Editorial Article

Aftershave: a truth behind iconic fragrance

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ABSTRACT

Aftershave is an important part of a man's daily lifestyle routine. After shave is a liquid product applied to skin after shaving. It contains an antiseptic agent such as denatured alcohol, stearate/citrate or witch hazel to prevent infection of cuts, as well as to act as an astringent to reduce skin irritation. Menthol is used in some varieties as well to numb damaged skin and it is an ingredient that shaving cream manufacturers have started including in their formulations, too. Aftershave with alcohol usually causes an immediate burning sensation when applying it post-shave, with effects sometimes lasting several minutes, but most commonly only for seconds. For this reason, a market consisting of highly differentiated products has been created—some using alcohols, some not. Some aftershaves use fragrance or essential oil to enhance scent. Moisturizers—natural and artificial, are often touted as able to soften the skin. Rinse your face and neck with cool water next to help close up your pores before you apply the aftershave. Do not apply aftershave immediately after you have finished shaving since doing so might make your skin sore or irritated. Pat your face and neck dry gently with a towel. As you shave, feel free to keep applying shaving cream. When you're done shaving, wash the area generously with lots of warm water. When you shave, shower in warm water first to soften skin, then lubricate with a shaving cream or lotion, never dry shave. Assure you use a clean, sharp, razor and shave in the direction of hair growth. Once shaven those hair follicles are open, clean area well and apply a gently aftershave lotion or aloe vera gel.

Keywords: Cologne, Moisturizer, Humectant, Denatured alcohol, Polyquaternium-10, Allantoin, Styptic

INTRODUCTION

Aftershave is a balm, lotion, wash or salve applied to the skin after shaving, as noted in The Art of Shaving. Frequently marketed toward men, aftershave products reduce the number of steps in a skincare routine. Although some aftershaves are nonsense; their only goal is to soothe the irritation caused by shaving; many commercially available aftershaves work as moisturizers, toners and cologne.[1]

Antiseptics: Shaving often results in minor cuts, abrasions and irritation. Antiseptic ingredients are included in aftershave to help minimize the risk of infection to these often small wounds. Alcohol-based aftershaves include SD-alcohol 40, an antiseptic that also functions as the base ingredient in the aftershave. About SD alcohol 40: Specially denatured (SD) alcohol is a mixture of ethanol with a denaturing agent. Ethanol is considered broadly toxic and linked to birth defects following excessive oral ingestion. Alcohol-free aftershaves may include polyquaternium-10 (Quaternized hydroxyethyl cellulose), an antiseptic that also functions as a preservative and surfactant. Hydroxyethyl cellulose is a gelling and thickening agent derived from cellulose. It is widely used in cosmetics, cleaning solutions and other household products. Hydroxyethyl cellulose and methyl cellulose are frequently used with hydrophobic drugs in capsule formulations, to improve the drugs' dissolution in the gastrointestinal fluids. This process is known as hydrophilization. It is also a key ingredient in the formation of big bubbles as it possesses the ability to dissolve in water but also provide structural strength to the soap bubble.

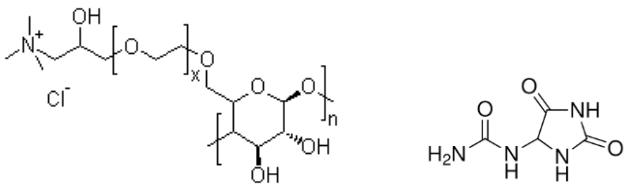


Figure-1: Polyquaternium-10 and Allantion

Polyquaternium-10 extends the shelf life of aftershave products, keeping potentially harmful microorganisms from growing in the formula. Polyquaternium is the International Nomenclature for Cosmetic Ingredients designation for several polycationic polymers that are used in the personal care industry. Polyquaternium is a neologism used to emphasize the presence of quaternary ammonium centers in the polymer. INCI has approved at least 37 different polymers under the polyquaternium designation. Different polymers are distinguished by the numerical value that follows the word "polyquaternium". Polyquaternium-5, polyquaternium -7 and polyquaternium-47 are three examples, each a chemically different type of polymer. The numbers are assigned in the order in which they are registered rather than because of their chemical structure. Polyquaterniums find particular application in conditioners, shampoo, hair mousse, hair spray, hair dye and contact lens solutions. Because they are positively charged, they neutralize the negative charges of most shampoos and hair proteins and help hair lie flat. Their positive charges also ionically bond them to hair and skin. Some have antimicrobial properties. Witch hazel is a natural antiseptic and astringent that may be present in aftershaves marketed as using natural ingredients. Witch hazel functions similarly to SD-alcohol 40, closing the pores and exerting antiseptic properties, but is derived from the oil of the Hamamelis virginiana tree. [2]

Moisturizers: Aftershave restores softness to skin after shaving; aftershave products include moisturizers to achieve this goal. Glycerin, a byproduct of soap making, is a hygroscopic ingredient found in many aftershave products. Glycerin draws moisture from the air to the skin, allowing freshly shaved skin to become supple again. Some aftershave products are oil based instead of alcohol based. Oil-based aftershaves may aggravate acne, though people with drier skin or those with sensitivity to alcohol may prefer them. Olive oil is mild oil expressed from the *Olea europaea* tree that is used to impart moisture and restore softness to skin when used in aftershave. Allantoin is an anti-inflammatory chemical. It also serves to moisturize the skin. A natural ingredient that works similarly to allantoin is aloe vera, extracted from the *Aloe barbadensis* leaf.

Allantoin is a chemical compound with formula $C_4H_6N_4O_3$. It is also called 5-ureidohydantoin or glyoxyldiureide. It is a diureide of glyoxylic acid. Allantoin is a major metabolic intermediate in most organisms including animals, plants and bacteria and is produced as a degradation product of purine nucleobases by urate oxidase (or uricase) from uric acid. Allantoin is present in botanical extracts of the comfrey plant and in the urine of most mammals. Chemically synthesized bulk allantoin, which is chemically equivalent to natural allantoin, is safe, non-toxic and compatible with cosmetic raw materials and meets CTFA and JSCI requirements. Over 10,000 patents reference allantoin.

Cosmetics and toiletries: Manufacturers cite several beneficial effects for allantoin as an active ingredient in over-the-counter cosmetics, including: a moisturizing and keratolytic effect, increasing the water content of the extracellular matrix and enhancing the desquamation of upper layers of dead skin cells, increasing the smoothness of the skin; promoting cell proliferation and wound healing; and a soothing, anti-irritant and skin protectant effect by forming complexes with irritant and sensitizing agents. An animal study in 2010 found that based on the results from histological analyses, a soft lotion with 5% allantoin ameliorates the wound healing process, by modulating the inflammatory response. The study also suggests that quantitative analysis lends support to the idea that allantoin also promotes fibroblast proliferation and synthesis of the extracellular matrix. A study published in 2009 reported the treatment of pruritus in mild-to-moderate atopic dermatitis with a topical non-steroidal agent containing allantoin.

Pharmaceuticals: It is frequently present in toothpaste, mouthwash and other oral hygiene products, in shampoos, lipsticks, anti-acne products, sun care products and clarifying lotions, various cosmetic lotions and creams and other cosmetic and pharmaceutical products.

Biomarker of oxidative stress: Since uric acid is the end product of the purine metabolism in humans, only non-enzymatic processes with reactive oxygen

species will give rise to allantoin, which is thus a suitable biomarker to measure oxidative stress in chronic illnesses and senescence.

Fragrance: Aftershaves are mostly scented. Individuals with sensitivities to fragrances may prefer an unscented aftershave lotion to avoid headaches, skin irritation or any number of other effects that may accompany exposure to a strong scent. Aftershaves that are scented may include chemical fragrances, often listed among ingredients lists simply as fragrance or perfume. A label with those ingredients may contain up to 4,000 different chemicals. Since scents are often proprietary formulas, the exact chemical makeup may not be revealed. Green or organic aftershave products may include a number of essential oils. Sandalwood, musk, patchouli oil and sage are popular essential oils in aftershave. A styptic (also spelled stiptic) is a specific type of antihemorrhagic agent that works by contracting tissue to seal injured blood vessels. Styptic pencils contain astringents. Antihemorrhagic agents used in medicine have various mechanisms of action: 1. Systemic drugs work by inhibiting fibrinolysis or promoting coagulation. 2. Locally-acting hemostatic agents work by causing vasoconstriction or promoting platelet aggregation.[3]

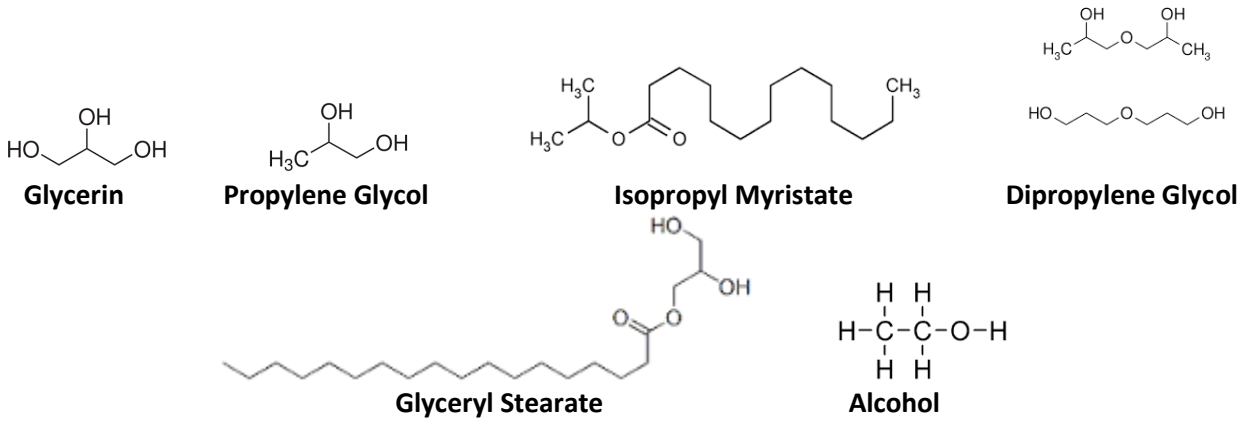
Figure-3: After shave

Old Spice [It opens with spicy, citrusy top notes: nutmeg, lemon, orange, star anise & aldehydes. Then the floral heart becomes apparent with carnation, jasmine, geranium, cinnamon, heliotrope, & pimento. All this is laid on a base of ambergris, benzoin, cedar, vanilla, tonka bean, and musk. Real men wear Old Spice!]
Axe [Water, Denatured alcohol, Stearate citrate, Menthol, Fragrance, Essential oil, Astringents & Antiseptics]
Gillette [water/EAU, aluminum starch octenylsuccinate, glycerin, myristyl propionate, mineral oil/huile minérale, phenoxyethanol, fragrance.]

Aftershave is sometimes mistakenly referred to as **eau de cologne** due to the very similar nature of the two products. Some aftershave manufacturers encourage using their fragranced aftershave as if it were cologne, in order to increase sales by encouraging consumers to use it in a more versatile manner, rather than just after a shaving session. Some aftershaves were inspired by cologne. Early aftershaves included witch-hazel and bay rum and have been documented in shaving guides. Both still are sold as aftershaves. Potassium alum, potash alum, or potassium aluminum sulfate is a chemical compound: the potassium double sulfate of aluminium. Its chemical formula is $KAl(SO_4)_2$ and it is commonly found in its dodecahydrate form as $KAl(SO_4)_2{\cdot}12H_2O$. Alum is the common name for this chemical compound, given the nomenclature of potassium aluminum sulfate dodecahydrate. It is commonly used in water purification, leather tanning, dyeing, fireproof textiles and baking powder. It also has cosmetic uses as a deodorant, as an aftershave treatment and as a styptic for minor bleeding from shaving. Shaving products are used to assist in the removal of unwanted body hair, to ease shaving by women and men and include products such as shaving soaps and creams as well as pre- and after shaving lotions.[4]

Common ingredients:

Colorants, Fragrance and Botanical Ingredients are used as organoleptic agents for colouring agent to make it attractive, flavouring agent for acceptable and holistic agent for making it lucrative to soothe, moisturize and scent the skin.



Lanolin Carbomer Mineral Oil

Figure-4: Common ingredients

Beneficial Ingredients in Aftershave: Let's take a look at the anatomy of an aftershave. The goal of the product is to soothe, moisturize and scent your freshly shaved skin, so the basic ingredients that make up a typical formula are an antiseptic agent, a moisturizer and a fragrance. A quality aftershave that does the trick will have an ingredients list that you can actually pronounce. The leading ingredient in almost all aftershaves is an astringent that serves as an antiseptic, to make sure all of the little cuts on tender face skin are properly cleaned and sealed, which prevents infection. In many brands, this ingredient is alcohol-based. Though alcohol is made from natural ingredients (sugar and yeast) and it's effective at accomplishing the task, it can also be extremely drying too many skin types. There are

other natural astringents that are less irritating, such as witch hazel, which is derived from the oil of a tree native to North America. You can also look for aftershaves that boast essential oils as key ingredients. Tea tree oil is an essential oil that's naturally antiseptic and antibacterial. It's also an incredibly effective astringent. Tea tree oil lends its distinct scent to the formula; fairly strong and medicinal on its own, but a great base when mixed with other scented oils.

Next comes the moisturizing ingredients. The most effective ones are naturally derived from tree nuts, such as olive oil and sweet almond oil, because these oils are easily absorbed by your skin. Glycerin, which is a byproduct of soapmaking, is another helpful ingredient in aftershave. It's a humectant, which means it draws moisture into skin and seals it there. Many balms and lotions contain healing herbal extracts, like chickweed and hibiscus. These herbs contain naturally occurring anti-inflammatory properties that help heal rashes caused by shaving. Aloe is another beneficial ingredient because it's extremely soothing to irritated skin, as you well know if you've ever used it on sunburn. As far as scent goes, most fragrances are made up of synthetic chemicals, which we'll cover in our next section. If you like a scent and want it to be natural, look for essential oils in the ingredients list. These oils are all-natural, scented oils that are extracted from plants. Types of essential oils commonly found in body products include lavender, peppermint, eucalyptus and tea tree oils. A quick trip through the grocery store shelves will yield a selection of aftershaves with ingredient lists that read like a chemistry paper. Synthetic ingredients are used in the majority of skincare products because they're almost always cheaper than natural ingredients, and they help make a formula more stable, meaning a longer shelf life, too. But, they generally aren't as effective as their natural counterparts. Not all are harmful, but there are some that should be avoided as much as possible. Here's what to look out for.

In the astringent category, propylene glycol is a type of alcohol approved for use in small amounts in the cosmetic industry. But this is the same stuff that's used to make antifreeze, so do you really want to put it on your skin? Benzyl acetate and ethyl acetate are solvents that are often found in perfumes and aftershaves. They're known carcinogens that have been linked to pancreatic cancer, not to mention they're found to be irritating to eyes and respiratory systems.

Fragrances are a controversial topic in the world of skincare. The problem with fragrance is that formulas are proprietary to the manufacturers, so they're not required to list the ingredients. A fragrance could be made up from as many as 4,000 different chemicals, but it's just listed in the ingredients as "fragrance" or "perfume." These chemicals can be responsible for all sorts of reactions like headaches, dizziness and trouble breathing, and sometimes even more serious reactions in particularly sensitive people. They're best avoided, especially if you have sensitive skin or allergies.

And lastly on our steer clear list are synthetic colorants. Remember red dye No. 5 in the M&M's that could kill you? The part about the deadly M&M's wasn't true, but it did make us take a closer look at synthetic colorants. Manufacturers may think a colored formula looks better in the bottle and therefore on the shelf, and maybe it does. But FD&C Yellow No. 5 is believed to be the cause of multiple reactions like asthma and hives, not to mention aggravating eczema problems. You'd hate to find out the hard way, so your best bet is to avoid dyes all together.

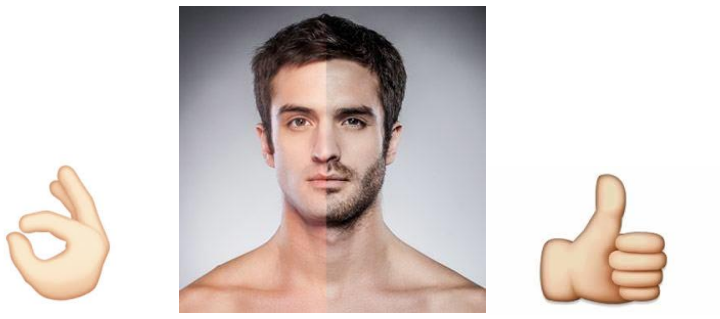


Figure-5: Aftershave: a truth behind iconic fragrance

APPLICATION

Most men who shave use some kind of aftershave product. Aftershave serves multiple purposes which include keeping germs away from the fresh skin and adding a nice scent. Aftershave tends to have alcohol which gives the skin protection against infection if there are any cuts or nicks in the skin. Applying aftershave splash includes rinsing the face with cold water, moisturizing, using the right amount, letting some of the alcohol evaporate and gently massaging the aftershave into the skin.

1. **Rinse your face**. Rinse with cold water immediately after shaving. Before you even consider applying aftershave, you want to make sure your face is completely free of shaving cream or leftover hairs. Fill your cupped hands with cold water and rub it thoroughly over the entire area that you shaved. The benefit of cold water is that it closes the pores of your skin which is best for aftershave application. Be gentle as your rub your face so you don't chafe or irritate the skin.

2. **Dry your face gently**. Use a dry towel and lightly dab at your face to dry it. Do not rub with a lot of pressure as this can irritate your freshly shaved face. It is also okay for your face to remain slightly damp, you just don't want it dripping wet.

3. **Wipe your face with witch hazel**. Witch hazel is an astringent anti-inflammatory compound, produced from the leaves and bark of the North American Witch-hazel shrub (*Hamamelis virginiana*). It is a component of many commercial healthcare products. The main constituents of the witch hazel extract include calcium oxalate, gallotannins, safrole, as well as chemicals found in the essential oil (carvacrol, eugenol). Witch hazel is mainly used externally on hemorrhoids, minor bleeding and skin irritation. As a hydrosol, it is used in skin care as an astringent and anti-oxidant. It is often used as a natural remedy for psoriasis and eczema; in aftershave and in-grown nail applications and to prevent facial sweating and cracked/blistered skin and for treating insect bites, poison ivy, and hemorrhoids. However, clinical studies supporting its effectiveness for these skin conditions are generally lacking. Evidence is lacking for further reported uses including gastrointestinal maladies (diarrhea, coughing up/vomiting blood), general infections such as colds and the specific infection tuberculosis, as well as eye inflammation, bruising, and varicose veins.

This is not a mandatory step, but will be beneficial for the best use of aftershave. Take a cotton pad and dampen it with witch hazel and lightly wipe it across the entire area that you shaved. The purpose of this is to help remove any residue that the water rinse left behind. It is a helpful step to clean the face more thoroughly which makes it easier to apply the aftershave.

You can usually purchase witch hazel in the same spot where rubbing alcohol is sold. Cotton pads are usually with cotton balls in the beauty section of stores.

4. **Apply moisturizer**. Shaving does more than trim the hairs of the face. It also takes off a layer or two of old skin. Because of this, your face can get dried out more easily. Aftershave tends to have alcohol, which also dries the skin out. To counteract this, it is a great idea to use moisturizer specifically designed for men's faces to lock in moisture before applying aftershave. Besides promoting healthy skin, moisturizer also helps the aftershave stick to the skin better and last longer.
Use a small amount of lotion, as you don't want to make the face oily. Any regular lotion will work, but you can also get special men's products by Dove or L'Oreal.

5. **Pour aftershave into your palm**. There are a few ways that are recommended for how to do this. One way is to shake 2-3 drops of aftershave into your hand. Less is better than more in this case. The second option is placing your palm over the opening of the aftershave bottle, tipping the bottle upside down briefly and turning it back upwards. The amount of aftershave this leaves on your hand is typically enough.

6. **Rub your palms together**. You want to use both hands when applying the aftershave, but you don't need to pour it directly onto both hands. Rubbing your hands together will transfer enough of the aftershave from one hand to the other. You don't

want to do this for so long that the aftershave all soaks into your hands, just enough to wet them both. 1-2 seconds is enough time.

7. **Let some of the alcohol evaporate**. Since aftershave tends to have alcohol, which dries out your skin, it is good to let some of it evaporate before rubbing your hands on your face. Once you have the aftershave on both hands, leave your hands open for about 4-5 seconds. This will release some of the alcohol from the aftershave. Be sure not to let it dry for too long or you won't have any to apply to your face.

The purpose of this step is mainly to avoid some of the burning that tends to accompany applying aftershave, but it also keeps some of the alcohol from drying out your skin.

8. **Massage the aftershave into your skin**. Now it is time to actually put the aftershave to your face. Gently rub your hands in a downward motion from the top of your cheeks to your jawline. Then swipe each hand up your neck and under your chin. You can massage the skin a little in each area to make sure the aftershave soaks in.

It may be necessary to apply a second coat of aftershave if you feel your face was not thoroughly covered, but you want to avoid applying too much. If you do apply a second coat, try to use slightly less than you used the first time.

CONCLUSION

Aftershave Lotions are products intended to be used by men after they have finished shaving. These products typically contain alcohol to freshen the skin and a moisturizer to soften the skin. The alcohol in Aftershave Lotions functions by closing pores in the skin and by preventing irritation, commonly known as razor burn. The safety of Aftershave Lotions is established by selection of ingredients that are safe and suitable for this purpose. In addition, Aftershave Lotions are assessed for their potential to cause skin or eye irritation or cause allergic reactions. Product safety is also established through strict adherence to the principles of Quality Assurance and Good Manufacturing Practices. This includes testing the compatibility of the product with packaging as well as shelf-life stability. Finally, the safety of products is monitored in the market-place to track any reports of consumer injury. Companies include a phone number on their products where comments or complaints may be reported.

↓ REFERENCES

1. Wells Frederick V. and Billot, Marcel. Perfumery Technology. Art, science, industry. Chichester: Horwood Books. 25, 278, 1981.
2. Coderch L, López O, de la Maza A and Parra JL. Ceramides and skin function. American Journal of Clinical Dermatology. 4(2): 107–129, 2003.
3. Bouwstra J.A. and Ponec M. The skin barrier in healthy and diseased state. Biochimica et Biophysica Acta. 1758(12): 2080–2095. 2006.
4. Lodén M, von Scheele J and Michelson S. The influence of a humectant-rich mixture on normal skin barrier function and on once- and twice-daily treatment of foot xerosis. A prospective, randomized, evaluator-blind, bilateral and untreated-control study. Skin Res Technol.19: 438–445, 2013.
5. Lu Y. Y. Humectancies of d-tagatose and d-sorbitol. International Journal of Cosmetic Science. 23(3): 175, 2001.
6. Young E. G., Wentworth H. P. and Hawkins W. W. The absorption and excretion of allantoin in mammals. J. Pharmacol. Experi. Therapeutics. 81(1): 1–9, 1944.
7. Araújo LU, Grabe-Guimarães A, Mosqueira VC, Carneiro CM and Silva-Barcellos NM. Profile of wound healing process induced by allantoin. Acta Cir Bras. 25(5): 460–466, 2012.
8. Vyas Krishna S and Saha Sibu P. Comparison of hemostatic agents used in vascular surgery. Expert Opinion on Biological Therapy. 13(12): 1663–1672, 2013.
9. http://www.executive-shaving.co.uk/shavepedia.cfm/shave_id/301