

By Jon Gunderson, Advantage Engineering Inc.

The cooling process can determine whether a job operates at a profit or a loss. Keeping your process cooling and temperature control equipment functioning efficiently and properly is a key to profitability.

Before beginning service on any equipment be sure to comply with all lockout, tag-out rules. Disconnect the main electrical power and relieve pent-up water and air pressure. When working on chillers, remember that you are working around pressurized gas.

## SIX KEYS TO CHILLER MAINTENANCE

Current regulations concerning refrigerant handling limit your ability to perform repairs that require getting into the refrigeration system. You must be certified to do this.

**1. Use a local certified refrigeration technician for repairs on chillers.** Many processors find that scheduling a preventive maintenance visit by a technician on a regular basis, at least annually, is a good investment in keeping a chiller in good repair.

**2. Keep the condenser clean.** Whether you use air-cooled or water-cooled models, a dirty condenser can lead to reduced performance, higher energy costs, and premature component failures. Schedule condenser cleaning on a regular basis. If your chiller is equipped with refrigeration gauges, you can watch the high-pressure gauge climb as your condenser becomes fouled. The optimum pressure varies with refrigerant type, so know where your chiller high-pressure reading should be and keep it there with a clean condenser.

**3. Pay attention to process fluid.** Don't use deionized water unless your system is designed for it. Don't ever use automotive antifreeze. It coats your system and actually reduces heat transfer. Use clean water with a scale and corrosion inhibiting additive or use an inhibited industrial glycol at concentrations recommended by the manufacturer. Too much can be as bad as not enough.

**4. Be sure electrical connections are tight.** Check the control panel and

motor wiring for loose connections and wear on a regular basis, at least annually. Preventing an avoidable short can save thousands of dollars

*Doing maintenance or repairs? Make a log that builds a history of details that will come in handy in the future and alert you to minor problems before they become major disasters.*

## Maintenance of chillers and mold-temperature controls

in unnecessary repairs.

**5. Set chiller limit switches and safeties to factory standards.** The mentality of "Keep the chiller running at any cost," can lead to adjusting things that shouldn't be adjusted. A simple check of high- and low-pressure switches, freeze-protection thermostats, and timers can avoid expensive future repairs.

**6. Keep a log.** A log builds a history of operating conditions, including temperatures, pressures, and sounds. A log can indicate potential problems before they become catastrophic.

## MOLD TEMPERATURE CONTROL MAINTENANCE

A mold temperature control unit consists of four major components: microprocessor control instrument, pump, heater valve, and cooling valve. Regular maintenance on a mold temperature control unit can be limited to the following key areas:

**1. Do an overall survey of the machine.** Be sure all water connections and fasteners are tight and not leaking.

**2. Be sure electrical connections are tight.** Check the control panel and component wiring for loose connections,

wear, and hot spots on a regular basis. Be sure the microprocessor sensor is clean.

**3. Remove and inspect the immersion-heating element.** Look for scale build up or sheath pitting, symptoms of poor water quality. Clean or replace the heating element. Don't forget the heater tank. Putting a new heater in an old tank full of scale can lead to accelerated heater failure. Clean the heater tank when replacing the heater.

**4. Check the pump and heater current draw.** Confirm that these are both "in spec." Low or no heater current draw probably means a partial or complete heater failure. High pump current draw may lead to a premature motor failure.

**5. Check cooling valves.** Both solenoid and modulating cooling valves are used in today's mold temperature control units. Solenoid valves are typically more likely to be included on a regular maintenance program. Solenoid valves have internal strainers or small orifices that require cleaning on a regular basis.

**6. Don't neglect a leaking pump seal.** A mechanical shaft seal (referred to as the "pump seal") keeps water from entering the motor and is a wear item that must be monitored. A minor leak will get worse and may lead to a motor failure as water works its way down the motor shaft into the motor windings. If the seal is leaking, replace it immediately. Take a look at the seal after replacing it. Expect even wear. If the seal faces look like an old vinyl record (grooved) you may have particles in the water that are wearing the seal prematurely. A hard and brittle rubber o-ring is a sign of overheating. The pump may have been operated dry.

## GOOD INTENTIONS MUST YIELD GOOD DEEDS

Plan to perform regular maintenance to achieve optimum equipment efficiency and long life. Your computer can help. Software programs like RJG's InsightPM and others allow you to schedule preventive maintenance on your equipment and tooling. Ensure that your preventive maintenance program is a high priority. Start it today!

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