



Your
microclimate
expert

Case study

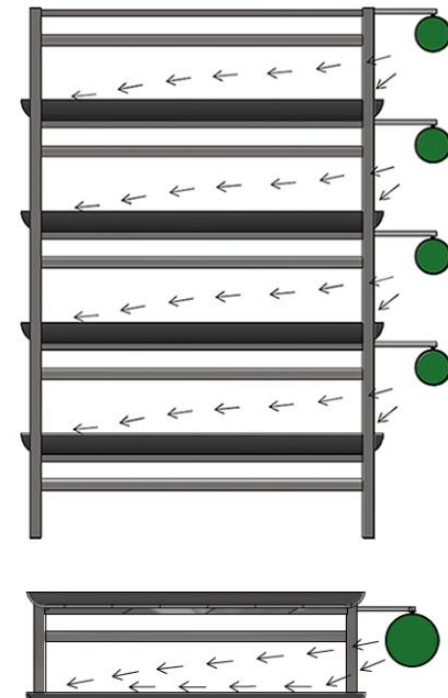
KE GreenDuct Breeze system delivered to one of the largest vertical farms in Southeast USA

Background

KE Fibertec NA has supplied a KE GreenDuct Breeze system to one of the largest Vertical farming plants in Southeast USA. More than 3,5 km (11.500 ft) KE GreenDucts in MW40 material with antibacterial treatment. The whole concept is based on a Micro-climate air distribution concept. The plant is supplying more than 10.000 lettuce heads per day to one of the biggest fast-food chains in the world.

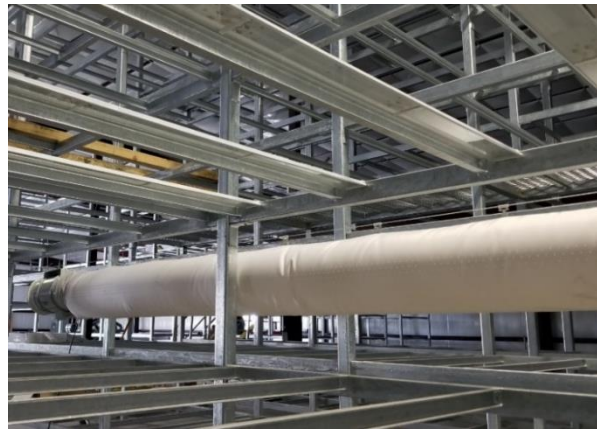
Micro controlled air distribution.

Large scale Vertical Farming facilities (typical > 20-25 ft tall (6-8 meter), with the purpose of making a micro controlled climate per shelf. One TBV-duct to be placed above or more likely beside the shelves so it does not sit beneath the LED light. The controlled air distribution provide a unique microclimate where the growth conditions can be controlled per individual shelf in respect to LED-light, water, fertilizer, carbon footprint and air.



To make a perfect microclimate solution per shelf a damper must be added per duct run to regulate the air distribution individually, so it fits the actual demand. It also requires a sensor (typical measuring temperature, carbon-level and relative humidity inside the shelf connected to the BMS System).

The on-line measurements regulate LED-light, water and air flow (typical between 25-100% of nominal air flow regulated by the damper).



Air flow conditions:

Requested temperature:

72F (22,4°C)

Requested humidity:

65% RH

Air flow:

20-100% of nominal (max. air flow 528.800 m³/h (311,752 CFM))

Static pressure:

12 Pa to 164 Pa depending on damper position

Expected velocity

> 0,2 m/s to prevent mildew

Total installed KE GreenDucts

3482 meter (11,416 Ft)

Duct diameter:

Ø305 (12")

Why did the customer choose KE GreenDucts?

Our US-customer chose a textile duct system from KE Fibertec because of the following reason:

- To create an optimum microclimate its essential that air is distributed uniformly per linear meter also at low air flow (down to 20-25% of nominal). Before receiving the order, KE made a full-scale test proving that the KE GreenDucts was sufficient inflated to secure the air flow even at 20% air flow.
- A gentle continuous air movement around the roots is very important to reduce stagnant air and possible growth of mold and fungus.
- Using KE GreenDucts instead of plastic ducts a tailormade air distribution pattern can be obtained. In this case all ducts are made with Inject holes pointing one-sided either to the left or to the right because the ducts are mounted on the side of the shelves. The advantage is they do not obtain space and thereby shadow for the LED light inside the shelves.
- Food and safety are very important because the risk of contamination is very big in a vertical farming facility. KE Fibertecs materials are special made at our weaving mill and the MW-40 material is clean room approved.
- The KE GreenDucts are treated with our environmentally friendly antibacterial treatment (approved according to EN/ISO 20645 and EN/ISO 20743 up to 3 washing cycles), which eliminate mold and fungi growth on the surface of the KE Greenducts.