

1 **APPENDIX. APPLICATION OF SAFs**

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3 **Appendix Table 1: SAFs for Fragrance materials in Different Product Types. Contribution of different SAFs and Rationale for Product**
 4 **SAF and Skin Condition SAF**

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Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Category 1 - products applied to the lips						
Lip products ^a	10	1	3*	3*	A SAF of 3* is applied because the site is applied to the lips (highly vascular and there is exposure to mucous membranes and possible exposure to dry or chapped lips). Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Toys	10	1	3*	3*	These products are placed have been placed in Category 1. There are no exposure data available; should exposure data become available, then the products will be re-categorized. Due to the possibility of ingestion of small amounts of fragrance materials from the use of the aforementioned allowable product categories (such as oral care, lip products or certain types of toys), materials present in the fragrance must not only comply with IFRA Standards but must also have an approved flavor materials status as defined by the IOFI Code of Practice.	100
Category 2 - Products applied to the axillae						

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Deodorants & antiperspirants of all types including fragranced body sprays ^a	10	1	3*	10	The SAF is 10 as these products are applied to the axillae where the skin is easily irritated due to a combination of factors including the unique environment of the axillae (humid, oil-rich sebum production and site for perspiration). There may also be acute transient irritation due to product application or mechanical irritation. Shaving may produce an acute transient response.	300
Category 3 - Products applied to the face using fingertips						
Eye products (Includes: eye shadow, mascara, eyeliner, eye make-up)	10	1	3*	3*	The SAF is 3* because product is applied to the peri-ocular site and face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Makeup (foundation) ^a	10	1	3*	3*	SAF is 3* because the product is applied to the face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Make-up remover ^b	10	1	3*	3*	SAF is 3* because the product may be applied to eyelids (peri-ocular region) and face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Nose pore strips	10	1	3*	3*	SAF is 3* because the product is applied to the nose with minimal skin contact. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Wipes or refreshing tissues for faces, neck, hands, body	10	1	3*	3*	SAF is 3* because the product may be applied to eyelids (peri-ocular region) and face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Body paint	10	1	3*	3*	SAF is 3* because the product may be applied to eyelids (peri-ocular region), face and body. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Make-up remover for face, eyes, and lips ^b	10	1	3*	3*	The SAF is 3* because product is applied to the peri-ocular site, lips and face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Masks: face and lips and around the eyes mask	10	1	3*	3*	SAF is 3* because the product may be applied to the face, lips and peri-ocular region. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Facial masks (facial treatment)	10	1	3*	3*	SAF is 3* because the product may be applied to eyelids (peri-ocular region) and face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Category 4 - Fine Fragrance						
Fine fragrance all types (eau de toilette, perfume, cologne etc.) ^a	10	1	3*	3*	The area is the neck, wrists, antecubital fossa. Irritation from shaving may produce an acute transient response. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Fragranced bracelets	10	1	3*	3*	The area is the wrists. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Ingredients of perfume kits	10	1	3*	3*	The area is the neck, wrists, antecubital fossa. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Scent pads, foil packs	10	1	3*	3*	The area is the neck, wrists, antecubital fossa. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Scent strips for hydroalcoholic products	10	1	3*	3*	The area is the neck, wrists, antecubital fossa. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hair perfume	10	1	3*	3*	The SAF is 3* because when the product is applied to the hair there may also be exposure to the scalp. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Category 5 - Products applied to the face and body using the hands (palms), primarily leave-on						
Facial cream (moisturizing)/facial balm ^a	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Moisturizer face, eyes, and lips	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face, peri-ocular site and lips. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hand cream ^a	10	1	3*	3*	The SAF is 3* because the product is applied to the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Body creams, lotions ^a	10	1	3*	10	The SAF is 10 because the area is the entire body which may include areas of inflamed skin, i.e.: intimate regions and axillae. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300
Nail care products including cuticle creams etc.	10	1	3*	3*	The SAF is 3* because some nail care products are applied to the fingers and the back of the hands.	100
Foot care products (creams & powders)	10	1	3*	3*	The SAF is 3* because the product is applied to the feet and may be applied with the palms of the hands.	100
Baby cream	10	1	3*	10	The SAF is 10 because the area is the entire body which may include areas of inflamed skin, i.e.: intimate regions and axillae. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300
Baby oil	10	1	3*	10	The SAF is 10 because the area is the entire body which may include areas of inflamed skin, i.e.: intimate regions and axillae. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Baby powder/talc	10	1	3*	10	The SAF is 10 because the area of exposure will possibly include the whole body ³³ including the peri-anal region. The skin integrity of some exposed areas may be compromised (diaper rash) ⁶² .	300
Insect repellent (intended to be applied to the skin)	10	1	3*	3*	The SAF is a 3*. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hand sanitizers	10	1	3*	3*	The SAF is 3* because the product is applied to the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Face toner/astringent/anti-bacterial cleansers ^b	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face and peri-ocular site. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
All powders and talcs (except baby powders and talcs)	10	1	3*	10	The SAF is 10 because the area of exposure will possibly include the whole body ³³ including the peri-anal region. The skin integrity of some exposed areas may be compromised (diaper rash) ⁶² .	300
Category 6 - Products with oral and lip exposure						
Toothpaste ^a	10	1	3*	3*	The SAF is a 3*. The sites are the lips and mouth. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Mouthwash ^a	10	1	3*	3*	The SAF is a 3*. The sites are the lips and mouth. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Category 7 - Products applied to the hair with some hand contact						

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Hair sprays ^a	10	1	3*	1	The SAF is 1 because it is applied to the hair with minimal exposure of the scalp and hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	30
Hair styling aids (mousse, gels, leave-in conditioners) ^a	10	1	3*	3*	The SAF is 3* because when the product is applied to the hair there will also be exposure to the scalp and the palms of the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hair permanent or other hair chemical treatments (e.g. relaxers) but not hair dyes	10	1	3*	3*	It is recognized that these product types involve repeated low-frequency exposure. In order to define a per diem exposure, a conservative surrogate product has been chosen, which is hair styling aids.	100
Dry shampoo or waterless shampoo	10	1	3*	3*	The SAF is 3* because when the product is applied to the hair there will also be exposure to the scalp and the palms of the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hair deodorizer	10	1	3*	3*	The SAF is 3* because when the product is applied to the hair there may also be exposure to the scalp and the palms of the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hair dyes	10	1	3*	3*	The SAF is 3* because when the product is applied to the hair there will also be exposure to the scalp and the palms of the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Category 8 - Products with significant ano-genital exposure						
Intimate wipes	10	1	3*	10	The skin site SAF is 10 because peri-anal region is involved.	300
Tampons	10	1	3*	20	SAF is 20 because close, occluded contact occurs with non-keratinized mucosa (vaginal mucous membrane) ^{37,40-48} and exposure may occur for extended periods of time. This area may be prone to irritation. Farage, 2003	600
Baby wipes	10	1	3*	10	The SAF is 10 because the peri-anal region may be exposed. The area is primarily the baby's buttocks, groin, lower stomach and upper thighs where the skin integrity may be compromised (diaper rash) ⁶² and could involve mucous membrane exposure ^{37,40-48} .	300
Wet toilet paper	10	1	3*	10	The SAF is 10 because the peri-anal region may be exposed.	300
Category 9 - Products with body and hand exposure, primarily rinse off						
Bar soap ^a	10	1	3*	10	The SAF is 10 because product may be used all over the body including the axillae and intimate regions. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300
Shampoo ^a	10	1	3*	10	The SAF is 10 because the product is applied to the head (hair) and scalp with the hands and may also be used over the entire body as a shower gel. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Face washes, gels, scrubs ^b	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Conditioner (rinse-off) ^a	10	1	3*	3*	SAF is 3* because the product is applied to the head (hair) and scalp with the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Liquid soap ^a	10	1	3*	3*	The SAF is 3* because product may be used on the hands and face. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Body wash/shower gels ^a	10	1	3*	10	The SAF is 10 because product may be used all over the body including intimate regions and axillae. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300
Bath gels, foams, mousses	10	1	3*	10	The SAF is 10 because product may be used all over the body including intimate body regions and the axillae. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300
Baby wash, bath, shampoo	10	1	3*	10	The SAF is 10 because product may be used all over the body including intimate body regions and the axillae. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	300

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Foot care products (feet are placed in a bath for soaking)	10	1	3*	3*	The SAF is 3* because product is used on the feet. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Shaving creams, foams, gels ^b	10	1	3*	3*	The SAF is a 3* because the area is a part of the face.	100
Depilatory, hair removal creams, foams, gels (including facial) ^b	10	1	3*	10	The SAF is 10. It has been judged that the use of depilatories may lead to an irritation that requires 10-fold assessment factor compared to the conditions of the confirmatory tests (e.g. HRIPT).	300
Waxes for mechanical hair removal ^b	10	1	3*	3*	The SAF is 3* because many skin sites could be exposed. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation as the wax is inert and contact time with skin is brief.	100
Face and lips scrubs	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face and lips. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Facial cleansing wipes and cleanser wipe-off products ^b	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face, peri-ocular site and lips. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Cleanser for face, eyes, and lips	10	1	3*	3*	The SAF of 3* has been attributed because the product is applied to the face, peri-ocular site and lips. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Shampoos for pets	10	1	3*	3*	The SAF is 3* because the product is exposed to the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Category 10 - Household care products with mostly hand contact						
Aerosol air fresheners ^a	10	1	3*	1	SAF is a 1 because the exposure may include the upper extremities of the body.	30
Hand wash laundry detergent ^b	10	1	3*	3*	The SAF is 3* because the product is exposed to the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Laundry pre-treatment (all types) ^b	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, there is limited contact with the hands.	100
Hand dishwashing detergent ^b	10	1	3*	3*	The SAF is 3* because the product is exposed to the hands. Products are not expected to be irritant and no additional contribution to skin condition is expected from product irritation	100
Hard surface cleaner (all types) ^b	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, there is limited contact with the hands.	100
Laundry detergents with skin contact (e.g. liquids, powders) ^b	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, there is minimal contact with the hands.	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Dry cleaning kits	10	1	3*	3*	The SAF is 3* because although the stain removing components of this product category may be more aggressive/irritating than surfactant based personal care products, there is minimal contact with the hands.	100
Toilet seat wipes	10	1	3*	3*	The SAF is 3* because contact with the hands is anticipated.	100
Fabric softeners - liquids ^b	10	1	3*	3*	The SAF is 3* because contact with the hands is anticipated.	100
Fabric Softeners - dryer sheets ^b	10	0.3	3*	3*	The SAF is 3* because limited contact with the hands is anticipated.	30
Bath cleaners, bleach, disinfectants, floor cleaner, kitchen cleaner, multi-purpose cleaner, soft surface cleaners, cleaner, window cleaner, furniture polishes (sprays and wipes), limescale removers ^b	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, there is minimal contact with the hands.	100
Washing up liquids ^b	10	1	3*	3*	The SAF is 3* because limited contact with the hands is anticipated.	100
Other household cleaning products (fabric cleaners, carpet cleaners, leather cleaning wipes, starch sprays, stain removers, fabric enhancing sprays)	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, there is minimal contact with the hands.	100
Animal sprays (all types)	10	1	3*	3*	The SAF is 3* because contact with the hands is anticipated.	100
Floor wax	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, minimal contact with the hands is anticipated.	100
Fragranced oil for lamp rings, reed diffusers, etc.	10	1	3*	3*	The SAF is 3* because contact with the hands is anticipated.	100
Odores distilled water (that can be added to steam irons)	10	1	3*	3*	The SAF is 3* because contact with the hands is anticipated.	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
In-wash scent booster pastilles	10	1	3*	3*	The SAF is 3* because although this product category may be more aggressive/irritating than surfactant based personal care products, there is minimal contact with the hands.	100
Category 11 - Products with intended skin contact but minimal transfer of fragrance to skin from inert substrate						
Feminine hygiene conventional pads, liners, interlabial pads	10	1	3*	10	The SAF is 10 because the contact is predominantly with stratified, squamous keratinized epithelium (Farage et al. 2003).	300
Diapers (baby and adult)	10	1	3*	10	The SAF is 10 because the peri-anal region may be exposed. The area of exposure will possibly include the whole body ³³ . The skin integrity may be compromised (diaper rash) ⁶² . There may also be mucous membrane exposure ^{37,40-48} .	300
Tights with moisturizers	10	1	3*	10	The SAF is 10 because contact with skin is anticipated and will be longer than brief. The ano-genital area may be exposed.	300
Scented socks, gloves	10	1	3*	3*	The SAF is 3* because contact with skin is anticipated and will be longer than brief.	100
Facial tissues (dry tissues)	10	0.3	3*	3*	The SAF is 3* because contact with the hands, lips, and face is anticipated.	30
Napkins	10	0.3	3*	3*	The SAF is 3* because contact with the hands, lips, and face is anticipated.	30
Paper towels	10	0.3	3*	3*	The SAF is 3* because contact with the hands is anticipated.	30
Toilet paper (dry)	10	0.3	3*	10	The SAF is 10 because the peri-anal region may be exposed. The area of exposure will possibly include the whole body ³³ . The skin integrity may be compromised ⁶² . There may also be mucous membrane exposure ^{37,40-48} .	100

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Wheat bags	10	1	3*	3*	The SAF is 3* because contact with skin is anticipated and will be longer than brief.	100
Solid fertilizers (pellet or powder)	10	1	3*	3*	The SAF of 3* has been attributed because the product may come into contact with the hand and uncovered extremities. No additional contribution to skin condition is expected from product irritation	100
Face Masks (paper/protective, e.g. surgical mask)	10	1	3*	3*	The SAF is 3* because contact with skin is anticipated and will be longer than brief.	100
Category 12 - Products not intended for direct skin contact, minimal or insignificant transfer to skin						
Candles ^a	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Closed air fresheners ^a	10	0.3	3*	1	The SAF is 1 because there is only rare accidental contact with the skin.	10
Laundry detergents with minimal skin contact (e.g. pods) ^b	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Air fresheners and fragrancing of all types (<i>concentrated aerosol with metered doses (range 0.05-0.5mL/spray)</i> , plug-ins, solid substrate, membrane delivery, electrical, potpourri, powders, fragrancing sachets, incense, liquid refills, air freshening crystals) ^a	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Air delivery systems	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Cat litter	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10

Product Type	Inter-individual SAF	Product Composition SAF	Frequency/Duration SAF	Skin Condition SAF	Rationale for Skin Condition SAF	QRA2 SAF
Deodorizers/maskers not intended for skin contact (e.g. fabric drying machine deodorizers, carpet powders)	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Fuels	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Insecticides (e.g. mosquito coil, paper, electrical, for clothing)	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Joss sticks or incense sticks	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Machine dishwash detergent, deodorizers and rinse aids ^b	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Paints	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Plastic articles (excluding toys)	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Scratch and sniff	10	1	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Scent pack	10	1	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Scent delivery system (using dry air technology)	10	1	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Shoe polishes	10	1	3*	1	The SAF is 1 because there is limited exposure to the skin.	10
Toilet blocks	10	0.3	3*	1	The SAF is 1 because there is limited exposure to the skin.	10

6 *In keeping with convention, values of 0.1, 0.3, 1, 3, 10, 30, 100 and 300 are used such that when multiplying SAF values, 3 is treated as an integer when multiplied with 1, 10, 100 to
7 give 3, 30 300 but when multiplied by itself it is considered as the number 3 approximates $\sqrt{10}$ (c. 3.16) such that $3 \times 3 = 10$.

8 Note: Products that contain sunscreens are not addressed separately but are included in the major product types (e.g. lip creams with sunscreen are included in lip product category).

9 ^aConsumer products in the Creme RIFM Aggregate Exposure Model, Version 2.0 (2018)

10 ^bConsumer products in the next version of the Creme RIFM Aggregate Exposure Model Version 3.0 (expected to launch Q3, 2019).

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