



VERTICAL FARMING 4.0

BRANCH OF INDUSTRY

Agriculture, Pharmaceutical Industry

ITEM

Vertical Farm

JOB

Controlled Plant Production

SPECIAL TECHNICAL FEATURES

- 100% Automation
- Outstanding Scalability
- Minimal Resource Usage
- Min. 36% Higher Biomass Production

TASK

The rapid increase in the world's population, along with global trends towards urbanization and plant-based diets, leads to a growing demand for agricultural products, especially in urban areas.

In the future, these products must be produced in close proximity with minimal resource usage and space requirements. This is essential to address the challenges posed by climate change, particularly in reducing CO2 emissions.

IMPLEMENTATION

The underlying technology was developed by Fraunhofer IME. ASA Automation, one of the few licensed partners, significantly contributed to transitioning the technology into mass production.

The installation is a novel plant cultivation system that surpasses existing systems in terms of cost-efficiency, sustainability, and automation. It distinguishes itself from previous approaches through the integration of a wave-shaped conveyor belt system. Plants are fixed on this conveyor and continuously exposed to orbitotrophic (gravitational) reorientation in space with aeroponic nutrient supply. This approach constantly changes the localization of plant hormones, leading to optimized biomass production. Modular LED technology ensures optimal lighting throughout the cultivation period.

Hyperspectral image processing is used to constantly monitor and assess plant health. For example, measurement of the current water content, pigmentation, influence of fertilisers and nutrient solutions, mould or pest detection.

BENEFITS

The installation enables significantly faster, cleaner, and more efficient production of crops. It has achieved a minimum 36% increase in biomass production and an 18% reduction in cultivation duration compared to previous methods.



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