

The Role of Fragrance in Product Development

By Ramon A. Llenado, PhD, Divisional Vice-President
Household Products Research, Lehn & Fink Products Group
Sterling Drug Inc., Montvale, New Jersey

In remarks on the role of fragrance in development of consumer household products, I will use the terms fragrance and perfume interchangeably with apologies to the industry purist. By consumer household products I refer to laundry products, cleaners, disinfectants and other functional mass merchandised products.

My presentation will cover:

- The importance of perfume and its interrelation with other aspects of successful product development.
- An outline of key problems encountered in the selection of perfume in household cleaning products.
- Crystal gazing—a look at the role of fragrance in new household products by the year 2000.

The goal of my presentation is to provide the perfume industry with our view of fragrance as a key material in cleaning products. Fully realizing that most perfumers see fragrances with artistry and passion, I must confess that I am treating perfume as simply a raw material used to create another product.

I am a user of perfume rather than a perfumer. I must also admit that my remarks are slanted toward my own discipline. You are, therefore, reading one person's views—to be debated and challenged.

The household cleaning market is large—almost \$9 billion dollars in manufacturer's sales,

or about \$40 annually for every man, woman, and child in the U.S. After inflation, real growth is predicted at 2% per year slightly ahead of population growth. This industry annually should consume up to 200 million lbs of perfume worth in excess of \$1 billion dollars.

This reason alone should be enough, I believe, to be interested in the role of fragrance in household cleaning products.

Historically, perfumes have been added to household cleaning products to mask unpleasant odors. These malodors were often due to the raw materials or processes employed. Frequently, raw materials were of unrefined animal or vegetable origin. Unsophisticated processes yielded by-products which were seldom separated from the sought-after product.

Today, the picture is markedly different. Emerging consumer needs necessitate the use of ever increasingly complex consumer products, which are perfumed to match the market strategy. The marketplace is dynamic. Singular utility products are giving way to multi-functional products. Mass marketers have quickly learned that it is not enough to have a good product—the product must also be presented correctly to the fickle consumer who wants value. And perfume is exerting a very profound role in today's market.

Consider the following survey by *Good Housekeeping Magazine*. When queried on how important perfume is in a cleaning product, al-

The Role of Fragrance in Product Development

most 73% of consumers said it is important. And this, in the light of increasing market penetration of "unscented products" many of which are hardly unscented.

In the successful marketing of household cleaning products, the most important elements are:

- Perfume
- Performance
- Positioning
- Packaging
- Patent
- Promotion
- Price

I call these the 7 P's of product development.

The perfume relates to each of the other six elements. For example, perfume impacts the perceived performance of products. In laboratory testing, the performance of two products with different perfumes is identical. In a blind consumer test, the consumers perceived differences in performance. Overall product preference is really due to perfume preference but the "halo effect" spills over to all other attributes. In net, consumers perceived the product with the preferred perfume to be superior even when all other attributes are equivalent.

Perfume is used to "signal" performance. In mature product categories, especially where unique technologies are unavailable, real consumer product differentiation is difficult. Where technical points of difference in product performance can be shown only through statistical analysis, a "signal" is desirable to announce the product's key benefits to the consumer. Perfume is a most notable way of achieving this. Is it any wonder then that new improved products are usually accompanied by a perfume change?

Perfume reinforces product positioning. Broadly speaking, product positioning is a process of segmenting a market category or targeting a specific market audience. Years ago, before the current proliferation of consumer products, it was sufficient to develop a good performing product that fulfilled a consumer need. Not anymore. To succeed in today's market environment, one must not only be alert to changing habits and practices, one must also be aware of consumer's lifestyle, mood, spending pattern and how these relate to proposed product positioning.

To announce a product positioning simply by advertising copy may not be convincing enough. Certain consumers have become cynical of advertising. This is where perfume, packaging, color, or form come in to support positioning. *Of the four, perfume is the most consumer relevant,*

if not the most noticeable.

Let me elaborate. It isn't smart to create a product to clean the kitchen with a perfume that consumers dislike in the kitchen. Similarly, a good performing disinfectant cleaner for the bathroom must be reinforced with a consumer-appreciated "clean scent" and not a perfume consumers associate with the kitchen.

But how does one choose a perfume for a specific product? There are as many successful approaches to perfume selection as there are successful consumer product companies.

One strategy that I particularly like is the laborious home use/diary study. I particularly dislike predictive computer modeled techniques. Not because of the computer or the predictive protocol, but because of the debatable quality of the input data and assumptions that invariably have to be made. In my mind, in computer modeling, garbage in garbage out. My problem is with what people put into the computer, not the computer.

I don't like focus group interviews because consumers have become adept at feeding the interviewers what we want to hear. Importantly, consumers more and more, are less and less likely to express preferences that they suspect mirror negatively their lifestyles, economic status or peculiar habits.

Thus, home use/diary study is my preferred way of selecting perfume for a product. *And I don't even ask any questions on the perfume itself.* I normally disguise the real intent of the product test.

For instance, I would place two or more products and ask consumers to use the products as they normally do. I would ask the consumer to keep a diary noting usage pattern, what tasks, for how long and any likes/dislikes about the product. At the end of the home use/diary study, I ask but one question: *Which of the products did you like the best?* And why? You will be surprised at the answers. Normally, since the only difference in the products being tested is the perfume, the perfume in the product preferred by consumers is the winning perfume.

I must comment that products must have adequate technical performance for perfume to have an impact. No amount of perfume or clever positioning would salvage a poor performing product. But there is no doubt that overall perceived product performance can benefit from an equally well researched fragrance.

Let's talk about the other P's of product development. Packaging must be coordinated with perfume. It makes little sense to have blue packaging with lemon perfume.

The Role of Fragrance in Product Development

Form follows function. A preferred fragrance acceptable for use in a liquid product may prove overpowering as an aerosol product. A product that suddenly is reformulated to produce lots of foam may prove the perfume inadequate where previously the perfume was appropriate.

Packaging also affects the stability of perfume. More on this topic later.

Patent protection is desirable for the perfume in consumer products. Some examples of patents related to the perfume are encapsulated fragrances for time release, fabric and hard surface retentive perfumes, and synergistic compositions of cleaners and perfumes where perfumes are also malodor counteractants.

Patent protection is becoming a matter of market survival. Given the \$20 million typically required to launch a product nationally, you don't want competition launching a similar product with a perfume identical to yours within a short period of time.

Price of the perfume in product is a major consideration. It is typical to find the price of perfume to be as much as 75% of the total cost of goods of products even when the perfume is only 1% or less of the formula.

This does not mean that the thrust of perfume selection should be on the basis of price alone. Rather cost-performance relationship should be the gist of the effort.

I would prefer to use half as much of a twice as expensive perfume that demonstrates good consumer acceptance than a half as expensive fragrance that requires twice as much to use.

Perfume is so important to highly successful products that I would work hard at cost-savings in the other product areas to pay for the perfume.

Perfume is often used as a promotion tool. How many times have you seen merchandising effort behind a "new scent," "fresh scent," "longer lasting scent." Nothing is wrong with this. It's another way of demonstrating my belief that perfume plays a central role in product development.

Allow me to turn your attention to the practical problems of perfume selection. I've already covered consumer preference testing, and so I will focus on other important factors such as:

- Stability
- Compatibility with packaging
- Reaction to fabrics, hard surfaces, or other materials
- Human and environmental safety
- Synergistic/antagonistic interaction with other formula ingredients

Nothing strikes greater fear in the hearts of formulators than unforeseen poor perfume stability. If Murphy invented chemistry before writing Murphy's Law, he would have used perfume to illustrate all the worst possible chemical reactions. Fruity esters are hydrolyzed. Herbaceous aldehydic notes are oxidized. Floral alcohols are reduced. Unsaturated essential oils/fixtures are condensed or polymerized. Acids and alkalies destroy one of a kind creations. Enzymes decompose laboriously concocted compositions. Bleach transforms beautiful scents to odors worse than the original unperfumed product scent.

And don't think stability problems are limited to liquids. Perfume instability also occurs in solids with disastrous consequences. A white powder turns yellow. A free flowing granule cakes or discolors.

Many perfumes affect packaging because of their special affinity to the plasticizer or resins. The reaction typically results in reduced package integrity or strength.

Perfume notes can be adsorbed by the package. When selective adsorption occurs on the package, desirable notes are suppressed leading to reduced perfume impact.

Perfumes can negatively affect polished surfaces. Care must be taken to prevent perfumes from contributing to a "dulling effect" on no-wax floors. Various types of fabrics, natural or synthetic, are affected by perfumes. Natural silk can be permanently stained. Certain perfumes can produce yellowing on wool, fade bright colors on polyester, deluster nylon. Some perfumes even corrode metal cans.

Perfumes must be safe to humans and the environment. In the absence of other means of assessing safety, animal testing must be employed. Perfumes must be demonstrated safe and non-sensitizing by multiple means of exposure—eyes, oral, skin and by inhalation.

Perfume suppliers have made giant strides to ensure that the perfumes they sell are safe. Suppliers use ingredients proven safe or generally recognized as safe under the guidelines of the International Fragrance Association and the Research Institute for Fragrance Materials.

From our standpoint, however, the consumer products we create must be tested over again once a perfume is added. This is a measure to ensure no adverse reactions occur when perfumes are added to base formulas. This is a rather laborious and costly endeavor, but an acceptably small price to pay to preserve the excellent public safety record of our industry.

Finally, ingredients that make up cleaning or

The Role of Fragrance in Product Development

disinfecting products have synergistic or antagonistic influence on fragrance. Many surfactants suppress the vapor pressure of perfume components while alcohols enhance them. Thus, the choices of perfumes and surfactants have to be made on the basis of the solution's physical chemistry. Salts such as builders tend to phase separate perfumes. The proper level of surfactants must be added to solubilize the perfume. Enzymes sometimes hydrolyze perfume components. Bleach universally destroys perfumes.

The study of perfume and the role it plays in product development is complex and will continue to be more complex for competitive and regulatory reasons. Fortunately, modern tools can greatly aid the optimization of perfume and products.

The last twenty-five years have shown dramatic progress in chemical instrumentation. Think of the great help modern instrumentation has provided our operations. Among today's modern tools, gas chromatography, mass spectrometry, liquid chromatography, ultraviolet, infrared, visible, and nuclear magnetic resonance spectroscopy have been the most useful. For sensitivity, the human nose reigns supreme. However, for resolution, reliability and reproducibility, I'll take a gas chromatograph and mass spectrometer for monitoring quality, stability studies and safety assessment.

No instrument thus far invented can predict consumer preference. A new field in the computer sciences, artificial intelligence, may do this for us in about ten years. In the meantime, I'll rely on old fashioned home use/diary studies to guide my perfume selection, occasionally augmented by the "nose" and modern analytical equipment.

Let us now crystal gaze and look at perfume's impact on products of the future.

The year 2000, sixteen years from now, may bring slow growth to a mature household products industry, but opportunities still abound for the alert marketer. I'm positive perfume will play an important role in what will become the market share game.

Population will grow at about 2% annually but per capita income is expected to grow by 9%. There will be a strong, important trend toward single person households. More women will be working outside the home. They will be more likely to pursue leisure than cleaning the house. Having the cleanest house or the whitest laundry will no longer hold the same importance as in years past. These working women having indulged in upscale and expensive fragrances will be looking for similar characteristics of perfume

in the cleaning products they purchase. This is an opportunity we cannot afford to ignore.

Other trends of importance will be (1) the aging of America and (2) product distribution away from food stores to mass merchandisers. Perfume and consumer perception of fragranced products by older Americans will occupy the minds of formulators in the years to come.

I don't believe there will be breakthrough technologies in the raw materials used in household cleaning products. There is over-capacity in the chemical industry today. Companies will not invest in new material ventures with low probability of commercial success. As a consequence, new product creativity will dwell on what is available. Perfume is a highly noticeable component of products and this is where innovation will come from through the year 2000.

New products that have no perfume will probably not succeed. Even "unscented" products currently proliferating will be outperformed by scented products.

Perfumes for cleaning products must suggest rational benefits to the consumer such as grease cutting benefit or "spring cleaning in a bottle everytime."

In the disinfectant area, perfumes must be able to impart deodorancy or malodor elimination in greater consumer impact than what can be derived from traditional bacteriocidal effects.

The late 1980s will provide higher levels of fragrance awareness and higher fragrance concentrations. Consumers will not only be looking for how products perform while they are doing the appointed tasks, but also how the linen cabinet smells when a certain laundry product is used, how a kitchen floor or living room carpet smells a day after it is cleaned.

Household product marketers will also have to be concerned about product aroma in competition with all the other aromas in the supermarket shelves and in the home shelves where these products are stored.

In summary, with the thoughts I've presented, I hope I've convinced most of you that fragrance has a key role in product development. That the synergy—perfume and product—should result in higher product quality, improved efficacy and increased consumer value. I believe consumers will reward the fragrance and household product companies that are alert to these trends.

Address correspondence to Ramon A. Llenado, PhD, Divisional Vice-President of Household Products Research, Lehn & Fink Products Group, Sterling Drug Inc., 225 Summit Avenue, Montvale, New Jersey 07645, USA.

