

Fragrance and its Role in Detergents

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The use of fragrance as an item of luxury and refinement is as old as the human race. As the world became increasingly civilised, fragrances were used as offerings to please the gods gradually replacing animal sacrifices. Fragrances originated in India in early times and regular barter trade by the Arabs carried it to the western shores, like Egypt, Persia, Greece, and Rome where it further flourished. In the Vedas, that are more than 3,000 years old, there is a mention of natural fragrances used for cosmetic purposes during religious ceremonies. There is reference in our Epics the *Ramayana* and *Mahabharatha* in knowledgeable detail. The synthesis and production of an increasingly large number of synthetic perfumery chemicals during the early 20th century introduced newer fragrance substances giving entirely new odour effect marking the beginning of modern perfumery industry. The technological development particularly witnessed in the past century has changed fragrance creation from a pure work of art to a combination of art and chemical science.

Mass production has increased the consumption of fragrance enormously and the whole population, not just priests or the rich and regal, buy fragrances delivered in various product forms. Today fragrances are present throughout all levels of product right from an expensive product to the cheapest and plays an invaluable role in all products used by a householder. The fragrance used in a product form may range from 0.5 to 2.0 % but its performance and signal attributes claim a very high percentage — almost up to 70 to 80%. That is the importance of this sensory perception. There are five senses — vision, sound, touch, smell, taste — using which we enjoy life on earth. Of all sensory perceptions, fragrance communication is the most complicated one, with a very high degree of subjectivity. To illustrate this aspect The Ford Research Institute, England conducted a market research using consumers and perfumers to see how objective is a fragrance description. The product used in testing was phenylacetic acid. The odour described by the panelists are as given in the table.

In spite of very high subjectivity an average healthy nose, which is the instrument of smell, can detect about 4,000 different odours, while sensitive and trained noses can smell more than 10,000 odours — thanks to the six to ten million receptor cells present in the olfactory membrane of the human nose, directly linked to the brain. Consumer needs are very complex. Food, clothing and shelter are necessities that are indispensable for survival. Soaps, detergents, personal and household care products, represent a strong emotional need.

TABLE 1
DESCRIPTIVE ANALYSIS OF PHENYLACETIC ACID

Experts (Perfumers)	Non - Experts Consumers
Acid	Flowery
Floral	Pleasant
Fragrant	Sour
Pungent	Sweet
Sharp	Vinegar
Silky	Warm
Sour	Heavy
Sprit	Putrid
Sweaty	Acid
Sweet	Decayed
Vinegar	Sweaty
	Silky
	Sharp
	Rancid
	Foul
	Pungent
	Anamalic

The Prophet Mohamed once said, *Perfume is the nourishment that stimulates my thinking*. Fragrance in functional products takes care of this emotional need, stimulating as well as calming or relaxing the user. Soaps and detergents have two basic requirements to fulfil.

1. Functional requirement to clean
2. Emotional requirement to give feeling of satisfaction that the cleaning is of high quality.

Thus, fragrances are necessary to provide that emotional feeling of satisfaction and social expression to a purely functional product.

Technically speaking the odour of soaps and detergents as perceived and interpreted by a consumer is the combined effect produced by the fragrance and the base odour.

Basic requirements of fragrance for use in synthetic detergents

1. Fragrance used in blended synthetic detergents should perform a dual role of masking the inherent odour of the raw material used and impart a distinct identity to meet any special requirement of the finished products.

- * In general off odours in detergents are usually due to odorous substances such as the petroleum derivatives occurring in alkyl aryl sulphonates and non-ionics.
 - * Fatty odour from aliphatic alcohol found in alkyl sulphate.
 - * Sulphur odour sometimes originating from nonylphenol sulphonates
 - * Odour formed due to slight oxidation of certain alkyl aryl detergents.
 - * Odour resulting from pyrolytic action when detergents are overheated during spray drying process.
2. The fragrance used should be compatible with the base components
 - * If a detergent powder is bleached, it is advisable to add fragrance in the end as sodium hypochlorite can destroy some fragrance material.
 3. The fragrance used should be stable during the accelerated storage study to confirm the stability of the fragrance throughout the shelf life of the final products and at varying environmental conditions.
 - * In case of powders, this is very important because powders have a large surface area and special attention is needed for stability and performance of the fragrance.
 - * In case of detergent bars and spray-dried powders one should also consider the comparatively higher temperatures encountered during processing.
 - * In case of heavy duty detergents, and products of high pH, is necessary to have fragrances that are more alkali resistant
 - * In case of detergents for dishwashing, the fragrance should be clean, fresh and not conflict with food odours. It should not persist on the dish after washing.
 4. Fragrance used should help support marketing / technical claims and product attributes.
 5. Fragrance should not endanger the health of the people who use the products or are engaged in its manufacture
 6. Its detrimental effects on the environment should be the bare minimum.
 7. Ingredients used in the manufacture of the fragrance should confirm to International Fragrance Research Association (IFRA) guidelines.

The primary items used for washing laundry are washing soap bars, and synthetic detergents (cake, powder or compacts). In one market research study, the following were the reasons given by the consumers for using the product:

DETERGENT POWDERS

Reasons	Actives
Cleanliness	Surfactants +
Good perfume	Fragrance
Freshness	Fragrance
Whiteness	Optical brighteners

DETERGENT CAKE/BARS

Reasons	Actives
Removing stubborn stains	Stain removing agents
Good perfume	Fragrance
Freshness	Fragrance
Whiteness	Optical brighteners

It is surprising that consumers decide on the quality of the detergent product based on the first impression formed by the quality of fragrance used.

TABLE 2
FRAGRANCE TRENDS IN DETERGENTS

Developed nations	Developing nations
Fresh	Citrus/cologne
Marine ozonic	Green
Fruity	Fruity floral
Musky woody base	Musky woody base

TABLE 3
TYPES OF FRAGRANCE LIKED IN DETERGENTS

Profiles	Benefits
Floral	<ul style="list-style-type: none"> * Long lasting freshness so economical. * Mind feels calm and nice. * Quality is assured. * Fewer chemicals, less harmful, so safe for use. * Fragrance spreads around giving an expensive image that others appreciate.
Lime	<ul style="list-style-type: none"> * Feeling of freshness and cleanliness * Lingering self-confidence.
Sandal	<ul style="list-style-type: none"> * Calm feeling/distinctive.

Perfume plays a very important role in each stage of washing. Washing process can be broadly divided into the following four important stages.

1. Soaking in detergent solution for half to one hour to loosen dirt and reduce effort during cleaning. Perfume at this stage is perceived to endow the clothes with a fresh look feeling.
2. Scrubbing of clothes especially in areas like collars / cuffs, using a detergent bar and brush to remove tough dirt and stains. Scrubbing is considered a tedious process and can be made pleasant by a good fragrance used in the detergent.
3. Rinsing in cold water at least four times to remove soapiness in clothes, and avoiding skin allergies. Perfume renders a nice and pleasant feeling to a tiring stage of washing.
4. Drying on hangers or clothes' line in the sun to kill germs and give newness to clothes.

Perfume gives happiness, satisfaction, and feels good value for money.