

Compressed Air

- ◆ Install a control system to coordinate multiple air compressors.
- ◆ Study part-load characteristics and cycling costs to determine the most-efficient mode for operating multiple air compressors.
- ◆ Avoid over sizing -- match the connected load.
- ◆ Load up modulation-controlled air compressors. (They use almost as much power at partial load as at full load.)
- ◆ Turn off the back-up air compressor until it is needed.
- ◆ Reduce air compressor discharge pressure to the lowest acceptable setting. (Reduction of 1 kg/cm² air pressure (8 kg/cm² to 7 kg/cm²) would result in 9% input power savings. This will also reduce compressed air leakage rates by 10%)
- ◆ Use the highest reasonable dryer dew point settings.
- ◆ Turn off refrigerated and heated air dryers when the air compressors are off.
- ◆ Use a control system to minimize heatless desiccant dryer purging.
- ◆ Minimize purges, leaks, excessive pressure drops, and condensation accumulation. (Compressed air leak from 1 mm hole size at 7 kg/cm² pressure would mean power loss equivalent to 0.5 kW)
- ◆ Use drain controls instead of continuous air bleeds through the drains.
- ◆ Consider engine-driven or steam-driven air compression to reduce electrical demand charges.
- ◆ Replace standard v-belts with high-efficiency flat belts as the old v-belts wear out.
- ◆ Use a small air compressor when major production load is off.
- ◆ Take air compressor intake air from the coolest (but not air conditioned) location. (Every 50C reduction in intake air temperature would result in 1% reduction in compressor power consumption)
- ◆ Use an air-cooled after cooler to heat building makeup air in winter.
- ◆ Be sure that heat exchangers are not fouled (e.g. -- with oil).
- ◆ Be sure that air/oil separators are not fouled.
- ◆ Monitor pressure drops across suction and discharge filters and clean or replace filters promptly upon alarm.
- ◆ Use a properly sized compressed air storage receiver. Minimize disposal costs by using lubricant that is fully demulsible and an effective oil-water separator.
- ◆ Consider alternatives to compressed air such as blowers for cooling, hydraulic rather than air cylinders, electric rather than air actuators, and electronic rather than pneumatic controls.
- ◆ Use nozzles or venturi-type devices rather than blowing with open compressed air lines.
- ◆ Check for leaking drain valves on compressed air filter/regulator sets. Certain rubber-type valves may leak continuously after they age and crack.
- ◆ In dusty environments, control packaging lines with high-intensity photocell units instead of standard units with continuous air purging of lenses and reflectors.
- ◆ Establish a compressed air efficiency-maintenance program. Start with an energy audit and follow-up, then make a compressed air efficiency-maintenance program a part of your continuous energy management program.