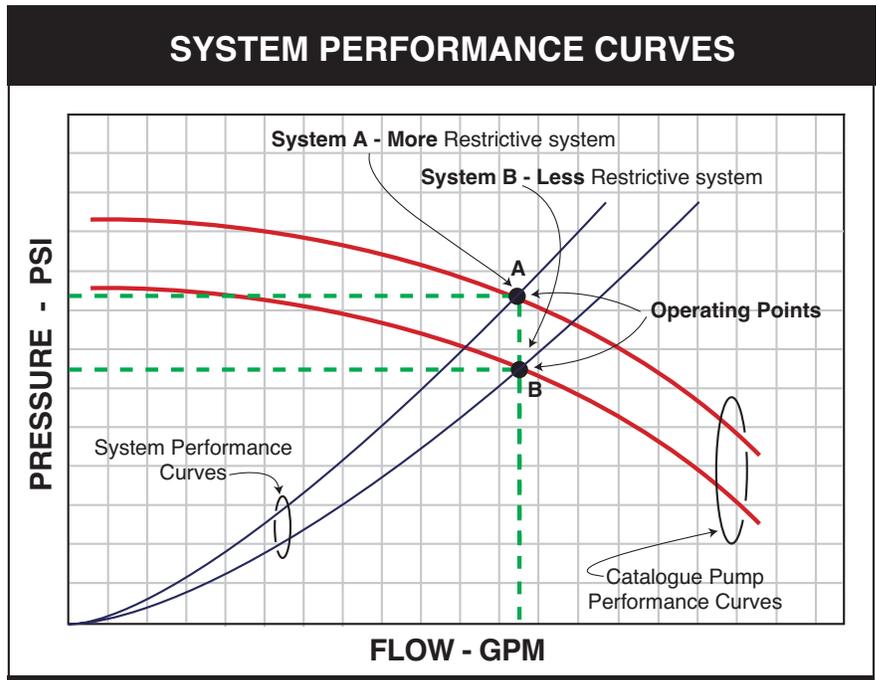
TURBULENT FLOW BY LINE SIZE (for water)

Pipe Size	Flow Required for Turbulence
1/4"	1.6 gpm
3/8"	2.5 gpm
1/2"	3.3 gpm
3/4"	5.0 gpm
1"	6.7 gpm
1-1/4"	8.3 gpm
1-1/2"	10 gpm

Chart A (above) can be used to help estimate the water flow rate required for a process in order to obtain turbulent flow conditions which promotes heat transfer.

Example: a mold has ten (10) 3/8" ins/outs. To be turbulent, each 3/8" in/out should have 2.5 gpm. Therefore, 25 gpm is required. A 3/4 HP pump (like in an SK-1035LE) rated for 35 gpm is the correct machine for this application.

SYSTEM PERFORMANCE CURVES



System A is an example of a more restrictive system compared to System B. To obtain the same flow rate, System A requires higher pump pressure and added horsepower.