

# **REDUCED-IGNITION PROPENSITY CIGARETTES**

## **A review of policy relevant information**

**Prepared for the Commonwealth Department of Health and Ageing**

**by**

**Simon Chapman  
Professor of Public Health  
University of Sydney**

**and**

**Antony Balmain  
Journalist, Documentary Director  
Melbourne  
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## Preface

In writing this report, we have drawn extensively from six key documents which have been recently published or broadcast:

- The March 2002 21 page background paper prepared for the Canadian Ministerial Advisory Council on Tobacco Control *Fire Safe Cigarettes: Preventing deadly fires caused by tobacco products*.<sup>i</sup>
- Laugesen et al's 2003 New Zealand study of the self-extinguishing properties of manufactured and hand-rolled cigarettes treated with different levels of citrate in their papers.<sup>ii</sup>
- Gunja et al's review of tobacco industry internal documents pertaining to fire-safe cigarettes and efforts made by the industry to thwart legislative developments in fire-safe cigarettes.<sup>iii</sup>
- Imperial Tobacco (Canada's) extensive 53 page submission to the 2002 Health Canada and the House of Commons Standing Committees<sup>iv</sup>. This document represents the single most recent elaborated summary of tobacco industry concerns and objections to mandated fire-safe cigarettes.
- Jennifer Dainer's 2003 thesis submitted to the University of Technology, Sydney on the ability of cigarettes to light bushfires.<sup>v</sup>
- The 2003 SBS TV Insight documentary *Cigarette Burns*, written and directed by Antony Balmain, the co-author of this report.

These reports represent the most recent and most important contributions to the debate about fire-safe cigarettes.

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<sup>i</sup> Lennox D, Genova R. Fire Safe Cigarettes: Preventing deadly fires caused by tobacco products. A Background Paper of the Ministerial Advisory Council on Tobacco Control. Prepared under the direction of the Product Modification Subcommittee. Toronto, Canada, March, 2002.

<sup>ii</sup> Laugesen M, Duncanson M, Fraser T, McClellan V, Linehan B, Shirley R, Hand rolling cigarette papers as the reference point for regulating cigarette fire safety. *Tobacco Control* 2003;12:406-10.

<sup>iii</sup> Gunja M, Ferris Wayne G, Landman A, Connolly G, McGuire A. The case for fire safe cigarettes made through industry documents. *Tobacco Control* 2002; 11:346-53.

<sup>iv</sup> Imperial Tobacco. A submission presented on behalf of Imperial Tobacco Canada To Health Canada and the Standing Committee on Health In consideration of The Regulatory Proposal for Reducing Fire Risks from Cigarettes and Bill C-260, An Act to Amend the Hazardous Products Act (fire-safe cigarettes) January 31, 2003.

<sup>v</sup> Dainer J. Can Cigarette Butts Start Bushfires. Thesis Forensic Science, UTS, 2003.

## Executive Summary

**Preferred terminology.** “Reduced ignition propensity” (or RIP) is the most accurate term used to describe cigarettes which have reduced propensity to start fires and should be the preferred term to refer to cigarettes variously described as “fire-safe” or “self-extinguishing”.

**Under-estimates of impact.** There are considerable problems involved in establishing whether cigarettes and other smoking materials such as roll your own cigarettes and cigars cause particular fires because evidence of cause is often destroyed in the fires. This results in wide confidence intervals being placed around the upper estimates of cigarette-caused fires with estimates being conservative.

**Fires caused by discarded cigarettes.** Annually, at least 4,574 fires are considered to be directly associated with cigarettes and smokers’ materials across Australia. In addition, up to 78,894 more fires each year could be associated with cigarettes and smokers’ materials.

**Bush fires.** Conservatively 7% of bushfires are estimated to be caused by discarded cigarettes.

Recent Australian experimental work has shown that smouldering cigarette butts can ignite bush litter in 4% of trials (wind speed approximately 40km/h, fuel moisture content approximately 12% of oven dry weight, humidity 14%). From 1000 smouldering butts discarded in comparable conditions, 40 fires might result.

**Deaths and injuries.** There are inconsistencies and gaps in the recording of death and injury caused by fires across different jurisdictions in Australia. Problems about establishing whether cigarettes and other smoking materials cause particular fires produces conservative estimates of the number of people killed and injured in cigarette-caused fires.

Twenty three percent of fire-caused deaths are estimated to be caused by cigarette-caused fires. This translates to some 21 deaths each year, with considerably more morbidity.

**Cost of fires.** Cigarette-caused fires cost Australia at least \$80.6m in 1998.

**Cigarettes use by arsonists.** Cigarettes are sometimes used as “ignition delay devices” by arsonists because they allow departure from the scene of a fire before a blaze erupts. RIP cigarettes may reduce this particular use of cigarettes.

**Attitudes toward RIP cigarettes** by fire authorities. Senior Australian fire authorities uniformly support efforts to mandate RIP cigarettes.

The international tobacco industry says it supports government standards for RIP cigarettes, but has a long history of opposing any given standard. Instead, the industry supports fire-prevention measures that take the focus away from concerns to change the ignition propensity of cigarettes.

**Design features that produce reduced ignition propensity cigarettes.** There are four design features of cigarettes that can be altered to make cigarettes less fire-prone: reduced tobacco

density; reduced paper porosity; decreased circumference of cigarettes; and removal or reduction of burn additives.

Tobacco companies in the USA have patented many RIP cigarettes, but to date only one such brand has been released on the market (Philip Morris *Merit*).

**Importance of reducing or eliminating citrate in cigarette paper.** A recent comparative study of self-extinguishment showed that all manufactured cigarettes burnt full length; 73% of *Merit* burnt full length; and no hand rolled cigarettes wrapped in virtually citrate-free paper burned full length. The elimination of citrate in cigarette paper appears to be a simple and effective means of dramatically reducing the ignition propensity of cigarettes.

**Legal concerns by tobacco companies.** It is possible that tobacco companies have not introduced RIP cigarettes due to concerns over possible litigation from people injured in fires caused by non-RIP cigarettes. Their position appears to dispute the validity of RIP cigarette standards, despite having developed and patented many RIP prototypes.

**Ignition Propensity legislation & regulations.** The state of New York is the first jurisdiction in the world to have legislated for all cigarettes sold to conform to a RIP fire standard. The New York standard is a performance-based standard, not a design standard, thus allowing tobacco companies to achieve this performance standard by whatever means they elect. On March 30, 2004 the Canadian Parliament passed legislation that will amend the Hazardous Products Act to allow provisions for complementary regulations under the Tobacco Act. The regulations would mandate for all cigarettes sold in Canada from 2005 to be reduced ignition propensity cigarettes.

Proposed Cigarette Ignition Propensity Regulations were prepublished in Canada Gazette Part 1 on May 1, 2004. These regulations would mandate an ignition propensity standard for all cigarettes manufactured or imported into Canada on or after October 1, 2005. A 75-day comment period has been set.

The proposed regulations for Canada recommend using the American Society of Testing Materials (ASTM) International method E2187 - 02b, dated December 10, 2002 and entitled *Standard Test Method for Measuring the Ignition Strength of Cigarettes*. This is the same performance standard that is currently in the New York standard for reduced ignition propensity cigarettes.

## 1. Definitions and Recommended Terminology

A “fire-safe” cigarette either has a lower propensity to ignite substrates such as bedding, carpet, furniture or vegetation (even though the cigarette burns its entire length) or will self-extinguish without burning its full length when left unpudded for an extended period. There are several terms that have been used sometimes interchangeably to describe cigarettes which are less likely to cause fires. These terms include: fire-safe cigarettes, self-extinguishing cigarettes, low ignition propensity cigarettes, and reduced-ignition propensity/potential cigarettes.

McGuire comments that:

“Prior to 1982, it was assumed that the only method available to render a cigarette less of a fire hazard was to cause the cigarette to “self-extinguish” within a short period of time. In the late 1960s research conducted at the [United States] National Bureau of Standards (NBS) on mattress flammability showed that cigarettes had to smoulder for up to 20 minutes before igniting a mattress.

Thus, in 1974 an act introduced in the U. S. Senate called for an arbitrarily defined 10-minute period within which cigarettes had to self-extinguish in order to be designated as less likely to ignite mattresses or furniture. In 1979, another act was introduced by Congressman Joseph Moakley in the U. S. House of Representatives that called for a more stringent but equally arbitrary five-minute self-extinguishment time. Then, in unpublished research conducted at NBS in the early 1980s, it was discovered that a cigarette could continue smouldering its entire length, from lit end to filter tip and for up to 20 minutes while placed on flammable mattresses or furniture and *not* cause ignition. By 1987, a more precise definition was created by NIST [National Institute of Standards and Technology] for a cigarette that was less of a fire hazard.” However, the less precise term “fire safe” cigarette has taken hold as the shorthand definition of a cigarette that NIST defines as a “reduced propensity for igniting mattresses and upholstered furniture.”<sup>1</sup>

The first term to be used in discussions about making cigarettes less of a fire hazard was “self-extinguishing cigarette”.<sup>2</sup> In the United States, the first patent for a self-extinguishing cigarette - Bristol 11.409 - was issued 150 years ago, in 1854. Since then about one hundred patents have been registered for cigarettes which in some way are designed to reduce their likelihood of starting fires, typically in bedding material or upholstered furniture.

The term “low ignition propensity (LIP) cigarette” was used by advocates for legislation to mandate these cigarettes in the United States, both in Congress and across 14 individual States to protect consumers and fire-fighters during the late 1970s and 1980s. Canada appears to be the first nation to use the expression “reduced ignition propensity cigarette (RIP cigarettes).

During this period the term “fire-safe cigarette” also began to be used. Indeed in 1984, an agreement was reached between the US Senators Heinz and Cranston, Congressman Moakley and the US Tobacco Institute over Fire-Safe Cigarette Legislation. A Technical Study Group (TSG) of Cigarette and Little Cigar Safety was created to determine the technical, economic and commercial feasibility of developing a cigarette with a minimum propensity to ignite upholstered furniture and mattresses.<sup>3</sup>

After the TSG determined that it was feasible to produce such a cigarette, the U.S. Congress passed the *Fire Safe Cigarette Act* of 1990. The 1990 law led to a standard “test method” – still disputed today by the tobacco industry -- enabling the final development and implementation of a fire safety performance standard for cigarettes.

In the state of New York, the term “reduced ignition propensity” cigarette has been used in the world-first legislation enacted in 2000. The new law mandated that the ignition propensity of cigarettes be reduced to a specified standard (see Appendix 1).<sup>4</sup>

The tobacco industry correctly contends that a truly fire-safe cigarette does not exist but that a “more fire-safe” or a self-extinguishing cigarette or cigarette with a reduced ignition propensity are more accurate terms.<sup>5</sup> Tobacco companies argue that cigarettes are meant to be ignited, have a burning coal and therefore can always cause fires in some circumstances. Advocates for safety standards including the US National Fire Protection Association use the term “fire-safe cigarettes” and “self-extinguishing” because the risk of fire is greatly reduced when significant changes are made to the structure of manufactured cigarettes.<sup>6</sup>

While all terms have enjoyed usage at different times, “reduced ignition propensity” (henceforth RIP) would appear to be the most accurate descriptor of the cigarettes under consideration. This term embraces self-extinguishing cigarettes (ie those designed to go out when left unpuffed for an extended period).

McGuire notes that “the less precise term “fire-safe” cigarette has taken hold as the shorthand definition of a cigarette that NIST defines as a “reduced propensity for igniting mattresses and upholstered furniture”<sup>7</sup> The term “fire-safe” would appear less of a “mouthful” than “reduced ignition propensity” cigarettes and is therefore likely to be more easily understood by the public. However, “safe” would imply that such cigarettes pose no potential at all to light fires and so is somewhat misleading and is therefore not recommended.

We therefore recommended that “reduced ignition propensity” (RIP) should be the preferred term and have used it in the report.

## 2. Overview of technologies that could reduce the ignition propensity of cigarettes or increase the self-extinguishing capabilities of cigarettes

### (i) Overview

Gunja et al<sup>8</sup> summarised patents registered from the early 1980s onwards in the USA to produce a fire-safe cigarette. Little is known about which, if any, of these patents were ever incorporated into manufactured cigarettes, which were retailed in the USA.

“Internal industry documents reveal that a fire safe cigarette has long been possible. PM [Philip Morris] asked for a full review of the existing patents on self-extinguishing cigarettes in 1979 and found that at least 33 patents existed for means claimed to be useful in making self-extinguishing cigarettes<sup>9</sup>. Many of these patents have existed for a long time: the first American patent for a self-extinguishing cigarette was issued in 1854, and patents were also issued in 1935 and 1936. In 1932, the National Bureau of Standards claimed to have “develop[ed] a treatment which caused the cigarette to go out as soon as thrown away”<sup>10</sup>. In 1974, PM reviewed a self extinguishing cigarette patented by Charles Cohn in 1962, that successfully self extinguished through a silicate solution added to the paper. 11 A *Mother Jones* article from 1979 focused on the Cohn patented cigarette and confirmed the product’s fire safety.<sup>11</sup> The tobacco industry was aware of research done before initiation of their own fire safe projects, and knew that they were not breaking entirely new ground on this issue.” (see table on p 30)

A 1987 US Technical Study Group (TSG), which was later called the Technical Advisory Group (TAG) was given the mandate in 1984 by the US government to look into the feasibility of developing lower-ignition propensity cigarettes.<sup>12</sup> vi It was later asked to develop an effective testing methodology to establish performance standards for fire-safe cigarettes.

The ignition of a substrate (upholstered furniture, mattress, bedding or vegetation) by a lit cigarette is a complex process that depends on the following factors:

- the characteristics of the substrate;
- the area of the burning cigarette coal;
- the speed of smouldering by the cigarette; and
- the zone of contact between the substrate and the smouldering cigarette.

Ignition of the substrate occurs when the burning cigarette heats the substrate material to the point where it begins to smoulder. Therefore, a less ignition-prone cigarette must generate less heat (i.e., burn less fuel or restrict access of oxygen to the fuel), or heat the fabric less efficiently.<sup>13</sup>

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<sup>vi</sup> The 2002 report from Health Canada, *Regulatory Proposal for Reducing Fire Risks from Cigarettes*<sup>vi</sup> drew particularly on the work of the TSG

The US TSG identified four distinct design features of cigarettes that could be altered to make cigarettes less fire-prone. These design changes are as follows:

- Reduced tobacco density.
- Reduced paper porosity.
- Decreased circumference of cigarettes.
- Removal or reduction of burn additives.
- The presence and length of a filter.

## **(ii) Potential Design Changes**

### **(a) Reduced tobacco density**

Reduced tobacco density was found to be the most important factor for reducing ignition propensity.<sup>14</sup> Tobacco density can be decreased by expanding the volume of the tobacco strands or by cutting them wider.<sup>15</sup> It is believed that the reduction in the amount of tobacco itself is responsible for the observed reduction in ignition propensity as there is less tobacco available for fuel per unit length of the cigarette.<sup>16</sup>

### **(b) Reduced paper porosity**

Reduced paper porosity was the second most important factor identified by TSG for reducing ignition. Why this is the case is still not fully understood though it is believed to be related to a reduction in the availability of oxygen which is necessary to fuel the smouldering process.<sup>17</sup>

#### ***Example: "Ribbed" cigarette paper technology***

In early January 1999, Philip Morris announced that it had developed a "ribbed" cigarette paper that might reduce the cigarette's ignition propensity.<sup>vii</sup> The RIP cigarette (Philip Morris' *Merit*) currently available in the U.S. and New Zealand markets uses a patented paper which has concentric bands of ultra-thin paper applied on top of traditional cigarette paper. Philip Morris stated that "...These bands or rings act as "speed bumps" to slow down the rate at which the cigarette burns as the lit end crosses over them." "Of particular importance to this process is the width and the air permeability of the bands, both of which have been found to have relatively strong linear relationships with ignition propensity. Specifically, as air permeability of the paper bands decreases, the ignition propensity of the cigarettes also decreases and conversely, as the width of the bands decreases, ignition propensity increases".<sup>18</sup>

Philip Morris issued the following warning about *Merit*:

"... Cigarettes made with this paper were evaluated under a laboratory test method designed by the National Institute of Standards and Technology to measure the likelihood that cigarettes will ignite the three test fabrics specified in this test method. Under this testing method, these cigarettes produced fewer ignitions of the three test fabrics as compared to the same cigarettes made without the special paper. It is important to note that the test fabrics are not necessarily representative of the kinds of fabrics one might find in a particular home or elsewhere. These cigarettes are not "fire safe." Do not handle or dispose of

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<sup>vii</sup> Philip Morris U.S.A., Media Release, July 12, 2000. The ribbed paper developed by Phillip Morris is known as "PaperSelect." Currently, only one Philip Morris brand, Merit cigarettes, is utilizing PaperSelect the product having been put into national circulation in the USA in July 2000.

cigarettes made with this special paper with any less care than other cigarettes. Anything that burns, including cigarettes or cigarette ashes, can cause a fire if handled carelessly.”

Laugesen et al (see below) included *Merit* in their study of self-extinguishment and found that 73% of *Merit* burnt to their full length compared with all (100%) comparison manufactured cigarettes. However, on self-extinguishment, *Merit* performed far worse than hand-rolled cigarettes using tobacco taken from manufactured cigarettes and rolled in papers with very low levels of citrate (100% of which self-extinguished before burning full length).

### **(c) Decreased circumference of cigarettes**

Decreased circumference of cigarettes was also found to play a role in reducing ignition propensity. Decreasing the circumference of a cigarette reduces the available tobacco, the paper per unit area and the contact zone between the substrate and the cigarette. Each of these factors reduces the tendency of a cigarette to ignite a substrate.<sup>19</sup>

### **(d) Removal or reduction of burn additives**

Considerable controversy has surrounded the tobacco industry's use of burn additives such as citrate to enhance the burn rate of cigarette paper. It would appear logical that the removal or reduction of burn additives would reduce ignition potential. Further, all three of the experimental cigarettes with the lowest ignition potential in the TSG study had no burn additives in their papers. This has been corroborated by the more recent work of Laugesen et al (see below). However, the reduction of paper burn additives was concluded by the TSG in 1987 to have a highly variable effect on ignition propensity and was then concluded to be not supportable as a significant or reliable method of decreasing the fire hazard of cigarettes.<sup>20</sup>

#### ***Example: Removal of Burn additive ‘citrate’ - Laugesen et al New Zealand study***

An important study published in 2003 by a New Zealand group<sup>21</sup> points strongly to the importance of the addition of citrate to cigarette paper as a factor promoting the ignition propensity of cigarettes. In this study, the investigators compared the propensity of (a) New Zealand made *Holiday*, and *Horizon*, and US made *Marlboro* manufactured cigarettes; (b) US manufactured *Merit* with banded paper; (c) *Holiday*, *Horizon* and *Marlboro* hand rolling tobaccos, hand rolled in *Rizla* cigarette papers; (d) manufactured cigarettes as in (a), reconstructed using *Rizla* hand rolling cigarette papers to extinguish when placed on a substrate of filter paper in accordance with ASTM test standard E2187-02.<sup>22</sup>

40 cigarettes per brand were lit and placed on 15 layers of filter paper. Citrate was extracted by 0.1N hydrochloric acid from the cigarette papers and from tobacco in manufactured cigarettes, and the supernatant analysed by high performance liquid chromatography using ultraviolet visual light spectrophotometer.

For each brand of manufactured cigarettes, 40/40 burnt full length; for *Merit* banded paper cigarettes 29/40 (73%) burnt full length; and for each brand of hand rolled cigarettes 0/40 burnt full length. 0/40 manufactured cigarettes reconstructed with *Rizla* hand rolling paper burnt full length.

Citrate content varied as follows: (a) In manufactured cigarette papers: 0.3–0.8 mg; in tobacco of manufactured cigarettes: *Holiday* 0, *Horizon* 0, *Marlboro* 8.8 mg; (b) *Merit*: in banded paper 0.418 mg; in tobacco 10.23 mg; (c) In hand rolled cigarettes: in the papers < 0.08 mg; in hand rolled tobacco 13.3–15.0 mg; (d) In hand rolling papers of reconstructed cigarettes: < 0.018 mg.

The authors concluded that the wrapping paper is a key determinant of whether or not unpuffed cigarettes burn their full length. Popular brands of manufactured cigarettes all burnt full length, but none did so when re-wrapped in hand rolling cigarette paper. They argued that the hand-rolling paper used provides an acceptable standard for reducing the fire ignition potential of manufactured cigarettes, and could be used as a basis for regulation or litigation.

**(e) The presence and length of a filter**

The presence and length of a filter are other possible design features that may affect cigarette ignition propensity. An epidemiological study of factors that affect smoking found that households where smokers consumed filterless cigarettes tended to have more fires and that there was a weak but statistically significant relationship between increased filter length and reduced ignition propensity.<sup>23</sup> However, when tested in a laboratory, some researchers have observed that the presence of a filter decreases ignition propensity, while others have observed the opposite - that the presence of a filter increases ignition propensity. Still others have found no difference in the ignition propensity of filtered and unfiltered cigarettes.<sup>24</sup> The TSG concluded that more research is required to fully understand the relationship between the cigarette filter and ignition propensity. However this consideration is of little interest in the Australian context as an insignificant number of manufactured cigarettes sold here do not have filters.

### **3. Overview of technologies/protocols for testing the self-extinguishing capability or ignition propensity of cigarettes and identification of any associated issues**

NIST has developed two suitable standard methods for testing the relative ignition propensity of cigarettes:

- a mock-up furniture ignition test method; and
- a cigarette extinction method.

A further standard has been developed for testing the ignition potential of cigarettes for bushfire:

- Dainer's Cigarette ignition potential in bush fires.

#### **(i) The Mock-up Ignition Method**

The Mock-up Ignition Method uses fabric and foam to simulate a piece of furniture. The foam is a block of open-cell, non fire-retarded, flexible polyurethane of a standard size, density and air permeability. The foam is covered with a sheet of one of three standard fabrics of differing weights and a metal rim is placed on top to ensure good contact between layers. For the heaviest fabric a sheet of polyethylene film is included between the fabric and the foam to increase the ignition resistance. This is done for comparison purposes to ensure that there is one mock-up that can only be ignited by the most ignition prone cigarettes.<sup>25</sup>

To conduct the test, a lit cigarette is placed on one of the mock-ups in a controlled chamber. Ignition is considered to have occurred if the char mark spreads at least 10 mm away from the tobacco column. The procedure is repeated a set number of times<sup>viii</sup> for each cigarette mock-up combination and the percent of failures is calculated.<sup>26</sup>

#### **(ii) The Cigarette Extinction Method**

The Cigarette Extinction Method uses a set number of layers of standard filter paper<sup>ix</sup> as a heat-absorbing substrate. The filter paper acts as a heat sink for the burning cigarette and once the cigarette coal has cooled to a certain temperature it should self-extinguish. The more layers of filter paper used, the sooner the cigarette should self-extinguish. Thus, the test measures whether a cigarette, when placed on the layers of filter paper, would burn long enough and strong enough to cause ignition should it be dropped on a piece of furniture.<sup>27</sup>

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<sup>viii</sup> The number of times the procedure needs to be repeated will depend on the sensitivity and reproducibility required

<sup>ix</sup> Circular pieces of very pure cellulose paper used to filter liquids in laboratories. The paper only chars when exposed to a lit cigarette, i.e., it does not catch fire or smoulder.

In the test, a lit cigarette is placed on three, ten or fifteen layers of filter paper. For each number of filter paper layers, the procedure is repeated a set number of times<sup>x</sup> and the percent of failures is calculated. Failure is defined as the cigarette burning its full length. It is important to note that while the end point is the cessation of burning, this is not a test for "self-extinguishing" cigarettes.

Generally, cigarette designs that perform well in the filter paper test also perform well in the mock-up ignition test, sometimes burning their full length without causing an ignition.<sup>28</sup>

A comparison of the filter paper and mock-up ignition tests indicates that both tests produce similar results. In addition, nine laboratories, including four in the cigarette industry, showed that both methods produced results that were repeatable and reproducible.

The benefit of the mock-up test is, that the use of material and foam is closer to real world conditions and thus would be expected to be a more reliable test. However, the material and foam used in the manufacture of furniture is highly variable and constantly changing. In order to run a test that can be used for scientific comparison over the long term it is essential to have a guaranteed, long-term supply of standard fabrics of highly uniform quality, and this has proven extremely difficult to accomplish.<sup>29</sup> The tobacco industry has already signalled its concerns that there are likely to be international variations in fabrics and furnishings which would create problems for any international standard. Filter paper, on the other hand, is a product that is commonly used in scientific laboratories, and can be easily standardised.

Since the results from the filter paper cigarette extinction method have been shown to correlate well with those from the furniture mock-up case, this is the method of choice at the moment.<sup>30</sup>

ASTM International a U.S.-based organisation that develops standard testing methodologies, has recently approved a methodology for testing the relative ignition propensity of cigarettes. The ASTM test is based on NIST's Cigarette Extinction (filter paper) Method.<sup>xi</sup>

### **(iii) Dainer's Cigarette ignition potential in bush fires**

In addition to the Canadian report, Jennifer Dainer's honours dissertation from the University of Technology (Sydney) *Can Cigarette Butts Start (Bush) Fires?*, presents a series of unique methods for investigating the probability of cigarette butts igniting fuels that can typically be found on roadsides or beside railway tracks. Her study tested this probability under both laboratory and outdoor conditions.

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<sup>x</sup> The number of times the procedure needs to be repeated will depend on the sensitivity and reproducibility required. Fewer repetitions are necessary when using the filter paper method because the substrate is less variable.

<sup>xi</sup> A copy of ASTM's *E 2187-02: Standard Test Method for Measuring the Ignition Strength of Cigarettes* (the filter paper method) can be obtained for a fee by contacting ASTM International 100 Barr Harbor Drive, West Conshohocken, PA 19428-2959, USA Website: [www.astm.org](http://www.astm.org)

Under laboratory trials, samples of hay with known amounts of moisture -- either 2% to 4%, 5% to 7% or 8% to 10% of their oven dry weight -- were subject to ignition by a cigarette butt. The laboratory tests were performed using variations of wind speed and the degree of contact between the cigarette's combustion coal and the fuel bed. The fuel used was hay rather than common leaf litter because it allowed for a more consistent sample. The outdoor tests were designed to test cigarette butt ignition in ambient weather conditions only, and therefore no manipulation of the environmental conditions was attempted.

Two brands of cigarettes were selected from ten, based on their ability to cause damage to filter paper after being lit, placed on the paper and allowed to burn freely. Dainer addressed the following questions for all cigarettes tested:

- Did any of the cigarettes self extinguish during the trials?
- Did the cigarettes burn down to the filter and actually char the filter, or did they self extinguish prior to reaching the filter?
- How severe was the damage to the filter?
- How severe was the damage to the filter paper?

The following physical parameters were tested for 10 cigarettes and average values obtained for;

- Length and diameter of the cigarette.
- Weight of tobacco contained in each cigarette.
- Moisture content of the tobacco.
- Weight of the filter.

The following methods were used during the laboratory tests:

- The cigarette brand was varied between the two chosen brands and the length of each cigarette was standardised to 40cm.
- The placement of the cigarette butt was varied. Cigarettes were either placed on top of or pushed into the fuel bed.
- Two wind speeds were used during these trials, "calm" ( $0 \text{ ms}^{-1}$ ) and "wind" ( $1 \text{ ms}^{-1}$ ). In the wind trials, air was passed over the fuel bed at  $1 \text{ ms}^{-1}$  by a small axial fan. (p48)
- The temperature was controlled at 38 to 43°C to simulate extreme mid-summer conditions experienced in Sydney.
- 80 ignition tests were undertaken, in order to obtain a sufficient sample size for all variables.

Under outdoor conditions, wind, temperature and fuel moisture content were all measured. The trials were conducted by determining an area of roadway where grass of suitable length and condition was present to conduct the trials. Information compiled by the New South Wales Fire Brigades detailing locations of fires that occurred over the previous summer was examined.

Dainer was able to demonstrate that under laboratory conditions ignition of hay by cigarette butt was possible, with 33% of samples igniting and that cigarette butts can ignite outdoor samples, with 3 ignitions resulting from 75 trials (4%).

## **4. Australian Data: Incidence, Morbidity and Mortality and Community Costs<sup>xii xiii</sup>**

### **(i) Incidence of cigarette-caused fires**

#### **(a) Overview**

Fire cause investigators have indicated that it is often difficult to determine the exact ignition source of a fire because the evidence is often destroyed and consumed by fire. Cigarette butts are of course easily destroyed in fires, with remnants of butts seldom remaining as evidence. Conclusions about the likely role of cigarettes and smoking materials in causing fires are therefore deduced from a combination of evidence about the location and ignition point of fires (eg: beds, lounge chairs, roadsides) and the elimination of other likely causes. However, as will be seen, fire investigators are unanimous in believing that cigarettes are a significant cause of fires in Australia, although the “confidence intervals” of certainty that they place around their estimates are very wide because of the indeterminate nature of the cause of many fires.

Australian fire organisations have some data on fires caused by cigarettes, although a comprehensive national data set has not been collated on the forensic cause of all fires along with the associated costs of damage to property, injury and death.

Len Foster, Chairman of the Australasian Fire Authorities Council, the peak body which represents all fire agencies and associated bodies in the Australasian region, highlights the number of cigarette-caused fires just in Victoria and the fact that cigarette-caused fires account for significant numbers of fatalities:

“CFA statistics in Victoria -- using that as an example -- would say that about seven per cent of wild fire or bush fire are caused by cigarettes and about nine per cent of structure fires in Melbourne are caused by cigarettes. That translates in that period to about 30 per cent of fatalities... If you look at in terms of loss of life, very significant indeed.”<sup>31</sup>

An indication of the variations in the figures associated with cigarette-caused fires is found in the varying state estimates cited by fire authorities. For example, the Queensland Fire and Rescue Service reported that in a four-year period (1/7/96 – 30/6/00), 74 structure fires involved fatalities. Of these 74, for which a cause could be identified, 48 per cent involved cigarettes and smokers’ materials.<sup>32</sup>

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<sup>xii</sup> Note community costs include costs of injury and death, damage to buildings and parks as well as costs to the fire services of dealing with cigarette and related fires.

<sup>xiii</sup> Fires can also be caused by smoking materials other than cigarettes such as cigars, cigarillos, pipes and bidis. These forms of tobacco use are dwarfed by cigarette smoking in Australia, so throughout this report we will refer only to cigarettes, which should be taken to also refer to hand-rolling cigarettes.

The South Australia Metropolitan Fire Service (SAMFS) Chief Officer, Grant Lupton, confirms that in his jurisdiction, there are large impacts on the community and the fire service as a result of fires caused by cigarettes and smokers materials:

“It’s a very serious issue, the number of fires caused by the misuse of smokers material, specifically cigarettes, is very high, accounts for a large percentage of fires, especially in private residences.”<sup>33</sup>

The SAMFS’s fire cause investigator Geoff Sulley estimates that “Somewhere around 25 per cent of our total fires are cause by cigarettes.”<sup>34</sup>

## **(b) National estimates**

Some Australian fire agencies have provided data to the authors of this report, covering the extent of fires caused by cigarettes and associated costs. The Australasian Fire Authorities Council, through its Australian Incident Reporting System, which is currently being administered by the NSW Fire Brigade, conducted specific data collation for the purposes of this report.<sup>35</sup> However, the data they provided excludes both South Australia and the Northern Territory.

In a recent five-year period (01/07/97- 30/06/02), across Australia, Australasian Fire Authorities Council reports that 394,468 fires were or may have been associated with cigarettes and smokers’ materials. Of these, 22,870 fires were directly associated with cigarettes and smokers’ materials. A further 3,455 fires were associated with discarded materials, some of which would be cigarettes and smokers’ materials. A further 371,598 fires were caused by undetermined or other ignition source/factors, many of which Australasian Fire Authorities Council suggest could have been associated with cigarettes and smokers’.

This means that annually, at least 4,574 fires are considered to be directly associated with cigarettes and smokers’ materials, excluding hundreds of fires in the Northern Territory and South Australia. In addition, up to 78,894 fires each year could be associated with cigarettes and smokers’ materials.

## **(c) Victorian estimates**

The Metropolitan Fire and Emergency Services Board (MFESB - Melbourne) was the only state or territory based agency to provide reasonably comprehensive data for the purposes of this report, including numbers of fires and costs associated with cigarette-caused fires.<sup>36</sup> In the five-year period (01/01/99 until 31/12/03), in Victorian large urban centres, there were 7,830 fires that the MFESB determined were definitely caused by cigarettes, an average of 1,565 per year in Victoria. This is a conservative estimate as it neither includes cases of arson where cigarettes were used as an ignition device (see pages 14,15) nor thousands of fires that were lit by an undetermined form of heat ignition which may include cigarettes.

The MFESB covers most of Melbourne and several other large urban centres around Victoria, while the Country Fire Authority (CFA) handle the rest of the state excluding national parks. The Victorian Department of Sustainability and the Environment (DSE) handle fires in National Parks and other public lands. The CFA did not provide any data for the purposes of this report.

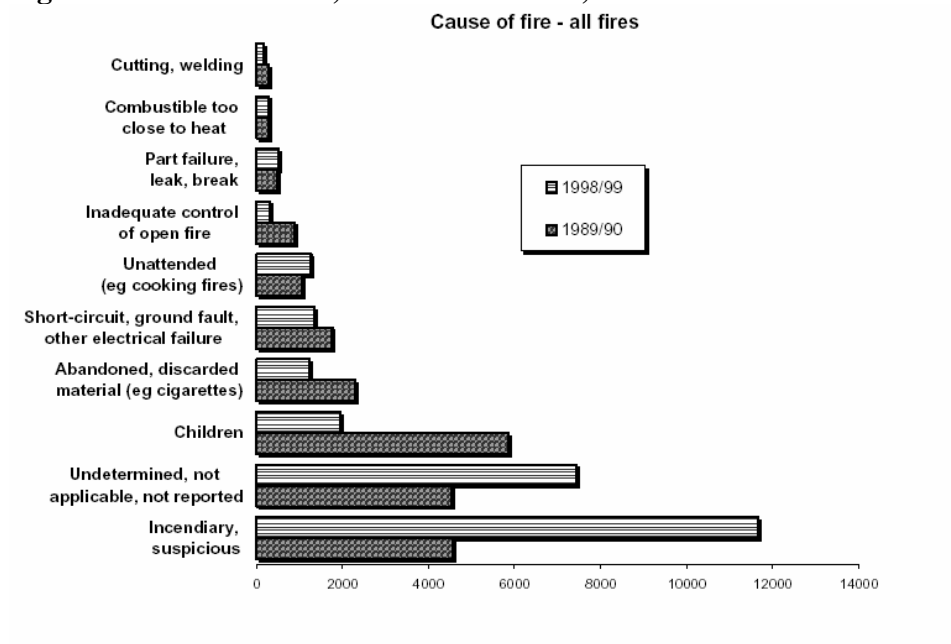
The DSE estimates that cigarettes and smokers' materials caused 5.8 per cent of all fires, between 1972/73 and 2003/04, in Victorian national parks and public lands.<sup>37</sup> Again, it should be noted that this estimate could be higher when considering undetermined ignition and cause of fire such as arson, which have not been incorporated in these figures. In this 31-year period, well over 4.1 million hectares of Victorian public land has been burnt in fires caused by cigarette and smokers' materials.

Another study on Victorian Prison fires by the Metropolitan Fire and Emergency Services Board (MFESB) in Melbourne, shows how during the period 1/1/1990 – 1/7/2000, of 314 fire incidents, 135 – or 43 per cent - resulted from smoking paraphernalia (including cigarettes, matches and cigarette lighters).<sup>38</sup>

**(d) New South Wales Estimates**

The New South Wales Fire Brigade in their 10 year review of fire causes shows that “abandoned, discarded material” such as cigarettes are the largest cause of fires after those caused by children, undetermined and incendiary or suspicious causes (see Figure 1). Cigarettes and abandoned smokers' materials are also highly likely to be included in the two largest categories mentioned above – undetermined and incendiary or suspicious.

**Figure 1: Causes of fires, New South Wales, 1989/90 and 1998/99**



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### (e) Northern Territory Estimates

In the Northern Territory, 27 per cent of the land is affected by bushfires every year. The NT Bushfire Council says that over half of the Top End is affected by bushfires. The Council says cigarettes and smokers' materials cause "many" of these fires.<sup>39</sup>

### (ii) Incidence of cigarette-caused bushfires

#### **Disaster: Cigarette butt starts bushfire**

Jonathon Moran, November 27, 2002<sup>40</sup>

*NSW's Lake Macquarie area was declared a natural disaster zone today as a discarded cigarette butt was blamed for bushfires that destroyed one house and forced hundreds to evacuate their homes. The Lake Macquarie bushfire burnt out 4000 hectares in one day and destroyed three factories. Several hundred people also were evacuated from homes in outer south-western Newcastle. Mr Debus said a cigarette butt thrown from a car window on the F3 freeway, connecting Sydney and Newcastle, was the likely cause of the blaze.....*

### (a) Overview

Bushfires devastate tens of thousands of hectares of Australian bushland and national park. Some of these have encroached on residential property, causing massive property loss in addition to razing the flora, grazing stock and wildlife destroyed in these fires. Some of these fires are likely to have been caused by discarded cigarettes. Talkback radio callers routinely report seeing people toss lighted butts from cars during total fire ban periods, and politicians have introduced significant fines for throwing butts in several jurisdictions.

However little scientific investigation has occurred into whether discarded butts can indeed ignite bush litter. In 2002/2003 the New South Wales Fire Brigades responded to 561 call outs that related to fires started in grass or bark litter (the type found on road median strips) where the source of ignition was attributed to cigarette butts and/or other smoking materials.<sup>41</sup> Attribution to discarded cigarettes in these cases appears relatively straightforward in the absence of any other plausible ignition source.

### (b) Dainer's Studies

In 2003, Jennifer Dainer undertook an Australian study on the probability of ignition of grassy fuels by cigarette butts.<sup>42</sup> Her laboratory and field research confirmed previous findings by the CSIRO that with windy conditions and low humidity, 50 per cent, that is one in two cigarette butts could cause a fire, while in very low humidity and windy conditions, up to 90 per cent of cigarettes could cause fires.<sup>43</sup>

Dainer's work demonstrates that cigarettes sold in Australia today are able to light bush litter under non-laboratory conditions. Her abstract concludes:

"Firstly, a series of laboratory trials were conducted to determine if cigarettes could cause hay to undergo ignition. Samples of hay were dried out then stored in a controlled environment chamber until they absorbed a known amount of moisture – either 2% - 4%, 5% - 7% or 8% - 10% of their oven dry weight. These samples were then subjected to ignition by cigarette butt as the wind speed was varied, along with

the degree of contact between the cigarette's combustion coal and the fuel bed. The results of these trials revealed that ignition of hay by cigarette butt was possible, **with 33% of samples igniting**. [our emphasis]

Three important trends were evident as the results were analysed:

- As the fuel moisture content *increased*, the number of ignitions *decreased*;
- As the wind speed was increased from calm conditions ( $0\text{ms}^{-1}$ ) to “windy” conditions ( $1\text{ms}^{-1}$ ) the number of ignitions increased significantly; and
- As the degree of contact between a cigarette's combustion coal and the fuel bed was increased, the number of ignitions increased, given sufficient ventilation.

#### *Outdoor trials*

Outdoor ignition trials were also conducted to determine if cigarette butts could ignite grassy fuels that had been subjected to ambient weather conditions only. That is, no manipulation of samples or environmental conditions was attempted. However, parameters were monitored and recorded (wind speed approximately 40km/h, fuel moisture content approximately 12% of oven dry weight, humidity 14%). The results of this experiment reveal that cigarette butts can ignite outdoor samples, **with 3 ignitions resulting from 75 trials (4%)**. [our emphasis]

#### *Butt survey*

Finally, a survey was executed to determine how many cigarette butts could be recovered from two median strips located on a major three lane Sydney road, and to measure the draught created by passing cars experienced by the median strip (a potential fuel bed). In total 426 cigarette butts were collected, averaging approximately 7 per day on each median strip.

A wind speed of  $1\text{ms}^{-1}$ , when applied in the laboratory context, was found to significantly increase the potential for cigarettes to ignite hay samples. The wind draught created by a steady line of passing cars, as measured from the fuel bed of a median strip, was between  $2.8$  and  $4.1\text{ms}^{-1}$ . Therefore, regardless of the prevailing wind speed conditions, cigarettes that land on a median strip after being jettisoned from a moving vehicle are subjected to wind speeds that are strong enough to *significantly* increase the probability of ignition.

The results of this project reveal that ignition is reliant upon many factors which must combine to provide the required conditions for a cigarette butt to ignite a grass fuel sample, with the probability of ignition rising sharply with slight variations in one or more of the relevant parameters.”

The New South Wales Minister for Emergency Services, the Hon Tony Kelly, commented: “This means if 1000 people threw cigarette butts out of their car onto grass under these conditions, they could start 40 fires”.<sup>44</sup>

Many cigarette butts are improperly discarded in Australia each year. Dainer's work is therefore of critical importance to the emerging picture of the likely role played by cigarettes in starting bushfires in Australia.

### **(iii) Role of cigarettes in arson**

Fire investigators have reported that cigarettes are sometimes used by arsonists. Two leading fire investigators told SBS Television's Insight program in 2003 that there are many instances where cigarettes have been used as time-delay incendiary/arson devices around Australia.

“I think the country fire services Australia wide are well aware of what cigarettes can do as an incendiary device. Over the years, yes, there’s been heaps and heaps of cigarettes used as delay devices for deliberate fires.” (Geoff Sulley, of the South Australian Metropolitan Fire Service)<sup>45</sup>

Using cigarettes as an arson device enables the arsonist to get away from the scene of the crime. Lighted cigarettes can be affixed to a wick leading to flammable material, allowing the arsonist to leave the crime scene before the fires begins:

“They were used as a delay device so the perpetrator could get away. It only gives him four or five minutes but that’s enough to get in your car, drive away unannounced and (they) don’t have to speed.”

and:

“Using a cigarette to do this particular type of arson gives the culprit time to actually leave the scene because of the slow burn of the cigarette and be at some other place when the fire takes hold.”<sup>46</sup>

These public comments by Australia’s leading fire investigators are significant because arson and deliberately lit fires have become the leading cause of fires, (both structure and bush fires) in most jurisdictions. Incendiary, arson and suspicious fires therefore cause hundreds of millions of dollars worth of damage every year and also cause further injuries and deaths. An unknown percentage of this damage and these costs can be attributed to cigarettes, according to the evidence from fire investigators.

This aspect of cigarette-caused fires has so far not been accounted for at all in any data collation or studies to date as far as the authors were able to determine. If reduced ignition propensity cigarettes were mandated in law, it is possible that this means of starting fires would be eliminated, although we can only speculate as to whether arsonists would readily find a substitute method.

The NSW data alone suggests that overall costs of arson fire runs in the tens of millions of dollars (See table below).

**Table 1: Ignition factor by type of fire and dollar loss due to building fires<sup>47</sup>**

Ignition Factor	Building Fires	Mobile Property Fires	Vegetation Fires	Outside Rubbish Fires	Other Fires	Total Fires	Dollar Loss due to Building fires
Incendiary	442	1 231	2 215	1 792	264	5 944	<b>\$ 9 241 457</b>
Suspicious	834	2 531	2 638	1 964	410	8 376	<b>\$28 542 725</b>

#### **(iv) Morbidity and Mortality associated with cigarettes and smokers’ materials**

##### **(a) Morbidity**

Smoke inhalation and heat cause respiratory injuries, commonly known as smoke inhalation injuries. Those who are injured in fires and suffer burns are also susceptible, depending on the severity of the injury, to a range of other trauma complications ranging from:

- Cardiac arrest to shock

- Disseminated intravascular coagulation
- Rhabdomyolysis, renal failure
- Respiratory failure
- Thermal changes
- Stress on organs
- Septicaemia
- Crush injuries

Curling's Ulcer, an ulcer of the duodenum also occurs in 11 per cent of people who are seriously burnt.<sup>48</sup>

*Ridolfo and Stevenson's 1998 report* on tobacco-caused mortality and morbidity<sup>49</sup> provides no morbidity estimates for tobacco-caused fires. However, English et al's study of 1992 data for morbidity attributable to cigarette-caused fires estimated there to be 31 deaths, 134 hospital separations, and 4749 hospital bed days caused by tobacco-caused fires.<sup>50</sup>

## (b) Mortality

Alex Conway, a senior fire investigator with the Melbourne Fire Brigades believes cigarettes often cause fire fatalities:

"I've investigated many fires that have involved fatalities from smoking... Many people have died from the result of bedding fires during the night from cigarettes that have been smouldering and of course what happens is the fumes overcomes them while they're asleep, they're not alert, they're not awake to it, finally they drift off and they die as a result of it in their bed."<sup>51</sup>

In the United States, up to one third of fire deaths are caused by cigarette fires,<sup>52</sup> while in Ontario, Canada 35 per cent of fatalities in house fires are cigarette related.<sup>53</sup> In Australia there is a lack of accurate data on smoking-caused fire deaths due to the manner in which data are collected and collated by fire agencies. In the past year, fire agencies under the auspices of the Australasian Fire Authorities Council have attempted to collate data through a newly formed Australian Incident Reporting System National database. The Australasian Fire Authorities Council reported that they do not have information on the number of fire deaths in Australia associated with cigarettes.<sup>54</sup>

However, there are several sources of Australian data on deaths caused by fires started by cigarettes and smoking materials.

### 1. National Estimates

*National estimates derived from coronial sources* (excluding Queensland for year 2000) of cigarette fire related fatalities have been provided by the Monash University National Centre for Coronial Information (MUNCCI). Findings from closed coronial cases from July 2000 to February 2004 indicate that at least 52 people lost their lives in fires caused by cigarettes (an annual average of 14.2 deaths).<sup>55</sup> This is almost certainly an underestimate because of limitations such as:

- Other smoker materials such as cigarette lighters and matches were not included in the report, nor were intentional self harm deaths involving cigarettes.
- The search was dependent upon the Object or Substance Producing Injury field being coded under 'Personal Use Item', or on the police summary of circumstances or coronial finding being attached. Often these fields may not be completed until the closure of a case.
- Due to technical difficulties in obtaining reports from country areas and some cases still being under investigation, the police narratives and coronial findings for additional cigarette related deaths may not yet be attached to the NCIS.<sup>56</sup>

**AIHW Study:** Ridolfo and Stevenson in their 2001 Australian Institute of Health and Welfare study used the attributable fraction of 23%<sup>xiv</sup> of fire deaths as being caused by cigarettes and smoking materials developed by English et al. (1995).<sup>57</sup> The total number of fire deaths excluding deaths by fire assault and suicides by fire reported by the Australian Bureau of Statistics over a recent two-year period (1999-2000) was 187.<sup>58</sup> Therefore, the 23 % attributable fraction is 43 deaths over the two-year period (21.5/annum), a slightly higher estimate than the 14 annual deaths estimated by MUNCCI from closed coronial cases.

**A National Trauma Registry Consortium in Australia** is being set up by the Royal College of Surgeons, which would provide data on the number of fire deaths across the country in hospitals. This new database together with a full search of the Coronial database, should finally provide a comprehensive picture of the total number of deaths associated with cigarette-caused fires in Australia each year.

## 2. Queensland

**The Queensland Fire and Rescue Service Report on Structural Fire Fatalities in Queensland, 2001** reported that there were 74 fire fatalities arising from 55 structural fires in Queensland between 1 July 1996 and 30 June 2000.<sup>59</sup> In a majority of the cases (45 or 61%), there was insufficient information to identify the cause of the fires. In the remaining 29 cases, however, it was found that 14 (48%) of the victims died as a result of fires that were caused by cigarettes, matches or lighters.<sup>60</sup> These were not disaggregated further.

## 3. New South Wales

**The New South Wales Fire Brigades** in its 2001-2002 annual report category on "Fatalities in Building Fires by Ignition Type" does not include a specific category for cigarettes and smokers' materials caused fatalities. A figure can be extrapolated, however, from the categories *Misuse of heat of ignition (such as falling asleep, mental impairment)* and *Misuse of material ignited*, which account for 12 out of 38 deaths (32%) between 1995/96 and 1998/99.<sup>61</sup> There were a further 14 deaths from undetermined ignition factors and one incendiary, meaning the figure could be higher than the 32 per cent figure calculated above.

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<sup>xiv</sup> On page 2 of the AIHW report an attributable fraction of 17% of smoking caused fire deaths among all fire deaths is reported. However on p71, the fraction used is 23%. English (personal communication 9 March 2004) confirms that 23% was the fraction used in his original 1992 report.

## (v) Costs associated with smokers' material and cigarette-caused fires

### (a) Overview

There are several sources of estimates of the costs of fires caused by tobacco products in Australia. Collins and Lapsley used the Queensland Fire and Rescue Service's data, which attributed a conservative 1.9 per cent of all fires to smokers' materials (excluding matches and lighters). The QFRS estimated the value of property damage caused by fires (although it does not list the value of damage in fires that destroy only vegetation, livestock and native animals).<sup>62</sup> Collins and Lapsley extrapolated the Queensland data to Australia and derived Australia-wide data on numbers of fires and expenditures on fire services from the *Report on Government Services 2000* (Steering Committee, 2000).

They noted that since fire costs do not include valuation of public property damage, such as national parks, loss of animals and of amenity during bush regeneration, their estimates are conservative in terms of the total costs of fires resulting from smoking.<sup>63</sup> They concluded that for 1998-99, tobacco-caused fires cost some \$52.1 million in "tangible" costs like health costs, property damage and fire service costs plus a further \$28.5 million in intangible costs (value of lives lost in such fires).

The Flinders University Research Centre for Injury Studies (incorporating the Australian Institute of Health and Welfare Injury Surveillance Unit) estimated the cost of injury by fire, flame or burns in Australia for 1995-1996. It estimated total costs from all burns at \$329,794,000 with direct injury costs making up \$171,948,000 while morbidity and mortality costs totalled 157,846,000.<sup>64</sup>

Total Costs	Direct Costs	Morbidity	Mortality
\$329,794,000	\$171,948,000	\$99,674,000	\$58,172,000

Using English et al's 23 per cent attributable fraction of fire injuries attributable to cigarette-caused fires, the national injury cost of cigarette-caused fires applied to the Flinders group's data would be \$39,548,040 for 1995-1996, which is 8.78 times the health costs recorded by Collins and Lapsley.

Furthermore, there are significant other costs such as psychological impacts on burns and fire victims from cigarette-caused fires, which are not taken into account in the above estimates. The loss of income, medical care, impact on businesses along with other impacts associated with the psychological impacts of fires and fire injuries have not been taken into account in calculating the costs. This indicates that again, the costs are likely to be higher than has been reported.

**Table 2: Costs of smoking-attributable fires, 1998-1999.**

	\$m	\$m
<b>Health</b>		
Medical	0.6	
Hospital	3.9	
<b>Total health</b>		4.5
<b>Labour</b>		
In the workforce	16.4	
In the household	4.9	
<b>Total labour</b>		21.3
<b>Fire services</b>		21.0
<b>Property damage</b>		5.3
<b>Total tangible costs</b>		52.1
<b>Value of loss of life</b>	28.5	
<b>Total intangible costs</b>		28.5
<b>Total costs</b>		80.6
<b>Total tangible n.e.i.</b>		26.3
<b>Total intangible n.e.i.</b>		0.0
<b>Relevant costs as a proportion of GDP</b>		0.02%

*Note: n.e.i. signifies not elsewhere included*

#### **(b) NSW Data**

The New South Wales Fire Brigades Annual Statistical Report of 2001/2002<sup>65</sup> estimated the statewide loss due to building fires directly related to cigarettes, smokers' materials and matches at \$5,387,335 (\$2,655,132 from smokers materials plus \$2,732,203 from lighters and matches). This figure does not include a percentage of the \$96.5 million worth of damage caused by an undetermined ignition source.

**Table 3: Form of heat ignition by type of fire and dollar loss due to building fires, NSW 2001/2002**

<b>Form of Heat Ignited First</b>	<b>Building Fires</b>	<b>Mobile Property Fires</b>	<b>Vegetation Fires</b>	<b>Outside Rubbish Fires</b>	<b>Other Fires</b>	<b>Total Fires</b>	<b>Dollar Loss Due to Building Fires</b>
<b>Undetermined, not reported or not applicable</b>	1 693	3 094	6 069	3 331	667	14 854	<b>\$96,434,046</b>
<b>Heat from smokers materials (eg Cigarette, cigar, pipe)</b>	<b>349</b>	<b>78</b>	<b>954</b>	<b>560</b>	<b>63</b>	<b>2 004</b>	<b>\$2,655,132</b>
<b>Heat from open flame, spark – Match</b>	542	1 389	4 324	3 250	296	9 801	<b>\$9,054,362</b>
<b>Lighter (flame type)</b>	229	352	1 263	799	139	2 782	<b>\$2,732,203</b>
<b>Rubbish fires</b>	15	4	45	211	10	285	<b>\$152,201</b>

**(c) Victorian Data**

The MFESB, estimates the cost to its fire service of attending cigarette-caused fires, at \$27,607,479 over the five-year period (\$5,521,496 per year). This figure does not incorporate the costs of injury or death to MFESB staff, 14 of whom were injured in this period in cigarette-caused fires.

The MFESB covers the second largest population base in Australia after the NSW Fire Brigades and there are 10 other fire agencies as well as fire units from state bodies such as those responsible for national parks dealing with fires. The figure of over \$5.5 million is therefore consistent with the Collins and Lapsley estimate of \$21 million for total fire service costs associated with fires caused by cigarette and smokers' materials in the financial year 1998/1999.<sup>66</sup>

Australian insurance companies hold significant information about the cost in terms of damage to property resulting from cigarette-caused fires. Unfortunately, while requests have been sent to several insurance companies, none provided any information about the community costs associated with fires caused by cigarettes and smokers' materials.

**(d) Summary**

It is clear that cigarette-caused fires cost Australia at least \$80.6m per annum as estimated by Collins and Lapsley. The real figure is likely to be considerably higher, however, when taking in to account up to \$39.55 million in injury costs. The costs in terms of loss of life are also likely to be higher than the \$28.5 million estimated. There are also hundreds of cigarette-caused grass and bushfires, which provide an unquantified cost to Australia's flora and fauna every year.

## 5. Australian Fire prevention regulation relevant to cigarettes

### (i) Overview

Over the past 25 years in Australia, fire prevention efforts have focussed on strategies that range from fire safety education directed at children, to sprinkler systems, standards for childproof cigarette lighters, standards and regulations for building materials and mandatory smoke alarms for newly erected buildings. Rural and country fire services have also successfully advocated for regulations on fire restrictions particularly for bush fire danger periods.

Australian fire safety developments have embraced both standards and regulatory strategies. Some fire safety regulations and standards in Australia have their roots in the FOC (Fire Offices' Committee) rules in the UK written by Sir John Wormald in 1885. Lee et al point out that Australia adopted the British rules relating to sprinklers in 1939 as CA16. The standards eventually became formalised as Australian Standard (AS 2118).<sup>67</sup>

During the 1980s and 1990s, there have been a number of fire safety standards developed in Australia concerned with reducing the propensity of materials to combust. The standards range from Textiles—Woven and knitted fabrics for window furnishings (AS 2663.1—1997), to Furniture—Assessment of the ignitability of upholstered furniture Part 1: Ignition source—Smouldering cigarette (AS/NZS 3744.1:1998 - ISO 8191-1:1987).

Many of the standards involving fire safety regulations have involved the peak fire body, Australasian Fire Authorities Council, and the Fire Protection Association. It is worth noting, however, that development of the standards relating to smouldering cigarette, mentioned above and the specification for burning behaviour of upholstered furniture—Smouldering Ignitability (AS/NZS 4088.1:1996) did not involve representation from fire organisations on the standards committee.<sup>68</sup> A list of Australian fire safety standards is found at Appendix 1 to this report.

A significant study by the Victorian Metropolitan Fire and Emergency Services Board (MFESB) may lead to new Australian standards for correctional facilities. The report shows how the leading cause (43%) of deaths in Victorian prisons over a ten-year period (1990-2000) involved smoking paraphernalia (including cigarettes, matches and cigarette lighters). The report recommended among other things that prisons needed to consider using fire-retardant mattresses and linen. The MFESB recommended also that a new standard be developed on prison mattress testing, selection and use.<sup>69</sup>

Other safety programs initiated include the development of the child-proof lighter, during the early to mid 1990's. South Australia became the first state to introduce mandatory trade standard regulations on child-proof lighters, based on research and measures taken in the United States. The Australasian Fire Authorities Council supported this move and called on the Federal Government to follow suit:

“Australasian Fire Authorities Council supports a mandatory standard for the production and sale of disposable lighters within Australia. . . . It is recommended that the Federal Consumer Affairs Department introduce the following standard for *disposable gas lighters*, based upon the SA legislation. ”<sup>70</sup>

In 1995 the Australasian Fire Authorities Council outlined its concern about the lack of enforcement of a standard on the safety of matches. An Australian Standard - Safety Matches and Containers – (AS 3667-1989) outlines the performance and labelling requirements for safety matches for domestic purposes, wind proof, water proof and book matches.

Since 1991, fire agencies around Australia have focussed much of their fire prevention education strategies around the installation and maintenance of smoke alarms. Over recent years, all Australian states and territories have either mandated that smoke alarms be fitted in homes or actively encouraged their installation. Fire agencies have changed their target from awareness about smoke alarms to promoting their maintenance, for example the Victorian “Change your clock, change your alarm battery” campaign run by the MEFSB.<sup>71</sup>

Several of the fire agencies also expressed to the authors of this report that their education campaigns frequently involve the safe disposal of cigarette butts, being wary of smoking in bed and being aware of the dangers of throwing cigarette butts from car windows. Victoria and New South Wales and the NRMA in NSW have all initiated campaigns about the dangers of cigarette butts being thrown from car windows. These states have also implemented on-the-spot fines for anyone caught throwing cigarette butts from a moving vehicle.

Several states and territories have regulations in place which involve the safe disposal or non-ignition of cigarettes during bushfire danger periods. In New South Wales, anyone caught lighting a cigarette within 15 metres of crops, grain or dry grass during a bushfire danger period faces a fine of up to \$5,500, although such regulations are extremely difficult to police and there are very few fines issued along these grounds.<sup>72</sup>

For example, the NSW Rural Fire Regulation states;  
" Division 2 Bush Fire Danger Periods

28. Offence to light, use or carry tobacco product

(1) A person must not, without lawful authority:

- (a) light any tobacco product, match or other material, or
- (b) use or carry any lighted tobacco product, match or other material within 15 metres of any stacks of grain, hay, corn or straw or any standing crops, dry grass or stubble field.

(2) A person must not, without lawful authority, leave or deposit a lighted tobacco product, match or any incandescent material on any land, or on any bridge, wharf, pontoon or similar structure.

Maximum penalty (subclause (1) and (2)); 50 penalty units." A penalty unit currently is \$110.

## **(ii) Preliminary views of fire authorities on the regulation of self-extinguishing cigarettes**

In the strategies described above, Australian fire prevention authorities support policies and programs which are similar to those in the United States. However, the US fire safety landscape has also featured on-going high profile debate about the importance of legislating for manufacturers to produce reduced ignition propensity (RIP) cigarettes.

Australian Fire Chief Officers, fire cause investigators, the Fire Protection Association and tobacco companies have expressed support for the development and implementation of fire safety regulations and standards for reduced ignition propensity (RIP) cigarettes. Many of the fire agencies and the tobacco companies made their comments public for the first time in Australia in 2003, during the broadcast of a documentary on SBS Television's Insight program.

### **(a) Australasian Fire Authorities**

In 2002, Len Foster the CEO of the peak representative body for all fire-fighting agencies, the Australasian Fire Authorities advised:

“As a fire industry, we will support any effort to reduce the risk of fire and certainly to our fire fighters and just as we would work towards increasing the safety of composition of vehicles and safety of buildings and so on. We would expect if there's a risk arising out of cigarettes and we can reduce that risk, we'd support it.” “If we could increase public safety by reducing the flammability of cigarettes, we'd support it totally.”<sup>73</sup>

### **(b) Fire Protection Association**

Ross Hodge, Executive Director of the peak body Fire Protection Association (FPA) Australia, stated:

“I think the next step now is to get governments to introduce a standard for cigarettes, that ... have to meet a particular standard in their ignition propensity.”

The FPA has called on the Federal and State Governments to make a commitment to a time frame for the introduction of legislation for safety standards for cigarettes. Mr Hodge also highlighted how he believes that for too long, there has been a focus in fire safety solely on the development of fire resistant products and materials but now, the cigarette industry should be responsible and manufacture a more fire-safe product.

“For decades there has been an emphasis on the general manufacturing industry to develop fire-resistant products and materials, now time is well overdue for the cigarette industry to share that responsibility in manufacturing a more fire-safe product.”<sup>74</sup>

### **(c) South Australian Metropolitan Fire Service (SAMFS)**

Geoff Sulley from the SAMFS argued that cigarettes are much more of a fire hazard than many consumer items which are routinely removed from shops because of their propensity to cause fires:

“If it’s accidental well I try to take as many measures as possible to stop a like fire from happening again. And that’s my primary role is to identify those trends and problem areas. We’ve had some success with that in the past with computers, air-conditioners, lamps, table lamps... They don’t come up all that often but every year there’d be two or three different products that we’d be able to identify that we can take the measures to stop either that product being marketed or in fact being sold.”

Reporter: “Well you mentioned that if products are found to be unsafe they are taken off the market. Cigarettes kill people in fires don’t they?”

Geoff Sulley: “They do. They do, there’s no doubt about that.”

Reporter: “Should they be taken off the market?”

Geoff Sulley: “Well there’s a problem for you. I’d love them to.”<sup>75</sup>

Fire investigators in other states also believe that the regulation and introduction of RIP cigarettes would reduce loss of life, injury and damage to property.

#### **(d) Melbourne Metropolitan Fire Brigade**

Alex Conway of the Melbourne Metropolitan Fire Brigade said:

“I believe if they [RIP cigarettes] can be manufactured and if we can stop them smouldering after that, I believe yes we should make all endeavours to have that brought in to legislation here. ...I could only support it. I believe that, that would be the way to go. Anything that reduces the risk of fire to the general public has got to be a great outcome for all. ..If they could be made safer then we’d all be much more happier and the community would be much more safer.”<sup>76</sup>

The Melbourne Fire Brigade says it does not have an active policy relating to the regulation of RIP cigarettes but would support their introduction:

“Anything that does not affect the health of the user but minimises the risks of fires is strongly supported.”<sup>77</sup>

#### **(e) New South Wales Rural Fire Service**

In New South Wales, Russell Taylor, the Community Education Manager with the Rural Fire Service advised that he supported any reduction in the cause and types of ignitions.

“It doesn’t matter how large or small the number of fires related to smoking are, if we can reduce that number - even to zero - we can then concentrate on other types. If this self-extinguishing cigarette works it would be good, especially for structure fires where I assume they play a more significant role.”<sup>78</sup>

No other State or Territory fire agencies put forward their direct views for the purposes of this report.

## 6. Tobacco industry position on reduced ignition propensity cigarettes

### (i) Tobacco Industry Position on RIP Cigarettes

In general, the tobacco industry in the US and Canada has been opposed to legislation requiring RIP cigarette standards.

#### (a) Focus on Smoker Behaviour and Flammability of Bedding & Furniture

The industry's position can be characterised as one of seeking to frame the problem of cigarette-caused fires as being defined by a combination of *smoker behaviour* (improper disposal of lighted butts) and *flammability of surfaces* (bedding, furniture etc).

Solutions to the problem under this definition thus lie in educating and prosecuting individuals who throw away lighted butts, and developing standards for reduced flammability of bedding, furniture and other surfaces.

In framing the problem this way, the industry has sought to exclude any consideration of the role of the industry in manufacturing tobacco products which cause fires, death and injury. Its principal motivation in this regard appears to have been to avoid litigation over cigarette-caused fire deaths and injuries:

"In view, however of their recent decision taken by the Tobacco Institute not to work actively in the development of self extinguishing cigarettes (for product liability reasons) it will be necessary for B&W management to define its wishes before GR&DC is asked to undertake any work."<sup>79</sup>

#### (b) Industry Liaison with Fire Prevention Community & Public Policy Makers

In the 1980s and 1990s, cigarette companies donated several million dollars in the United States to fire agencies. The donations had the aim of influencing the fire organisations to focus on fire prevention methods other than self-extinguishing cigarettes.<sup>80</sup>

A 1992 Philip Morris (USA) planning document identified this strategy: "ISSUE: Efforts by anti-smoking groups to mandate a 'fire safe' cigarette could destroy the competitiveness of leading brands and increase the cost of manufacturing cigarettes. STRATEGY: ...PM-USA will expand coalitions among the fire prevention community and public policy makers to diffuse support for 'fire-safe' legislation at the state and federal level..."<sup>81</sup>

The Fire Protection Association (FPA) is the peak industry body in Australia, which works with governments on fire safety standards. Ross Hodge, the FPA's chief executive officer, has expressed his concerns about the fire risk of cigarettes and the behaviour of the tobacco companies as is highlighted in the section below on regulation of self-extinguishing cigarettes.

Mirroring tobacco industry efforts in the USA, tobacco industry funded 'fire education' documents can be found in virtually every fire organisation in Australia, as reported in an

investigation by SBS Television's Insight program in 2003.<sup>82</sup> In the early 1990s, Rothmans sponsored the Melbourne-based Fire Protection Association of Australia and another tobacco company sponsored the Melbourne Metropolitan Fire Brigades' (MFESB) unofficial publication for the fire officers - "Word Back".

It has been reported that the targeting of Australian fire organisations still continues. The NSW Fire Brigade advised in 2002 that it had recently declined a suggestion from one of the two big tobacco companies to participate in a fire safety brochure and a fire safety program. (*personal communication to authors*).

There have not been any specific education campaigns in any state focussing directly on the correct disposal or extinguishment of cigarettes in homes, as far as the authors could ascertain from correspondence and contact with all fire agencies Australia-wide.

### **(c) Industry response to Canadian proposal for Reduced Ignition Propensity Cigarettes**

Imperial Tobacco (Canada) made a submission to Health Canada's call for comments on its report on RIP cigarettes.<sup>83</sup> The Imperial submission challenges all the main arguments for RIP cigarettes.

On reducing tobacco density Imperial noted that reduced tobacco density "was achieved in part by the use of "expanded tobacco", which is tobacco that is subjected to a freezing and then a thawing process to allow it to expand volume but maintain its weight". Imperial continued: "While significantly reducing tobacco density may reduce ignition propensity of a cigarette resting on the standard test medium, it is also widely known that significant levels of expanded tobacco inclusion can significantly increase the incidence of coal fall-out, which in itself is a potential fire hazard." (<sup>84</sup>p17)

*Comment:* if this assessment is true, the statement that "coal fall-out ... is potential fire hazard" would need to be subjected to empirical test. These "coals" would be likely to be extremely tiny and remain alight for only a brief moment and thus have doubtful ability to ignite substrates. They may though, be able to burn small holes in fine cloth such as used in clothing and so may cause widespread consumer unacceptability.

On reduced paper porosity Imperial said: "Although reduced paper porosity can reduce ignition propensity, it will also significantly increase the delivery and relative proportion of various toxic constituents, such as carbon monoxide (CO), hydrogen cyanide (HCN), oxides of nitrogen (NOx) and volatile aldehydes. This effect was noted in Canada's Expert Committee Report on Cigarette Smoke Toxicity in 1998. In addition, increased levels of oxides of nitrogen can result in increases in the deliveries of volatile and tobacco specific nitrosamines. This could offset a dramatic reduction in the amount of tobacco specific nitrosamines that is being achieved in 2003 and future years resulting from changes that have occurred to the curing process for tobacco in Canada." (<sup>85</sup>p17)

*Comment:* Cigarettes *per se* are highly toxic. Given that companies like Imperial sells cigarettes which cause widespread disease, their expressed concern about potential increases in toxicity that might be caused by reducing paper porosity seems disingenuous. To balance

the predicted population-wide health and other benefits from RIP cigarettes against putative increases in toxicity that might increase the negative impact on population health among smokers, detailed projections would need to be calculated, which significantly, Imperial chose not to provide.

*On decreased circumference:* “Decreased circumference cigarettes may seem to lead to reduced ignition propensity in standard tests. However, as the Proposal notes, the zone of contact between the burning coal and the substrate is important. Standard tests do not measure what may happen when a cigarette falls in a crevice. In the real world reduced circumference cigarettes are more likely to lodge in crevices, produce a large zone of contact, and initiate fires.

In addition, past experience of gaining consumer acceptance of reduced circumference cigarettes has also proven to be difficult. There is a relatively limited market for “slim” type products in Canada.” ( <sup>86</sup>p17)

*Comment:* Australian tobacco companies have often shown that they can reduce the circumference of cigarettes. For many years when Australian cigarette were taxed by weight, local manufacturers responded by (among several strategies) producing small-gauged cigarettes that allowed them to offer more cigarettes per pack than competitors. They therefore have the technological capability of doing this should legislation demand it.

*On reduction or removal of burn additives:* “Canadian cigarettes use conventional levels of burn additives on the cigarette paper (0.5 to 2.0%) which have a long history of use for cigarette design purposes to help ensure a consistent burn and hence less cigarette to cigarette variation in tar deliveries and to help to hold the cigarette ash together. As the Proposal recognises, reduction in levels of these conventional additives alone has not been shown to result in a product with reduced ignition propensity.”

*Comment:* Laugesen et al’s study of self-extinguishment involving low citrate content paper would appear to contradict the above statement.

#### **(d) Tobacco Industry endorsement of an Industry-wide standard in Australia**

Two Australian tobacco companies, British American Tobacco Australasia (BAT) and Phillip Morris have publicly endorsed the introduction of regulations for RIP cigarettes. Corporate Affairs Director at BAT, John Galligan admitted that BAT has been developing fire-safe cigarettes for 25 years and that they have the technology available to introduce such a cigarette.

*Reporter:* “So does British American Tobacco know how to make a cigarette which goes out in two minutes or around that time?”

*John Galligan:* “Anyone could change a cigarette design to do probably just that.”<sup>87</sup>

Mr Galligan said that it was the responsibility of governments to set a standard for self-extinguishing cigarettes:

“We need governments to set a standard against which we can measure our products and I think you’ll find any tobacco company in the world will be looking for that. Now it’s over to government to determine that standard.”

Similarly Phillip Morris has publicly welcomed the introduction of a more fire-safe cigarette:

“Philip Morris Limited would welcome the opportunity to work with the Australian Government and participate in any effort to develop an industry-wide standard for reduced ignition propensity cigarettes. We would also be happy to share Philip Morris’ knowledge and experience in that regard.”<sup>88</sup>

However, such statements should be viewed circumspectly because the tobacco industry, while sometimes agreeing to the notion of an abstract “standard” has characteristically then set about opposing any given standard proposed by governments and fire authorities.

#### **(e) Product Liability concerns**

If cigarette manufacturers can manufacture RIP cigarettes, why do they not market them? McGuire states that former tobacco industry scientist turned whistleblower, Jeff Wigand, informed him that “the companies were afraid of product liability suits and were counselled by their attorneys to always suggest that there are insurmountable scientific problems associated with producing a commercially acceptable fire safe cigarette.”<sup>89</sup>

Burn survivors injured in fires caused by someone else’s cigarette could make a potential personal injury claim against the cigarette’s manufacturer using the argument that the manufacturers knew how to produce a cigarette that will not cause ignition of furniture or mattresses but chose not to market such products.<sup>90</sup>

In 2003, Philip Morris in the USA paid \$US2m to a burn victim to settle a case of a child who suffered disfiguring burns in a fire-caused by a smouldering cigarette. The settlement, reached secretly in May 2003, resolved a nearly nine-year legal battle over responsibility for injuries to Shannon Moore, who was 21 months old and asleep in her car seat when her mother's parked car erupted in flames. She was burned over 77% of her body and had to have all of her fingers amputated. She also lost her hearing from prolonged use of antibiotics to fight infections, and now, at age 13, has limited ability to speak.

Lawyers for the girl blamed the fire on the defective design of a Marlboro 100 cigarette, which like other brands is intentionally made to burn down to the filter even when not being puffed. The lawsuit claimed that the child's mother, Shelly Moore, inadvertently allowed the cigarette to fall on the car seat, where it continued to smoulder until it started a fire.<sup>91</sup>

**Table 2** Summary of internal fire safe research projects

Project name	Company	Date	Research targets	Results
Hamlet	PM	1982-87	Non-porous paper, banded paper, reduced chalk, base treated paper, double wrapped paper, blend and flavour modifications	Achieved low ignition propensity and cigarette with subjectives at parity to control
(Unnamed)	BW	1983-89	Non-porous paper, banded paper, slow burn paper	Abandoned goal of self extinguishment to target ignition propensity
LIP (low ignition propensity)	RJR	1988-90	Circumference, expanded tobacco, and paper porosity	No consumer acceptable prototype
Tomorrow	PM	1987-	Mass burn rates targeted via expanded tobacco, tobacco cut, paper porosity, additives, and banded wrappers	Achieve successful prototype using banded wrappers (2000 Merit)
IP (ignition propensity)	RJR	1991-	Altered blends and paper porosity, use of burn additives	"No significant difference in acceptance"
Reduce ignition propensity	BW	1993	Low porosity paper, burn additives, banded paper, cross hatch papers	No successful prototypes

Source: Industry documents 19 31 34 35 39 48 49 71 72

from : M Gunja, G Ferris Wayne, A Landman, G Connolly, and A McGuire “The case for fire safe cigarettes made through industry documents” *Tobacco Control*, Dec 2002; 11: p348.

Experienced tobacco control advocates have suggested that tobacco companies are opposed to fire safety regulation because it creates an additional “marketing” problem for their industry in that it serves to remind consumers of yet another way in which cigarettes can kill, thereby potentially discouraging consumption of the product.

In Australia, several public health lawyers, including Jonathan Liberman believe the tobacco companies are also possibly in breach of the crimes act because they are manufacturing a product such that it is much more of a danger ie fire hazard than it could be with different technologies:

“There’s a strong case for breaches of the crimes act where you have companies making products in a way that are more dangerous than they need to be, knowing that the consequences are that people are dying unnecessarily, then there’s a strong case for the application of the criminal law. We’re talking about potentially a range of offences such as, conduct endangering life, recklessly causing serious injury, negligently causing serious injury and so on...”<sup>92</sup>

Formerly private tobacco industry documents which have become public as a result of settlements between U.S. states and the tobacco companies, suggest that tobacco industry opposition to fire safe cigarette regulation has been driven largely by the legal concerns outlined above. In a secret memo prepared in 1987, tobacco industry lawyer William S. Ohlemeyer of Shook, Hardy & Bacon warned that the development of a fire safe cigarette might expose the tobacco industry to lawsuits from persons previously injured in fires. He wrote that "in litigation that is now quite unattractive . . . the existence of a 'goof-proof' cigarette . . . could make this litigation significantly more attractive [to plaintiffs]"<sup>93</sup>

In Canada, at a meeting in Montreal on August 22-24, 1990 of executives from Canada’s largest tobacco company, Imperial Tobacco Ltd, together with executives from many of its foreign affiliates, including the U.K. based British American Tobacco and the American based Brown & Williamson, the issue of fire-safe cigarettes was discussed. In the minutes from that meeting Imperial Tobacco designated such research as its lowest possible priority.

The reason given for its lack of interest in the issue of fire-safe cigarettes was that there was “no regulatory pressure in ... Canada”.<sup>94</sup>

It appears from this document and the considerations outlined above that tobacco companies are unlikely to be motivated to voluntarily change their products to make them fire-safe unless government regulatory pressure is applied to bring about such a change. Indeed, the industry’s strategy is likely to be one of publicly supporting the need for government to introduce a standard but then engaging in protracted efforts to object to any particular standard, test or use of particular test fabrics proposed by governments. As Imperial Tobacco Canada summarised its objections:

“Regrettably, no cigarette or cigarette design parameters have yet been identified that simultaneously would reduce the cigarette’s ignition propensity in a clear or predictable way under realistic conditions and would be acceptable from both a consumer and public health perspective. Significant efforts to develop a LIP cigarette that consumers would agree to smoke have to date failed.”

“The current situation with respect to the development of a standardised test for measuring the cigarette’s ignition propensity is at least equally problematic. One of the methods investigated by the US National Institute of Standards and Technology (NIST), which utilises a canvas fabric stretched over a polyurethane foam assembly, does not produce reliable results from test to test and is not representative nor predictive of results in the real world. Canvas is not a fabric commonly found in home furnishings. Indeed, a series of scientific studies has confirmed that the cigarette designs that appear to perform relatively well in the NIST canvas assembly can produce substantially different results - or even diametrically opposite results - on the fabrics and other substrate materials actually found in homes. This would suggest that factors related to the flammability characteristics of the furnishing fabric itself may be more predictive of ignition propensity.”<sup>95</sup>

“The alternative test method that has been developed, which involves the use of a standard filter paper, used commonly in laboratories to filter solids from liquids, produces results that are more reliable from test to test. But very real doubts remain concerning whether such results have any real-world significance. While results from the filter test may correlate with that of the canvas test, there is no scientific evidence that they correlate with the real-world potential for initiating fires.<sup>96</sup> The latter observation remains true whether one is speaking of the United States of America or Canada. Obviously, if a test method is not predictive of results in the real world, requiring cigarette manufacturers to alter their products based on the test method makes no sense. Legislation of such a standard could have little, if any, or even possibly a negative impact on the incidence of accidental fires.”

The cigarette industry has also challenged the comparability of fabrics used on upholstered furniture and as bedding materials between the U.S. and other nations. It has pointed to differences between fire-safety standards for Canadian and U.S. furniture and upholstered materials.

## 7. Potential Issues around Regulation for Reduced Ignition Propensity Cigarettes

### (i) Might RIP Cigarettes be more toxic to smokers?

The Technical Advisory Group of the US Consumer Product Safety Commission in 1993 emphasised that:

“... it is essential that changes in the physical properties of cigarettes for the purpose of achieving reduced ignition potential do not result in additional adverse health effects. Even a small increase in human toxicity could outweigh the beneficial effects of fewer fires.”<sup>97</sup>

Imperial Tobacco (Canada) has argued that changes to the physical properties of cigarettes designed to reduce their propensity to cause fires might inadvertently change parameters of cigarettes which might make them more toxic than they are already.

However, Laugesen et al’s New Zealand study demonstrates that cigarettes with the highest rates of self-extinguishment had the lowest rates of citrate in their papers. If the presence of citrate in tobacco paper is the single most important predictor of a cigarette burning to its full length, then the production of RIP cigarettes would involve *removal not addition of citrate additive*. Those who would argue that RIP cigarettes might somehow have higher risk than non-RIP cigarettes would therefore need to demonstrate that cigarettes with high levels of citrate additive were less toxic than those with greatly reduced levels.

The Canadian Non-Smokers’ Rights Association submission to Health Canada noted that most proposals to reduce the ignition propensity of cigarettes do not involve the addition of any chemicals, such as fire-retardants, and so it would be logical to assume that these solutions would not make cigarettes more toxic. The submission added: “Wouldn’t it also be desirable to get rid of as many additives (citrate) as possible in cigarettes, especially when they are added just so that cigarettes can keep on burning?”<sup>98</sup>

The Canadian Non-Smokers’ Rights Association cited Dr Andrew McGuire, the Executive Director of the Trauma Foundation at San Francisco General Hospital and a member of the TSG, who expressed the same opinion when he testified during a Coronial inquest in Ontario in 1995.<sup>99</sup> He said of RIP cigarettes: "It is basically the same tobacco. And in keeping in mind, there were no chemicals added. This had nothing to do with adding or subtracting chemicals. It was using the existing product, tobacco, paper and just changing ever so slightly the paper and expanding the tobacco."

McGuire also explained that the TSG included a National Cancer Institute scientist who had the responsibility of testing each experimental fire-safe cigarette for tar, nicotine and carbon monoxide levels. The results showed that the experimental cigarettes delivered amounts of toxic substances comparable to commercial cigarettes such as *Marlboro* and *Camel*.<sup>100</sup>

In its report, the TSG recommended that more work be done to track changes in toxicity levels of fire-safe cigarettes.<sup>101</sup> The US government agreed and assigned the task in 1990 to

the Consumer Product Safety Commission in collaboration with the Secretary of Health and Human Services. Unfortunately, the Commission had a very limited budget to complete its mission.

Because of this financial constraint which prevented any extensive testing, the Commission and the TAG decided instead to develop a testing protocol which could be used to assess the health effects of fire-safe cigarettes.<sup>102</sup> Four levels of testing were recommended:

**Tier 1: chemical analyses of smoke:** acidity and reduction/oxidation potential, carbon monoxide, hydrogen cyanide, and nitrogen oxides, aldehydes, volatile hydrocarbons, volatile nitrosamines, particulate matter (tar), catechols, nicotine, phenols, polynuclear hydrocarbons, and tobacco-specific nitrosamines.

**Tier 2: in vitro tests:** Salmonella mutagenicity (Ames' assay) and mouse embryo fibroblast cell transformation assay.

**Tier 3: indicators of human smoking behaviour:** levels of cotinine and carbon monoxide in human subjects, smoker topography (puff volume, frequency, and draw velocity).

**Tier 4: in vivo tests:** mouse inflammatory lung response, hamster respiratory tract carcinogenicity, and mouse skin painting carcinogenicity.

Preliminary testing done on five cigarettes (two commercial brands, two low ignition-potential prototypes, and a standard reference cigarette) showed that the protocol could determine differences in toxicities between cigarette types. Philip Morris has used the protocol to measure the toxicity of its Merit brand of cigarettes. The results did not reveal a higher level of toxicity for these cigarettes.<sup>103</sup>

It is noted that globally, including in Australia, tobacco companies are able to add any additives they wish to, in order to aid unspecified "processing" purposes. A voluntary disclosure agreement between the companies and the Australian government was signed on 20 December 2000.<sup>104 105</sup> This agreement provided for brand-by-brand disclosure of ingredients by descending order of weight. However, significant exclusions were "flavourings that give each brand its unique characteristics" and "processing aids and preservatives that are not significantly present and do not functionally affect the finished product". Nowhere were any terms like "significantly present" or "functionally affect" defined.

All BAT (see <http://www.health.gov.au/pubhlth/strateg/drugs/tobacco/bat/bata.pdf>) and Philip Morris (see [http://www.philipmorrisinternational.com/pages/eng/smoking/Ingredients\\_au.asp](http://www.philipmorrisinternational.com/pages/eng/smoking/Ingredients_au.asp)) cigarettes contain unspecified "processing aids". Yet none of these are revealed, let alone tested for their potential toxicity.

Imperial Tobacco Canada has stated, in relation to possible increased toxicity: “We believe this to be a valid concern. We propose that Health Canada, in conjunction with the industry, establish an appropriate toxicological testing program. Such programs should draw on proposals made to regulators in other jurisdictions such as the United States (eg, 1993 CPSC Toxicity Testing Plan to the US Congress and the US Institute of Medicine report of 2001), as well as the recommendations set out in the 1998 Health Canada Expert Committee findings on “Cigarette Smoke Toxicity Reduction”. Imperial Tobacco Canada Limited scientists are willing to participate actively in this initiative.”<sup>106</sup> (p51)

“In our view, it is fundamentally important that the issue of a framework for risk assessment that could be used to compare one product against another is addressed, since it is clear that modifying the combustion characteristics of a product can significantly alter the nature and the concentration of combustion by-products. Such a framework is essential to underpin the direction for cigarettes that may reduce the health impact on smokers, as well as being used to evaluate the toxicity of reduced ignition propensity cigarettes. Imperial Tobacco Canada wishes to support Health Canada in the development of such a risk assessment framework.”<sup>107</sup> (p20-21)

## **(ii) Consumer Acceptance of RIP Cigarettes**

Tobacco industry objections to fire-safe cigarettes have included lack of consumer acceptability. Allusions have been made to the concern that such cigarettes might throw off tiny embers which would damage smokers’ clothing and that they would go out when not being puffed enough or left smouldering in an ashtray.

As reported on USA’s *60 Minutes*<sup>108</sup> in 1994, Philip Morris researchers began working on their version of a fire-safe cigarette in 1980. The research project was given the code name “Project Hamlet,” (apparently a reference to an inside joke at Philip Morris “To burn or not to burn.”) The goal of the project was to create a commercially acceptable fire-safe cigarette. In 1987, Philip Morris researchers sent unmarked packs of “Hamlet” cigarettes to dozens of taste testers who smoked and rated the fire safe cigarettes. The results, as detailed in a memo that went up the chain of command within Philip Morris, indicated that the taste testers could not distinguish any difference between the “Hamlet” cigarettes and Marlboros.”<sup>109</sup>

Imperial Tobacco(Canada) imply in their submission to Health Canada that the small brand shares of *Merit* in the USA and New Zealand mean that consumers reject the product and by extension, any RIP cigarette:

“It is worth noting in the context of consumer acceptance of “fire-safe” products that the only product currently on the market in the United States with this ribbed paper technology has a market share of just over 1%... Moreover, since its release in July 2000, sales audit data indicates that the brand is losing share. The same brand in New Zealand had a market share of 0.003%.(p34)

“Merit is a brand that has been on the market in the United States since 1976. The year prior to the change to ‘Paper Select’ it had a market share of 1.84%. In 2002 Merit’s market share was 1.07%. Not only did Merit fail to attract new smokers to its modified product but it apparently lost smokers who were already smoking the brand.”(p14)

Laugesen et al reported the results of a telephone poll of a nationally representative sample of 750 adults aged 18 and over (25% being smokers) who were asked in 2003 “Research has shown that cigarettes that go out more quickly if you don’t puff on them are less likely to cause house fires than other cigarettes. Would you support or oppose making it compulsory for all ready-made, tailor-made cigarettes sold in New Zealand to go out quickly when they are not being puffed?” The proposal for self-extinguishing cigarettes was supported by 67% of all smokers, 61% of manufactured cigarette smokers, 82% of hand rolled smokers, and by 68% of non-smokers.<sup>110</sup>

The disjunction between the above result and *Merit*’s very small brand share in New Zealand is probably largely explained by there being a total tobacco advertising ban in New Zealand. Philip Morris has therefore not been able to communicate to smokers that *Merit* is a RIP cigarette. It is therefore unsurprising that it has not grown in market share.

## **8. Report on the ignition propensity standards considered or adopted by other jurisdictions**

### **(i) New York**

The state of New York in the USA became the first jurisdiction in the world to mandate a standard for fire-safe cigarettes. Since June 28, 2004, no cigarettes are allowed to be sold in New York unless they meet the performance standard E2187-02b *Standard Test Method for Measuring the Ignition Strength of Cigarettes*. This standard requires that no more than 25 percent of the cigarettes tested in a test trial shall exhibit full length burns on the filter paper specified in the test method. The New York standard also requires that any cigarette which uses “lowered permeability bands in the cigarette paper to achieve compliance with the performance standard ... shall have at least two nominally identical bands on the paper surrounding the tobacco column. At least one complete band shall be located at least 15mm from the lighting end of the cigarette. For cigarettes on which the bands are positioned by design, there shall be at least two bands fully located at least 15mm from the lighting end and 10mm from the filter end of the tobacco column (or 10mm from the labelled end of the tobacco column for a non-filtered cigarette)”. The complete regulations for New York are found in Appendix 2.

The New York regulation does not endorse any particular method of meeting the fire safety standard. It is important to emphasise that the New York standard is a performance standard, not a design standard. It is understood that most *Merit* cigarettes as currently manufactured do not meet the New York performance standard and will have to be reformulated.

It is understood that all manufacturers expect, at least initially, to use banding to meet the New York standard. Philip Morris does not have a monopoly on this technology. The paper company Schweizer Maudit has developed an alternative way of making the paper.

### **(ii) Canada**

On April 19, 2001 Canada’s Ministerial Advisory Council on Tobacco Control concluded<sup>111</sup>:

- Cigarette fires cause 100 needless deaths a year [in Canada]. Tobacco companies can fix the problem, and governments can oblige them to do so. Fixing the problem would be both responsible and popular. Failure to do so would be irresponsible and ill viewed by the general public. Governments should save lives through responsible public health action; they should not kill people by negligence or by failure to act.
- Canada needs fire-safe cigarettes and she needs them now. We urge the government to act now to make cigarettes fire-safe.

“To that end we offer the following recommendations for your consideration:

### ***Recommendations***

- 1) Health Canada immediately request the tobacco industry to make all their cigarettes fire safe by ensuring that they self-extinguish within five minutes on a standard extinction test. The tobacco industry should be requested to respond within thirty days and to achieve fire safety for all their cigarettes by the end of 2003.
- 2) Should no meaningful response be received within thirty days, the government should initiate the preparation of regulations pursuant to Section 5 of the *Tobacco Act* along the lines proposed in the Background Paper (Section J.4). The government should establish a firm timetable that would see the regulation implemented by the end of 2003. The government may wish to take into account the timing, form and content of the New York Regulation concerning fire-safe cigarettes, so as to maximize public health effects.
- 3) Appropriate communications strategy to be developed by Health Canada.
- 4) Through funding, technical assistance and other means, the government should assist plaintiffs and their lawyers to bring civil and criminal legal actions against the tobacco industry, with a view, among others, of holding the tobacco industry accountable for the harm it causes to smokers and non-smokers.”

John McKay, the Canadian Member of Parliament for Scarborough East, has been sponsoring a Private Member's bill urging Health Canada to move on this issue via Bill C-260, An Act to amend the Hazardous Products Act (fire-safe cigarettes). This bill was passed by the House of Commons on October 31 2003. However, it was blocked at second reading in the Senate on November 5 2003. On 30 March 2004, the Bill was passed by the Canadian parliament, to take effect from the beginning of 2005. The legislation amends the Hazardous Products Act to allow provisions for complementary regulations under the Tobacco Act.

On May 1 2004, Canada's proposed ignition propensity regulations were prepublished in Canada Gazette Part I, along with regulations requiring that toxicity tests be conducted on cigarette emissions annually, and the results reported to the Minister of Health. These regulations would mandate an ignition propensity standard for all cigarettes manufactured or imported into Canada on or after October 1, 2005. A 75-day comment period has been set.

The proposed regulations recommend using the American Society of Testing Materials (ASTM) International method E2187 - 02b, dated December 10, 2002 and entitled *Standard Test Method for Measuring the Ignition Strength of Cigarettes*. This is the same performance standard that is currently in the New York standard for fire-safe cigarettes.

The proposed regulations are at <http://www.hc-sc.gc.ca/hecs-sesc/tobacco/legislation/rip2/cipr.html> and those amending the reporting regulations are at: <http://www.hc-sc.gc.ca/hecs-sesc/tobacco/legislation/rip2/ratrrr.html>

The Standing Committee on Health of the Canadian House of Commons held three public hearings on this bill. Health Canada officials, the Canadian Association of Fire Chiefs, the health community and the tobacco industry were all invited to testify before the Committee. Links to the minutes of these hearings can be found at:

<http://www.parl.gc.ca/InfoCom/PubDocument.asp?DocumentID=696324&Language=E>  
<http://www.parl.gc.ca/InfoCom/PubDocument.asp?DocumentID=828660&Language=E>  
<http://www.parl.gc.ca/InfoCom/PubDocument.asp?DocumentID=1089031&Language=E>

A regulatory impact analysis statement can be found at:  
<http://www.hc-sc.gc.ca/hecs-sesc/tobacco/legislation/rip2/impact.html>

### **(iii) New Zealand**

In May 2001 moves by Alliance MP Grant Gillon to introduce a Cigarettes (Fire Safety) Bill in New Zealand saw US tobacco lawyers Covington and Burling come to the country to oppose the move. John Rupp, a lawyer with the firm told a select committee<sup>112</sup> no agreed test existed to measure the fire risks of different brands of cigarettes, and no agreement had been reached on changes that could be made to cigarettes to reduce the risk. The Bill did not proceed, however politicians who advocated for the reform pledged to continue their work in parliament.

## **Appendix 1: Fire Safety Standards in Australia**

### **AS 2663.2—1999**

Australian Standard™  
Textiles—Fabrics for window furnishings  
Part 2: Coated curtain fabrics

### **AS 2687—1997**

Textiles—Upholstery fabrics for domestic and commercial use (excluding face-coated fabrics)

### **AS/NZS 3744.1:1998**

#### **ISO 8191-1:1987**

Furniture—Assessment of the ignitability of upholstered furniture  
Part 1: Ignition source—Smouldering cigarette. This standard not represented by either FPA or Australasian Fire Authorities Council.

### **AS/NZS 1530.3:1999**

Australian/New Zealand Standard™  
Methods for fire tests on building materials, components and structures  
Part 3: Simultaneous determination of ignitability, flame propagation, heat release and smoke release

### **AS/NZS 4088.1:1996**

Specification for burning behaviour of upholstered furniture  
Part 1: Upholstery materials for domestic furniture—Smouldering ignitability

### **NFPA 267**

NFPA 267 sets out the testing procedures required to determine the fire characteristics of mattresses and bedding assemblies exposed to a flaming ignition. The test determines the heat release, smoke density, weight loss and generation of carbon monoxide from the mattresses and bedding assemblies. This information has been found useful in assessing the fire hazard in occupancies that are identified as or considered to be public occupancies.

The test specimen consists of the actual mattress or bedding assembly item positioned on a weighting platform with a 'T' gas burner on a 45-degree angle at the head of the assembly. An exhaust system is located centrally over the assembly, which collects and records the required gases and products given off by the specimen during the test.

### **AS/NZS 3744.3**

Upholstery composites in the form of mock-up seat and back assembly of cushion and cover are subjected to gas flame source in these ignitability tests. The nominal 160mL/min gas flame tests corresponds to the BS5852/ Source 2 method and the nominal 350mL/min gas flame test is the equivalent of the BS5852/ Source 3 method.

**AS/NZS 4088.1 (Int) 1993**

Mock-up seat with foam cushion and standard FR polyester fabric is subjected to gas flame for 40 seconds. FR Stamina foams have non-ignition rating in this test. It is based on the BS5852 standard with Source 2 ignition.

**AS/NZS 4088.1 1996**

The BS5852/Source 0 and AS/NZS 3744.1 test measures the resistance of resistance of upholstery combinations to smouldering cigarette ignition. In the AS/NZS4088.1: 1996 test cushioning materials are tested with standard cover and cover materials are tested with standard fabric. The ignition source is a smouldering cigarette, as in the above Standards.

**AS/NZS3744 Parts 1 & 2**

Combination of cover and filling is tested for resistance to smouldering and flaming ignition by subjecting it to smouldering cigarette (AS/NZS 3744.1) and/or to match flame equivalent (AS/NZS3744.2) ignition sources. This method is technically identical to the BS5852 Source O and Source 1 tests.

**AS1530 Part 3**

Vertical sheet of material is subjected to radiant panel ignition source for 20 minutes. Ignitability, spread of flames, heat evolved and smoke are measured and indexed. Originally intended as a test for wall lining materials. Some FR foams have also been tested to this standard. 8 Dunlop Flexible Foams. 1998a Fire Safety Considerations of Correction Facilities Standards.

**AS2122**

Mass retained and afterburn time of vertical foam samples measured in a test with a standard gas flame. Combination of foam sample and FR polyester cover in a seat/back mock-up is subjected to 17g timber crib ignition (BS5852:1990/Source 5). The mass loss should be less than 60g for pass rating. BS5852 describes the test method, the performance specification for foams with the standard cover is found in BS3391: 1990/Appendix A.

**CAL 117**

Foam tested to flaming ignition as a vertical test piece and to cigarette ignition in combination with a cotton cover with the burning cigarette placed at the joint of horizontal and vertical test pieces.

**F.A.R. 25.853/App. F/Part 1**

Standard foam test piece in a vertical position is subjected to gas burner ignition source. The damage should not exceed 200mm for pass rating. Not to be confused with App. F/Part II, the aircraft seat assembly testing, where the flame source is a kerosene burner.

**FMVSS302 & SAE T2002**

Gas burner flame is applied to one end of a standard size horizontal foam piece. The flame spread rate should not exceed 100mm/min for pass rating.

## **Appendix 2: Part 429 Fire Safety Standards for Cigarettes – State of New York, USA**

### **1. General Requirements.**

(a) On and after June 28, 2004, no cigarettes subject to the provisions of section 156-c of the Executive Law shall be sold or offered for sale in this state unless:

(1) such cigarettes have been tested in accordance with the test method prescribed in section 3 of this Part;

(2) such cigarettes meet the performance standard specified in section 4 of this Part; and

(3) a written certification has been filed by the manufacturer with the Department of State, Office of Fire Prevention and Control, 41 State Street, Albany, New York, 12231-0001, and the Office of the Attorney General, Cigarette Fire Safety Certifications, Administration Office, State Capitol, Albany, New York 12224 in accordance with section 6 of this Part.

(b) Nothing in this Part shall prohibit wholesale dealers or retail dealers from selling their inventory of cigarettes existing on June 28, 2004, provided that such wholesale dealer or retail dealer can establish that New York State tax stamps were affixed to such cigarettes pursuant to Article 20 of the Tax Law prior to June 28, 2004, and provided further that such wholesale dealer or retail dealer can establish that such inventory was purchased prior to June 28, 2004 in comparable quantity to the inventory purchased during the same period of 2003.

### **2. Definitions. For the purposes of this Part:**

(a) "Agent" shall have the same meaning as subdivision eleven of section four hundred seventy of the tax law.

(b) "Cigarette" shall mean any roll for smoking whether made wholly or in part of tobacco or any other substance, irrespective of size or shape and whether or not such tobacco or substance is flavored, adulterated or mixed with any other ingredient, the wrapper or cover of which is made of paper or any other substance or material except tobacco.

(c) "Manufacturer" shall mean:

(1) any entity which manufactures or otherwise produces cigarettes or causes cigarettes to be manufactured or produced anywhere that such manufacturer intends to be sold in New York State, including cigarettes intended to be sold in the United States through an importer; or

(2) the first purchaser anywhere that intends to resell in the United States cigarettes manufactured anywhere that the original manufacturer or maker does not intend to be sold in the United States; or

(3) any entity which becomes a successor of an entity described in paragraph (1) or (2) of this subdivision.

(d) "Repeatability" shall mean the range of values within which the repeat results of cigarette test trials from a single laboratory will fall 95 per cent of the time.

(e) "Retail dealer" shall have the same meaning as subdivision nine of section four hundred seventy of the tax law.

(f) "Sale" shall mean any transfer of title or possession or both, exchange or barter, conditional or otherwise, in any manner or by any means whatever or any agreement therefor. In addition to cash and credit sales, the giving of cigarettes as samples, prizes or gifts, and the exchanging of cigarettes for any consideration other than money are considered sales.

(g) "Sell" shall mean to sell, or to offer or agree to do the same.

(h) "Quality control and quality assurance program" shall mean the laboratory procedures implemented to ensure that operator bias, systematic and nonsystematic methodological errors, and equipment related problems do not effect the results of the testing. This program ensures that the testing repeatability remains within the required repeatability values stated in section 3(e) of this Part for all test trials used to certify cigarettes in accordance with this regulation.

(i) "Wholesale dealer" shall have the same meaning as subdivision eight of section four hundred seventy of the tax law.

### 3. Test Method.

(a) Testing of cigarettes shall be conducted in accordance with the American Society of Testing and Materials ("ASTM") standard E2187-02b "Standard Test Method for Measuring the Ignition Strength of Cigarettes," subject to the modifications stated in Appendix A to this Part. This standard may be obtained from the publisher at ASTM International, 100 Barr Harbor Drive, P. O. Box C700, W. Conshohocken, Pennsylvania 19428-2959. This material is available for public inspection and distribution at the Department of State, Office of Fire Prevention and Control, 41 State Street, Albany, New York 12231-0001.

(b) Testing shall be conducted on 10 layers of filter paper.

(c) Forty replicate tests shall comprise a complete test trial for each cigarette tested.

(d) The performance standard required by section 4 of this Part shall only be applied to a complete test trial.

(e) Laboratories conducting testing in accordance with this section shall implement a quality control and quality assurance program that includes a procedure that will determine the repeatability of the testing results. The repeatability value shall be no greater than 0.19 pursuant to section 4 of this Part.

### 4. Performance Standard.

(a) When tested in accordance with section 3 of this Part, no more than 25 percent of the cigarettes tested in a test trial shall exhibit full length burns.

(b) Each cigarette listed in a certification submitted pursuant to section 6 of this Part that uses lowered permeability bands in the cigarette paper to achieve compliance with the performance standard set forth in subdivision (a) of this section shall have at least two nominally identical bands on the paper surrounding the tobacco column. At least one complete band shall be located at least 15 millimeters from the lighting end of the cigarette. For cigarettes on which the bands are positioned by design, there shall be at least two bands fully located at least 15 millimeters from the lighting end and 10 millimeters from the filter end of the tobacco column (or 10 millimeters from the labeled end of the tobacco column for a non-filtered cigarette).

(c) The manufacturer or manufacturers of a cigarette that the Office of Fire Prevention and Control determines cannot be tested in accordance with the test method prescribed in section 3 of this Part shall propose a test method and performance standard for such cigarette to the Office of Fire Prevention and Control. Upon approval of the proposed test method and a determination by the Office of Fire Prevention and Control that the performance standard proposed by the manufacturer or manufacturers is equivalent to the performance standard prescribed in section 4 of this Part, the manufacturer or manufacturers may employ such test method and performance standard to certify such cigarette pursuant to section 6 of this Part. All

other applicable requirements of this Part shall apply to such manufacturer or manufacturers.

#### 5. Test Data.

In order to ensure compliance with the performance standard specified in section 4 of this Part, data from testing conducted by manufacturers to comply with this performance standard shall be kept on file by such manufacturers for a period of 3 (three) years and shall be sent to the Office of Fire Prevention and Control upon its request, and to the Office of the Attorney General upon its request, at the addresses specified in section 1(c) of this Part.

#### 6. Certification.

(a) Each manufacturer shall submit a written certification attesting that:

(1) each cigarette listed in the certification has been tested in accordance with section 3 of this Part; and

(2) each cigarette listed in the certification meets the performance standard set forth in section 4 of this Part.

(b) Each cigarette listed in the certification shall be described with the following information:

1. brand (i.e., the trade name on the package)
2. style (e.g., light, ultra light)
3. length in millimeters
4. circumference in millimeters
5. flavor (e.g., menthol, chocolate) if applicable
6. filter or non-filter
7. package description (e.g., soft pack, box)
8. marking approved in accordance with section 8 of this Part.

(c) Each cigarette certified under this section shall be re-certified every three years.

#### 7. Notification of Certification.

Manufacturers certifying cigarettes in accordance with section 6 of this Part shall provide a copy of such certifications to all wholesale dealers and agents to which they sell cigarettes, and shall also provide sufficient copies of an illustration of the cigarette packaging marking utilized by the manufacturer pursuant to section 8 of this Part for each retailer to which the wholesale dealers and agents sell cigarettes. Wholesale dealers and agents shall provide a copy of these cigarette packaging markings received from manufacturers to all retail dealers to which they sell cigarettes. Wholesale dealers, agents, and retail dealers shall permit the Office and Fire Prevention and Control to inspect markings of cigarette packaging marked in accordance with section 8 of this Part.

#### 8. Marking of Cigarette Packaging.

(a) Cigarettes which have been certified by a manufacturer in accordance with section 6 of this Part shall be marked to indicate compliance with the requirements of this Part. Such marking shall be in eight point type or larger and consist of :

(1) Modification of the product UPC Code to include a visible mark printed at or around the area of the UPC Code. Such mark may consist of alphanumeric or symbolic character(s) permanently stamped, engraved, embossed or printed in conjunction with the UPC; or

(2) Any visible combination of alphanumeric or symbolic character(s) permanently stamped, engraved, or embossed upon the cigarette package or cellophane wrap; or

(3) Printed, stamped, engraved or embossed text that indicates that the cigarettes meet New York Standards.

(b) Such marking shall be unique to packages that meet New York Standards.

(c) A manufacturer must use only one marking, and must apply this marking uniformly for all packages (including but not limited to packs, cartons, and cases) and brands marketed by that manufacturer.

(d) The Office of Fire Prevention and Control must be notified at the address specified in section 1(c) of this Part as to the marking which is selected.

(e) Prior to the certification of any cigarette, a manufacturer shall present its proposed marking to the Office of Fire Prevention and Control for approval. Upon receipt of the request, the Office of Fire Prevention and Control will approve or disapprove the marking offered. Proposed markings shall be deemed approved if the Office of Fire Prevention and Control fails to act within 10 business days of receiving a request for approval.

(f) No manufacturer shall modify its approved marking unless the modification has been approved by the Office of Fire Prevention and Control in accordance with this section.

#### 9. Severability.

If any clause, sentence, paragraph, or section of this Part be adjudged by any court of competent jurisdiction to be invalid, such judgment shall not affect, impair or invalidate the remainder hereof but shall be applied in its operation to the clause, sentence, paragraph, or section hereof directly involved in the controversy in which such judgment shall have been rendered.

## **Appendix 3: Fire Agencies and State Government Agencies Involved in Emergency Fire Response**

### **ACT**

[ACT Emergency Services Bureau](#)

### **NSW**

[New South Wales Fire Brigades](#)

[New South Wales National Parks & Wildlife Service](#)

[New South Wales Rural Fire Service](#)

[State Forests of New South Wales](#)

### **NT**

[Bushfire Council of Northern Territory](#)

[Northern Territory Fire & Rescue Service](#)

### **QLD**

[Queensland Fire & Rescue Service](#)

[Queensland Parks & Wildlife Service](#)

### **SA**

[Country Fire Service](#)

[Dept of Environment Heritage & Aboriginal Affairs](#)

[South Australian Metropolitan Fire Service](#)

### **TAS**

[Parks & Wildlife Tasmania](#)

[Tasmania Fire Service](#)

### **VIC**

[Australasian Fire Authorities Council](#)

[Country Fire Authority](#)

[Department of Sustainability & Environment](#)

[Metropolitan Fire & Emergency Services Board](#)

Fire Protection Association Australia (FPA Australia)

<http://www.fpaa.com.au/>

### **WA**

[Department of Conservation & Land Management](#)

[Fire & Emergency Services Authority](#)

### **Select websites for information and discussion.**

The US Trauma Foundation <http://www.tf.org/tf/injuries/cigar5.shtml>

American Burn Association fact sheets

<http://www.ameriburn.org/advocacy/fireSafeCig.htm>

Commentary on The Joseph Moakley Memorial Fire Safe Cigarette Act of 2002 H.R. 4607/S. 2317 <http://www.burnsurvivorsttw.org/hr4607.html>

The RJ Reynolds tobacco company position on fire-safe cigarettes

<http://www.rjrt.com/TI/TIFireSafety.asp>

The Australasian Fire Authorities Council ([www.afac.com.au/index.html](http://www.afac.com.au/index.html))

The US National Fire Protection Association ([www.nfpa.org/catalog/home/index.asp](http://www.nfpa.org/catalog/home/index.asp))

Flinders University Adelaide, Research Centre for Injury Studies  
<http://www.nisu.flinders.edu.au/>

Victorian Injury Surveillance and Applied Research System (VISAR)  
<http://www.general.monash.edu.au/muarc/visar/>

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- <sup>14</sup> Gann RG, Harris Jr RH, Krasny JF, Levine RS, Mitler HE, and Ohlemiller TJ, The Effect of Cigarette Characteristics on the Ignition of Soft Furnishings, Report No. 3, Technical Study Group on Cigarette and Little Cigar Fire Safety, Cigarette Safety Act of 1984, and NBS Technical Note 1241, U.S. National Bureau of Standards, Gaithersburg, MD, 1987.
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