Historical Facts of Metal Casting

3200 B.C. A copper frog, the oldest known casting in existence, is cast in Mesopotamia.
2000 B.C. Iron is discovered.
800-700 B.C. First Chinese production of cast iron.
645 B.C. Earliest known sand moulding (Chinese).
233 B.C. Cast iron plowshares are poured in China.
500 A.D. Cast crucible steel is first produced in India, but the process is lost until 1750, when Benjamin Huntsman reinvents it in England.

Middle Ages to 1800

1455 Dillenburg Castle in Germany is the first to use cast iron pipe to transport water.
1480 Birth of Vannoccio Biringuccio (1480-1539), the "father of the foundry industry," in Italy. He is the first man to document the foundry process in writing.
1642 Saugus Iron Works, America's first iron foundry (and second industrial plant), is established near Lynn, Massachusetts. The first American iron casting, the Saugus pot, is poured there.
1709 Englishman Abraham Darby creates the first true foundry flask for sand and loam moulding.
1720 Rene Antoine de Reaumur develops the first malleable iron, known today as "European Whiteheart."
1730 Abraham Darby is the first to use coke as fuel in his melting furnace in Coalbrookdale, England.
1750 Benjamin Huntsman reinvents the process of cast crucible steel in England. This process is the first in which the steel is completely melted, producing a uniform composition within the melt. Since the metal is completely molten, it also allows for alloy steel production, as the additional elements in the alloy can be added to the crucible during melting. Prior steel production was accomplished by a combination of forging and tempering, and the metal never reached a molten state.
1776 Foundrymen Charles Carroll, James Smith, George Taylor, James Wilson, George Ross, Philip Livingston and Stephen Hopkins sign the American Declaration of Independence.
1794 First use of the cupola in iron founding. Invented by John Wilkinson of England, the original had metal-cladding and utilized a steam engine to provide the air blast.

The 19th Century

1809 Centrifugal casting is developed by A. G. Eckhardt of Soho, England.
1815 The cupola is introduced in the United States in Baltimore, MD.
1818 First cast steel produced by the crucible process in the U.S. at the Valley Forge Foundry.
1825 Aluminum, the most common metal in the earth's crust, is isolated.
1826 Seth Boyden of Newark, NJ, is the first to develop a process for and produce "blackheart" malleable iron.
1831 In Cincinnati, OH, William Garrard establishes the first commercial crucible steel operation in the U.S.
1837 First dependable moulding machine is marketed and used by the S. Jarvis Adams Company in Pittsburg.
1845 The open hearth furnace is developed.
1851 Sir Henry Bessemer and William Kelly both invent a simple converter that uses blasts of air to burn out the impurities, silicon, manganese and excess carbon in pig iron. Although Kelly is the first to use a converter, Bessemer obtains the U.S. patents. Kelly proves patent priority in 1857.
1863 Metallography, the etching, polishing, and microscopic evaluation of metal surfaces, is developed by Henry C. Sarby of Sheffield, England. It is the first process to physically examine the surface of castings for quality analysis.
1867 James Nasmythe develops a gear-tilted foundry ladle, increasing worker safety and operational economy.
1870 Sandblasting is first used to clean large castings by R. E. Tilghman of Philadelphia.
1880-1887 The Sly tumbling mill is developed. It is the first cleaning machine for small castings. This mill greatly reduced the time needed for hand-cleaning operations and produced a finer

finished product.
1896 American Foundrymen's Association (renamed American Foundrymen's Society in 1948 and now called the American Foundry Society) is formed.
1897 Investment casting is rediscovered by B.F. Philbrook of Iowa. He uses it to cast dental inlays.

Late 20th Century

Early 1970s The Semi-Solid Metalworking (SSM) process is conceived of at Massachusetts Institute of Technology. It combines aspects of casting with aspects of forging.
1971 The Japanese develop V-Process moulding. This method uses unbonded sand and a vacuum.
1971 Rheocasting is developed at Massachusetts Institute of Technology.
1971 U.S. Congress passes the Clean Air Act and OSHA, the Occupational Health and Safety Act.
1972 The first production Austempered Ductile Iron (ADI) component is produced by Wagner Castings Company.
1974 Fiat introduces the in-mould process for ductile iron treatment.
1976 Compacted graphite iron (CGI), an iron with elongated graphite particles with rounded edges and roughened surfaces, is developed in the U.K. It has characteristics of both gray and ductile iron.
1982 The Warm-Box binder system is introduced.
1993 First foundry application of a plasma ladle refiner (melting and refining in one vessel) occurs at Maynard Steel Casting Company in Milwaukee, WI.
1995 Babcock and Wilcox, Barberton, OH, patent a lost foam vacuum casting process to produce stainless steel castings with low carbon content.
1996 Cast metal matrix composites are first used in a production model automobile in the brake rotors for the Lotus Elise.
1997 Electromagnetic casting processes developed by Argonne and Inland Steel Corporation. Electromagnetic edge containment greatly reduces cost and energy expenditures in steel production.
2007 Nanotechnology and nano manufacturing.