

Industrial Visit: Daikin Plant, Neemrana

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Welcome to our presentation highlighting the key aspects of our industrial visit to the Daikin Plant in Neemrana, Rajasthan. This visit provided invaluable insights into the advanced manufacturing processes, technology, and sustainability initiatives employed by a global leader in HVAC systems.



Introduction to Daikin and Neemrana Plant

Daikin Industries

Daikin Industries, a global leader in HVAC systems, was founded in 1924 in Osaka, Japan. With \$27.9 billion in revenue in Fiscal Year 2023, Daikin operates in over 160 countries, providing innovative and efficient air conditioning solutions worldwide.

Neemrana Plant

Daikin India established its operations in 2000 and expanded with the Neemrana plant in 2009, investing ₹1,000 Crores (approximately \$120 million USD). The plant serves as a key manufacturing hub with a production capacity of 1.2 million units per year.

Manufacturing Processes Observed

1 Coil Production

The automated fin stamping process operates at a rate of 120 fins per minute. The process involves copper tube bending and brazing, followed by leak testing using helium leak detectors with a sensitivity of 10^{-9} atm-cc/sec, ensuring the highest quality standards.

2 Assembly Line

The conveyor-based assembly line ensures smooth material flow. Real-time quality checks are performed at each stage to maintain a defect rate below 0.5%. Torque-controlled tools are used for precise assembly, ensuring the reliability of each unit.



Technology and Automation



Robotic Welding

Robotic welding ensures consistent weld quality and reduces labor costs, enhancing the overall efficiency of the production process.



Automated Guided Vehicles (AGVs)

AGVs are used for material handling, increasing efficiency by 30%, streamlining the movement of components within the plant.



PLC-Based Control Systems

PLC-based control systems enable precise process monitoring, ensuring each step in the manufacturing process is carefully controlled and optimized.





Quality Control and Testing

1

Performance Testing

Performance testing is conducted in environmental chambers, simulating extreme conditions from -15°C to 55°C , ensuring the units can withstand diverse climates.

2

Sound Testing

Sound testing is performed in anechoic chambers to minimize noise levels, ensuring the units operate quietly and efficiently.

3

Energy Efficiency Testing

Energy efficiency testing is conducted to meet BEE (Bureau of Energy Efficiency) star rating standards, adhering to IS 1391 standards, ensuring energy-efficient products.

Sustainability and Environmental Initiatives

Eco-Friendly Refrigerants

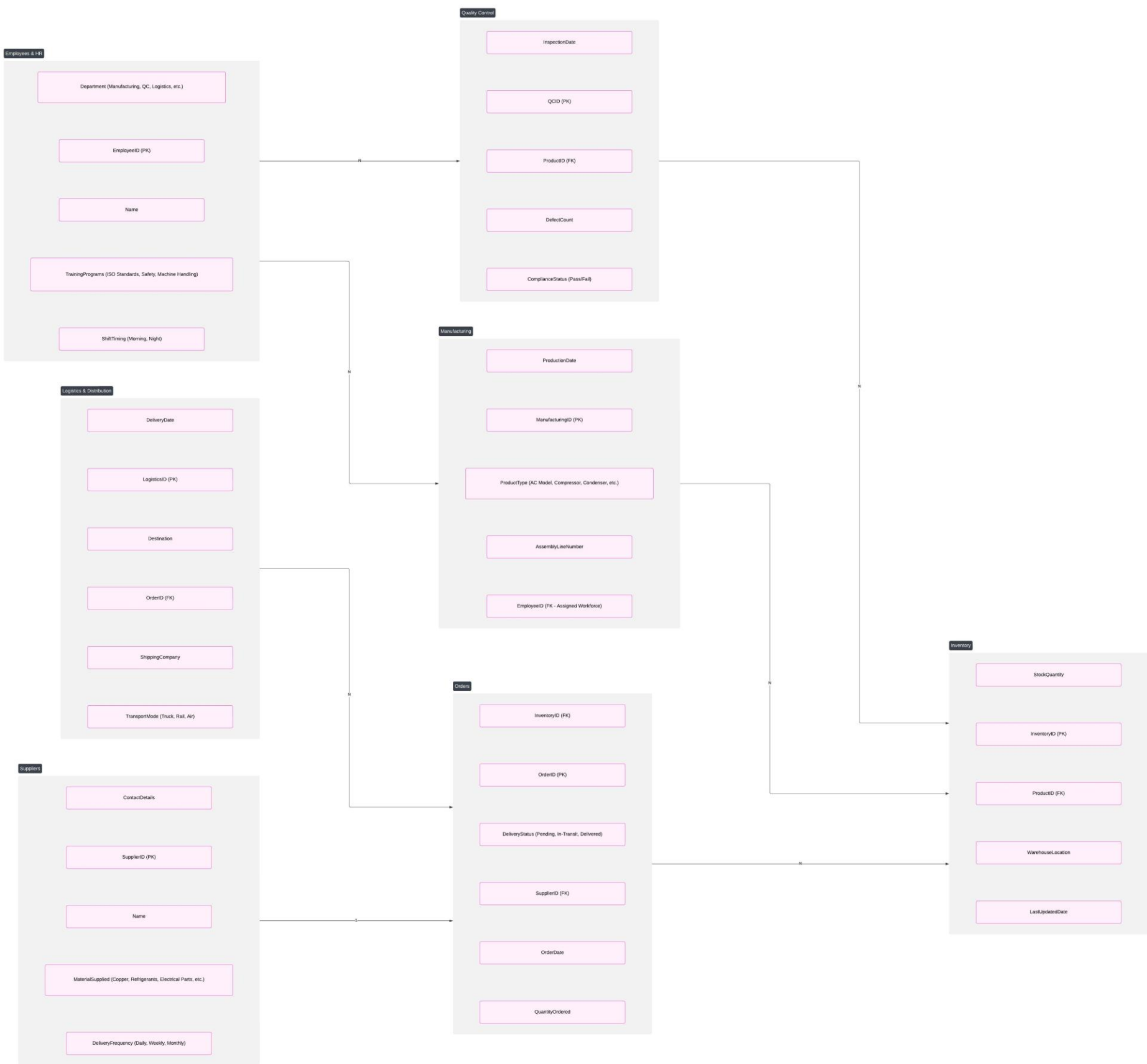
Daikin uses eco-friendly refrigerants like R-32 with a lower global warming potential (GWP) of 675 compared to R-410A (GWP of 2088), reducing environmental impact.

Solar Power Installation

The 2 MW rooftop solar power plant reduces the carbon footprint by 2,000 tons of CO2 annually, showcasing a commitment to renewable energy.

Water and Waste Management

Implementing a zero-liquid discharge system, recycling 95% of water used in manufacturing, and recycling 90% of waste generated in the plant promotes resource conservation.





Key Learnings and Observations

1

Automation and Technology

The importance of automation and technology in modern manufacturing was clearly demonstrated through the advanced processes observed at the Daikin plant.

2

Quality Control

The significance of quality control and testing in ensuring product reliability was evident in the rigorous testing procedures implemented throughout the manufacturing process.

3

Sustainability

Daikin's commitment to sustainability and environmental responsibility was highlighted through the various initiatives aimed at reducing their carbon footprint.

4

Practical Exposure

The visit provided practical exposure to real-world manufacturing processes, offering invaluable insights into the workings of a leading HVAC systems manufacturer.

Conclusion and Acknowledgements

The industrial visit to the Daikin Plant in Neemrana was an enriching experience, providing valuable insights into advanced manufacturing processes, technology, and sustainability initiatives. We extend our sincere gratitude to Daikin India for providing this opportunity and to the faculty and staff who organized the visit.

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