



Home fires are now faster and fiercer

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An expert peer-review has confirmed domestic fires have become much faster and more dangerous “the time needed to escape ... has been reduced to as little as three minutes from 17 minutes only three decades ago”.

NIST (US National Institute for Science and Technology) released in December 2007 a peer-review and update of the major 2004 study carried out with [Underwriters Laboratories](#) showing that “escape times” (time between start of a fire and reaching untenable conditions or flash over) have dropped drastically, from 17 minutes in 1975 to 3 minutes today.

The study looked at location and performance of smoke alarms and was based on laboratory tests, modelling, and two full scale tests in actual residential structures with representative sizes and floor plans, using actual furnishings and household items for fire sources.

The initial 2004 study was subjected to peer review and correction. The revised version, published in December 2007, corrects a number of calculations and assumptions, and can now be considered to be peer-reviewed and confirmed. The overall conclusions showing the increase in danger of home fires are not affected by the changes.

NFPA (the US National Fire Protection Association) states that the revised study “adds credibility to the characterization of polyurethane foams and similar materials as ‘solid gasoline’. The furnishings we surround ourselves with today pose a higher level of risk than in past decades, resulting in faster-developing fires and less time for escape. ... synthetic materials produce hotter fires and more toxic smoke than natural furnishings ... The fire continues to grow if other furniture becomes involved; an upholstered sofa alone can produce a 4-megawatt fire. For a reasonable level of safety in the broad range of occupancies that use upholstered furniture, the “ultrafast” fire scenario should be addressed.”

Furniture, consumer products and reduced escape times

The study shows that upholstered furniture and mattresses account for the top four most deadly fire scenarios. Full scale fire test results on chairs and mattresses (both non flame retarded) showed that “untenable conditions” (such that escape for room occupants had become impossible) were reached after just 3 minutes.

The study report conclusions state: “Escape times in this study were systematically shorter than those found in a similar study conducted in the 1970's. This is related to some combination of faster fire development times for today's products that provide the main fuel sources for fires, such as upholstered furniture and mattresses, different criteria for time to untenable conditions, and improved understanding of the speed and range of threats to tenability.”

This confirms that the increasing fire load of consumer products and home decorations is effectively making home fires increasingly dangerous, to a point where fire alarms sounding will often not provide adequate time for occupants to escape. Flame retardants, to slow fire spread and development, are thus increasingly critical.

Underwriters Laboratories press release, 4th October 2005: <http://www.ul.com/media/newsrel/nr100305.html>

US National Fire Protection Association (NFPA) position, January 2008:

<http://www.nfpa.org/publicColumn.asp?categoryID=&itemID=37321&src=NFPAJournal>

Summary of 2004 report in Canadian Fire Alarm Association journal "Three minutes escape time":

<http://www.cfaa.ca/journal-2004-summer-escape.pdf>

Access to the revised NIST study, including explanations of modifications, etc. Bukowski, R.W. et al., 2004, revised December 2007, "Performance of Home Smoke Alarms, Analysis of the Response of Several Available Technologies in Residential Fire Settings" NIST Technical Note 1455 (396 pages) <http://smokealarm.nist.gov/>