

GROCERY OPERATIONS TO REDUCE RISKS OF AIRBORNE INFECTIOUS DISEASE TRANSMISSION

- ▶ Verify that heating, ventilation, and air conditioning (HVAC) systems are working as designed, paying particular attention to exhaust and outdoor air systems [1]. While working in the store area, the maintenance crew should maintain social distancing and wear protective gear including face mask and gloves. Maintenance should only be done by properly qualified individuals, and the following items should be considered:
 - ▶ The dampers, damper control, exhaust fan, and motor belts in an outside air system should be checked for proper functioning. Check outside air intake regularly for any potential risks such as exhaust near the intake.
 - ▶ Provide proper clearance between air intakes/exhausts and pedestrians.
 - ▶ Inspect air-cooled condenser surfaces for damage or evidence of leaks. Repair or clean as needed.
 - ▶ Check drain pan, drain line, and coil for biological growth and debris. Clean as needed.
 - ▶ The control schedule of economizer, building exhaust, and thermostat set point should be checked for positive air balance (less than 5 pascals) to provide appropriate dilution ventilation. It may be important for the retailer to examine their outside air strategies, and possibly adopt three outside air operation modes based on outside air quality:
 1. Occupied mode: Increase outside air as much as possible and close return air damper during the occupied hours.
 2. Flushing mode: Maximum outside air two hours before and after occupied times.
 3. Unoccupied mode: Minimum outside air. Freeze protection capability of air handling equipment should be verified in cold climates.
 - ▶ To ensure cleaner air inside the building, the air filters in the store area, bathrooms, and offices should be checked and frequently replaced.
 - ▶ In locations without filters, such as cold prep areas, the interior evaporators coils and surrounding areas should be inspected for moisture accumulation and biological growth. If present, clean or disinfect as needed.
- ▶ On a weekly basis, verify that refrigeration systems are working properly. While working in the store area, the maintenance crew and store staff should maintain social distancing and wear protective gear including face mask and gloves. Maintenance should only be done by properly qualified individuals, and the following items should be considered:
 - ▶ Appropriate air flow rate in display cases should be maintained by:
 - ▶ Keeping the honeycomb clean,
 - ▶ Keeping the air-plenum clean, and
 - ▶ Checking the evaporator fans.
 - ▶ The evaporator coils and drip pans should be kept clean.
 - ▶ The display case set-point temperature should be maintained by monitoring suction pressure.
 - ▶ Door handles and other touch points in display cases should be disinfected as often as possible (daily).
 - ▶ Sneeze guards should be installed around service meat cases, hot food salad bars, and cashier stations.

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- ▶ **Maintain/Encourage Social Distancing:** Social distancing has been identified as an important way to reduce transmission of Covid-19, but it also assists ventilation systems. Fewer potential sources of the virus in a given area makes it easier for ventilation systems to dilute potentially contaminated air. With that in mind, consider implementing strategies that encourage social distancing [2,3,4]. Examples include:
 - ▶ Tape marks on the floor to indicate how far apart customers should be (6 feet or 2 meters).
 - ▶ If an aisle or corridor is narrow (less than 6 feet), make the aisle or corridor one way and post signage to that effect.
 - ▶ For areas in which it is naturally difficult to maintain distancing, limit the number of customers and employees allowed in at one time.
 - ▶ If feasible, limit the number of customers in the store to make distancing easier.
 - ▶ **Encourage or require the use of masks [5]:** As with distancing, masks reduce a known transmission route but also help ventilation systems. In this case, masks reduce the potential source strength of an infected individual – if an infected person coughs into a mask, fewer potentially infectious droplets must be dealt with by the ventilation system.
 - ▶ Provide store employees and service technicians with face masks and gloves.
 - ▶ If feasible, require customers to also wear face masks.

All employees should also be provided training regarding hygiene and disposal of personal protective equipment (PPE) after use. The disposal procedure includes:

1. Carefully remove mask and gloves by rolling inside out.
2. Place in a plastic bag that can be sealed.
3. Complete cleaning of tools and equipment using cleaning agent, bleach solution, or soapy water.
4. Remove inner suit and gloves by rolling inside out, being careful to not come into contact with any contaminated surfaces.
5. Wash hands, arms, and face (in that order) with soap and water for at least 20 seconds immediately after removing PPE.
6. Keep your PPE clean by following manufacturer instructions carefully.

Resources:

1. ASHRAE: Standard practice for inspection and maintenance of Commercial Building HVAC Systems. ANSI/ASHRAE/ACCA Standard 180-2012
2. CDC: [Covid-19 Resources](#)
3. California Department of Industrial Relations Division of Occupational Safety: [Covid-19 Resources](#)
4. National Grocers Association: [Covid-19 Guidelines](#)
5. OSHA: [Covid-19 Resources](#)

Notes:

Developed by the Oak Ridge National Laboratory. Bryan Beitler of CoolSys assisted in the preparation of this document. This information is based on recommendations and guidance from ASHRAE and other sources. This is a quickly changing area of research and readers should review for any recent guidance. Each building in each climate type will differ and affect final implementation. Professional engineers who are familiar with each individual building should consider any changes as they impact a specific, unique building.