STORAGE VENTILATION PREPERATION

Another storage season is approaching. Whether your equipment is new or old it is important to keep it in best shape possible. Here are some tips to help keep it in good working order. You can do a lot of this work yourself or elect to have your ventilation contractor do it for you, either way preventative maintenance will pays for itself.

FANS - The Heart of the Ventilation System and are often overlooked

- Visually check Fan motor mounts for tightness
- Visually check electrical wiring conduits. If not secured they can rub on the fan guard or fan frame and cause an electrical short, simple few zip ties can solve that problem
- Check fan guards for breaks or loose bolts. Damaged fan guard can cause further damage to the fan blade. Broken fan guards can be a sign of unbalanced blade or loose motor mount causing vibration.
- Check fan blade for cracks especially around the center hub, check for chipped blades.
- Check fan housing for cracks at welds. Especially if your fans are over 10-15 years old
- Fan blades should be clean and free of residue. CIPC or even dust residue will often cause a fan blade to become unbalanced. Steam clean or wire brush will get the job done.

VARIABLE FREQUENCY DRIVES - If fans are not equipped with VFD's, consider having them installed. VFD's are a great storage management tool, reduce energy cost and have a short payback, But do require a little maintenance.

- Power off at the end of the storage season. This will reduce potential damage from external power events, like lightning, when they are not in use.
- Clean VFD Heat sink; aluminum radiator located in the back of most VFD. Heat sink can get dirty with sprout inhibiting chemicals or dirt. Blow out with compressed air, brush with soft brush.
- Clean Off Cooling Fans. On most VFD's the cooling fans run whenever the VFD is running and are necessary to keep the VFD's Electronics cool. Cooling fans are a common maintenance Item, replace as needed.
- Inspect electrical connections. (VFD's have Capacitors that can hold a charge for a few minute, Make sure they have been powered off for at least 3 minutes.) Check all electrical connections for tightness, any discolored wires is a sign of overheating. VFD's mounted adjacent or near to fan wall are susceptible to vibration causing terminals to get loose.
- Keep water away from VFD's while cleaning electrical rooms. A drop of water or chemical into the VFD electronics can cause serious damage.

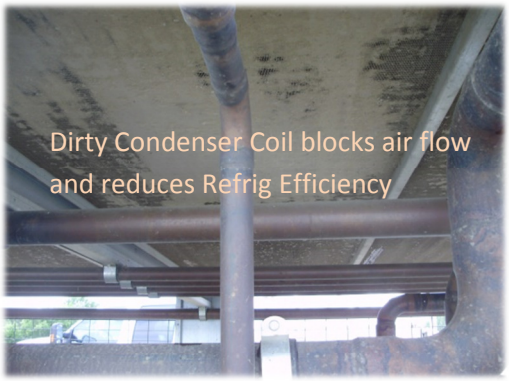
MOTOR STARTERS OR CONTACTORS

- Power off all electrical circuits
- Open the contactor cover and inspect overloads (for signs of overheat)
- Check for loose or discolored wires, discolored terminals
- Have technician look at it if you are not sure if it in good working order or needs repair.

REFRIGERATION CONDENSING UNITS - Expensive and should be properly maintained by a Qualified Mechanical contractor. However, there are a few preventative maintenance items that can be done in advance.

- MAKE SURE ALL POWER IS SHUT OFF BEFORE PERFORMING ANY OF THE BELOW ITEMS
- Visually inspect electrical panels for any discolored wiring or terminal blocks, burned contactors or relay contact points.
- Compressor contactors should be replaced every 3-4 years
- Condenser and/or Compressor VFD – same maintenance as Fan VFD (see above).
- Check Condensing fans for electro-mechanical issues such as loose motor mounts, fan blades not in line with other Fans, broken motor mounts or fan guards.

- Inspect for refrigeration leaks. Leaks will appear as oil spots or oily dirt covered area. Refrigerant blends with the refrigeration oil in a system, when it leaks out the location will appear oily. Refrigerant leaks can be costly and should be repaired by a qualified technician as soon as possible. Repaired area should be thoroughly cleaned from oil and dirt so that it doesn't cause a false alarm in the future.
- Condenser Coil Cleaning
    - MAKE SURE POWER IS SHUT OFF TO CONDENSING UNIT
    - Cover any electrical devices or junction boxes with plastic or plastic bags prior to washing.
    - Condenser coils can be cleaned with a garden hose and a flat nozzle.
    - Rinse from the Downstream side first to push most of the dirt out the upstream side. Condensing Fan guards may need to be removed to reach into the coil area.
    - Rinse from the Upstream side. Wash as if you were combing the fins.
    - Rinsing steps may need to be repeated a couple of times to get them clean. You should be able to see light thru the coils.
    - Cleaning will improve efficiency of the unit and extend its life, once a year is a must.



- Evaporator Slab Coils or Unit Coolers
    - Same steps as Condenser coil cleaning, Except use Steam or Hot water.
    - Use low pressure steam or "near steam" hot water to remove any chemicals or organic matter from the coil fins.
    - Do Not Use High Pressure it may damage the coil fins
    - Special Coil fin cleaning agents are available, but steam generally gets the job done.
- Check for any loose or missing electrical cover.
- Many Refrigeration valves and fittings have caps or screw on covers to prevent leakage or protect fitting/valve from the environment. They should be replaced if missing.
- New computerized refrigeration controls have a lot of sensor wiring. Check that all sensor cables are secure and not touching hot gas piping. A few zip ties will save a lot of hassle and possibly service call.

EVAPORATIVE COOLER (CELL) - Natural refrigeration tool that is often overlooked when it comes to maintenance.

- Drain and Dry and the end of storage season. Drain bypass and supply plumbing. Drain Water tank. Water sitting in tanks breads bacteria. Water "wicking" at the bottom of media can deteriorate media.
- Use a Wet/Dry Vac and a few had towels to clean tank.
- Clean supply water filter. If supply water filter is not in place, consider installing one. Filter will reduce maintenance and assure water header is performing per design. With a filter installed, Supply headers should not need any cleaning. Filter should be checked and cleaned on a regular basis during storage season.
- Check for hard water/mineral deposits on the face of the media, most of it will show on the upstream side, Mineral deposits are a sign that there is not adequate water feed to the media. Mineral deposit is hard to clean, but you can hose it down and use soft brush to brush some if it off without damaging media.
- Adjust float valve so that water level is just below bottom of media. Water level above the bottom of media will cause "wicking". Wicking will soften and eventually deteriorate the media.
- Check media saturation. If media is not completely saturated or "Streaking", water distribution header may be plugged or the pump size in insufficient. Media manufacturers have a formula to calculate GPM requirements based on total media Area, your ventilation supplier can provide you with this info.

- Tip – On a dry day with the system running and intake doors open, Cell media should be fully saturated. If not you may need a larger pump.

HUMIDIFICATION - CENTRIFUGAL

- Drain and clean water tank. It will help extend the life of the water pump.
- Inspect the float valve for proper operation.
- Clean Disk. If the disk has mineral build up, Lime Away will polish it up nicely.
- Spin the disk by hand before starting the new season. Motor Bearings sometimes seize up a little if they had moisture in them when they were last shutoff.
- Check that the disk is not binding against the teeth while it spins. Reposition the disk if necessary.

HUMIDIFICATION – HIGH PRESURE

- Change or clean water filter
- Check motor belt or direct shaft coupling
- Clean or replace plugged nozzles
- Some Systems have a flush valve at the end of the line to flush any debris out. You could remove last nozzle if you don't have one to do the same

FRESH AIR INTAKE DOORS

- Check for mechanical issues, loose actuator assembly, door clamp
- Make sure that the intake door is sealed well when it is in closed position, door spring should be slightly depressed.
- A shot of silicone spray on the actuator shaft will help keep the actuator seals lubricated and squeak free.

CONTROL SYSTEM

- All Temperature, Humidity and CO2 Sensors should be calibrated and checked by a qualified technician.
- Nothing nicer than a clean control panel.
- Check inside for water damage or sign of water presence, this maybe an indication of water condensate coming into the panel during operation. A simple fix is to seal conduits entering the panel, water damage to controls can be very costly to repair.

LIGHT TREE

- Use 60 watt rough service bulb or 75W Equivalent LED bulbs are a great choice.
- A Little Anti-Seize on the bulb threads will reduce vibration and extend life expectancy.

EXHUAST – The entire air system depends upon proper exhaust

- Check that exhaust dampers or exhaust doors open and close freely.
- Exhaust dampers have plastic or metal pivot bearings that can wear out. They should be inspected annually.
- Exhaust doors often have absorber shocks that reduce rapid movement in either direction. Absorber shocks should be checked.

BUILDING "CLIMATIZATION"

After all the maintenance is done, it's a good idea to let the system run and "climatize" the building for 2-3 days before the storage season starts. This will give you confidence that everything is ready to go and prepare the building environment for product.

Proper maintenance is all about the details. A smooth running ventilation system with accurate controls will increase produce quality, save time and increase profitability.

BTU Ventilation