



Smithsonian  
*National Museum of American History*  
*Kenneth E. Behring Center*

## Guide to the Stephanie Kwolek Innovative Lives Presentation

NMAH.AC.0596

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## Collection Overview

<b>Repository:</b>	Archives Center, National Museum of American History
<b>Title:</b>	Stephanie Kwolek Innovative Lives Presentation
<b>Identifier:</b>	NMAH.AC.0596
<b>Date:</b>	1996 March 25
<b>Extent:</b>	0.45 Cubic feet (3 boxes)
<b>Creator:</b>	Kwolek, Stephanie Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation.
<b>Language:</b>	English
<b>Summary:</b>	This collection consists of two and one half hours of original (BetaCam SP), master (BetaCam SP) and reference (viewing) copies (VHS), documenting a lecture program for children on March 25, 1996 by Stephanie Kwolek, inventor of Kevlar. Kwolek discusses her invention of Kevlar as well as her background and life experiences.

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## Administrative Information

### Acquisition Information

Created by the Jerome and Dorothy Lemelson Center for the Study of Invention and Innovation, National Museum of American History, Smithsonian Institution, March 25, 1996.

### Provenance

Transferred from the Lemelson Center to the Archives Center on July 8, 1997.

### Available Formats

Original videos digitized in 2014. See repository for details.

### Processing Information

Collection processed by Alison Oswald, archivist, and Erin Molloy (volunteer), July 14, 1997 and revised July 22, 2011.

### Preferred Citation

Stephanie Kwolek Innovative Lives Presentation, Archives Center, National Museum of American History, Smithsonian Institution

## Restrictions

The collection is open for research use. Series 3, Original Videos (BetaCam SP) is stored off-site. Arrangements must be made with the Archives Center two weeks prior to a scheduled visit.

## Conditions Governing Use

Collection items available for reproduction, but the Archives Center makes no guarantees concerning intellectual property rights. Archives Center cost-recovery and use fees may apply when requesting reproductions. Release forms exist.

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## Biographical / Historical

Stephanie L. Kwolek was born in 1923 in New Kensington, Pennsylvania. She earned a bachelors degree in chemistry from Margaret Morrison Carnegie College, now known as Carnegie Mellon University, in 1946. Upon graduating 1946, Kwolek joined the DuPont Company in Buffalo, New York, where she worked in the Textile Fibers Pioneering Research Laboratory. In the laboratory she researched and developed new synthetic fibers. Kwolek's specialty at DuPont was low-temperature polymerization. She discovered the first liquid crystal polymers, which created an entire branch of research and invention. In 1964, Kwolek began searching for new high-performance chemical compounds. By 1965, she had discovered a compound that, when spun into fiber, was very strong and stiff. She found that the rigidity of this fiber nearly doubled when exposed to heat. The final product resulted in Kevlar (US Patent 3,819,587; RE 30,352) a high-performance aramid fiber used in bullet-resistant vests, crash helmets, boat shells, and radial tires.

Kevlar provides low stretch or elongation, improved cut resistance, better heat resistance, increased strength, reduced weight, and better impact resistance. Kwolek received a patent for Kevlar in 1971. During her forty year career, Kwolek received twenty-eight patents. She retired from DuPont in 1986.

Kwolek has received various awards for her invention, including the American Society of Metals Award in 1978, and both the American Chemical Society Creative Invention Award and the American Institute of Chemists Chemical Pioneer Award in 1980. In July of 1995, Kwolek was inducted into the National Inventors Hall of Fame. In 1996 she received the National Medal of Technology, and in 1997 the Perkin Medal was presented by the American Section of the Society of Chemical Industry to Kwolek. Both honors are rarely awarded to women. Kwolek received the 1999 Lemelson-MIT Lifetime Achievement Award for her innovations in the polymers industry, most notably her invention of Kevlar®.

## References

Howell, Caitlan. Innovative Lives, [Stephanie Kwolek and Kevlar, the Wonder Fiber](#), 1996.

[Stephanie L. Kwolek](#)

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## Scope and Contents

This collection consists of two and one half hours of original (betaCam SP), master (BetaCam SP) and reference (viewing) copies (VHS), documenting a lecture program for children on March 25, 1996 by Stephanie Kwolek, inventor of Kevlar. Kwolek discusses her invention of Kevlar as well as her background and life experiences.

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## Arrangement

The collection is divided into three series.

**Series 1, Reference Videos, 1996**

**Series 2, Master Videos, 1996**

**Series 3, Original Videos, 1996**

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## Names and Subject Terms

This collection is indexed in the online catalog of the Smithsonian Institution under the following terms:

Subjects:

- Chemistry -- 20th century
- Chemists -- 20th century
- Inventions -- 20th century
- Inventors -- 20th century
- Women inventors -- 20th century

Types of Materials:

- Lectures -- 1990-2000
- Videotapes -- 1990-2000

Names:

- DuPont.

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## Container Listing

### Series 1: Reference Videos (VHS), 1996 March 25

5 videocassettes (vhs)

1 electronic discs (dvd)

Box 3, Video RV  
596.1

Tape 1, Stephanie Kwolek Innovative Lives Presentation, 1996 March 25  
Total Running Time: 30:00

Tape 1 starts with over ten minutes of close up shots of unidentified machinery in an unknown location and of school children in the auditorium before Kwolek is introduced. Kwolek begins the presentation by discussing her interest in technology, her career as a research chemist, and the applications for Kevlar, which include the production of helmets, oil drilling rigs, chaps, and airplane escape chutes. She continues with a discussion about her experience working for the DuPont Company researching polymers, and she describes how polymers are chemically constructed. In 1964, Kwolek was asked to search for a high-performance fiber to reinforce tires so automobiles would use less gasoline.

The tape skips between time code 25:30 and 25:50.

Box 3, Video RV  
596.2

Tape 2, Stephanie Kwolek Innovative Lives Presentation, 1996 March 25  
Total Running Time: 18:00

Stephanie Kwolek continues her discussion on Kevlar by demonstrating how the fibers can stretch. She then begins speaking about her childhood, noting that initially she did not intend to be a chemist; she planned on working as a fashion designer. She credits her father, a "naturalist" who died when she was ten years old, for instilling in her a love of science. In college she studied medicine and chemistry, and after she began working for DuPont in the Fibers Department, she decided to pursue chemistry as her career.

The students in the audience are given the opportunity to pose questions to Stephanie Kwolek during a question and answer session. Some of the questions include: how much producing Kevlar costs; how bullet-proof vests are made; how to cut Kevlar; can Kevlar be transparent; what specifically got Kwolek into fibers; where she attended college; how stiff Kevlar can be; what the origin of the name "Kevlar" was; and how the discovery changed her life.

Box 3, Video RV  
596.3

Tape 3, Stephanie Kwolek Innovative Lives Presentation, 1996 March 25  
Total Running Time: 30:00

Stephanie Kwolek continues answering questions from the school group. Some of these questions include: did she have any doubts about entering the field of chemistry; how long the invention process was; how much weight a strand of Kevlar can hold; and how did it end up being used in bullet-proof vests. The children are then invited to come to the front of the auditorium to speak with Kwolek and participate in a hands-on demonstration involving Kevlar rope, gloves, a helmet, and a vest. Kwolek hands out pieces of Kevlar fiber to the students. The next portion of the tape features Kwolek being interviewed by two young female students. The subjects discussed include how Kevlar is used in

different products, the other achievements Kwolek has completed in her career, and the twenty-fifth anniversary of the development of Kevlar.

Box 3, Video RV  
596.4

Tape 4, Stephanie Kwolek Innovative Lives Presentation, 1996 March 25  
Total Running Time: 29:00

The interview with Stephanie Kwolek continues as she discusses her interests and influences during her childhood and her experience at Margaret Morris Carnegie College, now Carnegie Mellon University. She explains that while women were not permitted to enroll in the engineering college at the time, there were a number of women who studied chemistry and other sciences. Kwolek also discusses her experiences during the invention and development of Kevlar. While working at DuPont she looked for new ways to make polymers with higher temperature stability, and in 1964 she was asked to look for the next generation of a high performance fiber. She explains the process of applying technical methods to test and create polymers. Kwolek describes how she and the other team members collaborated to produce Kevlar. She talks briefly about her experience as a woman working in a technical, male-dominated field, and she encourages women to continue to work in the fields of science.

Box 3, Video RV  
596.5

Tape 5, Stephanie Kwolek Innovative Lives Presentation, 1996 March 25  
Total Running Time: 20:00

In the final tape of the Stephanie Kwolek interview, she discusses her role in advertising Kevlar, and her isolation as a research assistant from the bad publicity DuPont faced during the Vietnam War. She finishes the interview by encouraging youth to enter the field of chemistry with a broad academic background that includes mathematics and business courses.

Kwolek then holds up various products made of Kevlar and briefly discusses their use. The products include a glove intended to protect wearers from sharp objects, a cable made of ropes of Kevlar to anchor oil rigs in the ocean and a fiber optic cable.

The last scenes of the video are shots of spooled fiber, a helmet, a bullet-proof vest, the gloves and the cable shown by Kwolek, a pair of Kevlar pants, a sheet of Kevlar, a sheet of Kevlar with bullets lodged in it, and a strand of Kevlar rope.

\* Video flickers at the following places: 9:45-10:00, 11:00, and 14:50.

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## Series 2: Master Videos (BetaCam SP), 1996-03-25

*5 videocassettes (betacamsp)*

*Box 2, Video MV 596.1-5*

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## Series 3: Original Videos (BetaCam SP), 1996-03-25

*5 videocassettes (betacamsp)*  
*Box 1, Video OV 596.1-5*

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