10 Tips to Keep Your Top Entry Mixer Running Efficiently

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TECH TIPS & TOOLS

1. Admix Lock out critical speed

All mixers have what is called critical speed. This is a harmonic that becomes obvious when the mixer is run in that speed range. Typically, it will be seen in the form of a vibration or wobble in the shaft system. Many times this becomes apparent when a variable frequency drive (VFD) is added and the mixer speed is changed to optimize the process. Before varying the speed of any mixer, ask the manufacturer for the critical speed and the recommended lockout range. Typically, you would lockout 20% on either side of the critical speed.

2. Prevent corrosion of lower drive bearings

Many times tanks are flooded for cleaning. Make sure that the mixer has a lower seal designed to not allow the cleaning solution to enter the mixer drive. Many times, a small offset elevation pedestal can be added to create an "air gap" between the mixer drive and the tanks mount nozzle to allow the cleaning solution to escape before entering the mixer drive.

3. Don't run your mixer through drawdown or pump out

Mixers are typically designed to run in fluid and many are designed to run completely dry. However, no mixer is designed to run during drawdown (tank being discharged). It is highly recommended that a control parameter be added that when the tank outlet valve is opened or the transfer pump is turned on, that the mixer automatically shuts off.

4. Check mixer shaft straightness

The straighter the shaft, the less radial load is put on the bearings. The less load on the bearing, the longer the life. A good part of preventive maintenance is to always check shaft straightness to insure that it is within tolerance.

5. Don't overload your mixer

Keep in mind that as products and formulas change, viscosity and solids may change, too, as will the load on the motor. As an example, if specific gravity changes from 1.0 (8.34#/gal) to 1.3 (10.842#/gal), power draw on the mixer (or a pump) also changes by that ratio. A 2 HP mixer that drew 1.7 HP at 1.0 SG now draws 1.7 x 1. 3= 2.21 HP and is now overloaded.

6. Check mixer compatibility when making process changes

If your process changes, it is always wise to check with the mixer manufacturer to insure design compatibility with the new process. For example, not all mixers are designed to have frozen solids added directly to a vessel. This can cause severe deflection and shaft bending.

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7. Be sure your gearbox is designed for washdown environments

Plant sanitation has changed and more washdown is now taking place. Insure that breathers and seals on existing gearboxes are designed for this duty. Gortex breathers are now available and allow pressure to normalize, but do not allow moisture to enter the box.

8. Double check installation of your washdown motor

You've already determined that a washdown duty motor is required for your tough environment. But, did you know that even washdown duty motors may fail if the correct weep holes are not plugged? The intent of a weep hole in an electric washdown duty motor is to allow water to escape. If the correct weep holes are not open, it allows water to pool in the bearings and cause premature failure.

9. Properly position your mixing impeller

Some formulas today demand that your mixer be run at very low liquid level so you may be asked to mount the impeller closer to the bottom of your tank. A good rule of thumb is that an impeller should never be installed any closer than one impeller diameter off bottom. Severe deflection, motor overloading and premature bearing failure could be the result if mounted any closer. Always check with your mixers manufacturer, as there are other impeller options available for retrofit.

10. Keep steady bearings submerged

Bottom steady bearings are common in many mix tanks. These Teflon or Rulon "bearings" must be submerged to run the mixer. If a mixer is seeing premature motor failure, the culprit may be that the mixer is being run in a dry condition causing excess drag from this dry bearing and often times, overloading the motor.

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