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Repairs and Maintenance

Don Pfeleiderer

Kitchen Grease Exhaust Maintenance
Staying ahead of the game Part One: Upblast Fans

You may not realize it, but one of the most important items in a kitchen is the hood ventilation fan. Without it, a restaurant could not operate its cooking equipment.

Additionally, there are many other issues in the kitchen that arise from an improperly operating exhaust system. Most fan units are belt driven, although new technology is making variable-speed direct drives without belts more prevalent.

Each system has its pros and cons. The belt-driven system generally is less expensive to repair in the event of a breakdown, but it often requires more maintenance to keep it running. Direct-drive fans require the removal of the fan blades if the motor fails, which is more difficult than replacing a motor on a belt-drive fan.

Since more than 90 percent of restaurant fans are belt driven, let's concentrate on several problems that we encounter the most in the field on aluminum belt-driven upblast fans (PRVs).

PROBLEM AREAS:

Worn or broken fan belt.

This is the simplest problem to repair and easiest to prevent. Simply make sure the belts are checked regularly and are tightened to the proper tension. Over tightening a fan belt could lead to premature failure of the bearings and other items. We recommend making sure the belt has approximately 1 inch of slack for smaller sizes (slack to the first knuckle from perpendicular).

Deteriorating Vibration Isolators.

This is one of the most common problems with exhaust fans and typically happens after the fan ages and starts to break down. The vibration isolators are rubber-type connectors (Image 1) that hold the entire framing section (Image 2) to the fan and act as a shock absorber for any fan vibrations transmitting to the fan and fan plate and base. These start to dry out and deteriorate with age. The result is the complete breakage of the isolators.

As part of normal fan maintenance, check that the frame is still secured to the motor housing plate. Isolators are inexpensive to replace. Failure to replace them when they are broken can cause the fan blades to become knocked off center resulting in very expensive damages to the blades, bearings or worse. Many restaurant managers complain that the fans are making a clanking noise. This is a common symptom of broken isolators and needs to be checked as soon as possible. This symptom is most common right after a cleaning as the fan is usually tipped on its side during the cleaning process which is the most-common time for an old worn-out isolator to fail.

Bent or Broken Fan Bases.

This problem typically occurs where they attach to the curb or the fan shroud, which can cause loss of air suction and the deterioration of the entire fan. This is completely preventable with the proper installation of hinges that do not allow the fan to be tipped back more than 80 degrees. (Images 3 & 4)

Excess Vibration.

Before calling in a professional vibration balancer, make sure the blades are completely clean. Many companies do not thoroughly clean both side of the fan blades, so check the back of the blades to make sure there is no buildup. As little as just a couple of grams of old grease in the wrong place can cause excess vibration. You can also take a picture of the area in question using a digital camera on a micro setting (Image 5) or manually feel behind it with your hand (Image 6). Also check for fan blade damage that may be causing the vibration. The intake of the fan may have hit the intake venturi and bent the blade assembly. This could have been caused by bad isolators, bearings or shafts and needs to be corrected before balancing.

Excess Grease.

There are UL-listed products on the market that will remedy excess grease leaking onto the roof or prevent greasy runoff from the cleaning going onto the roof.

Electrical.

Make sure it has plenty of slack to allow the fan to be tipped back for cleaning. The conduit should be either a liquid tight conduit or an SOOW (oil and weather resistant) cord, depending on the local electrical codes. Weatherproof and grease-resistant electrical and watertight fittings are a must.

Generally, SOOW cords last longer in cold climates, because as they don't crack as much in the cold. It also must run on the outside of the fan and fan base per NFPA-96 recommendations. Many contractors run the electrical inside the fan base, which will always fail in time (Image 7). Worse still, some new installations actually run the electrical inside the ductwork. This is very dangerous as it exposes the wiring to high heat, grease and stretching when the fan is tipped back.

Fan Bearings and Fan Shaft.

Failure of either of these items can lead to some of the most expensive fan repairs, including replacement. This happens if the failure leads to damages to the fan intake or fan blades. When the friction of the shaft spinning on the bearing housings a fire could result when the extreme heat or loose hot metal in the shaft gets slung around the housing area.

GET PROACTIVE

Install bearings with grease fittings and make sure they are greased with a high-quality lithium or synthetic grease during the semi-annual fan maintenance. Also, use synthetic grease for cold weather operations in the North. This allows the grease to flow and lubricate the bearings faster in extreme cold, greatly extending the bearing life.

If you do not do regular maintenance on the fans, you may opt for a sealed bearing. A regularly serviced bearing with grease fittings far outlasts the sealed bearings, but only if they are regularly greased. In addition, you have full control of the lubricant used in the bearing with fittings. If you do not maintain your fans and bearings regularly, the sealed bearings do last longer in most cases. Make sure your staff recognizes when bearings are going bad.

One option is to perform a bearing vibration test when you do your regular maintenance. This test, done in conjunction with vibration balancing, can determine possible bearing wear and future failure.

In future articles I will address periodic replacement of bolts and washers on aluminum fans as they wear out. I will also focus on known problems with loose fan blade hubs and cost-saving guidelines for repairing them.

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