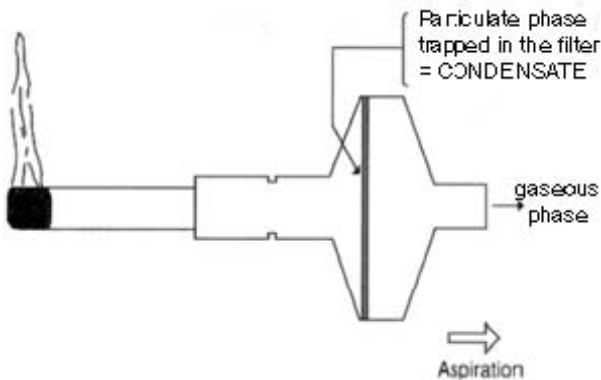


What is the FTC method of cigarette analysis?

Dating back to 1936, when most smokers used unfiltered cigarettes, the Federal Trade Commission (FTC) method was developed as the standard method for measuring the toxic components (specifically tar, nicotine and carbon monoxide) of cigarettes. The FTC protocol was initially reported by American Tobacco Company researchers and published in the July issue of *Industrial and Engineering Chemistry* by J.A. Bradford and colleagues. After the first Surgeon General Report entitled *Smoking and Health: Report of the Advisory Committee to the Surgeon General of the Public Health Service* appeared in 1964, a publication authored by C.L. Ogg appeared in the *Journal of the Association of Official Analytical Chemists*. Although not substantively different from Bradford's 1936 design, Ogg's paper provided further development of the FTC method.

The FTC method of cigarette analysis is performed on a series of cigarettes that are held in place by a device. Once held by the device, the cigarettes are simultaneously ignited and artificially puffed by syringes. This "mechanized smoking" is clearly unlike the human manner of smoking. At any rate, after the machine "inhales" several times, the particulate components of smoke are collected on a glass filter (called a Cambridge filter pad) and the gas phase, i.e. CO, NO is collected in collection bags. (See Figure 1)

Figure 1. **A Single Port of a Smoking Machine**



The smoke constituents from each modern filtered cigarette are generated utilizing the following method:

A 35 cc puff volume from a 2 second puff duration with a puff every 60 seconds to a cigarette length of 23 millimeters (mm) or length of the over wrap plus 3 millimeters (mm).

The deposited particulate (solid) matter collected on the Cambridge pad is treated by extraction and analyzed with sophisticated analytical instrumentation as are the collected gases.

It is clear that the current FTC method is seriously flawed and needs to be revamped. First, the method has not taken into consideration changes in cigarette design, such as RECON and

other tobacco blend types, ventilated filters, and additives. Second, the method does not accurately reflect actual human smoking behaviors based on addictive nicotine burdens. Specifically, the FTC method does not recognize the unconscious behaviors of smokers (such as compensation) that essentially negate the ventilation effect realized on the smoke machine, such as taking more frequent, voluminous or larger puffs, covering the air holes with their lips or fingers or smoking more cigarettes.

Because the FTC method is flawed some nations and states (Canada and Massachusetts) have rejected this method and replaced it with a more accurate alternative method. (See Table 1). Although these alternative methods mirror more closely human smoking behaviors, the fact is, an automated machine method will never accurately duplicate human smoking behavior. The major flaw is that filter ventilation holes in cigarettes which are situated outside of the cigarette holder in the smoking machine port allow for dilution of the true tar, nicotine and other combustion products delivered during human smoking.

Table 1, below is a comparison of two alternative cigarette delivery measurement methods that attempt to address the defects in the current FTC method. In both the Canadian and the Massachusetts methods, the ventilation holes are blocked either completely or 50 % to prevent air dilution, and the puff volumes and durations are enhanced to be more consistent with human smoking. While these methods are distinct improvements over the FTC method, they are still imperfect and cannot fully mimic human smoking. The Canadian and Massachusetts methods significantly increase the overall delivery of smoke constituents.

Table 1. Methods of Smoke Analysis

**MACHINE MEASUREMENT
TAR & NICOTINE**

METHOD	PUFF VOLUME	PUFF DURATION	CIGARETTE BUTT LENGTH
FTC/ISO*	35 cc	2 sec/min	23 mm 3 mm + over wrap
MA Method 50 % VENT BLOCK	45 cc	2 sec/30 sec	
CANADIAN METHOD 100 % VENT BLOCK	55 cc	2 sec/30 sec	

* Current standard method of reporting tar, nicotine and CO

In 1987 the FTC discontinued its own testing of cigarettes and accepted the measurements of the tobacco industry. The industry agreed to allow the FTC to monitor its laboratory's procedures, in particular the Cambridge Filter Method. The FTC obtains cigarette test results from each of the industry's manufacturers through its compulsory process authority and has reported the results to Congress each year since 1998. The FTC has continued to collect data but has **NOT** reported the results to Congress or the public since 2002. These results are obtainable via a Freedom of Information Act Request which can be filed by going to: <http://www.ftc.gov/foia/foiarequest.shtml>

The industry's cigarette design using cigarette ventilation allows the industry to attach the monikers, such as **LIGHT** or **MILD** that convey to the consumer an alternative product with a reduced health burden. In reality, however, the products with these monikers are just as pestiferous as regular, "full bodied" cigarettes. In other words, products that have the words "**LIGHT**" and "**MILD**" on their packaging, do not have a reduced health burden.

References:

1. Bradford JA, Harlan WR, Hanmer HR. *Nature of cigarette smoke: technique of experimental smoking*. Industrial and Engineering Chemistry 1936;28(7):836-839.
2. Ogg CL. *Determination of particulate matter and alkaloid (nicotine) in cigarette smoke*. Journal of the Association of Official Analytical Chemists 1964;47(2):356-362.
3. U.S. Department of Health and Human Services. *The FTC Cigarette Test Method for Determining Tar, Nicotine, and Carbon Monoxide Yields of US Cigarettes*, Report of the NCI Expert Committee, Smoking and Tobacco Control Monograph 7, 1996
4. Wigand JS. *Cigarette testing methods, product design, and labeling: time to clean up the "negative baggage"*. Tobacco Control 1998;(7):336-337 Winter
5. <http://www.ftc.gov>