

23ME702

:REFRIGERATION AND AIR CONDITIONING

UNIT -2

Production of low temperature

Mrs. G Anitha

Assistant Professor, Mechanical and Engineering
Narsimha Reddy Engineering College (Autonomous)
Secunderabad, Telangana, India- 500100.



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UGC AUTONOMOUS INSTITUTION

Maisammaguda (V), Kompally - 500100, Secunderabad, Telangana State, India

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- **Introduction**
- **What is Low Temperature Production?**
- Low temperature production is the process of reducing and maintaining temperature below the surrounding atmosphere.
- It is the basic principle of refrigeration.
- Used for food preservation, air conditioning, medical storage, and industrial applications.

- **Need for Low Temperature**
- **Importance of Low Temperature**
- Preservation of food and beverages
- Storage of medicines and vaccines
- Comfort air conditioning
- Industrial cooling processes

- **Methods of Producing Low Temperature**
- **Common Methods**
- Ice Refrigeration
- Evaporative Cooling
- Expansion of Gases
- Refrigeration Cycles
- Liquefaction of Gases
- These methods remove heat from a substance or space to lower its temperature.

Cooling by Ice

- **Ice Refrigeration**
- One of the oldest cooling methods.
- Ice absorbs heat while melting.
- The latent heat of fusion produces cooling.
- Used in ice boxes and temporary cooling applicatio

- **Evaporative Cooling**
- **Cooling by Evaporation**
- When a liquid evaporates, it absorbs heat from surroundings.
- This causes a reduction in temperature.
- Examples:
 - Water coolers
 - Desert coolers
 - Sweating in humans
- **Principle:** Latent heat of vaporization.

- **Cooling by Expansion of Gas**
- **Expansion Cooling**
- When compressed gas expands, its temperature decreases.
- Used in air refrigeration systems.
- Based on:
 - Joule-Thomson Effect
 - Adiabatic Expansion
- **Applications:** Aircraft refrigeration and gas liquefaction.
- decreases.

Refrigeration Cycles

Artificial Refrigeration Methods

Vapour Compression System

Most commonly used.

High efficiency.

Vapour Absorption System

Uses heat energy instead of mechanical work.

Air Refrigeration System

Uses air as refrigerant.

These systems produce temperatures much lower than ambient conditions.



Thank You..