

The Role of Fragrances in Household Products

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As I completed preparation for this talk, I read with interest the article by Margaret Vogel in *HAPPI* with the same general title. My first thought was, "Damn! I've been scooped!" But as I read on I realized her very good article had a slightly different objective and, in fact, is a nice complement to this paper.

The importance of household products to the fragrance industry is based on the huge volume potential of the category. All have fragrance as an important component, some subcategories more than others. Laundry detergents compose a category of over \$3 billion, consisting of powdered and liquid detergents as well as multi-functional systems in both product forms.

Fabric softeners are a three quarter billion dollar category, consisting of liquid rinse-added fabric softeners and dryer-added sheet products.

Laundry boosters are nearly a billion dollar category and include products like liquid and powdered bleaches, spot removers, and water softeners like our own Calgon.

Liquid dishwashing detergents, LDL's, are an \$830 million category. Their counterparts for the

automatic dishwasher are nearly \$500 million in combined sales and the subject of significant activity in the past year or two with the introductions of liquid products for the automatic dishwasher.

Hard surface cleaners are a one half billion dollar category with great potential for growth if consumers will react positively to fragrance alternates. Room deodorants, quasi-household products, are over \$300 million and carpet cleaners are now over \$70 million.

These figures simply serve as a reminder of the great volume potential you know exists in this market.

Evolution of Fragrances

I'd now like to spend a few moments describing a fragrance evolution that began in the mid-1970s. This fragrance evolution was derived from the laundry category and, specifically, fabric softeners. I believe it began with the introduction of sheet fabric softeners for the dryer, like Cling Free and Bounce, both introduced in the mid-70s.

How do I define this fragrance evolution? It is clearly based on fragrance substantivity or retentiveness to fabrics. It developed as a result of a marriage of scientific investigations and creativity to first identify and categorize the substantivity of hundreds of aromatic raw materials. This then armed the perfumer with a library of functional components for creative finishing. Tests on finished compounds and later on products containing those creations were ultimately able to demonstrate the benefits of all this research.

This fragrance evolution began with a need to support subjective perceptions of functional performance like fabric softening. Substantive fragrances were required to help convince the consumer that these little sheets could indeed soften fabrics—clothes smelled good after they were dried, so the product must have worked!

Now having defined the fragrance evolution, what effect did all this testing have, first on individual products, then on the category as a whole.

First, I believe fragrance now has greater importance as a meaningful product attribute. Fragrances now offer better support to product functionality. There is a strong halo effect by fragrance on functional product attributes. This is clearly seen in consumer testing where, in tests with fragrance as the only test variable, products showing superior fragrance attributes also win on fabric softening.

Consumers have a greater awareness of fragrance. It is an important factor in their purchase decision. Listen to consumers: they say a product *smells* better, not simply that it *works* better.

The fragrance evolution has meant fragrance is used at higher concentrations in functional products. This obviously has led to greater sales dollars to your industry.

And finally, there are more sophisticated fragrances in more variety in the category.

Fragrance identity in the household category has certainly grown. It has expanded from fabric softeners to virtually all laundry products. Dryer-added fabric softeners, rinse-added fabric softeners, led by the well-known "April fresh Downy"; powdered laundry detergents; liquid laundry detergents, now representing almost 40% of the detergent category; combination detergent/fabric softener products in both liquid and powdered varieties, a subcategory nonexistent fifteen years ago. And now consumers have fragrance choice in their favorite product with unscented versions of Tide and Bounce, for example; or regular vs. "scented" Clorox bleach; or now April fresh vs. new Sunrinse Downy. Plus so many products are sold on the basis of new, distinctive fragrance pitches.

All of this attention by manufacturers to fragrance has expanded awareness of fragrances by consumers creating consumer perceptions of fragrance at various points during product usage.

As an example, consumers notice the fabric softener product's fragrance in the package. I've seen people in stores actually pick up a box from the shelf and smell it before making their purchase decision. Also from the package, consumers are aware of product fragrance as they extract the sheet from the box for use.

During usage, the product's fragrance is quite apparent in the dryer exhaust or in the laundry room. I jog at night on the streets in my neighborhood and I can now locate which of my neighbors use Bounce, Cling Free, etc. by the odor of dryer exhaust as I run by!

And most importantly, due to fragrance substantivity on fabrics, consumers are very aware of the product's fragrance on fabrics as they sort laundry from the dryer, or while wearing clothing, or even during use of items such as towels where wetting releases fragrance notes.

Fragrance Requirements

The importance of fragrance to consumers has reinforced the need to attend to fragrance requirements as we develop new and improved products. Indeed, requirements may be stiffer now than ever before.

Again using a fabric softener fragrance as an example, we require the fragrance oil to be stable on storage, not to change color or character during bulk storage in original containers.

The fragrance must be compatible with other product components. It must be chemically inert and it must blend with and/or mask product base odors. This is one of the primary reasons we give you a product base to work with on any fragrance project.

The fragrance must survive the product manufacturing process, sometimes at particularly high temperatures. There must be no color changes indicative of fragrance degradation or interaction with product components and there must be no significant loss of fragrance character.

During manufacture of the product, the fragrance must be uniform. Distribution of fragrance on the substrate, for example, must be uniform.

Fragrance stability in the finished product is very important. We require the product *and* the fragrance to be stable for up to three years. While certainly some fragrance loss may occur during this time, we nonetheless expect fragrance intensity and quality to remain acceptable during the product's shelf life.

Again, the fragrance must be substantive to a variety of fabric types. While the odor on clothing may not exactly duplicate odor from the package, it must meet objectives to be acceptable. Consistent with the overall stability objective, fragrance substantivity must remain at acceptable intensity and quality levels throughout the product's life.

Finally, we product manufacturers would like all of these requirements to be met in a fragrance oil costing no more than \$2.00 per pound, or less!

Fragrance Development Procedure

The importance of fragrance requires, therefore, very careful consideration in new fragrance development. I'd like to describe some of the procedures we at Beecham use. While we have several people who call themselves "fragrance experts," we have no perfumer on staff and therefore must rely on your expertise in fragrance development.

As a first step, we set project objectives, defining the product, the product category and, where pertinent, the appropriate benchmark. We also define the fragrance character desired but only if we have a specific in mind. The generic "fresh and clean" is used quite frequently.

We describe fragrance functionality, that is, objective characteristics of the fragrance, like intensity and substantivity, often defined relative to a benchmark.

We also try to describe connotations the fragrance should deliver to the consumer. How should the consumer perceive the fragrance and how should it support product functionality?

Finally, concentration is defined, often in association with price. We define an overall price objective in terms of price per unit weight of product, allowing flexibility in concentration and bulk price to meet this objective.

After fragrance submissions are received, we initiate our in-house testing where, I should point out, all testing is conducted with submitter identity blinded.

Our first step is to prepare product samples with all submissions in order to initiate stability testing. We monitor fragrance quality and intensity vs. relevant controls on product stored at room temperature and accelerated conditions.

We simultaneously begin to evaluate product fragrance. Via panel tests conducted with an objective statement, we measure objective fragrance parameters such as fragrance quality and intensity, and, if desired, we also measure subjective parameters like preference.

We also evaluate product performance attributes focusing first on *fragrance* functionality,

measuring such characteristics as quality, intensity and fragrance substantivity on fabrics through the drying process. We also check *product* functionality to be sure fragrance candidates do not measurably affect ingredient transfer from the sheet to fabrics, fabric softening and anti-stat performance.

All these evaluations may be performed several times as the number of fragrance candidates are narrowed down.

After completing our laboratory technical testing, we submit our recommendations to Marketing and specify which fragrance alternatives satisfy all the technical objectives. This is the first time Marketing will have seen any fragrance candidates.

Consumer Testing

Consumer testing is next and we have a variety of test designs from which to choose, ranging from local consumer panels conducted in malls, "mall intercept" tests, and full-fledged test markets. Typically though, our first consumer tests are done through nationally representative panels. We usually conduct paired comparison tests where both products are presented to panelists in "blinded" cartons. We ask panelists questions about product performance, fragrance and color, and an overall product preference question.

Whenever possible, consumer tests should require product usage to gain consumer reaction to fragrance at all encounter stages. I am not a proponent of "sniff tests" as consumer evaluations.

Results of consumer tests are finally analyzed by several company departments to yield a decision to a) start the project over again; b) conduct additional market testing; or c) launch the improved fragrance.

In quick summary form, to chart what we have accomplished in our fragrance project, we start with a carefully written fragrance objective which we share with several suppliers to solicit fragrance candidates. When submissions are received, we subject them to stability testing while simultaneously initiating evaluations of product fragrance and performance, focusing on both fragrance and product functional attributes. When laboratory testing is complete, we submit our recommendations to Marketing. Manufacturing trials are then conducted to confirm absence of negative effects during product manufacture and also to prepare product for consumer testing. Consumer test results are then analyzed to justify a go or no-go decision.

All this new fragrance project work presumes that a basic product with all its functional attri-

butes has been developed or is currently marketed. With respect to fragrancing these products, we must keep in mind a very basic tenet: the success of household products requires delivery of basic product functions like cleaning, softening or grease-cutting. Fragrance is secondary to these attributes.

Fragrance can differentiate between products, it can help create perceptions like freshness or longlastingness, it can *support* product functionality and it can mask undesirable base odors. But fragrance can *never* replace basic product functional attributes. Fragrance alone cannot sell a poor product. It may induce a first sale, but if the product does not perform, fragrance will not sell it again.

The importance of fragrance in household products today is created because consumers find most products deliver the basic functional attributes. Being satisfied with basic performance, consumers look for that extra, subjective quality, like fragrance, to help them choose a product alternative.

Future Applications

Now, what does the future hold. Your challenge is to address the following questions:

- Is the *science* behind new fragrance introductions today any different than the science applied 5-6 years ago?
- What is the next evolutionary step in fragrance applications for household products?
- How do you plan to promote and *support* technical partnership with your customers?

To respond to these challenges, creativity in perfumery will require more application of the combination of chemistry, human physiology and human psychology. Chemical research must support development of fragrance components for *functionality*, not simply odor. We must examine carrier chemicals to improve substantivity of fragrance notes not currently applicable in household products, or to improve compatibility or stability. And we must continue the study of physiology to learn methods to heighten or block sensation of fragrance notes.

New product entries in the household category generate activity and excitement. To continue to participate in this excitement, your task is clearly to find the products and techniques to fill future promises.

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