

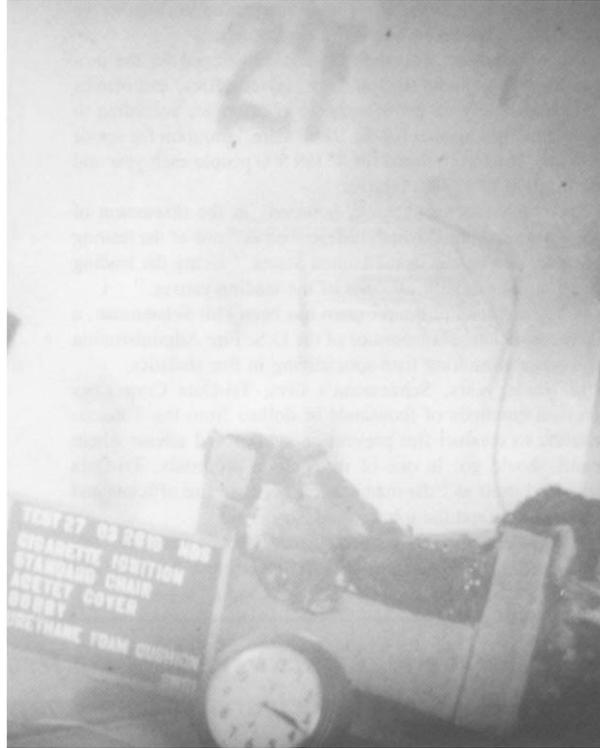
## Appendix F – Cigarette Fire Scenarios

**Opinion:**

A cigarette did not cause this fire

**Support:**

No cigarette butt was found in the debris. Cigarette butts at fire scenes are not definitive proof, though, and a butt may have been burned completely before flashover. The homeowner was only gone for 30 minutes, and cigarette fires often spend a long time (30 min +) smoldering before the fire develops. The homeowner claims to use ashtrays.



Cigarette placed on armchair smoldered for a long time before igniting

A cigarette dropped on a sofa or easy chair may smolder at 700 degrees © for 30 to 60 minutes, according to fire experts, which is more than enough time to ignite many types of furnishings.

Cigarettes tend to cause smoldering fires, which can transition to flaming fires

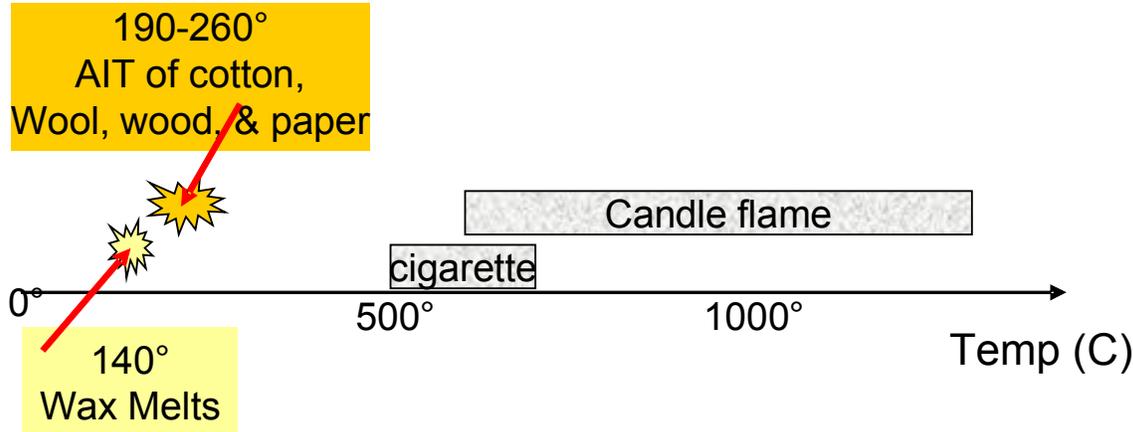
Source: [www.aliciapatterson.org/APF1004/Levin/Levin.html](http://www.aliciapatterson.org/APF1004/Levin/Levin.html)

Images of burn marks from smoldering cigarettes:



### Information about candles and cigarettes

- A free-burning Cigarette has a temperature of 930-1300 deg F (500-700 deg C)
- A cigarette lying on a surface has a lower temp



- Open Flames have a temperature of (1000-2300 deg C) (candles)
- Candle Flames: 600 deg C to 1400 deg C (<http://webexhibits.org/causesofcolor/3B.html>)
- Peak Candle Temp ~1400 deg C (<http://www.doctorfire.com/flametmp.html>)
- Wax melts at 120-167 deg F (49-75 deg C)
- Cotton ignites at 250 dec C
- Wool AIT = 205-230 deg C (Ignition Handbook)
- Paper ignites at 218-246 deg C
- Wood ignites at 190 - 260 deg C

Three elements are necessary for a cigarette fire to occur:

1. Contact between the cigarette and the potential fuel source
2. Susceptibility of the fuel source to ignition
3. Propensity of the cigarette to ignite fires when put in this position.

25.4.5 Smoking Materials. Modern upholstery fabrics and materials, by their chemical nature, are generally difficult to ignite with a cigarette. Ignition may occur if a lighted cigarette is buried in paper, tissues, or other debris, or if the seat material comes into contact with open flame. Urethane foam seating burns readily, once ignited with a flame, and adds substantially to the intensity of a vehicle fire.

Cigarette-initiated fires account for only 10% of residential fires (which is a larger percent than candle-initiated fires)

25 to 33 percent of upholstered furniture fires are caused by small flames, the rest by cigarettes.

September 18, 2002:

**CAMP PENDLETON (CA)**- A wildfire that scorched 247 acres on the base Monday afternoon was started by a cigarette butt tossed by a passing motorist, fire investigators said.

The fire burned for about four hours along Vandegrift Boulevard, near the airfield, before firefighters got it under control. Scott Simpson, an investigator with the Camp Pendleton Fire Department, said there are thousands of cigarette butts on the ground in that area, but he was able to find the specific one that ignited Monday's fire. "Burn patterns helped indicate the point of origin," Simpson said

## Characteristics

potentially a smell of cigarettes

How it starts: Examples:

- Investigators determined that the woman had been smoking in bed and touched her bed linens with her cigarette, starting the fire. As flames spread, she got into her wheelchair, but couldn't make it out of the unit.
- Investigators found an ashtray on a bedroom chair and noted burn patterns indicating that the fire started in that area. They determined that smoking materials ignited the chair and paper items located nearby.
- Investigators believe that a cigarette ignited carpeting in the first-floor den and that the fire then spread in all directions.
- The fire began when a cigarette ignited papers in a plastic wastebasket and spread to wooden molding and a closet. Once the wastebasket melted, the fire also ignited the wooden floor and bedding.
- a fire started by a discarded cigarette ignited grass and leaves under a porch near the only door to her motel room. Investigators believe the fire may have smoldered for as long as 30 minutes before she detected the fire and called 911 at 2 a.m.
- Investigators believe the fire began when discarded smoking materials ignited the living room couch.

Additional resources:

<http://www.firesafety.gov/directory/public/electrical.shtm>

[http://www.interfire.org/res\\_file/patterns.asp](http://www.interfire.org/res_file/patterns.asp)

<http://www.interfire.org/features/burnpatterns.asp> liquid accelerants

<http://www.straightdope.com/mailbag/mfireorigin.html> information on fire burn patterns