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FOR IMMEDIATE RELEASE

THE IMPACT OF AIR CONDITIONING

Backgrounder

Today we take air conditioning for granted, but it began as a technique to improve manufactured products and processes.

On July 17, 1902, Willis Carrier, a 25-year-old mechanical engineer employed by the Buffalo Forge Co., solved a quality problem for Sackett-Wilhelms Lithographing Co., a Brooklyn, N.Y. printer. The problem: when temperature and humidity changed from day-to-day, the dimensions of the paper changed, causing the colored inks to misalign. This created delays and missed deadlines for the printer. Armed with little more than some old U.S. Weather Bureau tables and a slide rule, Carrier designed a solution that stabilized the temperature and moisture in the air so the paper stayed the same size regardless of the ambient temperature or relative humidity. This solution became the design for the first modern air conditioning system, to control temperature, humidity and air circulation and to cleanse the air.

Textile mills experienced the same problems on dry days when static electricity caused cotton fibers to misbehave. Threads got fuzzy, they broke and fabric couldn't be woven evenly. So engineers had to figure out a way to add tons of moisture to the air circulated in mills such as the Chronicle Cotton Mill in Belmont, N.C. The extra humidity "conditioned" the fibers. In fact, that's how "air conditioning" got its name.

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THE IMPACT OF AIR CONDITIONING – Page 2

2002 marks the centennial anniversary of Willis Carrier's invention of modern air conditioning, an invention that forever improved the way people live, work and play. It is also the 80th anniversary of Carrier's invention of the centrifugal chiller, which brought comfort cooling to the masses, as well as industrial processes, and would eventually change the face of urban architecture and open up whole areas of the world for development. A key to the invention was the use of a refrigerant fluid that was much safer than the ammonia common at the time. It made the cooling of large public places practical for the first time.

Department store owners and clientele benefited first from the benefits of the new, centrifugal chiller air conditioning system. In 1924, the owners of Detroit's J.L. Hudson department store wanted to keep their popular "bargain basement" sale days going during the summer months, but the frantic pace of shopping in the heat caused many shoppers to faint. An air conditioning system in the basement ended the fainting and soon the system was expanded to serve the first three floors, and eventually the entire sales space.

Macy's New York installed a centrifugal chiller air conditioning system in 1929 and used it as a drawing card for patrons who wanted to shop in comfort. They even ran a tongue-in-cheek advertisement telling people they couldn't spend the night in the store. The ad entitled, "Pleasant Dreams," reads, "*Come at 9:30 and stay until 5:30, but don't ask to spend the night. We'd understand how you'd want to. We want to ourselves. It's so cool here we've been tempted many times during the hot spell to snuggle down beside an escalator and catch up on our sleep. But it can't be arranged . . . we just have to remember that in a few hours morning will come and bring with it another cool Macy day.*"

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Air Conditioning's Impact on American Entertainment

Theater-goers benefited next. The promise of “air conditioned comfort” helped many a 1920s theater owner improve summertime box office receipts, when crowds typically shunned hot theaters for cooler pleasures. Perhaps the biggest opportunity to make a public impact came when the centrifugal chiller brought comfort to the Rivoli Theater in New York’s Times Square, in 1925. The Rivoli was on Broadway, and Dr. Carrier knew that success would lead to almost instant recognition and reward – or immediate humiliation.

The system debuted on Memorial Day, 1925. The machine was late in starting, and the theater was hot when the crowd filed in. Among the viewers was Adolph Zukor, the head of Paramount Pictures. Engineers were worried as they watched patrons’ cardboard fans flutter. Mr. Zukor was watching the people and the waving fans instead of the picture. But the temperature gradually dropped, and the patrons put their fans away. In the lobby at the end of the film, Zukor said: *‘Yes, the people are going to like it.’*

By 1930, more than 300 theaters around the United States hung banners from their marquees that enthusiastically announced: “Cooled by Refrigeration.”

Air conditioning systems also played a role in the development of the motion picture “talkies” that would be shown in those theaters as the new Hollywood sound studios could close doors and windows, eliminating objectionable outside noise while keeping actors cool and refreshed despite the intense heat of the powerful klieg lights and arid Southern California climate.

So it's safe to say there'd be no "summer blockbusters" if it weren't for the advent of air conditioning.

Theme parks from Tokyo, to Orlando to Paris also rely heavily on air conditioning to keep their guests from roasting at their attractions. Although you may feel you're taking a boat ride along a jungle river, the temperature inside the ride would be truly tropical if it weren't for thousands of tons of carefully hidden cooling throughout the parks.

Air Conditioning's Impact on Architecture

As air conditioning began to change commerce, it would soon change the face of urban architecture, freeing business from the limits imposed by summer heat and humidity.

Large buildings no longer required center courtyards and open windows for cross-ventilation during heat waves. Central refrigeration and air distribution systems made large, permanently enclosed work spaces cool enough to be productive. With windows that opened no longer a necessity, architects could design high-rise glass-walled structures in direct sunlight that could still be kept comfortable inside. Today we see the results in skylines from Singapore to Los Angeles, to Dallas, Atlanta, Miami and dozens of other "hot climate" cities. Indeed, the growth of America's "Sun Belt" has paralleled the spread of air conditioning.

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Air Conditioning Comes Home

But it wasn't until after World War II, however, that air conditioning was widely available to homeowners and apartment dwellers.

In 1955, William J. Levitt, America's leading homebuilder at the time and the virtual inventor of the suburbs, predicted that air conditioning would soon become a basic feature of American homes. He was right. In 1965, 10 percent of American homes, about three million, were air conditioned. In 1999, the U.S. Census Bureau reported that 92.5 million homes – 80 percent of all homes in the country – had air conditioning. In places such as Florida and Texas, that number exceeds 95 percent, and 99 percent of all new homes in the South are built with central air conditioning.

Another area of our lives where air conditioning and refrigeration have made an enormous impact is in the grocery store. We take the fresh fruits and vegetables available in our grocery stores for granted, but if it weren't for the kind of transport and display temperature controls that have been developed, those fragile bananas would look a lot different than they do. When bananas are cut in the jungles of Costa Rica or Ecuador they are floated along in troughs of water as workers pack them to make sure they are not bruised by too much handling. During the three-week trip to U.S. ports, temperature changes as little as two degrees can start their ripening process too early or cause chill damage. Today's climate-controlled shipping containers now allow customers on shore to monitor and control the temperature of their perishables by satellite if they want to. And refrigerated display cases allow us to enjoy a wide variety of fruits and vegetables year-round.

THE IMPACT OF AIR CONDITIONING – Page 6

Throughout his life, Willis Carrier was a dedicated problem-solver. His final project before his death in 1950 was to determine the size of a drop of water. He was working on the development of the heat pump. So he probably would not be surprised at some of the other things his invention has spawned. For example, the Sistine Chapel, in Rome, was air conditioned by Carrier in 1993 to help preserve the restored frescoes of Michelangelo. There were so many technical puzzles to solve, and the stakes were so high, it took longer to design and install the system than it took Michelangelo to paint the chapel's ceiling.

There's a one-of-a-kind refrigerated display case preserving the 500-year-old frozen, mummified remains of an Inca girl found on top of a 20,000-foot Peruvian volcano. The "Ampato Maiden" was visited by more than 100,000 people when it was on display at National Geographic Explorer's Hall in Washington, D.C. The mummy is on permanent display, in a Carrier refrigerated display case, at the Catholic University in Arequipa, Peru.

In 1998 the historical contents of George Washington's Mount Vernon estate – right down to a set of the first president's wooden teeth – were preserved by a Carrier air conditioning system. Also in 1998, Dr. Carrier was distinguished as one of *Time* magazine's 100 most influential people of the century.

Though we may have grown accustomed to the air conditioning around us, industry continues to solve perplexing problems with comfort in much the same way Dr. Carrier did when he started it all in 1902.

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