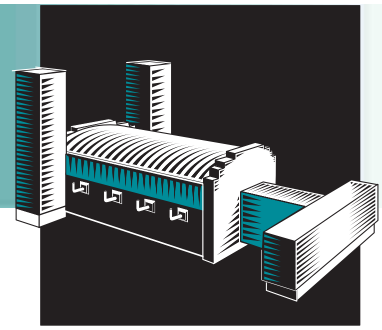
MOTORS

Cost Reduction Strategies



Motors

Motor systems are responsible for 59% of all electricity consumed by U.S. manufacturers. Although the glass industry only accounts for about 1% of all motor energy use in manufacturing, this still represents a large quantity of electrical energy consumption.

You can identify energy-saving opportunities in the motor systems at your plant by conducting a systems analysis and instituting energy-conscious practices.

Did you know...
Turning off a 100-hp standard efficiency motor when it's not needed, even for just an hour per day, will save more than twice as much as replacing it with a premium efficiency motor.

Systems Analysis

Focus on the subset of your plant's motors that is most likely to offer the greatest savings opportunities.

1. Select systems with large motors that run for long periods.

The largest motors that run the most should receive priority attention. A good rule of thumb is to select about 25% of the largest and busiest motors for further consideration.

2. Identify priority load types.

Motors are used for various loads throughout the plant. Fluid handling systems, such as pumps, fans, and air compressors, consume a significant percentage of all motor energy used in glass plants. These systems are commonly centrifugal devices and particularly sensitive to system design, so they are strong candidates to provide energy cost savings.

Detailed review should concentrate on only those systems identified in the screening steps above. This will minimize use of resources and engineering involvement. Once your in-house engineering staff or a hired consultant has collected and analyzed field measurements, specific solutions to improve system performance can be documented and presented to management. Examples of motor system solutions include use of adjustable speed drives, resizing or repairing equipment, eliminating parallel devices or bypass loops, and reducing leaks.

Energy-Conscious Practices

The following motor practices are simple, require no investment, and provide immediate savings. These practices may also be applied to motor-driven equipment to produce even greater efficiency.

1. Establish a new motor purchase policy.

Lock in energy efficiency by making it your corporate policy to consider replacing failed motors with more efficient ones. If an oversized motor fails, weigh the merits of replacing it with one that is properly sized for the application. Review motor efficiency specifications when purchasing any rotating equipment. The Department of Energy (DOE) can provide samples to help you begin.

2. Devise a motor repair/replace policy.

In addition to replacement motor availability, consider the following factors when deciding whether to repair or replace a failed motor: original motor efficiency, rewind costs and efficiency loss assumptions, new motor purchase price, motor horsepower rating, energy costs, investment criteria, motor loading, and annual hours of motor operation. For motors less than 50 horsepower, it is usually most cost effective to replace failed motors immediately. Motors identified by system screening, as discussed earlier, should be evaluated prior to failure on a case-by-case basis. Again, DOE can provide sample policy statements to help you quickly start this effort. DOE also provides free software to aid you in this evaluation and provide the framework for implementing a repair-versus-replace policy.

MotorMaster+ 3.0
Energy-efficient motor selection and management software
This popular software features motor inventory management tools, maintenance log tracking, efficiency analysis, savings evaluation, energy accounting, and environmental reporting capabilities. Additional information on motors and free copies of MotorMaster+ 3.0 are available at the OIT Best Practices website or Clearinghouse. http://www.oit.doe.gov/bestpractices/software_tools/software.shtml

3. Adopt model motor repair specifications.

Define model repair specifications for low-voltage induction motors to ensure consistent, high-quality diagnosis and repair. The quality of a motor overhaul is critical to motor efficiency. Here again, DOE can provide help in this area.

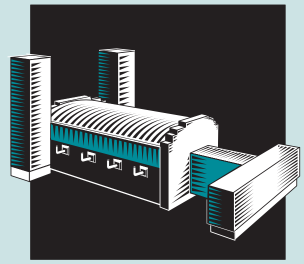
4. Monitor power quality.

Improper voltage level and voltage imbalance can degrade motor performance, reduce motor life, and decrease reliability. A 1% voltage imbalance, for example, can cause a 5-10% current imbalance. For a motor that is operating near rated load, a 2% voltage imbalance can cause motor tripping or overcurrent. Talk with your electrical supplier about voltage levels and acceptable levels of imbalance.

5. Evaluate adjustable-speed drive performance.

Adjustable-speed drives can be a power tool in reducing energy use, but use caution. Motor life can be adversely affected by voltage spikes, bearing currents, and additional heating caused by the non-linear, non-symmetric drive voltages and currents. Avoid negative impacts by taking preventative measures (such as use of filters, short feeder lengths, special cable designs, etc.).

ASDMaster
Adjustable-speed drive evaluation methodology and application software
This software helps you select the right drive for your application. The software can be purchased at http://www.epri-peac.com/asdmaster/



Other Resources

OIT Clearinghouse
800-862-2086

www.oit.doe.gov/bestpractices

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