BRIEFING NOTE INTO THE FLAMMABILITY OF CLOTHING MATERIALS

Summary of main facts

1/ Purpose and background of note

The purpose of this note is to assist the Coroner and other interested parties, in determining if there are any matters that should properly be considered, in particular relation to vulnerable people such as the elderly and immobile who smoke, as likely to prevent future fire deaths where the flammability of clothing (and incontinence pads) may be a factor.

East Sussex Fire & Rescue Service (The Service) have attended a number of fire fatalities involving elderly / immobile persons who smoke and where it is considered that due to the flammability and ease of ignition, incontinence pads and clothing may have been a significant contributory factor in their deaths.

Information relating to the issues with incontinence pads and fire are highlighted in a fatal fire report (available on request) into the death of an elderly man at Ringmer near Lewes on 1 March 2012. The inquest into this death is being heard in Coroners Court on 6 September 2012.

This note is a summary of the main facts relating to the flammability of clothing and other related matters (including current regulation in the UK and elsewhere) and has been produced to support the fatal fire report and inquest into the above mentioned fire death.

2/ Fire properties of some common clothing materials

Depending on the type of fabric, its textile construction, its weave, weight, and finish, as well as looseness of fit, clothing can pose a serious risk of burn injury if these properties cause clothing to ignite quickly and burn rapidly.

Clothing that fits tighter to the body or is made out of tightly woven fabric is safer than loose-fitting clothing;

Wool burns very slowly and is difficult to ignite.
Cotton burns easily quickly.

Rayon (a manufactured alternative to silk - http://www.wisegeek.com/what-is-rayon.htm) ignites easily, but burns slower than cotton.

Silk is much less flammable compared to rayon.

Nylon is less flammable as well, but melts and can adhere to the skin.

In summary, materials such as cotton, cotton/polyester blends, rayon and acrylic are generally more combustible than 100 per cent polyester, nylon, wool and silk. The weave is also a factor in determining flammability. Fine threads with open weaves are more combustible than heavy, closed weaves of the same material.

3/ Other issues

3.1 Loose-fitting clothes - The design and fit of garments is also a critical element in the hazard. Loose-fitting garments with long, flowing design and billowing sleeves are hazardous anywhere near open flames. The garments most commonly associated with clothing ignition injuries are pyjamas, nightgowns, robes, shirts/blouses, pants/slacks, dresses and any sheer, flowing garments made from highly combustible fabric.

3.2 Burning cigarettes - Burning cigarettes, cigarette ash, matches or lighters are a major cause of clothing fires.

3.3 Other open flames around the home - Clothing fires are also caused by open flames from candles, gas cooker tops, barbeques, open fires and space heaters. People involved in grinding metal, welding or soldering are also exposed to sparks that can cause clothing to catch fire. Note; in East Sussex there have been a number of fire fatalities where persons (typically elderly) have died after their clothing came in contact with open flames.

4/ Reducing the risk

Some polyester fabrics are considered permanently fire retardant. This is because fire retardant properties are built directly into the molecular structure of the fibres. Many natural
fibres, including cotton, can be topically treated with a chemical that reduces the fabric’s flammability to the extent that it becomes nearly non-combustible. Some synthetic fabrics may be topically treated with fire retardant chemicals after the manufacturing process (in the same manner as natural fibres such as cotton), or may be untreated (or untreatable) and therefore considered non–fire retardant.

When a fabric is designated as 'inherently fire retardant', 'permanently fire retardant' or 'durably fire retardant', the flame retardant properties will last for the life of the fabric. Fire retardant fabrics that have been topically treated with chemicals will lose the flame retardant properties over time, particularly with repeated cleaning.

People should always follow instructions for washing and care of fabrics and clothing treated with fire retardant chemicals. Failing to do so can reduce their flame resistant qualities.

Choosing clothing made of fabrics such as polyester, nylon, wool and silk is likely to significantly reduce the risk of fire and in the case of elderly / immobile people who smoke - could be considered a highly effective control measure.

5/ Statistics

Australia

- 12 deaths resulted from clothing fires between 2000 and 2006.
- 100 per cent of those who died were older Australians:
  - 10 victims were over 65 years old
  - 1 victim was 60 years old
  - 1 victim was 54 years old.

USA

- An average of 120 people died in the USA each year from clothing thermal burns between 1999 and 2004.
• 75 per cent of these victims were 65 years old or older (USA National Centre for Health Statistics (NCHS)).
• The annual USA average from 1997 to 2006 for clothing-related burn injuries treated in emergency departments was 4,321. Of these:
  o 3,205 related to daywear
  o 1,175 related to daywear worn by people aged 25 to 64
  o 801 related to daywear worn by people aged 14 to 24 (USA National Electronic Injury Surveillance System (NEISS)).

Britain

• Around 80 people in Britain are killed each year after their clothing catches on fire.

UK Regulation

While there is a mandatory standard to reduce the risk of burns from children’s nightwear (must conform to the Nightwear (Safety) Regulations 1985) there are currently no compulsory safety requirements for other children’s clothing or for any adult clothing. Burns from clothing fires are a significant cause of serious injury and death—particularly in older age groups, where incidents are mainly related to robes, pyjamas and nightgowns. While most fabrics used in clothing can burn, some materials are much more flammable than others.

In the US, strict regulations govern the manufacture and sale of such clothes, but UK law covers only children's nightwear. Adult nightwear that does not pass these regulations must carry a warning, but may still be sold. There are no regulations which stop the sale of potentially dangerous day clothes.

Home Office statistics show as many as a third of all clothing fires in Britain result in death, and more than two-thirds in injury.

David Jenkins, a product safety adviser at the Royal Society for the Prevention of Accidents, said: "The materials being used are often three times more flammable than nightwear treated
with flame-retarded chemicals. There is a requirement in the US for all clothing material to satisfy a minimum flammability requirement. There are no equivalent standards in this country."

Dr Don Christian, the chairman of the British Standard Technical Committee for the Fire Behaviour of Textiles, said: "Textile technology has made significant advances in the use of materials. This has increased the threat because there has been no evaluation of their fire performance or safety levels."

6/ Conclusion / Recommendation

Based on the experiences of The Service of fire fatalities occurring in East Sussex involving elderly / immobile persons who smoke and the issues raised in relation to clothing / incontinence pads as being a likely contributory factor, I believe that it would be appropriate for further consideration to be given to this matter by those agencies who are in a position to determine if there are reasonably practical measures that should be taken to raise awareness of the risk and mitigate its impact.

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