

AICHE Equipment Testing Procedure

500.0 Test Procedure

501.0 Pre-Run Data

The pre-run data as decided by following Test Planning Section 300.0 should be obtained before the test runs are begun.

501.1 Obtain, or determine and record the properties of the liquid being pumped during the test.

501.2 Measure and record the measurements decided upon by the plan; for example, suction entry to discharge centerline on sump pumps.

501.3 Record the driver data.

501.4 Calibrate all instruments involved in the test as outlined in the appropriate portion of Section 400.0.

502.0 Pretest Checks

Prior to operating the pump to perform the test the following checks should be made.

502.1 Check that the physical requirements as developed under Planning have been completed - for example, alignment.

502.2 Determine that the fluid to be pumped is available in sufficient quantities to complete all the test runs to be made.

502.3 Follow and check the piping systems to insure that fluid will be delivered to, and be discharged from the pump as required by the needs of the test. Are there branch lines to be accounted for in obtaining flow, etc.?

502.4 Check the driver and pump for direction of rotation, freedom of turning and coupling alignment

502.5 Check the instrumentation to be sure sensing systems are full and are not influenced by ambient conditions.

503.0 *Trial Run Checks*

503.1 Open the pump suction and discharge valves. In some cases it may be desirable to begin with a partially open discharge valve to avoid the effect of full flow surge on some system components or to reduce power requirements at start-up. Make sure the pump is primed.

503.2 Start the pump by applying power or admitting steam to the driver.

503.3 Observe this initial operation check for vibration, shaft seal leakage, pump priming or need for venting, and heat build-up in the shaft seal, bearings, or pump and motor casings. The discharge pressure should be appropriate for the conditions.

503.4 Check to determine if the pump is delivering a flow which is consistent with that expected.

503.5 Use a stroboscope, a direct-reading tachometer, or other device selected during the test planning to determine if the design speed is attained.

503.6 When pressures, flow rates, speed, temperatures, and power readings are stable or within acceptable limits of fluctuation, proceed with the test run or runs necessary for the desired determinations.

504.0 *Test Run*

The data enumerated in this section will establish all the operating characteristics, but the data to be collected during a run may be abbreviated as decided in the test plan. Obtaining this bench-mark information on a new pump or a newly overhauled pump will provide the basis for evaluation of any future tests: any deficiencies observed in the trial run must be corrected. If none are observed, the test run can proceed.

504.1 Data required are suction pressure, discharge pressure, absolute pressure on the surface of the liquid being pumped, liquid temperature at the suction, flow rate, power readings, and pump speed.

504.2 Line up and start the test systems as stated under the Trial Run Checks in Section 503.0, or proceed if the system is already, operating.

504.3 Establish the flow desired and allow conditions to stabilize.

504.4 Take the required readings and record on a data sheet, such as the example in the appendix (see Figure 802.2.1). The need for simultaneous data depends on whether readings are fluctuating. Obviously, if there is no change, one person can proceed from data point to data point and collect the readings.

504.5 Change the flow rate, then return to the first data point and allow time for the conditions to stabilize.

504.6 If taking data to establish characteristic curves the data points for increasing flow rates should be repeated with decreasing flows.

504.7 Check the pump, instrumentation and piping system after the test is completed to see that no changes have occurred which would cause erroneous readings.