

## Air Conditioning and Refrigeration C H R O N O L O G Y

**Significant dates pertaining to Air Conditioning and Refrigeration**  
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**Assembled by Bernard Nagengast for American Society of Heating, Refrigerating and Air  
Conditioning Engineers**

**Additions by  
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End of 3 <sup>rd</sup> . Century B.C.	Philon of Byzantium invented an apparatus for measuring temperature.
1550	Doctor, Blas Villafranca, mentioned process for cooling wine and water by adding potassium nitrate
About 1597	Galileo's 'air thermoscope'
Beginning of 17 <sup>th</sup> Century	Francis Bacon gave several formulae for refrigeration mixtures
1624	The word thermometer first appears in literature in a book by J. Leurechon, <i>La Recreation Mathematique</i>
1631	Rey proposed a liquid thermometer (water)
Mid 17 <sup>th</sup> Century	Alcohol thermometers were known in Florence
1657	The Accademia del Cimento, in Florence, used refrigerant mixtures in scientific research, as did Robert Boyle, in 1662
1662	Robert Boyle established the law linking pressure and volume of a gas at a constant temperature; this was verified experimentally by Mariotte in 1676
1665	Detailed publication by Robert Boyle with many fundamentals on the production of low temperatures.
1685	Philippe Lahire obtained ice in a phial by enveloping it in ammonium nitrate

- 1697 G.E. Stahl introduced the notion of “phlogiston.” This was replaced by Lavoisier, by the “calorie.”
- 1702 Guillaume Amontons improved the air thermometer; foresaw the existence of an absolute zero of temperature
- 1715 Gabriel Daniel Fahrenheit developed mercury thermometer
- 1730 Reamur introduced his scale on an alcohol thermometer
- 1742 Anders Celsius developed Centigrade Temperature Scale, later renamed Celsius Temperature Scale
- 1748 G. Richmann presented papers on experiments with cold At St. Petersburg Academy of Sciences
- 1755 William Cullen of Glasgow, Scotland produced cold from fluids evaporated by a vacuum pump.
- 1755 Hoell noted the strong cooling rate when expanding air in a cylinder (more exact tests by Wilcke in 1770)
- 1760 Von Braun, in Petersburg, froze mercury, using a refrigerant mixture
- 1761 Joseph Black introduced the notion of latent heat
- 1774 Joseph Priestley isolated ammonia and noticed its great affinity for water
- 1779 J.H. Lambert (posthumous note) stated that -270 degrees C was the absolute zero
- 1783 Laplace suggested that heat was due to movement of molecules of matter
- 1784 Clouet and Monge liquefied a gas (sulfur dioxide) for the first time using low temperatures
- 1787 J.A.C. Charles showed that all gases, at constant pressure, had the same coefficient of expansion (shown precisely by Gay Lussac, in 1802)
- 1787 Martinus van Marum liquefied ammonia, by compression

1788	Publications by Blagden on experiments for subcooling water and freezing point depression of hydrous solutions
1793	Lowitz obtained -50 C by a mixture of snow and calcium chloride
1799	Fourcroy and Vauquelin liquefied ammonia, at atmospheric pressure (the experiment was repeated by Guyton de Morveau in 1804)
1803	Dalton announced his “law of partial pressures”
1803	Thomas Moore of Maryland received US patent for refrigerator. First patent issued in US on refrigeration.
1805	Oliver Evans proposed a closed cycle vapor compression refrigeration system in <i>The Young Steam Engineer’s Guide</i>
1805	Frederic Tudor, Boston, founded the natural ice industry.
1821	Seebeck discovered the thermoelectric effect for generation of electricity
1821	Jacques Berard – Experiments on storage of fruits in various gas mixtures
1822	Cagniard de la Tour introduced the notion of critical temperature
1823 (and following years)	M. Faraday liquefied a series of gases, including chlorine, SO <sub>2</sub> , CO <sub>2</sub> , H <sub>2</sub> S, NH <sub>2</sub> , nitrous oxide
1823	John Leslie constructed a vacuum/absorption freezing apparatus in England.
1824	Sadi Carnot, “Reflections on the motive power of fire, and on machines which can develop this power” (concept that all thermal power cycle efficiency is limited by the temperature difference between the source and the sink).
1829	Nathaniel Wyeth received US patent for a horse drawn ice Cutter.
1830	Bi-metal type thermostat invented by Andrew Ure

- 1834 Jacob Perkins patents mechanical refrigeration machine.
- 1834 Caoutchoucine, a distillate of natural rubber, used as a refrigerant by John Hague in the first working model of a vapor-compression refrigeration machine using Perkins' patent.
- 1834 Thilorier solidified carbon dioxide
- 1834 Peltier described the heating effects of electricity (thermoelectricity) and discovered the reduction of temperature by the thermoelectric effect
- 1835 Thilorier first produces dry ice
- 1842 Dr. John Gorrie proposes comfort cooling of homes, and entire cities in the South using mechanical refrigeration.
- 1843 J.P. Joule – Experiments and report on the mechanical equivalent of heat
- 1844 Dr. John Gorrie proposes an air-cycle refrigerating machine for making ice. (British patent 13234, 1850; US patent 8080, 1851.
- 1847 H. Helmholtz. Paper on conservation of energy
- 1848 Dr. David Boswell Reid proposes air-conditioning in British House of Parliament using cool well water and by ice and deodorizing bactericides
- 1848 Alexander Catlin Twining began experiments with vapor-compression refrigeration and ice making . Caveat filed with US Patent Office in 1849. British Patent 13167 of 1850. US Patent 10,221 of 1853
- 1849 Charles Piazza Smyth presents results of experiments with air-cycle refrigeration to Royal Society of Edinburgh
- 1850 Alexander Twining proposes carbon dioxide as a refrigerant in British Patent 13167 of 1850.

- 1850 R.J.E. Clausius put forward the modern version of Carnot's Principle and introduced the notion of entropy (the word was not used until 1865)
- 1852 William Thomson (Lord Kelvin) introduced the thermodynamic scale of temperature and described the concept of a "heat pump," for heating a house
- 1854 James Harrison began experimenting with vapor compression for ice making in Victoria, Australia. Victoria Patent 25/55 in 1855. British Patents 747 of 1856 and 2362 of 1857. A dozen of his machines were in operation in 1861.
- 1855 von Rittinger (Austria) – Installation of mechanical vapor recompression heat pump for salt production
- 1855 First commercial ice making plant using vapor compression refrigeration constructed in Cleveland, Ohio by Alexander Twining.
- 1858 First refrigerated railway transport (U.S.)
- 1860 Ferdinand Carre patented aqua-ammonia absorption refrigeration. British Patent 2503 of 1860. US Patent 30201 of 1860
- 1860-61 D.I. Mendeleev introduced the notion of the critical state as the "absolute temperature of vaporization"
- 1861 Meat freezing plant, Sydney, Australia
- 1860's Commercial fan type warm air heating and ventilating systems marketed by B.F. Sturtevant Company, Boston
- 1862 Thomas Andrews established the critical state of CO<sub>2</sub>
- 1862 Closed air-cycle refrigerating system by Alexander Kirk
- 1864 *Scientific American* publishes article proposing comfort cooling system for hospitals.
- 1865 Daniel Somes publishes pamphlet promoting his system for cooling hotels, theaters, halls and churches.

- 1867 Daniel Livingston Holden began constructing ice making Plants using chymogene (petroleum ether) refrigerant.
- 1867 Carbon dioxide refrigerating system patented by Thaddeus Lowe (British Patent 952)
- 1867 J.B. Sutherland, Detroit – Refrigerated wagon (ice) patented
- 1868 Methyl ether used as a refrigerant by Charles Tellier
- 1868 Frederick Edwards: *Ventilation of Dwelling Houses*
- 1868 Ammonia vapor-compression ice making plant constructed by John Beath in San Francisco
- 1869 Double acting ammonia compressor constructed in New Orleans by Francis DeCoppet
- 1870 Peter Van der Weyde patented thermostatically controlled refrigeration system (US Patent 105609)
- 1870 thermodynamic Carl Linde publishes paper using a rigorous approach to refrigeration: *The Extraction of Heat at Low Temperature by Mechanical Means.*”
- 1872 Ammonia vapor-compression ice making system perfected by David Boyle
- 1875 Cold storage plant using mechanical refrigeration by Thomas Mort of Australia
- 1875 Sulfur Dioxide refrigerant successfully used as a refrigerant by Raoul Pictet in Switzerland. British Patent 2727.
- 1876 First intercontinental refrigerated transport by ship (U.K.)
- 1876 Covered ice skating rink, Chelsea, England.
- 1877 Louis Cailletet liquefied oxygen by expansion (as a fog). A similar result was obtained shortly afterwards for nitrogen, air, methane, carbon dioxide

- 1877 Raoul Pictet liquefied oxygen by cascade cooling, obtaining a transitory jet
- 1877 Enclosed crankcase compressor using piston wrist-pins patented by Alexander Ballentine (US Patent 191638)
- 1877 Leicester Allen built a high pressure (15 bar) closed cycle air refrigerating machine
- 1876-77 F. Windhausen built the first industrial water vapor refrigerating machines (from studies made in 1870)
- 1878 Methyl Chloride successfully used as a refrigerant by Camille Vincent of France. (British Patent 470 of 1879)
- 1878 First refrigerated morgue (Paris – Carre’s absorption machine)
- 1879 Charles Tellier used refrigerated ship Le Frigorifique to send meat from France to South America
- 1880 Use of cork as insulating material for cold stores patented by GRÜNZWEIG
- 1882 Electric Fan marketed by Schuyler Skaats Wheeler
- 1881 Kamerlingh Onnes founded the Leyden cryological laboratory
- 1883 Ethyl Chloride vapor-refrigerating system patented by Cassius Palmer (US Patent 290600)
- 1883 K. Olszewski and S. Wroblewski liquefied oxygen in a permanent form and later obtained the same result for nitrogen and carbon dioxide
- 1884 Lodge - first large electric filter or precipitator for air cleaning
- ca. 1885 First ideas on the use of refrigeration for air-cooling and dehumidification of private buildings specially in hot countries. (Smith, Pettenkofer, Linde, Brückner).
- 1885 Compound ammonia compressor – W.G. Lock’s Australian patent

- 1886 T.B. Lightfoot, of London, produced a list of various refrigerant mixtures
- 1886 F. Windhausen constructed an operational CO<sub>2</sub> refrigerating compressor
- 1887 J. & E. Hall – industrial manufacture of CO<sub>2</sub> compressors
- 1889 J. & E. Hall – First two-stage CO<sub>2</sub> compressor
- 1889 Sulzer: First industrially manufactured two-stage ammonia refrigerating compressor. Another type (Stuart St. Clair) was made by York in 1892
- 1889 Downward distribution system for conditioned air used by Alfred Wolff at Carnegie Hall. Subsequently used by Wolff in all his air conditioning systems.
- 1891 The trade journal *Ice and Refrigeration* began publishing
- 1891 Massachusetts Ventilation Law
- ca. 1891 Broadway Theater, New York, comfort cooled using ice
- 1892 First air conditioned house in U.S. San Lorenzo, CA by M. Dillenberg of San Francisco
- 1893 Committee to define “standard ton of refrigeration” established by American Society of Mechanical Engineers
- 1894 Hans Lorenz introduced the polytropic cycle
- 1894 Hermann Reitschel publishes a "Guide for the Calculation and Design for Ventilating and Heating Installations" Included a chapter that applied scientific principles to comfort cooling of rooms.
- 1894 American Society of Heating and Ventilating Engineers founded by Hugh Barron, Louis Hart and William Mackay.
- 1894 Hermetically sealed refrigeration system patented by Marcel Audiffren in France (French Patent 238845). Manufactured after 1903 in France by Henri Singrun.

- 1895 Chicago Telephone Co. installed air washer to cool, filter and humidify the air at its exchange building.
- 1895 "Bypass method" of air conditioning first proposed – by S. Woodbridge for cooling Senate Wing of U.S. Capitol
- 1895 Hampson, Linde – First Joule-Thomson air liquefiers.
- 1898 Revillon Bros. fur merchants, New York, air conditioned with system designed by Alfred Wolff using Carbondale equipment
- 1899 Use of liquid air in dermatology (A.C. White, in New York). In 1908 M.C. Query, in Paris, used it to treat eczema. Practical use in dermatology only after 1940.
- 1900 Linde – Air liquefier with ammonia precooling
- ca 1900 Dental anesthesia by vaporization of refrigerants
- 1900 Passenger compartment air conditioning installed on 6 Mississippi river steamships.
- 1900 Warren Johnson invents the "humidostat"
- 1901 Auditorium of Scranton High School comfort cooled using ice.
- 1901 300 ton co-generation comfort air conditioning system installed at New York Exchange. System designed by Alfred Wolff. Used absorption refrigeration machinery designed by Henry Torrance, Carbondale Machine Co.
- 1902 Claude – First expansion engine air liquefier.
- 1902 Linde – Single-stage rectification column.
- 1902 Armour Building, Kansas City MO, installed dual-duct air conditioning system; each room individually controlled with a thermostat
- 1902 Research lab for fans and air heating and cooling established by Buffalo Forge Co., Buffalo NY

- 1902 Air conditioning system for precise humidity control designed by Willis Carrier for a Brooklyn, NY printing plant.
- 1903 Multiple-effect compression system developed by Gardner T. Voorhees. US Patent 793864 of 1905.
- 1903 Formation of the Ice Machine Builders Association of the United States (forerunner to ARI-1953)
- 1903 Use of solid carbon dioxide in dermatology (M. Julinsberg, Germany)
- 1904 Public debut of air conditioning: Missouri State Building, St. Louis World's Fair
- 1904 Self-contained mechanical refrigerator displayed at St. Louis World's Fair by Brunswick Refrigerating Co.
- 1904 First air conditioned bank: Hanover National Bank, New York, by Alfred Wolff
- 1904 American Society of Refrigerating Engineers founded
- 1904 Introduction of enthalpy and plotting of calculation of compression refrigerating machines by R. Mollier. Thermodynamic properties of carbon dioxide and ammonia are published
- 1905 Modern type Automatic Expansion Valve patented by Albert Marshall (US Patent 785265)
- 1906 Willis Carrier patents "Apparatus for Treating Air".
- 1906 Psychrometric Chart developed by Willis Carrier first published in Buffalo Forge Catalog.
- 1906 The term "air conditioning" coined by Stuart Cramer
- 1906 Clock (night setback) Thermostat by Jewell Thermostat Co. and Electric Thermostat Co.
- 1906 Frank Lloyd Wright's Larkin Administration Building, Chicago. First office building specifically designed to

- accommodate the “paraphernalia” of air conditioning. Used Kroeschell Carbon Dioxide system.
- 1906 Brooklyn Bridge subway station air conditioned.
- 1906 Walter Fleisher designs first air conditioning system for a tobacco factory
- 1906 Freeze-drying. Discovery of the process by A. d’Arsonval and F. Bordas (France). The method was discovered independently by Shackwell (U.S.A.) in 1909.
- 1906 Claude – Improved air separation with reflux column.
- 1906 Heylandt – High pressure expander for air and oxygen liquefaction.
- 1906 First hospital to be air conditioned: Boston Floating Hospital
- 1906 Walter Nernst – Theory of the behavior of matter in the neighborhood of absolute zero (“Third law” of Thermodynamics). In 1912 he produced a new formula: absolute zero is in principle unattainable.
- 1907 Air conditioning installed in dining and meeting rooms at Congress Hotel, Chicago, equipment designed by Frederick Wittenmeier.
- 1907 Willis Carrier patents “dew point control” system for precisely controlling humidity in a room.
- 1908 Elements of year round air conditioning defined by G. B. Wilson (heating, cooling, humidifying, dehumidifying, filtering)
- 1908 First International Congress of Refrigeration, Paris
- 1908 Maurice Leblanc – Steam jet refrigerating machine (made by Westinghouse in 1909, in Paris)
- 1909 German Society of Refrigerating Engineers (DKV) founded
- 1909 Open air ice skating rink using brine, Vienna, Austria

- 1909 A sliding vane compressor (ethyl chloride) was in use on an American ship, the Carnegie
- 1911 Constant superheat (thermostatic) expansion incorporated in a multiple evaporator refrigeration system patented by Albert Marshall (US Patent 1166874)
- 1913 First International Refrigeration Exposition held in Chicago
- 1913 M. T. Zarotschenzeff began experiments in quick freezing
- 1913 E. Altenkirch- Comprehensive thermodynamic study of binary mixtures for absorption refrigerating machines
- 1914 Air cooled electric self-contained household refrigerating unit, the DOMELRE, marketed by Fred Wolf Jr.
- 1914 Water cooled self contained household refrigerating unit marketed by Edward Williams
- 1914 Kelvinator founded – household refrigeration unit marketed 1918.
- 1916 Average employee has to work 3162 hours to pay for a refrigerator.
- 1916 St. Louis Coliseum uses 12 tons of ice to cool air that was blown "...through conduits into the hall, above the heads of the gathered throng" at the Democratic National Convention.
- 1916 Clarence Birdseye began experiments in quick-freezing
- 1918-30 First insulated containers (France, U.K., Italy)
- 1919 ASHVE Research Bureau founded
- 1920 Hermetic motor-compressor patented by Douglas Stokes of Australia (US Patent 1362757)
- 1920 W.S.E. Rolaff – Rolling piston rotary compressor, first manufactured by Norge in Detroit as “Rollator” using sulfur dioxide refrigerant.

- 1921 Sulzer – “Frigorotor” sliding-vane compressor, for methyl chloride.
- 1922 *ASHVE Guide* first published
- 1922 V-belt drive first applied to refrigeration systems
- 1922 Willis Carrier built prototype centrifugal compressor equipped refrigerant to chiller using carbon tetrachloride. Changed dichloroethylene in 1923.
- 1923 Electrically refrigerated ice cream cabinet marketed by Nizer
- 1924 Rich’s Department Store, Atlanta, completely air conditioned
- 1925 Adsorption refrigerating machine using silica gel/SO<sub>2</sub>
- 1925 *The Aerologist*, the first air conditioning trade journal, published by E. Vernon Hill.
- 1926 Gas fired absorption household refrigerator marketed by A.B Elektrolux in Sweden. Mfg. Under license in US by Servel after 1927
- 1926 Giauque, Debye - Adiabatic demagnetization cooling
- 1926 R. Follain – Multi-stage steam jet refrigerating machine (made in 1928 by S.C.A. M. in Paris)
- 1926 Carrier "Weathermaker" A high efficiency residential gas furnace incorporating a blower and filter invented by Carlyle Ashley. Marketed beginning in 1928.
- 1927 Capillary tube refrigerant control invented by Thomas Carpenter (US Patent 1919500)
- 1927 Crosley Icy Ball portable aqua-ammonia absorption Refrigeration unit for rural areas
- 1927 Modern type “thermostatic expansion valve” patented by Harry Thompson (US Patent 1747958)
- 1928 Chlorofluorocarbon refrigerants synthesized by General Motors Research Lab team of Thomas Midgley, Albert Henne and Robert McNary for Frigidaire. Announced

- publicly in 1930
- 1928 Electrically refrigerated vending machine by Vendometer Corporation of New York
- 1928 Keesom – Discovery of superfluidity.
- 1930 Railroad passenger terminal, Cleveland OH, air conditioned
- 1930 Kelvinator refrigeration unit used to comfort cool a customized Cadillac automobile.
- 1930 Home in Tucson, AZ installed a heat pump air conditioner
- 1930 Railroad passenger terminal, Cleveland OH, air conditioned
- 1930 I. Amundsen – Domestic adsorption refrigerator (activated carbon: methyl alcohol)
- 1930 1<sup>st</sup> International Heating and Ventilating Exposition held in Philadelphia, Pennsylvania.
- ca 1930 Sulzer conceived the “dry piston” compressor
- ca. 1930-35 First market survey of air conditioning “...sent to 2000 high grade men and 500 high grade women.” By *Time Magazine*
- 1931 Georges Ranque discovered the production of cold by the vortex effect. (French patent, 1933)
- 1931 Rockefeller Center designed with air conditioning.
- 1931 Frigidaire markets "Hot-Kold" year – round central system air conditioning system for homes.
- 1931 Southern California Edison C. installed a heat pump air conditioning system in its Los Angeles office building
- 1932 Chesapeake & Ohio Railroad begins running first overnight train with air conditioning, the between New York and Washington.

- 1932 Self-contained console type heat pump air conditioner designed by an engineering team led by Henry Galson. Marketed by DeLaVergne div. Baldwin-Southwark Corp.
- 1932 G. Maiuri – Multi-stage ammonia absorption machine
- 1933 Year – round air conditioning of homes demonstrated by Frigidaire at "Century of Progress" Chicago World's Fair.
- 1934 Six air conditioned homes displayed at "Century of Progress" Chicago World's Fair.
- 1934 Lysholm conceived the screw compressor (with two rotors)
- 1935 934 air conditioning installations reported in Chicago. Includes 171 offices, 143 restaurants, 136 theaters, 90 stores, and 69 restaurants.
- 1935 48 tract homes constructed in Washington DC that featured year – round General Electric air conditioning.
- 1935 Freeze-drying. Paper by E.W. Flosdorff and S. Mudd (U.S.) described freeze-drying equipment developed by them in previous years.
- 1935 Air-Conditioning Manufacturers Association was formed in the U.S.
- ca 1935 Small electromagnetic refrigerating compressor developed by W. Konig.
- 1936 United Air Lines uses air conditioning in its "three mile a minute" passenger planes.
- 1936 Crosley Radio Corp. markets air-conditioned bed.
- 1936 Albert Henne, co-inventor of the Chlorofluorocarbon Refrigerants, synthesizes refrigerant R-134a. This refrigerant was hailed in the 1980's as the best non-ozone depleting replacement for the most commonly used Chlorofluorocarbon.

- 1937 High pressure air conditioning system "Conduit Weathermaster" first installed. Designed by Carlyle Ashley and Willis Carrier.
- 1937 A.A. Berestneff – “Kathabar” open absorption refrigerating system (water: lithium chloride)
- 1937 Kapitza, Allen – Theory of superfluid helium
- 1938 U.S. Capitol, Senate Office Building, Old and New House Office Buildings completely air-conditioned by York Ice Machinery Co. At that time, the largest air conditioning system in the world.
- 1939 Packard markets first successful year-round auto air conditioning system.
- 1939 Freeze-drying of penicillin. First experiments in Great Britain. Industrial preparation in 1943.
- 1940 Freeze-drying of blood plasma. Semi-industrial preparation in the U.S.
- ca 1940 Absorption refrigerating machine using lithium bromide: water. Studies by Servel and Carrier.
- ca 1940 Non-lubricated piston compressor, with Teflon rings impregnated with graphite
- 1942 Heat pipe invented by R.S. Gaugler,( U.S. patent 1944)
- 1944 Air cycle refrigerating machine used to cool an airplane (Lockheed)
- 1945-50 Introduction of insulating foams
- 1947 43,000 Window Air Conditioners sold in the U.S.
- 1949 Peltier – Thermoelectric domestic refrigerator. A.F. Ioffe’s first thermocooling modules were made in 1938.
- 1949-50 Introduction of deep hypothermia in experimental surgery: J. Giaja and R.K. Andjus (Yugoslavia) and W.G. Bigelow (Canada). First tried in 1939 in the U.S.A. by C.A. Kossman.

ca 1950	Prototype absorption refrigerating machines heated by solar energy, notably by G. Lof.
ca 1950	Beginning of commercial development of heat pumps (U.S.) - 2000 made in 1954, 76,000 in 1963, 300,000 in 1976.
1952	Less than 1 % of U.S. homes have a room air conditioner. 360,000 window air conditioners sold that year.
ca 1952	J. Donald Kroeker – Heat pump installations on office buildings and shopping centers using ground water as the heat source.
1953	Two associations, the Refrigeration Equipment Manufacturers Association (REMA) and the Air-Conditioning and Refrigerating Machinery Association (ACRMA), unite to become the Air-Conditioning and Refrigeration Institute (ARI)
ca 1955	Penrod – studies of earth heat pumps
1957	1 <sup>st</sup> development of scroll compressor
ca 1958	Screw compressors used industrially, for refrigeration.
1958	First ARI performance rating standard for heat pumps is published.
1958	ARI initiates first product rating performance certification program for unitary air conditioners. ARI certification “seal” is introduced.
1958	In December, members of ASRE and ASHAE vote to merge into the American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE).
1959	Establishment of CECOMAF: European committee of manufacturers of refrigeration equipment
1966	First air conditioned school with no windows (New York)
1967	B. Zimmern – Single screw air compressor

1968-72	R-22 becomes standard refrigerant for unitary air conditioners and heat pumps
1969	54% of new cars equipped with air conditioning
1972	ARI and ASHRAE combine forces for the first co sponsored International Air-Conditioning, Heating, & Refrigeration Exposition
1975	Fixed orifice expansion devices introduced for unitary air conditioners
1975	ASHRAE Standard 90-75, "Energy Conservation in New Building Design" has a major impact on U.S. building codes.
1975	ARI's Unitary Equipment Directory features energy efficiency ratios (EER) for the first time.
1976	Indoor Air Quality becomes a big issue following the outbreak of Legionnaire's disease in a Philadelphia hotel.
1979	The U.S. Department of Energy calls on ASHRAE to help implement the "Emergency Building Temperature Restrictions" program.
1980	Scroll compressors developed for unitary air conditioner application
1986	Air conditioning joins list of inventions immortalized in the national Inventors Hall of Fame in the U.S.
1990	Parties to Montreal Protocol agree in London to amendments that eliminate CFC use and production by the year 2000.
1990's	Development of pulse-tube cryocoolers
1992	Montreal Protocol revised to advance CFC phaseout to end of 1995, with HCFCs to be phased out in steps by 2030.
1993-94	Automobile air conditioners transition to R-134a refrigerant
1994	Eurovent established the first industry certification program for air-conditioning equipment in Europe.

- 1995 R-410a introduced as refrigerant for unitary air conditioners
- 1999 A major history exhibit on air-conditioning, “Stay Cool! Air-Conditioning America” opened at the National Building Museum in Washington, DC.
- 2001 The Global Refrigerants Environmental Evaluation Network (GREEN) program was inaugurated as a global testing program to evaluate the performance of hydrocarbon and hydrofluorocarbon refrigerants in HVAC&R equipment.