

## Candle Cautions Healthy Alternatives to Paraffin

By Bill Strubbe

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Last year, while rearranging the paintings in her living room, Cathy Crystal noticed black smudges on the walls around the frames. Baffled, she looked around and discovered similar "ghostings" surrounding the electrical outlets and air conditioning vents. "We don't allow smoking in our house, and we have a vent over the stove," recalls the herbalist and nutritionist in Santa Cruz, Calif., "so it didn't make sense." It wasn't until a week later, while lighting a constellation of votive candles on the mantle for an evening soiree, that the source of the soot suddenly dawned on her.

The American Lung Association and the Environmental Illness Society of Canada both in recent years issued warnings that candles are among the most common unrecognized culprits of poor indoor air quality. David Kraus, an air quality engineer and former employee of the Florida Department of Health, says that paraffin candle soot is similar to that released by diesel fuel, and since 1992 the rate of complaints received rose from two a year to two a week. BSD or "Black Soot Deposition" damages paint, curtains, wallpaper, upholstery, clothing, and the ventilation or H/VAC system, not to mention human skin and lungs. Microscopic soot particles, which penetrate deep into the lungs, are responsible for aggravating respiratory illnesses and pose significantly higher risks in children, who have faster respiration rates.

The State of California, under its Proposition 65 Safe Drinking Water and Toxic Enforcement Act of 1986, identified a toxic stew of ingredients released by candles: acetone, 2-butanone, carbon disulfide, carbon tetrachloride, cresol, chlorobenzene, carbon monoxide, cyclopentene, ethylbenzene, phenol, styrene, tetrachloroethene, trichloroethene, benzene and toluene, the last two determined by the EPA to be possible carcinogens. Due to lack of regulations, candle manufacturers and retailers are not required to list or disclose toxic compounds in their products, nor do they have to supply a list of ingredients upon consumer requests.

"We do know that there are irritants in the burning of paraffin and petrochemicals," explains Chris Molinari, vice president of global communication at Aveda, which uses only beeswax and essential oils in their candle products. "And from a sustainability perspective, as a brand, we do not use any materials that are not from renewable sources."

The health hazards of paraffin fumes are exacerbated by health spas and massage therapists who often, in order to create a tranquil ambiance, burn candles in what are typically small, confined, airtight studio spaces. While a therapist imparts the benefits of their training and healing skills, the air that both client and therapist breathe is seriously compromised with toxins emitted by even a single candle.

"My massage room is quite small," explains Bill Murphy, a San Francisco massage therapist. "When I would burn votive candles -- sometimes as many as four or five -- I would begin to feel uncomfortable, overcome, suffocated. And that was before I heard about the hazards of paraffin. Now, even though they're more expensive, I only burn beeswax and soya candles."

As Murphy has discovered, not all candles are toxic. The offending culprits are paraffin, colorants, synthetically scented oils, and lead wicks. The most common fuel used in the candle industry is paraffin, the final refining product extracted after asphalt. This "bottom of the barrel" grayish-black sludge is then decolorized with 100 percent strength bleach, creating toxic dioxins. It's further processed using more carcinogenic chemicals, tinted with synthetic colorants, and artificially scented with chemicals producing chlorofluorocarbons (CFCs) -- the gases eroding the ozone layer and contributing to the greenhouse effect.

#### The Solutions

The unprecedented growth in the last decade of the candle market has motivated many companies -- Body Shop, Gap, and Banana Republic -- to introduce candles into their product line. With research indicating that fragrance intensity influences sales, manufacturers have exploited the trend of aromatherapy by simply dumping synthetic oils -- much of which does not completely combust -- into paraffin candles and claiming dubious benefits to health and well-being.

"Very few candle manufacturers use pure, essential oils, largely because of the expense," explains Kelly Hollandazzo, spokesperson for the National Association for Holistic Aromatherapy (NAHA), a professional organization actively involved in educating the public and manufacturers about true aromatherapy. "If a candle is scented of, say for example, coconut, watermelon, or cranberry, it is not natural because there is no essential oil for those scents. And massage therapists burning synthetic scented candles in their studio are more likely to cause allergic reactions. I use only unscented soy or beeswax candles."

NAHA recently developed quality standards for a "True Aromatherapy Product" seal -- look for a TAP sticker -- to help guide consumers.

Other possible hazards are unsuspecting wicks. A study done by the University of Michigan School of Public Health found that a candle burning with a lead core wick for an hour raises lead poisoning inside a home to unsafe levels. Maryanne McDermott, executive vice president of the National Candle Association (NCA), says that even though U.S. candle makers voluntarily agreed 25 years ago to prohibit lead wicks, some candles -- primarily imports -- sold in the country have lead in them. (To determine if a wick has a lead core, rub a piece of paper on the tip of the wick to see if it leaves a mark.)

Fortunately for the romantics among us, safe alternatives do exist. Beeswax, derived from

Mother Nature's flowers, is nontoxic, naturally aromatic, and the only fuel that emits beneficial negative ions when burned, thereby removing positively-charged particles of dust, pollen, mold, mildew, and toxic emissions from rugs, paint, and construction materials from the air. But beeswax supplies are limited, making them expensive, a beeswax votive costs about \$2, a paraffin votive about 50 cents.

Another renewable, nonpolluting, and moderately priced source of candle fuel is soya wax. Fourteen years ago, when Michael Richards' client, The Body Shop, requested cost-cutting measures on their beeswax candles, the Iowa candle maker began experimenting with vegetable-based waxes. With the help of the Soy Bean Council of Iowa he eventually created a viable market for what had become a surplus item. Richards currently uses only about 2 million pounds of soy oil a year, but hopes the amount will increase as the health hazards of paraffin become better recognized.

In 2000, after Richards learned about and then confirmed paraffin's toxicity through a controlled experiment -- even high quality paraffin generated considerable soot, while beeswax and soya produced little measurable soot -- British Petroleum sued to stop him from publicly speaking out about the results. (The NCA similarly threatened the American Lung Association with legal action.) Though the court ruled in Richards' favor, the National Candle Association sent letters to him and some of his wax customers threatening legal action claiming he lacked scientific basis for disparaging paraffin. Richards no longer manufactures candles, but now operates the Candle College to train cottage industry chandlers.

The NCA's response comes as little surprise because the oil industry holds a dominant position in the candle business. (Three companies account for about 80 percent of the candle business.) Not only do they sell their byproducts to the candle industry, but business people from the petroleum industry sit on the board of the NCA.

"Soya candles comprise only about 1 percent of the market. They're a little more expensive (a soya votive runs about 75 cents) than paraffin, but as we educate consumers and manufacturers and capture more of the market, the price will even out," Richards says, explaining that about 8 to 10 billion pounds of paraffin are used annually in the United States: 33 percent for candles, the rest in milk cartons, food packaging, wax paper, etc. "About 18 billion pounds of soy oil are produced every year, so we have the capacity to replace petroleum wax without having to plant more soy beans. We're part of a much bigger revolution. Many, if not most, of the products we now make from petroleum will be replaced within 15 years by plant-based products."

*Bill Strubbe is a freelance writer and massage therapist from Oakland, Calif.*