

# What can I do to reduce my mixer's operating costs?

A mixer's operating costs are broadly driven by two factors: the mixer design and your mixing application. These two factors are somewhat intertwined, since they both affect how efficiently your mixer operates.

**Mixer design:** There are literally dozens of different mixer and blender types, from low-speed, coarse-blend cement and concrete mixers to the high-speed mixers for fine particles and mists for inhalers where particles are in the micron and nanometer size range. The large mixers obviously operate under very different cost dynamics compared to the much smaller mixers for nanomaterials. One size mixer does not fit all, especially since end product values range from a few dollars per ton all the way up to thousands of dollars per gram.

**Mixing Application:** Again, there are a myriad of applications that require mixing and blending two or more powders or powders and one or more liquids. Mixing your materials cost-effectively requires an intimate understanding of your process in order to optimize it.

*Tom Patnaik,  
sales engineer—chemicals and minerals department,  
Hosokawa Micron Powder Systems,  
908-277-9217*

For much of the process industry, the energy cost associated with compressed air runs second only to the energy cost of running all the process machinery.

Mixer shaft seals can be a large source of plant air and horsepower consumption. Mechanical packing typically produces high torque loading of the shaft. While mechanical seals can offer horsepower savings from lower running torque, they vary widely in the amount of purge air consumed. Noncontacting labyrinth seals boast extremely low torque loading, but also typically consume far more purge air than contacting seals.

While contacting mechanical seals all appear very similar, there can be marked differences among them in torque and purge air consumption. Compare a variety of shaft seals to see which work best for your application. Also, consider installing seals that minimize leakage but also offer low running torque and the lowest possible air consumption.

Once you're satisfied that your seals are consuming as little air volume and drive energy as possible, check your pneumatically operated valves and other air-actuated components for static air leaks. Consider replacing pneumatic actuators

with electrically driven ones that are less expensive to operate, and consider conducting a plant air audit to find and repair leaks, inefficient design and components, and improper air use.

Many industrial mixers operate most efficiently when loaded from 60 to 75 percent of capacity. While the temptation to load to the brim may be strong, blend times on overloaded blenders can be much longer and horsepower consumption higher than on properly loaded machines. Operate the blender according to your manufacturer's recommendations to achieve optimal blend times and energy efficiency.

Processes performed under vacuum often take less time and produce higher product purity as vacuum is increased. Ensure that the door and valve seals are vacuum-tight and install mechanical seals with high vacuum containment. Better vacuum will minimize vacuum pump energy costs and can shorten batch times and improve product quality and throughput.

*Starkey Steuernagle,  
general manager,  
Woodex Bearing/MECO Shaft Seals,  
207-371-2210*

Here are some tips for reducing your mixer's operating costs:

- When mixing different batches with colors, start your cycle from light colors to the darker ones to reduce the amount of cleaning needed.
- When you process only a few batches per day, mix them all consecutively so you can keep the mixer running without expensive restarts.
- Keep your mixer clean and well maintained; nothing is more expensive than an unexpected breakdown.
- Keep wear parts in stock in case of emergencies.
- Train your operators on the best ways to operate the mixer.
- Don't mix even one second longer than necessary.
- Immediately discharge the mixture when it's done blending.
- Make sure you're using the best mixer type for your application.
- Choose a multiple-purpose mixer if you run several batches with differing requirements on the same mixer.
- If possible, don't run the mixer below capacity; this will save energy and increase performance.

*Gisbert Ischen,  
MAP division sales manager,  
WAM,  
817-232-2678*

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