



# Technical Committees – the Brains of ASHRAE

## Section 1.0 — Fundamentals and General

### 1.1 Thermodynamics & Psychrometrics

- Basic thermodynamic laws
  - Property relationships
  - Transport relationships

#### Recent Activities

Handbook F-1, F2.1

#### Membership

Voting	6	Corresponding	41	YEA	8
		Normal Attendance	23		





# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.2 Instruments and Measurements

- Principles of instrumentation
- Concepts and techniques of basic measurements

#### Recent Activities

Handbook	F-36
Research	1245-RP
	1636-RTAR

#### Membership

Voting	5	Corresponding	10	YEA	5
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# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.3 Heat Transfer and Fluid Flow

- Fundamental principles of the transport
  - Energy
  - Mass
  - Momentum

#### Recent Activities

Handbook	F-3, F-4, F-5 F-6, F-33
Research	1556-RP 1683-RTAR 1704-RTAR

#### Membership

Voting	13	Corresponding	56	YEA	16
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## Section 1.0 – Fundamentals and General

### 1.4 Control Theory and Application

- Control theory, systems, and components
  - Excluding refrigerant flow controls

#### Recent Activities

Handbook	A-47, F-07
Research	1455-RP
	1597-RP
	1633-RP
	1639-RTAR
	1711-RP

#### Membership

Voting	10	Corresponding	69	<b>YEA</b>	<b>4</b>
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# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.5 Computer Applications

- Computer applications for
  - Design/optimization of HVAC systems
  - Equipment and Components

#### Recent Activities

Handbook	A-40
Research	1468-RP

#### Membership

Voting	8	Corresponding	1	YEA	2
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# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.6 Terminology

- Used in HVAC&R
  - Terminology, nomenclature, definitions,
  - abbreviations, symbols and units

#### Recent Activities

Handbook	F-37, F-38
Terminology	Online

#### Membership

Voting	0	Corresponding	0	YEA	0
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# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.7 Business, Management & General Legal Education

- HVAC&R
  - Business, management
  - General legal matters

#### Recent Activities

#### Membership

Voting 11 Corresponding 45 **YEA** 2





# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.8 Mechanical Systems Insulation

- Application and performance of
  - Thermal and acoustical insulation systems
  - Pipes, tanks, equipment and ducts.

#### Recent Activities

Handbook	F-23
Research	1550-RP
	1646-RP
	1703-RTAR

#### Membership

Voting	8	Corresponding	13	YEA	0
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# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.9 Electrical Systems

- Electrical systems for HVAC&R

#### Recent Activities

Handbook A-56

#### Membership

Voting 6 Corresponding 36 YEA 2





# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.10 Cogeneration Systems

- Cogeneration systems
  - Cycles, and components
  - Heat recovery, energy conversion, system integration

#### Recent Activities

Handbook	S-7, S-8
Research	1592-RP

#### Membership

Voting	8	Corresponding	67	YEA	4
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# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.11 Electric Motors and Motor Control

- Electric motors (including hermetic) used in HVAC&R

#### Recent Activities

Handbook S-45

#### Membership

Voting 9 Corresponding 2 YEA 5





# Technical Committees – the Brains of ASHRAE

## Section 1.0 – Fundamentals and General

### 1.12 Moisture Management in Buildings

- Interaction between the weather, the building envelope, its systems and its occupants
  - Cross-cutting research
  - Collect and distribute information

#### Recent Activities

#### Membership

Voting 13 Corresponding 41 **YEA** 4







# Technical Committees – the Brains of ASHRAE

## Section 1.0 — Fundamentals and General

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### TG1 Optimization

- Optimization techniques for HVAC&R
  - Identifying, developing, disseminating
  - Components, systems and building systems
  - Fundamentals

#### Recent Activities

#### Membership

Voting 5 Corresponding 17 **YEA** 0





# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

### 2.1 Physiology and Human Environment

- Man's living environment, as altered by HVAC
  - Comfort
  - Health
  - Productivity

#### Recent Activities

Handbook	F-9, F-12
Research	1504-RP
	1515-RP
	1624-TRP

#### Membership

Voting	11	Corresponding	65	YEA	6
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# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

### 2.2 Plant and Animal Environment

- HVAC is not just for people!
- Growth
- Health
- Reproduction

#### Recent Activities

Handbook	A-24, A-25
Research	1475-RP

#### Membership

Voting	7	Corresponding	32	YEA	1
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# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

### 2.3 Gaseous Air Contaminants and Gas Contaminant Removal Equipment

- We filter the best from the rest!
  - Air Purification
  - Contaminant Properties
  - Air Filtration Energy Use

#### Recent Activities

Handbook	A-46, F-11
Research	1457-RP
	1625-RTAR
	1720-RTAR
	1579-WS

#### Membership

Voting	13	Corresponding	64	<b>YEA</b>	<b>6</b>
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# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

### 2.4 Particulate Air Contaminants and Particulate Contaminant Removal Equipment

- Breathe easy, filter the indoor air
  - Reduce occupant exposure
  - Removal, properties, effectiveness, energy use
  - Effects on living things

#### Recent Activities

Handbook	F-11, S-29
Research	1626-RTAR
	1691-URP
	1649-WS
	1734-RTAR
	1735-RTAR

#### Membership

Voting	18	Corresponding	82	YEA	7
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## Section 2.0 – Environmental Quality

### 2.5 Global Climate Change

- Impact of HVAC&R activities
  - Global environment
  - Climate change
  - Ozone depletion

#### Recent Activities

#### Membership

Voting 6 Corresponding 35 **YEA** 7





# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

### 2.6 Sound and Vibration Control

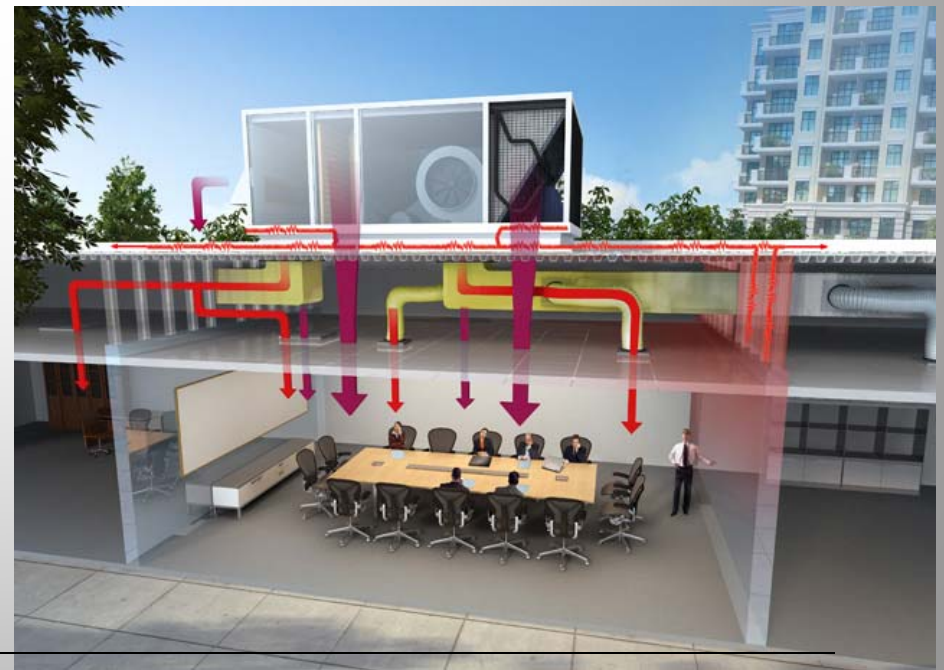
- Acoustics and Vibration Associated with HVAC&R Systems
  - Design & build quiet/vibration-free buildings
  - Define acceptable noise criteria
  - Develop measurement, prediction, rating, & control methods

#### Recent Activities

Handbook	A-48, F-8
Research	1408-RP
	1529-RP
	1707-RTAR
	1560-RTAR

#### Membership

Voting 17 Corresponding 75 YEA 14





# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

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### 2.7 Seismic and Wind Resistant Design

- Methods for survival of extreme events
  - HVACR equipment
  - Building mechanical/electrical service systems

#### Recent Activities

Handbook                      A-55

#### Membership

Voting    11    Corresponding    64    **YEA**    3







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## Section 2.0 – Environmental Quality

### 2.8 Building Environmental Impacts and Sustainability

- Impacts of buildings
  - Local, regional and global environment
  - Identifying and reducing these impacts
  - Enhancing ASHRAE member awareness

#### Recent Activities

Handbook	F-34, F-35
Research	1627-WS

#### Membership

Voting	12	Corresponding	74	YEA	5
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# Technical Committees – the Brains of ASHRAE

## Section 2.0 – Environmental Quality

### 2.9 Ultraviolet Air and Surface Treatment

- Equipment and systems that utilize ultraviolet radiation
  - Destroy or deactivate chemical and/or biological air and surface contaminants

#### Recent Activities

Handbook A-60, S-17  
Research 1509-RP  
1652, 1653-RTAR  
1669-RTAR  
1685-RTAR  
1724-WS  
1725-RTAR

#### Membership

Voting 10 Corresponding 49 **YEA** 4





# Technical Committees – the Brains of ASHRAE

## Section 2.0 — Environmental Quality

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### TG2 HVAC Heating Ventilation and Air-Conditioning Security

- Fundamental design principles
  - Cycles, and components
  - Vulnerability and resilience of HVAC&R systems subjected to extraordinary events

#### Recent Activities

Handbook                      A-59

#### Membership

Voting            8   Corresponding            37   **YEA**    0





# Technical Committees – the Brains of ASHRAE

## Section 3.0 — Materials and Processes

### 3.1 Refrigerants & Secondary Coolants

- Properties and functions of commercial and experimental materials
  - Refrigerants
  - Secondary coolants

#### Recent Activities

Handbook	F-29, F-30, F-31
Research	1507-RP
	1584-RP
	1717-RTAR

#### Membership

Voting	10	Corresponding	46	YEA	3
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# Technical Committees – the Brains of ASHRAE

## Section 3.0 – Materials and Processes

### 3.2 Refrigerant System Chemistry

- Chemical reactions inside refrigerant systems
- Effects of temperature, pressure and materials on reaction rates

#### Recent Activities

Handbook	R-6
Research	1410-RP
	1665-RP

#### Membership

Voting	10	Corresponding	45	YEA	2
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# Technical Committees – the Brains of ASHRAE

## Section 3.0 — Materials and Processes

### 3.3 Refrigerant Contaminant Control

- Sources, generation, and control
  - Water and other contaminants
  - Recovering, recycling, and reclaiming refrigerants

#### Recent Activities

Handbook	R-7
Research	1641-TRP

#### Membership

Voting	12	Corresponding	47	<b>YEA</b>	<b>2</b>
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# Technical Committees – the Brains of ASHRAE

## Section 3.0 — Materials and Processes

### 3.4 Lubrication

- Functions and interactions of lubrication
  - Physical and thermodynamic properties of refrigerant-lubricant systems

#### Recent Activities

Handbook	R-12
Research	1628-RTAR

#### Membership

Voting	10	Corresponding	25	YEA	5
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# Technical Committees – the Brains of ASHRAE

## Section 3.0 — Materials and Processes

### 3.6 Water Treatment

- Water treatment for building water systems
  - Scale, corrosion and microbiological control
  - Impacts of water treatment

#### Recent Activities

Handbook A-49

#### Membership

Voting 16 Corresponding 29 YEA 2







# Technical Committees – the Brains of ASHRAE

## Section 3.0 — Materials and Processes

### 3.8 Refrigerant Containment

- Methods of construction and service practices
  - Tight refrigeration systems
  - Storing and handling refrigerants
  - Evacuation, leak detection, emissions

#### Recent Activities

Handbook R-9

#### Membership

Voting 6 Corresponding 17 YEA 0





# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.1 Load Calculation Data and Procedures

- Identification and compilation
  - Engineering data
  - Procedures for calculating HVAC load

#### Recent Activities

Handbook	F-17, F-18
Research	1616-RP
	1681-TRP

#### Membership

Voting	8	Corresponding	21	YEA	4
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# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.2 Climatic Information

- Identification, analysis and tabulation of climatic data
- Analysis and design of HVAC systems

#### Recent Activities

Handbook F-14  
Research 1413-RP, 1561-RP  
1610-WS  
1613-RP  
1699-TRP  
1700-RTAR

#### Membership

Voting 11 Corresponding 28 YEA 2





# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.3 Ventilation Requirements and Infiltration

- Ventilation requirements, infiltration analysis
  - Airflow around buildings
  - Exhaust, exhaust re-entry and interactions

#### Recent Activities

Handbook A-45, F-16, F-24  
Research 1478-RP  
1635-TRP  
1450-RP

#### Membership

Voting 9 Corresponding 63 **YEA 2**







# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.4 Building Materials and Building Envelope Performance

- Requirements/performance of envelope
  - Properties of materials, transport properties
  - Interactions with interior

#### Recent Activities

Handbook	A-44, F-25 F-26, F-27
Research	1670-RTAR 1696-RTAR 1718-RTAR

#### Membership

Voting	13	Corresponding	106	<b>YEA</b>	<b>4</b>
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# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.5 Fenestration

- Identification and evaluation
  - Physical properties
  - Glazing, shading
  - Control devices

#### Recent Activities

Handbook F-15  
Research 1414-WS  
1415-RP  
1710-RTAR

#### Membership

Voting 6 Corresponding 50 **YEA** 1





# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.7 Energy Calculations

- Calculating building energy performance
  - Identifying, evaluating, developing
  - Recommending procedures

#### Recent Activities

Handbook	F-19
Research	1404-RP
	1588-RP
	1661-RTAR
	1676-RTAR

#### Membership

Voting	11	Corresponding	2	YEA	11
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# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

### 4.10 Indoor Environmental Modeling

- Procedures for indoor conditions
  - Developing
  - Evaluating
  - Recommending

#### Recent Activities

Handbook	F-13
Research	1458-RP
	1512-RP
	1675-RTAR

#### Membership

Voting	12	Corresponding	117	YEA	8
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# Technical Committees – the Brains of ASHRAE

## Section 4.0 Load Calculations and Energy Requirements

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### TRG4 Indoor Air Quality Procedure Development

- Developing specific guidance
  - Users applying the IAQP method
  - Defined by ASHRAE Standard 62.1

#### Recent Activities

#### Membership

Voting 12 Corresponding 4 **YEA** 0





# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.1 Fans

- Selection, application and testing-for-rating
  - Recommended installation practices
  - Field test procedures

#### Recent Activities

Handbook	S-21
Research	1420-RP

#### Membership

Voting	13	Corresponding	41	YEA	3
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# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.2 Duct Design

- HVAC Duct System Design And Performance
- Air and Other gases
- Characteristics
- Construction of all types

#### Recent Activities

Handbook	F-21, S-19
Research	1180-RP
	1606-RP
	1682-TRP

#### Membership

Voting	5	Corresponding	10	YEA	5
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# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.3 Room Air Distribution

- Distribution
  - Diffusion
  - Conditioning of air within rooms and similarly treated spaces

#### Recent Activities

Handbook A-57, F-20, S-20  
Research 1546-RP  
1629-RP  
1666-RTAR

#### Membership

Voting 16 Corresponding 33 **YEA 8**







# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.4 Industrial Process Air Cleaning (Air Pollution Control)

- Industrial processes and operations
  - Removal of particulate matter
  - Gaseous emissions

#### Recent Activities

Handbook	S-30
Research	1284-RP
	1623-RTAR

#### Membership

Voting	9	Corresponding	34	YEA	3
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# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

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### 5.5 Air-to-Air Energy Recovery

- Air-to-air heat exchangers
  - Application
  - Cost benefit relationship

#### Recent Activities

Handbook S-26

#### Membership

Voting 9 Corresponding 62 YEA 7





# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.6 Control of Fire and Smoke

- Design and application
  - Systems and components
  - Protection of life and property

#### Recent Activities

Handbook	A-53
Research	1447-RP
	1600-RP
	1644-RTAR

#### Membership

Voting	11	Corresponding	68	<b>YEA</b>	<b>4</b>
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# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.7 Evaporative Cooling

- Contact type heat transfer surfaces and equipment
  - Evaporative air-cooling
  - Residential, commercial and industrial

#### Recent Activities

Handbook A-52, S-41

#### Membership

Voting 7 Corresponding 50 **YEA** 2







# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.8 Industrial Ventilation

- Industrial environment for in-plant personnel
  - Processes
  - Equipment; air cleaning, heating, cooling, exhaust

#### Recent Activities

Handbook                      A-31, A-32, S28

#### Membership

Voting            8    Corresponding            36    **YEA**    1





# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.9 Enclosed Vehicular Facilities

- Technology and design requirements
  - Enclosed transportation facilities
  - Subways, tunnels, bus terminals, parking garages

#### Recent Activities

Handbook	A-15
Research	1690-RTAR
	1715-RTAR

#### Membership

Voting	10	Corresponding	70	YEA	5
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# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.10 Kitchen Ventilation

- Code compliant Commercial kitchens
  - Design, construction, installation
  - Commissioning
  - Sustainable operation

#### Recent Activities

Handbook	A-33
Research	1614-WS
	1631-RP
	1664-RTAR

#### Membership

Voting	7	Corresponding	15	YEA	4
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# Technical Committees – the Brains of ASHRAE

## Section 5.0 Ventilation and Air Distribution

### 5.11 Humidifying Equipment

- Raising humidity in residential & commercial spaces
  - Application and control, structural effect
  - Testing, physiological requirements

#### Recent Activities

Handbook	S-22
Research	1630-TRP

#### Membership

Voting	6	Corresponding	19	YEA	5
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# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.1 Hydronic and Steam Equipment and Systems

- Hydronic and steam systems
  - Boilers, chillers, terminal units, accessories, controls, integrated design

#### Recent Activities

**Handbook** F-22, S-13, S-14  
S-15, S28, S32  
S-36, S-44, S-46  
S-47, S-48

**Research** 1196-RP  
1695-RTAR

#### Membership

Voting 10 Corresponding 70 **YEA** 7





# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.2 District Energy

- Central plant integrated systems
  - Thermal energy or thermal energy and electric power to more than one structure
  - Heating, cooling, or combined thermal energy and power

#### Recent Activities

Handbook S-12

#### Membership

Voting 11 Corresponding 0 YEA 4





# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.3 Central Forced Air Heating and Cooling Systems

- central forced air systems
  - Comfort
  - Residential
  - light commercial

#### Recent Activities

Handbook S-10, S-33  
Research

#### Membership

Voting 13 Corresponding 0 YEA 2





# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.5 Radiant Heating and Cooling

- sensible radiant systems
  - space heating
  - cooling

#### Recent Activities

Handbook	A-51, A-54
	S-6, S-16, S-34
Research	1383-RP

#### Membership

Voting	12	Corresponding	80	YEA	9
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# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.6 Service Water Heating Systems

- Service hot water
  - Requirements
  - Design for heating and distributing

#### Recent Activities

Handbook	A-50
Research	1544-RP
	1640-WS

#### Membership

Voting	11	Corresponding	59	YEA	9
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# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.7 Solar Energy Utilization

- Equipment, processes and systems
  - Collect, convert, store and utilize solar energy
  - Dissipate energy by nocturnal radiation

#### Recent Activities

Handbook A-35, S-37

#### Membership

Voting 8 Corresponding 59 **YEA** 4





# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.8 Geothermal Heat Pump and Energy Recovery Applications

- Design and application of equipment & systems for heating & cooling
- Collect, store and utilize geothermal energy/fluids

#### Recent Activities

Handbook	A-34, S-9
Research	1385-RP
	1498-WS
	1674-RP
	1680-RTAR

#### Membership

Voting	15	Corresponding	86	<b>YEA</b>	<b>9</b>
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# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.9 Thermal Storage

- Storage of thermal energy
  - Heating and/or cooling
  - Charging or discharging at a controllable rate

#### Recent Activities

Handbook	S-51
Research	1576-WS
	1607-WS
	1719-RTAR

#### Membership

Voting	13	Corresponding	57	YEA	8
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# Technical Committees – the Brains of ASHRAE

## Section 6.0 Heating Equipment, Heating and Cooling Systems and Applications

### 6.10 Fuels and Combustion

- Properties and characteristics
  - Conventional, alternative and waste product fuels
  - Utilization for heating, refrigeration and air conditioning

#### Recent Activities

Handbook	F-28, S-31, S-35
Research	1517-RP

#### Membership

Voting	6	Corresponding	49	YEA	3
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# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.1 Integrated Building Design

- Facilitating interaction
  - All building disciplines
  - Concept development through lifecycle

#### Recent Activities

Handbook A-58

#### Membership

Voting 11 Corresponding 55 YEA 7





# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

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### 7.2 HVAC&R Construction & Design Build Technologies

- Enhancing collaboration
- Contractors and Design Build Firms
- ASHRAE membership

#### Recent Activities

#### Membership

Voting 10 Corresponding 20 **YEA 3**





# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.3 Operation/Maintenance Mgt

- Improving building operation and maintenance
  - Operation
  - Maintenance
  - Commissioning

#### Recent Activities

Handbook	A-39
Research	1609-TRP
	1650-RTAR

#### Membership

Voting	10	Corresponding	61	YEA	7
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# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.4 Exergy Analysis/Sustainable Buildings

- Do you want to see the unseen?
  - Exergy aspects of energy and power utilization of systems
  - Impact, analysis, solutions

#### Recent Activities

Voting      7      **Membership**      Corresponding      19      **YEA**      0





# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.5 Smart Building Systems

- Technologies enabling smart building design/operations
  - Control, operation, strategies
  - Optimization, documentation

#### Recent Activities

Handbook	A-42
Research	1615-WS
	1671-WS
	1697-RTAR

#### Membership

Voting 11 Corresponding 21 **YEA 19**





# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.6 Building Energy Performance

- Making a difference from a People, Planet, Profit Perspective
  - Estimation, measurement, analysis
  - Benchmarking, and management

#### Recent Activities

Handbook	A-36, A-41
Research	1702-RTAR

#### Membership

Voting	10	Corresponding	104	YEA	24
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# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.7 Testing and Balancing

- Procedures for air conditioning systems
  - Field testing
  - Balancing
  - Adjusting

#### Recent Activities

Handbook                      A-38

#### Membership

Voting    12    Corresponding    14    **YEA**    2







# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

### 7.8 Owning and Operating Costs

- Owning and operating costs
  - HVAC&R
  - Economic analysis techniques

#### Recent Activities

Handbook                      A-37

Research

APPA/ASHRAE URP 1590

<http://xp20.ashrae.org/publicdatabase/>

ASHRAE Research 1237 - TRP

#### Membership

Voting      7   Corresponding      44   **YEA**      5





# Technical Committees – the Brains of ASHRAE

## Section 7 – Building Performance

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### 7.9 Building Commissioning

- Building Commissioning ensures that buildings work!
- Commissioning and conformance
- Design intent, project requirements

#### Recent Activities

Handbook                      A-43

#### Membership

Voting    12    Corresponding    139    **YEA**    **9**





# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.1 Positive Displacement Compressors

- Use with refrigerants
  - Design, performance, features
  - Operating characteristics

#### Recent Activities

Handbook R-8, S-38, S-43

#### Membership

Voting 13 Corresponding 22 **YEA** 4







# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.2 Centrifugal Machines

- Packaged equipment
  - Centrifugal compressors
  - Heat exchangers, drivers, controls, accessories and refrigerating applications

#### Recent Activities

Handbook S-38, S-43

#### Membership

Voting 9 Corresponding 40 YEA 7







# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.3 Absorption and Heat Operated Machines

- Design, performance and application
  - Energized by heat source
  - Using thermodynamic cycle for heating or cooling

#### Recent Activities

Handbook	F-2, R-18
Research	1716-RTAR
	1462-RP
	1638-RTAR
	1662-RTAR

#### Membership

Voting	8	Corresponding	43	<b>YEA</b>	<b>3</b>
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# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.4 Air-to-Refrigerant Heat Transfer Equipment

- Design, performance, and application
  - Refrigerant, including water or brine, is used to transfer heat with air

#### Recent Activities

Handbook	R-14, S-23
	S-27, S-39
Research	1535-RP
	1564-RP
	1645-TRP
	1705-WS

#### Membership

Voting	9	Corresponding	70	YEA	15
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# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

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### 8.5 Liquid-to-Refrigerant Heat Exchangers

- Thermal/mechanical design, performance, & application
- Devices for accomplishing heat transfer between refrigerants and liquids

#### Recent Activities

Handbook	S-39, S-42
Research	1677-TRP

#### Membership

Voting	12	Corresponding	37	YEA	10
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# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.6 Cooling Towers and Evaporative Condensers

- Contact type liquid to air exchangers
  - Cooling towers, evaporative liquid coolers and condensers, spray ponds
  - Applications

#### Recent Activities

Handbook S-39, S-40

#### Membership

Voting 9 Corresponding 2 YEA 1







# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

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### 8.7 Variable Refrigerant Flow

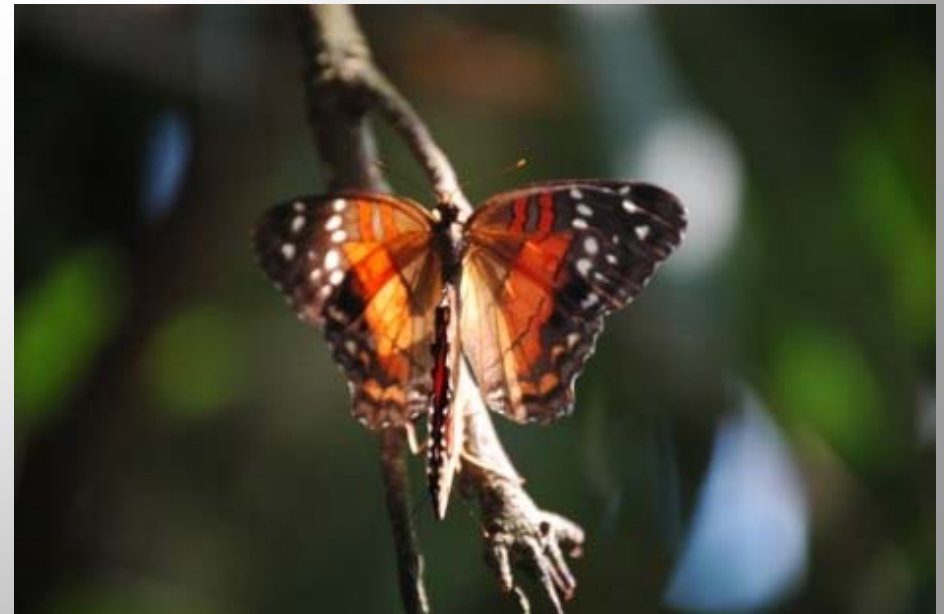
- Design, performance, and application
- Systems for commercial HVAC

#### Recent Activities

Handbook S-18

#### Membership

Voting 11 Corresponding 47 YEA 7





# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.8 Refrigerant System Controls and Accessories

- Refrigerant flow controls and other refrigerant control devices
- Relief devices, check valves, condenser water regulators and oil separators

#### Recent Activities

Handbook R-11

#### Membership

Voting 6 Corresponding 20 YEA 4





# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.9 Residential Refrigerators and Food Freezers

- Refrigerators and food freezers
- Intended for use in the home

#### Recent Activities

Handbook R-17

#### Membership

Voting 6 Corresponding 20 YEA 3





# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.10 Mechanical Dehumidification Equipment and Heat Pipes

- Design, performance, features, applications
  - Mechanical dehumidification equipment
  - Heat pipes

#### Recent Activities

Handbook	S-25
Research	1566-WS
	1712-TRP

#### Membership

Voting	9	Corresponding	33	YEA	3
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# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

### 8.11 Unitary and Room Air Conditioners and Heat Pumps

- Comfort cooling and/or heating systems
  - Unitary, room air, packaged terminal

#### Recent Activities

Handbook	A-1, S-49, S-50
Research	1581-RP
	1608-RP
	1642-WS
	1721-RTAR

#### Membership

Voting 10 Corresponding 62 **YEA** 16





# Technical Committees – the Brains of ASHRAE

## Section 8 – Air-Conditioning and Refrigeration System Components

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### 8.12 Desiccant Dehumidification Equipment & Components

- Equipment, performance, applications
  - Solid & liquid desiccant dehumidification
  - Load calculations, commissioning
  - Operation, and maintenance

#### Recent Activities

Handbook F-32, S-24

#### Membership

Voting 9 Corresponding 1 YEA 5





# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.1 Large Building Air-Conditioning Systems

- General design concepts of HVAC systems
  - Conditioning of large buildings
  - System integration

#### Recent Activities

Handbook	S-1, S-2, S-3 S-4, S-5
Research	1684-RTAR

#### Membership

Voting	12	Corresponding	23	YEA	8
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# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.2 Industrial Air Conditioning

- Aggressively protecting America's industrial workforce!
- Reduce hazardous workplace exposures,
- Industrial HVAC equipment design guides and standards
- Printing plants, textile plants, waste disposal plants, underground mines, etc

#### Recent Activities

Handbook            A-14, A-17, A-20  
                              A-21, A-22, A-26  
                              A-27, A-28, A-29  
                              A-30

#### Membership

Voting    12    Corresponding    23    **YEA**    2







# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.3 Transportation Air Conditioning

- Technical information
  - Applications
  - Aerospace, rail, surface vehicles, and ships

#### Recent Activities

Handbook	A-10, A-11
	A-12, A-13
Research	1262-RP
	1306-RP
	1603-TRP

#### Membership

Voting	16	Corresponding	22	YEA	0
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# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.4 Justice Facilities

- Application
  - Heating, ventilation, air conditioning, refrigeration
  - Life safety, energy conservation systems, privacy and security

#### Recent Activities

Handbook                      A-9

#### Membership

Voting            8    Corresponding            24    **YEA**            1





# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.6 Healthcare Facilities

- Application
  - Ventilating, air conditioning, refrigeration, life safety, and energy conservation
  - Hospital, outpatient, long-term care

#### Recent Activities

Handbook	A-8
Research	1397-RP
	1618-RTAR

#### Membership

Voting	18	Corresponding	110	YEA	16
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# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.7 Educational Facilities

- Application
  - Ventilating, air conditioning, refrigeration, life safety and energy conservation
  - Secondary schools, college

#### Recent Activities

Handbook                      A-7

#### Membership

Voting    10    Corresponding    22    YEA    0







# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

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### 9.8 Large Building Air-Conditioning Applications

- Application
  - HVAC&R, humidity control
  - Energy conservation

#### Recent Activities

Handbook                      A-2, A-3, A-5  
  A-6, A-23

#### Membership

Voting    15    Corresponding    25    **YEA**    **8**





# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.9 Mission Critical Facilities, Data Centers, Technology Spaces and Electronic Equipment

- Engineering Leadership in Technology / Data Centers
- Mission critical facilities, technology spaces

#### Recent Activities

Handbook	A-19
Research	1499-RP

#### Membership

Voting	14	Corresponding	241	YEA	24
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# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

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### 9.10 Laboratory Systems

- HVAC components for laboratory systems and their use

#### Recent Activities

Handbook	A-16
Research	1573-RTAR

#### Membership

Voting	17	Corresponding	79	YEA	10
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# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.11 Clean Spaces

- Air conditioning systems for cleanrooms, clean medical areas and spaces
  - Process, product, air conditioning, related process ventilation for R & D, manufacturing, assembly, test

#### Recent Activities

Handbook	A-18
Research	1399-TRP-R 1604-RP

#### Membership

Voting	13	Corresponding	119	YEA	4
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# Technical Committees – the Brains of ASHRAE

## Section 9 – Building Applications

### 9.12 Tall Buildings

- Buildings higher than 300 feet
  - Function, operation, energy
  - Human safety

#### Recent Activities

Handbook	A-4
Research	1673-TRP

#### Membership

Voting	12	Corresponding	20	YEA	2
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# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.1 Custom Engineered Systems

- All custom designed and fabricated refrigeration systems
- Food processing, pharmaceuticals, process cooling, cryogenics & more

#### Recent Activities

**Handbook** R-4, R-5, R-13  
R-45, R-46, R-47  
R-48, R-49, R-50

**Research** 1514-WS  
1602-RP  
1634-TRP

#### Membership

Voting 9 Corresponding 51 **YEA** 4





# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.2 Ice Plants/Ice Rinks

- Systems for ice cubes & ice rinks
  - Hockey, skating, curling, speed skating
  - All applications where ice is made

#### Recent Activities

Handbook	R-43, R-44
Research	1727-RTAR

#### Membership

Voting	4	Corresponding	17	YEA	1
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# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.3 Refrigerant Piping

- Covering all refrigerant piping
  - Natural & halocarbon refrigerants
  - Piping & insulation systems
  - Safety and Corrosion

#### Recent Activities

Handbook	R-1, R-2
	R-3, R-10
Research	1327-RP
	1513-WS
	1569-TRP

#### Membership

Voting	9	Corresponding	34	YEA	1
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# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.5 Refrigerated Distribution and Storage Facilities

- Food and Pharma to the world
  - Processing, chilling and freezing food
  - Large refrigerated storage facilities
  - Walk-in cooler & freezers

#### Recent Activities

##### Handbook

- R-19, R-20, R-22
- R-23, R-28, R-29
- R-30, R-31, R-32
- R-33, R-34, R-35
- R-36, R-37, R-38
- R-39, R-40, R-41, R-42
- 1434-WS

##### Research

##### Membership

Voting 6 Corresponding 45 **YEA** 4





# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.6 Transport Refrigeration

- Significant access to Transport Refrigeration business
- Covering all air, land, and sea transportation systems

#### Recent Activities

Handbook

R-25, R-26, R-27

#### Membership

Voting

6

Corresponding

36

YEA

4





# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.7 Commercial Food and Beverage Refrigeration Equipment

- Beer to Butter - 'cases' for cool
- Merchandisers, storage cases, walk-in freezers, coolers, beverage dispensers,

#### Recent Activities

Handbook	R-15, R-16
Research	1467-RP
	1706-RTAR
	1722-RTAR

#### Membership

Voting	8	Corresponding	76	YEA	12
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# Technical Committees – the Brains of ASHRAE

## Section 10 - Refrigeration

### 10.8 Refrigeration Load Calculations

- Calculation of all refrigeration loads
  - HVAC&R, humidity control
  - Identification and compilation of all contributing factors for all non-human comfort loads

#### Recent Activities

Handbook

R-24

#### Membership

Voting 6 Corresponding 17 YEA 2

