

IDENTIFYING THE AGE
OF
BUILDING SYSTEM AND COMPONENTS

A Handbook for Home Inspectors, Appraisers, Contractors, and Engineers

- HVAC Equipment and Components
 - Plumbing Components
 - Electrical Components
 - Building Components
 - Windows and Doors
 - Appliances

SAMPLE PAGES

By Mark J. Reinmiller

IDENTIFYING THE AGE
OF
BUILDING SYSTEMS AND COMPONENTS

**A Handbook for Home Inspectors, Contractors,
Appraisers, Engineers, and Other Professionals**

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<u>Contents</u>	<u>Page Number</u>
Disclaimer	1
Request for Input	1
About the Author	1
Using the Information in This Booklet	2
General Information Useful in Dating Components	3-4
<u>HVAC Equipment</u>	5-31
Furnaces; Boilers; Air Conditioning Equipment; Heat Pumps	
<u>HVAC Components</u>	32-38
Air Conditioner and Heat Pump Filter/Dryers	
Automatic Water Supply Valves	
Circulator Pumps	
Compressors (in AC and HP Condensing Units)	
Condensate Pumps/Drain Pumps	
Electronic Air Cleaners	
HVAC Controls	
Oil/Gas Burners and Related Components	
Pressure Relief Valves (PRV); Temperature/Pressure Relief Valves (TPV)	
Thermostats/Humidistats	
<u>Electrical Equipment</u>	39-45
Electric Motors	
Electrical, Miscellaneous	
<u>Plumbing Components</u>	46-51
Expansion Tanks; Well Pressure/Storage Tanks	
Sump Pumps	
Water Heaters	
Well Pumps and Controls	
Pressure Regulating Valves, Backflow Preventers, Etc.	
Plastic Water Supply and Drain Pipes	
<u>Building Components</u>	52-54
<u>Windows/Doors</u>	55
<u>Appliances</u>	56-62

Introduction

Disclaimer

The information contained in this booklet was obtained from numerous sources. I have tried to make sure this information is accurate, but it is likely that some mistakes will be found. Where I am unsure about the information provided, this has been noted. You must use your judgement when using this information. I cannot be responsible for errors in this booklet or for the misuse of this information.

Request for Input

This booklet could never be a complete list of manufactures date codes or other information that can provide estimates of age. There are thousands of manufacturers and brands names of equipment and components used in the construction of buildings. Manufacturers use various serial number patterns over the years, and sometimes in different components produced at the same time. I continually discover additional date codes and other methods of determining the age of equipment and components. Although I wish that I had more information available, I decided it was time to publish the available information for others to use.

I would greatly appreciate any information that readers can supply. Specific or general information that can be used to determine the age of building, systems, building components, or appliances is desired. Any supporting documentation would be helpful, but is not essential. My contact information is listed inside of the front cover.

About the Author

Mark J. Reinmiller has a Bachelor of Science degree in Mechanical Engineering from Drexel University and a Master of Science degree in Civil Engineering from Villanova University. Mr. Reinmiller is a Licensed Professional Engineer in Pennsylvania. He has worked in the Building Inspection and Consulting Engineering field since 1985.

Using the Information in this Booklet

There are many reasons why it is important or useful to determine the age of a building, system, building component, appliance, etc. When performing a building inspection for a client, an inspector is often asked questions about the age of buildings and many of the various systems and appliances in the building. Age is a significant factor in estimating useful remaining service life. How many people would buy a used car and not want to know its age?

Date codes on components such as windows, doors, electric service panels, heating and air conditioning systems, etc. can be helpful in determining the age of a building, or an addition to a building. This can aid in determining the age of other components, such as roofing, where age cannot typically be determined by date codes. Date codes can also be helpful in determining when major renovations were performed. The age of renovations can give a more complete picture as to the overall condition of an older building that has been substantially renovated. Similar date codes on numerous components may also indicate when an event such as a fire or flood occurred.

Date codes can be very useful when evaluating problems in buildings. As an example, water level lines on heating systems, water heaters, appliances, etc. can indicate the approximate timeframe of when water accumulation occurred in a basement. Date codes on sump pumps or PVC piping used for a sump pump discharge pipe may be an indication of the age of a sump pump or drainage system installation.

Date codes can be used to determine the timeframe related to specific concerns (e.g. aluminum wiring; lead paint; asbestos).

Date codes can provide important information regarding issues of code compliance. Having an approximate date of construction or renovation can aid in determining whether building permits were obtained. Knowing the approximate date of construction or renovation can provide a guideline as to what code requirements were in effect at the time of construction.

Date codes on systems and components are useful when performing forensic evaluations or when serving as an expert witness. Determining when renovations were performed and when events occurred can be a very important factor, especially when involved in litigation.

Although this handbook provides many useful ways to determine age, it not always necessary to look for date codes or other ways of determining the age of components. While the age of major systems and components is almost always relatively important, age of many components is not necessary very helpful in many situations. Determining the overall condition of systems and components is all that it necessary in many situations. In some cases it can take quite a bit of time to find and interpret date codes, but once you are familiar with typical date codes it is often easy to find and interpret these codes.

General Information Useful in Determining the Age of Components

Information on labels can provide clues as to the age of a component. One label that may be present is the Underwriters Laboratory label. Some key dates relating to the Underwriters Laboratory are listed below:

- 1901-Underwriter's Laboratories incorporated
- 1934-Underwriter's Laboratories introduced logo with UL in the middle of a circular design
- 1962-"Listed" replaced "Inspected on UL labels
- 1969-Underwriter's Laboratories adopts "Classified" on UL Labels as an alternative to the word "Listed" when their investigation of the product has certain limitations
- 1969-Underwriter's Laboratories promotes "Look for the UL Mark" on products in place of the listed model number
- 1974-Underwriter's Laboratories drops the apostrophe
- 1976-Underwriters Laboratories introduces the "UR" Mark for certification of Recognized Components
- 1992-Underwriters Laboratories introduces a UL mark for Canada (with a "C" adjacent to the UL logo), the first UL Mark for use in a specific country outside the United States
- 1994-Underwriters Laboratories introduced the Energy Verification Service (EVS) to provide UL Marks on products verified for energy efficiency per U.S. and Canadian government regulations
- 1997-Underwriters Laboratories introduced a combination Canada/US Mark (with a "C" and a "US" adjacent to the UL logo) to indicate product compliance with requirements for both countries
- Late 1990s to present-Underwriters Laboratories has opened affiliates or acquired other agencies in numerous other companies (see www.ul.com/marks_labels/mark/index.html for logos)

The American Gas Association is another organization that approves products and has an identifying Logo. Some key dates relating to the American Gas Association are listed below:

- 1918-The American Gas Association was formed from the merger of the National Commercial Gas Association and the American Gas Institute
- 1929-Possible first use of round logo with five-point star
- 1949-AGA trademarked "AMERICAN GAS ASSOCIATION INC CERTIFIED DESIGN COMPLIES WITH NATIONAL SAFETY STANDARDS" and "AMERICAN GAS ASSOCIATION INC. DESIGN COMPLIES WITH NATIONAL SAFETY STANDARDS CERTIFIED" (the words are in a circular logo with a five-point star)
- 1990-First use of "DESIGN CERTIFIED AMERICAN GAS ASSOCIATION" (the words are in a circular logo with a five-point star)

ASTM International is an organization that develops standards used by many manufacturers of building components. A label referencing an ASTM standard may be useful in establishing the approximately age of a component. Some key dates relating to ASTM International are listed below:

- 1898-Founded as the American Society of the International Association for Testing Materials
- 1902-Renamed the American Society for Testing Materials
- 1961-Renamed the American Society for Testing and Materials
- 2001-Renamed ASTM International

The American National Standards Institute (ANSI) coordinates the development of many standards produced by organizations such as ASTM International and the AGA. Some key dates relating to the American National Standards Institute are listed below:

1918-Founded as the American Engineering Standards Committee (AESC)
1928-Renamed the American Standards Association (ASA)
1966-Renamed the United States of America Standards Institute
1969-Renamed the American National Standards Institute

APA-The Engineered Wood Association develops standards for engineered wood products. Some key dates relating to APA-The Engineered Wood Association are listed below:

1933-Founded as the Douglas Fir Plywood Association
1964-Renamed the American Plywood Association (APA)
1994-Renamed APA-The Engineered Wood Association

Some manufacturer's labels include a company address. If an address is present and if a postal code or zip code is listed, this can be useful in determining the *maximum* age of a component.

- **Postal Zones** were introduced in 1943 for about 160 major cities (e.g. New York 17, NY; Philadelphia 7, PA). Before 1943 only the city name was used. If a postal zone is on a label the component cannot be older than 1943.
- **Zip Codes** were introduced in 1963. The standard five-digit number was used for all areas of the country. If a zip code is on a label the components cannot be older than 1963.
- **The Zip+4 Code** was introduced in 1983. These are typically not used on equipment address labels and therefore are not very useful in determining age.
- **Colors, styles, label design and material.** The design of equipment and the paint finishes used on the equipment can be useful in determining an approximate age of manufacture. Adhesive labels on HVAC equipment have been commonly used since the early 1980s. Although some equipment still has metal labels, this is less common and adhesive labels are seldom seen on equipment manufactured before the early 1980s.
- **Architecture**-I have not attempted to delve into architecture as a means of determining the age of a house or building. This is the subject of many books. A very good book on this subject is *A Field Guide to American Houses*, by Virginia and Lee McAlester.
- **Public records**-There are many sources of information for those interested in determining the age of houses and buildings. Public records, historical societies, libraries, title searches, fire insurance atlases (Sanborn), and books on old construction practices are a few. This subject is not covered in this book. There are experts in this field that specialize in determining the age of historic buildings.

HVAC Equipment

Furnaces; Boilers; Air Conditioning Equipment; Heat Pumps

General Notes:

See **General Information Useful in Determining the Age of Components** for information regarding Underwriters Laboratories, the American Gas Association, and other organizations

- mid 1800s**⁵ Central hot air and hot water heat developed
- 1860s**⁵ Manufactured gas space heaters produced
- 1885**⁵ First Honeywell thermostat produced
- 1890s**⁵ Natural gas used distributed in some areas
- 1900-1915**⁵ Change in boiler design to used sectional boilers (vertical and horizontal)
- 1905** National Commercial Gas Association founded
- 1906** American Gas Institute founded
- 1906**⁵ First Honeywell clock thermostat produced
- 1910**⁵ Honeywell heat generator introduced (mercury column used with open gravity hot water systems to boost system pressure to approx. 10 psi (increased water temperature to improve circulation)
- 1914**⁶ National Heating and Ventilating Association formed to represent manufacturers, wholesalers and contractors (became National Warm Air Heating and Air Conditioning Association-NWAHACA)
- 1915**⁸ American Society of Mechanical Engineers (ASME) publishes boiler code (note-ASME states that by 1910 there were approximately 1300-1400 boiler explosions per year)
- 1915**¹ Manufacturers of cast iron low pressure steam and hot water boilers and radiators formed the National Boiler and Radiator Manufacturer's Association (NBBMA)
- 1916**⁵ "Pipeless" furnaces introduced (gravity hot air furnace with single floor supply/return grill)
- 1918** American Gas Association founded
- 1917**² Thermostat controlled oil and gas burners introduced
- 1918** Underwriters Laboratories certifies their first oil burner
- 1920s**² Domestic oil and gas burners become common (note: many coal-fired systems were still in use through WW II and much later)
- 1925**^{2,5} Squirrel cage blowers used with residential furnaces (propeller type fan was introduced approximately 1920-22)
- 1929**¹ NBBMA changed its name to the Institute of Boiler and Radiator Manufacturers (I=B=R)
- 1930**⁵ (approx.) Introduction of circulator pumps-coincided with change to smaller radiators
- 1939**³ Approximate first use of fiberglass insulation-early use of fiberglass was mostly war related (note-most commercial uses came after WW II)
- 1940s**⁵ Introduction of radiant heating systems
- 1944**¹ I=B=R admitted the manufacturers of non-ferrous radiation and accessories (copper baseboard heaters and convectors)
- 1946**⁶ Air Conditioning and Refrigeration Contractors of America (ARCA) established
- 1950**⁵ (approx.) Change in hot air heating system design to place supply vents at exterior walls
- 1950s**⁴-General shutdown of manufactured gas plant in America
- 1958** ITT Industries trademarked the MONOFLOW name for special pipe tees used with a single supply/return header system
- 1960s**⁴ Last of the manufactured gas plants cease operation in America

- 1968**⁶ NWAHACA dissolved to merge with ARCA-(manufacturer members became part of what is now known as the Air-Conditioning & Refrigeration Institute-ARI)
- 1969**⁶ National Environmental Systems Contractors Association (NESCA) formed from NWAHACA to represent contractor members
- 1978**⁶ NESCA was renamed Air Conditioning Contractors of America (ACCA)

Sources:

1. Hydronics Foundation, Inc.-hydronics.org
2. ASHRAE-ashraejournal.org
3. Owens Corning-owenscorning.com
4. Former Manufactured Gas Plants-www.hatheway.net
5. "Trade Winds", Feb. 1960, Minneapolis Honeywell Regulator Co.-www.heatinghelp.com
6. Air Conditioning Contractors of America (ACCA)-www.acca.org
7. "American Gas Journal", Oct. 11, 1924-www.heatinghelp.com
8. American Society of Mechanical Engineers-www.asme.org

Boiler manufacturers typically used asbestos insulation (i.e. often a type that resembles gray corrugated cardboard) inside of boiler housings through the **1940s** or early **1950s** before switching to fiberglass (see examples below). This can be used as a guide for dating old boilers. Furnace manufacturers probably switched around the same time.

Examples:

1948-50 National boiler:	asbestos insulation
1950 GE Boiler:	asbestos insulation
1951 Bethlehem boiler:	asbestos insulation
1951 Bryant boiler:	asbestos insulation
1952 Richmond Radiator boiler:	asbestos insulation
1953 (approx.) Columbia boiler:	asbestos insulation
1953 Bethlehem boiler:	fiberglass insulation
1955 National-U.S. Radiator:	fiberglass insulation
1955 Columbia boiler:	fiberglass insulation
1955 Stott boiler	fiberglass insulation
1962 Thatcher boiler:	fiberglass insulation

Coal conversions:

Many old boilers originally designed to burn coal were converted to oil-fired or gas-fired. A common conversion involved removal of the ash clean-out door at the bottom of the boiler. The burner was typically placed in front of the opening and the opening is sealed with furnace cement. Coal conversions took place over a long period of time.

Mixed or manufactured gas (coal gas):

Many older gas furnaces and boilers indicate on the label that the unit was designed for use with mixed or manufactured gas. The dates above, or information from your local gas utility, can give an ideal when conversions occurred.

1960s-70s? to present:

Steel boilers have been required to have a rating plate on the boiler that identifies the year of manufacture. This plate is typically found on the front or top of the boiler, usually under the metal jacket. It is easy to locate on some boilers and is a definitive indicator of age.

1976:

Carrier introduced the furnace blower door safety switch on gas furnaces. I am unaware of when other manufacturers installed safety switches, but it was after 1976.

Gas control valves:

Many gas control valves have a four digit date code printed on the metal body in black ink. The first two digits are the year of manufacture and the second two are the week.

AGA or ANSI Gas Code date:

Some labels have an AGA or ANSI gas code date. The code was typically used for about three years for water heaters, but some boilers have a code date significantly more than three years older than the manufacture date.

Steam boilers:

Many areas of the country had central steam plants supplying steam to residential and commercial buildings for heating. The vast majority of these systems have closed down (some long ago and some in the relatively recent past). Local knowledge of these systems may be a useful guideline for dating boilers (or identifying old piping or hardware remaining in a house).

Glossary/Abbreviations:

AC-Air conditioning

AH-air-handler

B-boiler

CI-cast iron

CU-condensing unit

EC-Evaporator Coil

F-furnace

HP-heat pump

PTAC-Packaged Terminal Air Conditioner (i.e. through-wall units)

Stl-Steel

Unitary Products-HVAC equipment pre-engineered and sold as a packaged system (as opposed to custom designed equipment often assembled from various components and used in large commercial, institutional, or industrial applications).

The information listed below under the Date Code column represents typical manufacturer's serial numbers, unless labeled otherwise. The year indicator is underlined (it is not underlined on the equipment label). Manufacturers often use different serial number patterns over time, for different equipment, for equipment manufactured at different plants, or for equipment manufactured for them by other companies. These examples are not complete or 100 percent reliable. Where the information is known to be questionable it is followed by a question mark (i.e. ?). The general design and appearance of the equipment, date codes of equipment components, the equipment manufacturer (which can be different from the brand name), etc. should be evaluated to verify the date of manufacture.

<p>Bryant (bryant.com) (BDP Co.)</p>	<p>318<u>0</u>A00939; 088<u>2</u>xxxxxx (typical of F and AC since late 70's to early 80's)</p> <p>11Wxxxxxxx (50's into the early 80's) (first two numbers are week of manufacture, first letter is year of manufacture based on the chart below) 1963-P; 1964-R;1965-S 1966-T; 1967-U; 1968-V; 1969-W; 1970-X; 1971-Y; 1972-A; 1973-B; 1974-C; 1975-D; 1976-E; 1977-F; 1978-G; 1979-</p> <p>H0299V10435 (oil F mfg. by Dettson)</p>	<p>1904-Natural Gas Regulator Co; 1908-changed name to Bryant Heater and Mfg. Co-began mfg. gas water heaters; 1920s-major supplier of gas boilers; 1933-became part of Dresser Industries; 1945-Dresser acquired Payne and Day & Night; 1949-Day & Night, and Payne split from Dresser and formed Affiliated Gas Equipment (AGE); 1955-Carrier purchased AGE; 1974-Carrier formed BDP Co. 1996-introduced "Puron" refrigerant 1996-Payne spun off from Bryant; Day & Night name now used by ICP</p>
<p>Buderus (buderus.net)</p>	<p>05030060-00-3332-030<u>4</u>(?)</p>	<p>Gas-fired boiler-mfg. in Germany; the U.S. operation was established in 1990</p>
<p>Burnham Corporation (burnham.com) (Burnham; New Yorker; Thermo-Pride; Goverale; Kewanee; Bryan Steam; Thermal Solutions; Colmar</p>	<p>8567054 (steel boilers behind plate at front of boiler)</p>	<p>1873-Lord and Burnham produced boilers for heating greenhouses; 1895-Burnham boiler dept. formed; 1919-Burnham Boiler Co. formed; 1947-Burnham Corp. formed; 1975-acquired American Standards CI boiler business-dropped A.S. name</p>
<p>Carrier (carrier.com) (Weathermaker)</p>	<p>Date Code 4-<u>88</u> SN 18<u>88</u>E67189</p> <p>HC494707 <u>87</u>15 (generic highboy oil F)</p> <p>R<u>4</u>xxxxx (60's to early 80's) first letter in serial number is month of manufacture; first number is the last digit of the year</p> <p>(Note-Carrier appears to use same as old Bryant i.e. 10A165749; 25A 085298; 25A 085301; 16A431774)</p> <p>43<u>01</u>V04089S Gas-fired boiler (mfg. by ERC)</p>	<p>Carrier Engineering Co. formed 1915; 1922-began mfg.; 1955-Carrier purchased AGE; 1974-Carrier formed BDP Co.</p>

Building Components

General Notes:

Drywall-Many brands have a date code printed on the back side of the drywall (sometimes in a 00/00/00 format and sometimes as part of a serial number).

Plywood/OSB Sheathing-Some brands have a date code printed on the panel (typically a two digit year or a letter/year).

Fiberglass Ductboard-Some brands have a date printed on the ductboard.

Foil Tape (used to seal fiberglass ductboard joints, window/sheathing joints)-Some brands have a date printed on the tape.

Hollow Core Doors-Some doors have a date code printed on the top edge.

1927⁵-Kohler was the first to introduce plumbing fixtures in colors.

1934-First use of Glulam beams in the United States.

1940³-Approximate date that plywood was first used in building construction-most production was then diverted for wartime use. After WWII there was an approximately 250 percent increase in plywood production between 1947 and 1954.

1964³-Introduction of Southern Pine plywood-all softwood plywood was manufactured from douglas fir before that time.

1970s²-Waferboard was introduced

1978²-Oriented Strand Board (OSB) introduced

1994-Year that federal regulations required the manufacture of 1.6 gallon/flush toilets (these toilets were manufactured before this date and were required in some areas by local regulations).

1993-Year that federal regulations required the manufacture of mechanical openers with reversing sensors (not reversing clutches) or other suitable provisions.

1936¹-Owens Corning trademarked Fiberglas name (note: one "s" in Fiberglas)

1938¹-Owens Corning Fiberglas Corp. formed. In 1939 the company made its first preformed insulation (most early production was limited to wartime uses).

1956¹-Owens Corning added red dye to make insulation pink (an Owens Corning trademark). Promoted residential sales in 1957 (Source-owenscorning.com).

1960s⁴-Development of I-joists

Early 1970s⁶-Trus Joist introduced the TJI (wood I-joist).

Early 1970s⁴-Introduction of LVL (Laminated Veneer Lumber).

1980s⁴-Introduction of PSL (Parallel Strand Lumber).

1990s⁴-Introduction of LSL (Laminated Strand Lumber)

Sources:

1. Owens Corning (owenscorning.com)
2. Structural Board Association (osbguide.com)
3. APA-The Engineered Wood Association (apawood.org)
4. ASTM Standards for Engineered Wood Products-Focus on Glulam, I-Joists, and Structural Composite Lumber; Borjen Yeh, Ph.D. (astm.org)
5. Kohler Company (kohler.com)
6. Weyerhaeuser Company (www.ilevel.com)

Trademarks

American Plywood Association:

1986-PERFORMANCE RATED PANELS

1963/1984-SPAN-RATED

1981-APA RATED

1953-PLYRON

1953-TEXTURE ONE-ELEVEN

1953-TEXTURE 1-11

Gold Bond-**1927**-National Gypsum Co.-Plaster, gypsum, and wallboard

HOMART-**1947**-Sears-Various roofing and building products

HOMASOTE-**1920**-Agasote Millboard Co. (Homasote Company)-Fiber-Board sold in sheets

J-M-**1914**-Johns Manville-Wood fiber composition board used for walls and ceilings

PLIB-**1939**-Pacific Lumber Inspection Bureau trademark found on lumber

SPIB-**1969/1971**-Southern Pine Inspection Bureau trademark found on lumber

Western Wood Products Association:

1994-SYP

1978-HEM FIR

1978-HEM

1968-D FIR

WHITE TOP-**1905**-White Top-Asbestos roofing