



Looking Beyond The Horizon
BakingTECH
Vision 2020
 HILTON CHICAGO MARCH 1-3

Welcome!
Environmental Control
for
Food Safety & Quality

Vision 2020



Environmental Control
Wholesale Bakery

- Occupants**
 - Heat stress
 - Air exchange
 - Air movement
- Food Quality & Safety**
 - Space temperature
 - Humidity
 - Mold / Particulates



Bakery Overview – Environment

INDUSTRIAL BAKING FACILITY
AIR MANAGEMENT

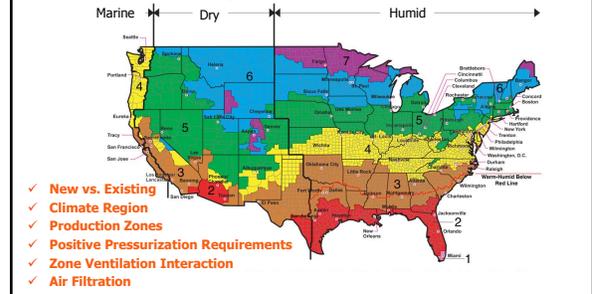


Outdoors Positive (+)



Facility Considerations

Marine ← Dry → Humid →



- ✓ New vs. Existing
- ✓ Climate Region
- ✓ Production Zones
- ✓ Positive Pressurization Requirements
- ✓ Zone Ventilation Interaction
- ✓ Air Filtration



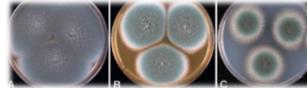
Cleanrooms

- Enclosures
- Exposure Impact Factor
- ISO Specifications
- Zones
- Compressed Air Filtration
- Product Temperatures



Mold

- Spores Active vs. Dormant
- Darkness / Light
- Moisture and Humidity
- Nutrient
- Temperature 40-100F
- Greenhouse will travel
- Time 24-240 hours



Space Pressurization

Space Pressurization Water Column "	0.03"	0.05"	0.07"	0.09"
CFM Leakage per Ft2	694	896	1,060	1,201
Electric Cost, Fan	\$40	\$53	\$64	\$74
Heating Cost	\$646	\$834	\$986	\$1,117
Wind Protection, MPH	7.9	10.2	12	13.6

- How Pressure and Velocity (MPH) Equate
- Importance of Dock Door Maintenance
- Motorized vs. Gravity Dampers



Air Filtration

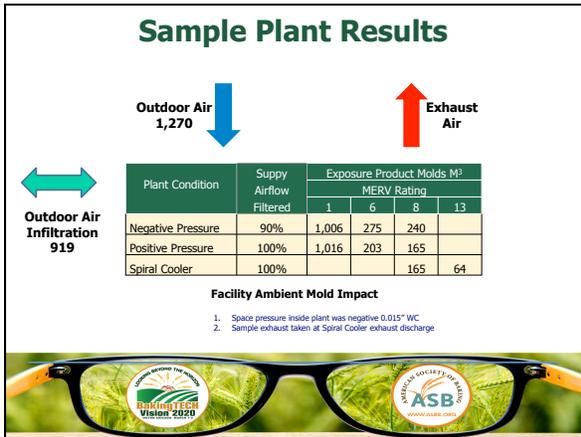
Description	Static-Fiber	Trifiber-Poly	Trifiber-Poly	Trifiber-Poly
Efficiency 3.0 Microns	<20%	84%	87%	>95%
Pressure Drop @ 500 FPM	0.08	0.31	0.46	0.78
Usage Area	None	Existing Retrofit	Non-Product	Product Zone
Energy Cost MCFM	\$4.51	\$17.46	\$25.92	\$43.94

Equipment Air Filtration

1. Minimum Efficiency Rating Value (MERV)
2. Continuous linked filters recommended to prevent air bypass.
3. Antimicrobial coating NOT recommended for "human Comfort" systems
4. Energy cost based on \$0.06 per kWh and 8,000 hours a year operation

- Existing Equipment retrofits may have negative impacts.
- MERV Ratings
- Material Type: Synthetic vs. Cardboard and Fabric





Environmental Control Systems

- Sanitation
- UV Lighting
- Air Filtration
- Outside Air Intakes
- Fabric Curtains
- Up-blast Exhaust Fans
- Location of Air Devices
- Air Distribution Types

Questions or Comments?

Thank You!

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