



SHEET METAL & AIR CONDITIONING
CONTRACTORS' NATIONAL ASSOCIATION

Sheet Metal and the HVAC Industry

December 7, 2023





Objectives

- ❑ Basics of HVAC Systems
- ❑ SMACNA Member Market Sectors
- ❑ Technical Collaborations & SMACNA Technical Resources



Basics of HVAC Systems

The purpose of an HVAC system is to provide a suitable thermal environment in a defined space that meets the needs of the occupants and the activity that takes place in the space.

- Residential
- Commercial
- Institutional



Basics of HVAC Systems

Air Conditioning Unit – An assembly of equipment for the treatment of air so as to control its temperature, humidity, cleanliness and distribution to meet the requirements of a conditioned space

Air Diffuser – Circular, square, linear or rectangular air distribution outlet typically located in the ceiling

Economizer – System of dampers, temperature and humidity sensors, and actuators which maximizes the use of outdoor air for cooling



Basics of HVAC Systems

Duct – A passageway made of sheet metal or other suitable material used for conveying air or other gas at various pressures

Humidifier – A device that adds moisture to the air

Plenum – An air compartment connected to one or more distributing ducts

Gage – Duct thickness (16ga, 18ga, 20ga, 22ga, 24ga, 26ga)

Pressure Class – ½", 1", 2", 3", 4", 6", 10" WG (residential/commercial)



Basics of HVAC Systems

How do we establish the control for temperature, humidity, air movement, air quality?

- Thermal Comfort (ASHRAE Standard 55)
- Ventilation (ASHRAE Standard 62.1 & 62.2)
- 80% Occupant Acceptance



Basics of HVAC Systems

Basic HVAC System Components

- Air Cleaner/Filtration
- Thermal Conditioner
- Air Mover
- Air Distribution System



Basics of HVAC Systems

Air Cleaners/Filtration

- High Efficiency Particulate Air Filters (MERV Rating 13)
- Ultraviolet Germicidal Irradiation (UVGI)
- Gas Phase Air Filtration (sorbent activated carbon)



Basics of HVAC Systems

Thermal Conditioner

- Direct Expansion (DX) Cooling
- Steam Heat
- Hot Water
- Chilled Water
- Swamp Coolers
- Electric Heat
- Oil fired



Basics of HVAC Systems

Air Mover

- Fans (centrifugal, vane axial, propeller)
- Pumps (typically for radiation type systems)



Basics of HVAC Systems

Air Distribution System (Material Types)

- Sheet Metal
- Fibrous Glass
- PVC
- FRP
- Phenolic
- Fabric



HVAC System Types

- Split Systems/Heat pumps
- Single Zone AHUs
- Variable Air Volume (VAV)
- Multizone HVAC Systems
- Dual Duct Systems
- Unitary/Packaged HVAC Systems
- Built-up AHUs
- Dedicated OA Systems
- Variable Refrigerant Flow Systems
- Chilled Beams



SMACNA Market Sectors

- Residential
- Commercial
- Industrial
- TAB
- Specialty
- Architectural



SMACNA Technical Collaborations

- ASHRAE (Technical Committees & Research)
- ICC, NFPA & IAPMO (Code Interaction)
- American Welding Society (AWS) Sheet Metal Welding Code
- American Institute of Architects (AIA)
- Construction Specifiers Institute (CSI)
- Rainscreen Assoc. North America (RAiNA)



Questions?