

# How a Cigarette Is Engineered

The design and content of cigarettes continue to make them attractive, addictive, and deadly.<sup>1</sup> Every day, more than 1,300 people in the United States die because of cigarette use.<sup>2</sup>

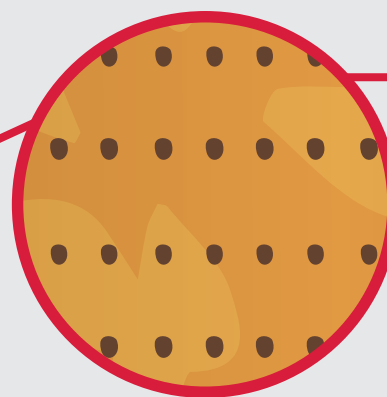
## Filter<sup>3,4,5</sup>

- Typically made from bundles of thin, hair-like fibers.
- Designed to trap smoke, but only stops a small portion of the smoke from being inhaled.
- The filter (and ventilation holes) in most cigarettes may lead smokers to inhale more deeply, pulling dangerous chemicals farther into their lungs.



## Tipping paper<sup>6</sup>

- Wraps around the filter, connecting it to the rest of the cigarette.
- **Ventilation holes**, if unblocked, dilute inhaled smoke with air.
- Manufacturers have chosen to place the ventilation holes where they are. The holes are largely ineffective. Because of their location, most smokers unknowingly block them with their fingers or lips.



## Cigarette paper<sup>3</sup>

- Holds the tobacco filler.
- Manufacturers add chemicals to the paper to control how fast the cigarette burns.
- Smokers inhale everything that is burned—the tobacco filler, the paper... everything.

## Tobacco filler<sup>7,8,9</sup>

- Made up of chopped tobacco leaves, stems, reprocessed pieces, and scraps.
- Dangerous chemicals can form in and be deposited on tobacco during the processing of the tobacco leaves.
- Other dangerous chemicals are created when the tobacco filler is burned.



## Additives<sup>10,11,12</sup>

Manufacturers can **add hundreds of ingredients** to a cigarette to make smoking more appealing and to mask the harshness of smoke.



Certain **additives**, like sugars, can form cancer-causing chemicals when they are burned.

**Sugar** and **flavor\*** additives can change the taste of smoke and make it easier to inhale, but no less harmful.



**Ammonia** and other **chemicals** added to tobacco may increase the absorption of nicotine, which is addictive.

Some additives are **bronchodilators** that could increase the amount of dangerous chemicals absorbed by the lungs.

<sup>6</sup>In 2009, The Family Smoking Prevention and Tobacco Control Act banned characterizing flavors in cigarettes, except for tobacco and menthol flavors.



**FDA'S REGULATORY AUTHORITY:** The FDA Center for Tobacco Products (CTP) has broad authority, via the Tobacco Control Act, to regulate the manufacturing, distribution, and marketing of tobacco products. To protect public health, CTP has the authority to regulate what ingredients tobacco manufacturers can put into their products.

<sup>(1)</sup> U.S. Department of Health and Human Services. *A Report of the Surgeon General: How Tobacco Smoke Causes Disease* (Fact Sheet). Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2010. <sup>(2)</sup> U.S. Department of Health and Human Services. *The Health Consequences of Smoking—50 Years of Progress: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014. <sup>(3)</sup> Taylor MJ. The role of filter technology in reduced yield cigarettes. Filtrona. World Tobacco Exhibition Kunming. <sup>(4)</sup> Kiefer JE, Mumpower RC II. *Parameters That Affect the Pressure Drop and Efficiency of Cellulose Acetate Cigarette Filters*. Research Laboratories, Tennessee Eastman Company; 2004; Bates number: 81052204/2269. <sup>(5)</sup> U.S. Department of Health and Human Services. *Let's Make the Next Generation Tobacco-Free: Your Guide to the 50th Anniversary Surgeon General's Report on Smoking and Health* (Consumer Booklet). Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2014. <sup>(6)</sup> Browne CL. *The Design of Cigarettes*. 3rd ed. Charlotte, NC: C Filter Products Division, Hoechst Celanese Corporation; 1990. <sup>(7)</sup> Spears AW. Effect of manufacturing variables on cigarette smoke composition. *CORESTA Bulletin d'Information*. 1974;6:65-78. <sup>(8)</sup> Geiss O, Kotzias D. *Tobacco, Cigarettes, and Cigarette Smoke: An Overview*. European Commission, Directorate-General, Joint Research Centre; 2007. <sup>(9)</sup> Baker R. A review of pyrolysis studies to unravel reaction steps in burning tobacco. *Journal of Analytical and Applied Pyrolysis*. 1987;11:555-573. <sup>(10)</sup> U.S. Department of Health and Human Services. *How Tobacco Smoke Causes Disease: The Biology and Behavioral Basis for Smoking-Attributable Disease: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health; 2010. <sup>(11)</sup> Rabinoff M, Caskey N, Rissling A, Park, C. Pharmacological and chemical effects of cigarette additives. *American Journal of Public Health*. 2007;97(11):1981-1991. <sup>(12)</sup> Talhout R, Opperhuizen A, Amsterdam J. Sugars as tobacco ingredient: Effects on mainstream smoke composition. *Food and Chemical Toxicology*. 2006;44(11):1789-1798.