

# Eliminating the hazards of vintage equipment

Updating older dissolver equipment with attention to safety precautions can help manufacturers protect their workers from injury.

An extreme safety hazard may be lurking in your manufacturing plant – but with a few simple steps you can eliminate this hazard, and at a reasonable cost.

Virtually every manufacturer of paint, ink, adhesive or similar coating products uses a dissolver or a similar machine, as the first ones were made prior to 1945 and have been manufactured by many U.S., European, Asian, and other companies ever since.

The machines are variously known as dissolvers, dispersers, post-mixers, and paint mixers. These machines generally consist of a hydraulic lift, a bridge, a shaft, and an impeller or blade. The shaft is driven by an electric motor and mechanical drive system mounted in or on the bridge as shown in Figure 1.

Many of these machines are very old and have changed ownership several times. They were designed and manufactured when there was a different standard of safety than what exists today. Consequently, these old machines do not have the guards, interlocks, and warnings required on new equipment; thus many coatings industry workers have been severely injured.

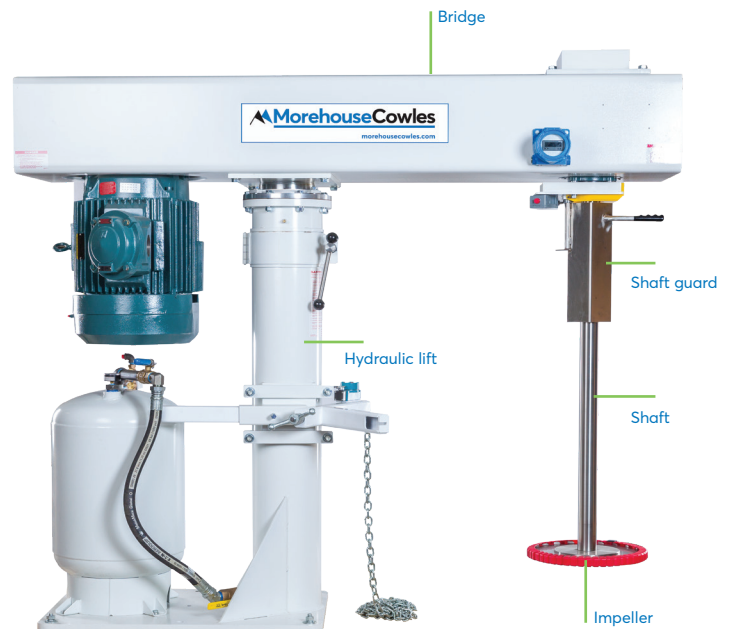


FIGURE 1: A dissolve generally consists of a hydraulic lift, a bridge, a shaft and an impeller or blade.

## THE HAZARD

There are several potential dangers associated with dissolvers. These include pinch points associated with raising and lowering the machines, the possibility of a small drum or vessel being thrown around if not adequately retained, and ignition of solvents by static sparks from undergrounded tanks. But the most serious hazard is potential contact with a rotating shaft.

A clean, unguarded shaft rotating at high speeds may not look dangerous, but the surface friction is so high that it can catch clothes, gloves, bags, etc., resulting in amputations or other grave injuries. The hazard is especially severe on small machines processing 30 to 150 gallon batches because of the likelihood of contact with the shaft.

The problem is exacerbated if there is high turn-over at the operator's position or poor training. Injured operators often report that they were never trained or instructed to operate the machines safely, contradicting with of the warning labels on the machines.

These hazards can and must be eliminated. The most straightforward way to do this is to retire the old dissolvers. After 20 or 30 years, they have paid for themselves many times over and newer machines have all the current safety mechanisms built-in.

## NEW MACHINES

A MorehouseCowles dissolver supplied today will include the following safety features:

- A shaft guard which will prevent contact with a rotating shaft
- An interlock which will turn the machine off if it is raised so that an un-guarded portion of the shaft is exposed
- A tank-holding device which will secure a mix tank in place
- An interlock to prevent operation of the machine if the tank-holding apparatus is not fixed to the tank
- Extensive warning labels describing safe operation procedures
- An operations manual including extensive safe installation procedures

In addition, we incorporate the following features as options:

- A mechanical scraper arm which automatically scrapes the tank wall, reducing batch time and eliminating the temptation to scrape the tank wall with a spatula – a practice which should be prohibited
- A cover to completely enclose the tank – the most positive means of preventing contact with a rotating shaft, while providing a direct means of controlling solvent vapor emissions

But what about a company which cannot afford a new machine now?

## EXISTING UNITS

The Occupational Safety and Health Administration (OSHA) places the responsibility for the safe installation and operation of a machine with its owner, not its manufacturer. In other words, it is up to you to ensure a safe installation in your plant. You can do this by modifying and old machines and by properly training your operators.

The most important modification to make is to install a shaft guard and limit switch to prevent an operator from coming into contact with the rotating shaft. To ensure against injury, the guard must be of sufficient length to cover the entire exposed length of the shaft when the smallest vessel ever used with the particular machine is in place, and when the machine is raised to the highest operating height used.

Since many product formulations are processed fastest by moving the impeller up and down in the batch, vertical travel must be accounted for. The shaft guard will only be effective if it is accompanied by a vertical lift limit switch.

Because the shaft guard must be sized for the extreme condition, it will sometimes be submerged in product and, therefore, require cleaning. On critical applications where cross-contamination must be avoided, a quick removal guard can be designed and a spare guard kept on hand for a shorter clean-up cycle. The used guard can then be cleaned off-line.

Additional safety upgrades include the addition of a tank holder and up-to-date warning signs. Finally, the safe practices outlined in operations manuals and literature should be studied and explained to every worker. An untrained or overly fatigued worker should not be allowed to operate a dissolver.

Safety information and warning labels are available, as well as retrofit guards for many older machines. Acting now will help provide a safe workplace for employees.