Interior Cleaner RTU

Volkswagon of America

Chemwatch Hazard Alert Code: **0**

Version No: **1.1**
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

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S.GHS.USA.EN

SECTION 1 IDENTIFICATION

Product Identifier

Product name	Interior Cleaner RTU
Synonyms	P/N 128003, 123061, 122256
Other means of identification	PS 122234

Recommended use of the chemical and restrictions on use

Relevant identified uses	Carpet/Upholstery Cleaner - Nonaerosol (RTU)

Name, address, and telephone number of the chemical manufacturer, importer, or other responsible party

Registered company name	**Volkswagon of America**
Address	3800 Hamlin Road Auburn Hills Michigan United States
Telephone	248-754-4944
Fax	1-248-754-4943
Website	Not Available
Email	Not Available

Emergency phone number

Association / Organisation	**Volkswagon of America**
Emergency telephone numbers	1-800-255-3924
Other emergency telephone numbers	Not Available

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

Note: The hazard category numbers found in GHS classification in section 2 of this SDSs are NOT to be used to fill in the NFPA 704 diamond. Blue = Health Red = Fire Yellow = Reactivity White = Special (Oxidizer or water reactive substances)

Classification	Not Applicable

Label elements

Hazard pictogram(s)	Not Applicable
SIGNAL WORD	**NOT APPLICABLE**

Hazard statement(s)

Not Applicable

Hazard(s) not otherwise classified

Not Applicable

Precautionary statement(s) Prevention

Not Applicable

Continued...

Precautionary statement(s) Response

Not Applicable

Precautionary statement(s) Storage

Not Applicable

Precautionary statement(s) Disposal

Not Applicable

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
7732-18-5	97.79-97.83	water
55965-84-9	<0.01	isothiazolinones, mixed
Not Available	1.18-1.41	Nonionic surfactant
Not Available	0.24-0.35	Amphoteric surfactant
34590-94-8	0.42-0.47	dipropylene glycol monomethyl ether
1589-47-5	<0.01	propylene glycol monomethyl ether - beta isomer
56539-66-3	<0.01	3-methoxy-3-methyl-1-butanol
24851-98-7	<0.01	methyl dihydrojasmonate
101-86-0	<0.01	alpha-hexylcinnamaldehyde
105-95-3	<0.01	ethylene brassylene
32388-55-9	<0.01	methyl cedryl ketone
140-11-4	<0.01	benzyl acetate
80-54-6	<0.01	p-tert-butyl-alpha-methylhydrocinnamaldehyde
6259-76-3	<0.01	hexyl salicylate
1222-05-5	<0.01	galaxolide
54464-57-2	<0.01	2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene
21145-77-7	<0.01	7-acetyl-1,1,3,4,4,6-hexamethyltetraline
18479-58-8	<0.01	dihydromyrcenol
31906-04-4	<0.01	lyral
78-70-6	<0.01	linalool
1335-46-2	<0.01	methylionone, isomers
1205-17-0	<0.01	piperonyl propanal
25152-85-6	<0.01	3-hexenyl benzoate
104-67-6	<0.01	gamma-undecalactone
106-02-5	<0.01	omega-pentadecalactone
2500-83-6	<0.01	tricyclodecenyl acetate
17511-60-3	<0.01	tricyclodecenyl propionate
103-95-7	<0.01	p-isopropyl-alpha-methylhydrocinnamaldehyde
115-95-7	<0.01	linalyl acetate
106-24-1	<0.01	geraniol
52474-60-9	<0.01	Precyclemone B
65405-77-8	<0.01	cis-3-hexenyl salicylate
78-69-3	<0.01	linalool tetrahydride
106-22-9	<0.01	beta-citronellol
5392-40-5	<0.01	citral
8008-57-9	<0.01	orange oil
8006-81-3	<0.01	ylang ylang oil
86115-11-9	<0.01	acetyl diisoamylene
33704-61-9	<0.01	6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone
68039-49-6	<0.01	2,4-dimethyl-3-cyclohexene-1-carboxaldehyde
8015-90-5	<0.01	celery oil

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with eyes:

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	▸ Wash out immediately with water. ▸ If irritation continues, seek medical attention. ▸ Removal of contact lenses after an eye injury should only be undertaken by skilled personnel.
Skin Contact	If skin or hair contact occurs: ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes, aerosols or combustion products are inhaled remove from contaminated area. ▸ Other measures are usually unnecessary.
Ingestion	▸ Immediately give a glass of water. ▸ First aid is not generally required. If in doubt, contact a Poisons Information Centre or a doctor. ▸ If spontaneous vomiting appears imminent or occurs, hold patient's head down, lower than their hips to help avoid possible aspiration of vomitus.

Most important symptoms and effects, both acute and delayed

See Section 11

Indication of any immediate medical attention and special treatment needed

Treat symptomatically.

SECTION 5 FIRE-FIGHTING MEASURES

Extinguishing media

The product contains a substantial proportion of water, therefore there are no restrictions on the type of extinguishing media which may be used. Choice of extinguishing media should take into account surrounding areas.
Though the material is non-combustible, evaporation of water from the mixture, caused by the heat of nearby fire, may produce floating layers of combustible substances.
In such an event consider:

- foam.
- dry chemical powder.
- carbon dioxide.

Special hazards arising from the substrate or mixture

Fire Incompatibility	None known.

Special protective equipment and precautions for fire-fighters

Fire Fighting	▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear full body protective clothing with breathing apparatus. ▸ Prevent, by any means available, spillage from entering drains or water course. ▸ Use water delivered as a fine spray to control fire and cool adjacent area. ▸ Avoid spraying water onto liquid pools. ▸ **DO NOT** approach containers suspected to be hot. ▸ Cool fire exposed containers with water spray from a protected location. ▸ If safe to do so, remove containers from path of fire.
Fire/Explosion Hazard	▸ Combustible. ▸ Slight fire hazard when exposed to heat or flame. ▸ Heating may cause expansion or decomposition leading to violent rupture of containers. ▸ On combustion, may emit toxic fumes of carbon monoxide (CO). ▸ May emit acrid smoke. ▸ Mists containing combustible materials may be explosive. Combustion products include: carbon dioxide (CO_2) other pyrolysis products typical of burning organic material.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Personal precautions, protective equipment and emergency procedures

See section 8

Environmental precautions

See section 12

Methods and material for containment and cleaning up

Minor Spills	▸ Remove all ignition sources. ▸ Clean up all spills immediately. ▸ Avoid breathing vapours and contact with skin and eyes. ▸ Control personal contact with the substance, by using protective equipment. ▸ Contain and absorb spill with sand, earth, inert material or vermiculite. ▸ Wipe up. ▸ Place in a suitable, labelled container for waste disposal.

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Major Spills	Moderate hazard. ▸ Clear area of personnel and move upwind. ▸ Alert Fire Brigade and tell them location and nature of hazard. ▸ Wear breathing apparatus plus protective gloves. ▸ Prevent, by any means available, spillage from entering drains or water course. ▸ No smoking, naked lights or ignition sources. ▸ Increase ventilation. ▸ Stop leak if safe to do so. ▸ Contain spill with sand, earth or vermiculite. ▸ Collect recoverable product into labelled containers for recycling. ▸ Absorb remaining product with sand, earth or vermiculite. ▸ Collect solid residues and seal in labelled drums for disposal. ▸ Wash area and prevent runoff into drains. ▸ If contamination of drains or waterways occurs, advise emergency services.

Personal Protective Equipment advice is contained in Section 8 of the SDS.

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	▸ Avoid all personal contact, including inhalation. ▸ Wear protective clothing when risk of exposure occurs. ▸ Use in a well-ventilated area. ▸ Prevent concentration in hollows and sumps. ▸ **DO NOT** enter confined spaces until atmosphere has been checked. ▸ Avoid smoking, naked lights or ignition sources. ▸ Avoid contact with incompatible materials. ▸ When handling, **DO NOT** eat, drink or smoke. ▸ Keep containers securely sealed when not in use. ▸ Avoid physical damage to containers. ▸ Always wash hands with soap and water after handling. ▸ Work clothes should be laundered separately. ▸ Use good occupational work practice. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS. ▸ Atmosphere should be regularly checked against established exposure standards to ensure safe working conditions.
Other information	▸ Store in original containers. ▸ Keep containers securely sealed. ▸ No smoking, naked lights or ignition sources. ▸ Store in a cool, dry, well-ventilated area. ▸ Store away from incompatible materials and foodstuff containers. ▸ Protect containers against physical damage and check regularly for leaks. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS.

Conditions for safe storage, including any incompatibilities

Suitable container	▸ Metal can or drum ▸ Packaging as recommended by manufacturer. ▸ Check all containers are clearly labelled and free from leaks.
Storage incompatibility	Avoid contamination of water, foodstuffs, feed or seed. None known

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters

OCCUPATIONAL EXPOSURE LIMITS (OEL)

INGREDIENT DATA

Source	Ingredient	Material name	TWA	STEL	Peak	Notes
US NIOSH Recommended Exposure Limits (RELs)	dipropylene glycol monomethyl ether	Dipropylene glycol monomethyl ether, Dowanol® 50B	100 ppm / 600 mg/m3	900 mg/m3 / 150 ppm	Not Available	[skin]
US ACGIH Threshold Limit Values (TLV)	dipropylene glycol monomethyl ether	(2-Methoxymethylethoxy)propanol	100 ppm	150 ppm	Not Available	TLV® Basis: Eye & URT irr; CNS impair
US OSHA Permissible Exposure Levels (PELs) - Table Z1	dipropylene glycol monomethyl ether	Dipropylene glycol methyl ether	100 ppm / 600 mg/m3	Not Available	Not Available	Not Available
US ACGIH Threshold Limit Values (TLV)	benzyl acetate	Benzyl acetate	10 ppm	Not Available	Not Available	TLV® Basis: URT irr
US OSHA Permissible Exposure Levels (PELs) - Table Z3	galaxolide	Inert or Nuisance Dust	5 mg/m3 / 15 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise

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						Regulated (PNOR) limit in Table Z-1.); Respirable fraction))
US OSHA Permissible Exposure Levels (PELs) - Table Z3	galaxolide	Inert or Nuisance Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Total dust))
US OSHA Permissible Exposure Levels (PELs) - Table Z3	7-acetyl-1,1,3,4,4,6-hexamethyltetraline	Inert or Nuisance Dust	5 mg/m3 / 15 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Respirable fraction))
US OSHA Permissible Exposure Levels (PELs) - Table Z3	7-acetyl-1,1,3,4,4,6-hexamethyltetraline	Inert or Nuisance Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Total dust))
US OSHA Permissible Exposure Levels (PELs) - Table Z3	omega-pentadecalactone	Inert or Nuisance Dust	5 mg/m3 / 15 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Respirable fraction))
US OSHA Permissible Exposure Levels (PELs) - Table Z3	omega-pentadecalactone	Inert or Nuisance Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Total dust))
US ACGIH Threshold Limit Values (TLV)	citral	Citral	5 ppm	Not Available	Not Available	TLV® Basis: Body weight eff; URT irr; eye dam
US OSHA Permissible Exposure Levels (PELs) - Table Z3	6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone	Inert or Nuisance Dust	5 mg/m3 / 15 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Respirable fraction))
US OSHA Permissible Exposure Levels (PELs) - Table Z3	6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone	Inert or Nuisance Dust	15 mg/m3 / 50 mppcf	Not Available	Not Available	(Name (((d) All inert or nuisance dusts, whether mineral, inorganic, or organic, not listed specifically by substance name are covered by this limit, which is the same as the Particulates Not Otherwise Regulated (PNOR) limit in Table Z-1.); Total dust))

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
dipropylene glycol monomethyl ether	Dipropylene glycol methyl ether	150 ppm	1700 ppm	9900 ppm
benzyl acetate	Benzyl acetate	30 ppm	330 ppm	2,000 ppm

Ingredient	Original IDLH	Revised IDLH
water	Not Available	Not Available
isothiazolinones, mixed	Not Available	Not Available
Nonionic surfactant	Not Available	Not Available
Amphoteric surfactant	Not Available	Not Available
dipropylene glycol monomethyl ether	600 ppm	Not Available
propylene glycol monomethyl ether - beta isomer	Not Available	Not Available
3-methoxy-3-methyl-1-butanol	Not Available	Not Available
methyl dihydrojasmonate	Not Available	Not Available

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alpha-hexylcinnamaldehyde	Not Available	Not Available
ethylene brassylene	Not Available	Not Available
methyl cedryl ketone	Not Available	Not Available
benzyl acetate	Not Available	Not Available
p-tert-butyl-alpha-methylhydrocinnamaldehyde	Not Available	Not Available
hexyl salicylate	Not Available	Not Available
galaxolide	Not Available	Not Available
2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene	Not Available	Not Available
7-acetyl-1,1,3,4,4,6-hexamethyltetraline	Not Available	Not Available
dihydromyrcenol	Not Available	Not Available
lyral	Not Available	Not Available
linalool	Not Available	Not Available
methylionone, isomers	Not Available	Not Available
piperonyl propanal	Not Available	Not Available
3-hexenyl benzoate	Not Available	Not Available
gamma-undecalactone	Not Available	Not Available
omega-pentadecalactone	Not Available	Not Available
tricyclodecenyl acetate	Not Available	Not Available
tricyclodecenyl propionate	Not Available	Not Available
p-isopropyl-alpha-methylhydrocinnamaldehyde	Not Available	Not Available
linalyl acetate	Not Available	Not Available
geraniol	Not Available	Not Available
Precyclemone B	Not Available	Not Available
cis-3-hexenyl salicylate	Not Available	Not Available
linalool tetrahydride	Not Available	Not Available
beta-citronellol	Not Available	Not Available
citral	Not Available	Not Available
orange oil	Not Available	Not Available
ylang ylang oil	Not Available	Not Available
acetyl diisoamylene	Not Available	Not Available
6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone	Not Available	Not Available
2,4-dimethyl-3-cyclohexene-1-carboxaldehyde	Not Available	Not Available
celery oil	Not Available	Not Available

OCCUPATIONAL EXPOSURE BANDING

Ingredient	Occupational Exposure Band Rating	Occupational Exposure Band Limit
isothiazolinones, mixed	E	≤ 0.1 ppm
propylene glycol monomethyl ether - beta isomer	E	≤ 0.1 ppm
3-methoxy-3-methyl-1-butanol	E	≤ 0.1 ppm
methyl dihydrojasmonate	E	≤ 0.1 ppm
alpha-hexylcinnamaldehyde	E	≤ 0.1 ppm
ethylene brassylene	E	≤ 0.1 ppm
methyl cedryl ketone	E	≤ 0.1 ppm
p-tert-butyl-alpha-methylhydrocinnamaldehyde	E	≤ 0.1 ppm
hexyl salicylate	E	≤ 0.1 ppm
2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene	E	≤ 0.1 ppm
dihydromyrcenol	E	≤ 0.1 ppm
lyral	D	> 0.1 to ≤ 1 ppm
linalool	E	≤ 0.1 ppm
methylionone, isomers	E	≤ 0.1 ppm
piperonyl propanal	E	≤ 0.1 ppm
3-hexenyl benzoate	E	≤ 0.1 ppm
gamma-undecalactone	E	≤ 0.1 ppm
tricyclodecenyl propionate	E	≤ 0.1 ppm

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p-isopropyl-alpha-methylhydrocinnamaldehyde	E	≤ 0.1 ppm
linalyl acetate	E	≤ 0.1 ppm
geraniol	E	≤ 0.1 ppm
Precyclemone B	E	≤ 0.1 ppm
cis-3-hexenyl salicylate	E	≤ 0.1 ppm
linalool tetrahydride	E	≤ 0.1 ppm
beta-citronellol	E	≤ 0.1 ppm
orange oil	E	≤ 0.1 ppm
ylang ylang oil	E	≤ 0.1 ppm
acetyl diisoamylene	E	≤ 0.1 ppm
2,4-dimethyl-3-cyclohexene-1-carboxaldehyde	E	≤ 0.1 ppm
celery oil	E	≤ 0.1 ppm
Notes:	*Occupational exposure banding is a process of assigning chemicals into specific categories or bands based on a chemical's potency and the adverse health outcomes associated with exposure. The output of this process is an occupational exposure band (OEB), which corresponds to a range of exposure concentrations that are expected to protect worker health.*	

Exposure controls

Appropriate engineering controls

Engineering controls are used to remove a hazard or place a barrier between the worker and the hazard. Well-designed engineering controls can be highly effective in protecting workers and will typically be independent of worker interactions to provide this high level of protection.
The basic types of engineering controls are:
Process controls which involve changing the way a job activity or process is done to reduce the risk.
Enclosure and/or isolation of emission source which keeps a selected hazard 'physically' away from the worker and ventilation that strategically 'adds' and 'removes' air in the work environment. Ventilation can remove or dilute an air contaminant if designed properly. The design of a ventilation system must match the particular process and chemical or contaminant in use.
Employers may need to use multiple types of controls to prevent employee overexposure.

General exhaust is adequate under normal operating conditions. If risk of overexposure exists, wear SAA approved respirator. Correct fit is essential to obtain adequate protection. Provide adequate ventilation in warehouse or closed storage areas. Air contaminants generated in the workplace possess varying 'escape' velocities which, in turn, determine the 'capture velocities' of fresh circulating air required to effectively remove the contaminant.

Type of Contaminant:	Air Speed:
solvent, vapours, degreasing etc., evaporating from tank (in still air)	0.25-0.5 m/s (50-100 f/min)
aerosols, fumes from pouring operations, intermittent container filling, low speed conveyer transfers, welding, spray drift, plating acid fumes, pickling (released at low velocity into zone of active generation)	0.5-1 m/s (100-200 f/min.)
direct spray, spray painting in shallow booths, drum filling, conveyer loading, crusher dusts, gas discharge (active generation into zone of rapid air motion)	1-2.5 m/s (200-500 f/min)
grinding, abrasive blasting, tumbling, high speed wheel generated dusts (released at high initial velocity into zone of very high rapid air motion).	2.5-10 m/s (500-2000 f/min.)

Within each range the appropriate value depends on:

Lower end of the range	Upper end of the range
1: Room air currents minimal or favourable to capture	1: Disturbing room air currents
2: Contaminants of low toxicity or of nuisance value only	2: Contaminants of high toxicity
3: Intermittent, low production.	3: High production, heavy use
4: Large hood or large air mass in motion	4: Small hood - local control only

Simple theory shows that air velocity falls rapidly with distance away from the opening of a simple extraction pipe. Velocity generally decreases with the square of distance from the extraction point (in simple cases). Therefore the air speed at the extraction point should be adjusted, accordingly, after reference to distance from the contaminating source. The air velocity at the extraction fan, for example, should be a minimum of 1-2 m/s (200-400 f/min.) for extraction of solvents generated in a tank 2 meters distant from the extraction point. Other mechanical considerations, producing performance deficits within the extraction apparatus, make it essential that theoretical air velocities are multiplied by factors of 10 or more when extraction systems are installed or used.

Personal protection

Eye and face protection

- Safety glasses with side shields
- Chemical goggles.
- Contact lenses may pose a special hazard; soft contact lenses may absorb and concentrate irritants. A written policy document, describing the wearing of lenses or restrictions on use, should be created for each workplace or task. This should include a review of lens absorption and adsorption for the class of chemicals in use and an account of injury experience. Medical and first-aid personnel should be trained in their removal and suitable equipment should be readily available. In the event of chemical exposure, begin eye irrigation immediately and remove contact lens as soon as practicable. Lens should be removed at the first signs of eye redness or irritation - lens should be removed in a clean environment only after workers have washed hands thoroughly. [CDC NIOSH Current Intelligence Bulletin 59], [AS/NZS 1336 or national equivalent]

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Skin protection	See Hand protection below
Hands/feet protection	Wear general protective gloves, eg. light weight rubber gloves. The selection of suitable gloves does not only depend on the material, but also on further marks of quality which vary from manufacturer to manufacturer. Where the chemical is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application. The exact break through time for substances has to be obtained from the manufacturer of the protective gloves and.has to be observed when making a final choice. Personal hygiene is a key element of effective hand care. Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended. Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include: · frequency and duration of contact, · chemical resistance of glove material, · glove thickness and · dexterity Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent). · When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended. · Some glove polymer types are less affected by movement and this should be taken into account when considering gloves for long-term use. · Contaminated gloves should be replaced. As defined in ASTM F-739-96 in any application, gloves are rated as: · Excellent when breakthrough time > 480 min · Good when breakthrough time > 20 min · Fair when breakthrough time < 20 min · Poor when glove material degrades For general applications, gloves with a thickness typically greater than 0.35 mm, are recommended. It should be emphasised that glove thickness is not necessarily a good predictor of glove resistance to a specific chemical, as the permeation efficiency of the glove will be dependent on the exact composition of the glove material. Therefore, glove selection should also be based on consideration of the task requirements and knowledge of breakthrough times. Glove thickness may also vary depending on the glove manufacturer, the glove type and the glove model. Therefore, the manufacturers' technical data should always be taken into account to ensure selection of the most appropriate glove for the task. Note: Depending on the activity being conducted, gloves of varying thickness may be required for specific tasks. For example: · Thinner gloves (down to 0.1 mm or less) may be required where a high degree of manual dexterity is needed. However, these gloves are only likely to give short duration protection and would normally be just for single use applications, then disposed of. · Thicker gloves (up to 3 mm or more) may be required where there is a mechanical (as well as a chemical) risk i.e. where there is abrasion or puncture potential Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.
Body protection	See Other protection below
Other protection	No special equipment needed when handling small quantities. **OTHERWISE:** ▸ Overalls. ▸ Barrier cream. ▸ Eyewash unit.

Recommended material(s)

GLOVE SELECTION INDEX

Glove selection is based on a modified presentation of the:
'Forsberg Clothing Performance Index'.
The effect(s) of the following substance(s) are taken into account in the ***computer-generated*** selection:
Interior Cleaner RTU

Material	CPI
BUTYL	C
NATURAL RUBBER	C
NEOPRENE	C
NITRILE	C
PVA	C
VITON	C

* CPI - Chemwatch Performance Index
A: Best Selection
B: Satisfactory; may degrade after 4 hours continuous immersion
C: Poor to Dangerous Choice for other than short term immersion
NOTE: As a series of factors will influence the actual performance of the glove, a final selection must be based on detailed observation. -
* Where the glove is to be used on a short term, casual or infrequent basis, factors such as 'feel' or convenience (e.g. disposability), may dictate a choice of gloves which might otherwise be unsuitable following long-term or frequent use. A qualified practitioner should be consulted.

Respiratory protection

Type A Filter of sufficient capacity. (AS/NZS 1716 & 1715, EN 143:2000 & 149:2001, ANSI Z88 or national equivalent)

Where the concentration of gas/particulates in the breathing zone, approaches or exceeds the 'Exposure Standard' (or ES), respiratory protection is required. Degree of protection varies with both face-piece and Class of filter; the nature of protection varies with Type of filter.

Required Minimum Protection Factor	Half-Face Respirator	Full-Face Respirator	Powered Air Respirator
up to 10 x ES	A-AUS	-	A-PAPR-AUS / Class 1
up to 50 x ES	-	A-AUS / Class 1	-
up to 100 x ES	-	A-2	A-PAPR-2 ^

^ - Full-face
A(All classes) = Organic vapours, B AUS or B1 = Acid gasses, B2 = Acid gas or hydrogen cyanide(HCN), B3 = Acid gas or hydrogen cyanide(HCN), E = Sulfur dioxide(SO2), G = Agricultural chemicals, K = Ammonia(NH3), Hg = Mercury, NO = Oxides of nitrogen, MB = Methyl bromide, AX = Low boiling point organic compounds(below 65 degC)

- **Cartridge respirators should never be used for emergency ingress or in areas of unknown vapour concentrations or oxygen content.**
- **The wearer must be warned to leave the contaminated area immediately on detecting any odours through the respirator. The odour may indicate that the mask is not functioning properly, that the vapour concentration is too high, or that the mask is not properly fitted. Because of these limitations, only restricted use of cartridge respirators is considered appropriate.**
- **Cartridge performance is affected by humidity. Cartridges should be changed after 2 hr of continuous use unless it is determined that the humidity is less than 75%, in which case, cartridges can be used for 4 hr. Used cartridges should be discarded daily, regardless of the length of time used**

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Continued...

Information on basic physical and chemical properties

Appearance	Clear colorless

Physical state	Liquid	**Relative density (Water = 1)**	0.9980
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	5.72	**Decomposition temperature**	Not Available
Melting point / freezing point (°C)	Not Available	**Viscosity (cSt)**	4.008
Initial boiling point and boiling range (°C)	Not Available	**Molecular weight (g/mol)**	Not Available
Flash point (°C)	>93.33	Taste	Not Available
Evaporation rate	Not Available	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Available
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Available
Vapour pressure (kPa)	Not Available	**Gas group**	Not Available
Solubility in water	Miscible	**pH as a solution (1%)**	Not Available
Vapour density (Air = 1)	Not Available	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	Product is considered stable and hazardous polymerisation will not occur.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7
Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	The material is not thought to produce adverse health effects or irritation of the respiratory tract (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable control measures be used in an occupational setting. Not normally a hazard due to non-volatile nature of product
Ingestion	Exposure to the piperidines may result in increased blood pressure and heart rate, nausea, vomiting, salivation, laboured breathing, muscular weakness, paralysis and convulsions. It may also excite the senses of hearing and touch. Swallowing of the liquid may cause aspiration into the lungs with the risk of chemical pneumonitis; serious consequences may result. (ICSC13733) The material has **NOT** been classified by EC Directives or other classification systems as 'harmful by ingestion'. This is because of the lack of corroborating animal or human evidence.
Skin Contact	The material is not thought to produce adverse health effects or skin irritation following contact (as classified by EC Directives using animal models). Nevertheless, good hygiene practice requires that exposure be kept to a minimum and that suitable gloves be used in an occupational setting. Falcarinol can cause allergic and irritant contact dermatitis - A human pretest of 5% falcarinol was made with a 48 hour application under occlusion to the volar aspects of forearms of 48 subjects. None gave irritant reactions. In the maximisation test, the 5% falcarinol preparation was applied under occlusion to the same sites on forearms for 5 alternate day 48 hour periods, after an initial 24 hour pretreatment of the patch site with a 5% aqueous sodium lauryl sulfate under occlusion. Of the 26 subjects in the study, 6 did not complete the tests due to the severity of their reactions. Six additional subjects demonstrated flareups at the sensitisation patch test site during initiation and further testing was stopped. The ability of falcarinol to sensitise 10 of the 20 subjects at non-irritating concentration was significant. The substance produced erythema in at least four of eight sensitised guinea pigs. Contact Dermatitis, Vol 19, pp 125-128, 1988 Falcarinol is a fatty acid found in ivy and red ginseng. An allergic contact dermatitis from the ivy Hedra helix was described in a case report of a 44 year old nonatopic male gardener. After exposure on two occasions, clinical symptoms include vesiculation and exudation on both extensor forearms, erythematous lesions on the arms and hands, intense itching, erythema and 1 to 2 millimeter papules, distributed
Eye	Although the liquid is not thought to be an irritant (as classified by EC Directives), direct contact with the eye may produce transient discomfort characterised by tearing or conjunctival redness (as with windburn).

Continued...

Chronic	Long-term exposure to the product is not thought to produce chronic effects adverse to the health (as classified by EC Directives using animal models); nevertheless exposure by all routes should be minimised as a matter of course.

Interior Cleaner RTU

TOXICITY	IRRITATION
Not Available	Not Available

water

TOXICITY	IRRITATION
Oral (rat) LD50: >90000 mg/kg[2]	Not Available

isothiazolinones, mixed

TOXICITY	IRRITATION
dermal (rat) LD50: >1008 mg/kg[1]	Eye: adverse effect observed (irreversible damage)[1]
Oral (rat) LD50: 53 mg/kg[2]	Skin: adverse effect observed (corrosive)[1]
	Skin: adverse effect observed (irritating)[1]

Nonionic surfactant

TOXICITY	IRRITATION
Not Available	Not Available

Amphoteric surfactant

TOXICITY	IRRITATION
Not Available	Not Available

dipropylene glycol monomethyl ether

TOXICITY	IRRITATION
Dermal (rabbit) LD50: 9500 mg/kg[2]	Eye (human): 8 mg - mild
Oral (rat) LD50: 5130 mg/kg[2]	Eye (rabbit): 500 mg/24hr - mild
	Skin (rabbit): 238 mg - mild
	Skin (rabbit): 500 mg (open)-mild

propylene glycol monomethyl ether - beta isomer

TOXICITY	IRRITATION
Not Available	Not Available

3-methoxy-3-methyl-1-butanol

TOXICITY	IRRITATION
dermal (rat) LD50: >2000 mg/kg[1]	Eye: adverse effect observed (irritating)[1]
Oral (rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

methyl dihydrojasmonate

TOXICITY	IRRITATION
Oral (rat) LD50: >5000 mg/kg[2]	Not Available

alpha-hexylcinnamaldehyde

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >3000 mg/kg[2]	Skin (g.pig): 100 mg/24h-SEVERE
Oral (rat) LD50: 3100 mg/kg[2]	Skin (rabbit): 100 mg/24h -SEVERE
	Skin (rabbit): 500 mg/24h - mod

ethylene brassylene

TOXICITY	IRRITATION
dermal (rat) LD50: >5000 mg/kg[2]	Eye: irritating *
Oral (rat) LD50: >5000 mg/kg[2]	Respiratory system: irritating *
	Skin (rabbit): 500 mg/24h - mod

methyl cedryl ketone

TOXICITY	IRRITATION
Oral (rat) LD50: 5200 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Skin (rabbit): 500 mg/24h - mod
	Skin: no adverse effect observed (not irritating)[1]

benzyl acetate

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]

Continued...

	Inhalation (mammal) LC50: 489.44091 mg/l/8H[2]	Skin (rabbit): 100mg/24h-moderate
	Oral (rat) LD50: 2490 mg/kg[2]	Skin: no adverse effect observed (not irritating)[1]

p-tert-butyl-alpha-methylhydrocinnamaldehyde		
	TOXICITY	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Skin (rabbit): 500 mg/24h - mod
	Oral (rat) LD50: >1000 mg/kg[2]	

hexyl salicylate		
	TOXICITY	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral (rat) LD50: >5000 mg/kg[2]	Skin (rabbit): 100% irritant *
		Skin: no adverse effect observed (not irritating)[1]

galaxolide		
	TOXICITY	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[2]	Skin (rabbit): 500 mg/24h - mod
	Oral (rat) LD50: >3250 mg/kg[2]	

2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene		
	TOXICITY	**IRRITATION**
	Not Available	Not Available

7-acetyl-1,1,3,4,4,6-hexamethyltetraline		
	TOXICITY	**IRRITATION**
	dermal (rat) LD50: 7940 mg/kg[2]	Not Available
	Oral (rat) LD50: 570 mg/kg[2]	

dihydromyrcenol		
	TOXICITY	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Eye: adverse effect observed (irritating)[1]
	Oral (rat) LD50: 3600 mg/kg[2]	Skin (rabbit): 500 mg/24h - mild
		Skin: adverse effect observed (irritating)[1]

lyral		
	TOXICITY	**IRRITATION**
	dermal (rat) LD50: 11187 mg/kg[2]	Eye (rabbit): 100 mg - mild
	Oral (rat) LD50: 3200 mg/kg[2]	Skin (rabbit): 500 ul/4h - mild

linalool		
	TOXICITY	**IRRITATION**
	dermal (rat) LD50: 5610 mg/kg[2]	Skin (guinea pig):100mg/24h-mild
	Oral (rat) LD50: 2790 mg/kg[2]	Skin (man): 16 mg/48h-mild
		Skin (rabbit): 100 mg/24h-SEVERE
		Skin (rabbit): 500 mg/24h - mild

methylionone, isomers		
	TOXICITY	**IRRITATION**
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral (rat) LD50: >2000 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

piperonyl propanal		
	TOXICITY	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (rat) LD50: 3362 mg/kg[1]	Skin: no adverse effect observed (not irritating)[1]

3-hexenyl benzoate		
	TOXICITY	**IRRITATION**
	Not Available	Eye: no adverse effect observed (not irritating)[1]
		Skin: no adverse effect observed (not irritating)[1]

gamma-undecalactone		
	TOXICITY	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Skin (guinea pig): 100 mg/24h-mod

Continued...

	Oral (rat) LD50: 18500 mg/kg[2]	Skin (rabbit): 100 mg/24h-SEVERE

omega-pentadecalactone	TOXICITY	IRRITATION
	dermal (rat) LD50: >2000 mg/kg[1]	Eye(rabbit): 0.5% nonirritant
	Oral (rat) LD50: >2000 mg/kg[1]	

tricyclodecenyl acetate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Not Available
	Oral (rat) LD50: >5000 mg/kg[2]	

tricyclodecenyl propionate	TOXICITY	IRRITATION
	dermal (rat) LD50: >5000 mg/kg[2]	Skin (rabbit): 500 mg/4h-moderate
	Oral (rat) LD50: >5000 mg/kg[2]	

p-isopropyl-alpha-methylhydrocinnamaldehyde	TOXICITY	IRRITATION
	dermal (rat) LD50: >5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
	Oral (rat) LD50: >2000 mg/kg[1]	Skin (rabbit): 500 mg/48h - mild
		Skin: adverse effect observed (irritating)[1]

linalyl acetate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Skin (guinea pig): 100mg/24h-mod
	Oral (rat) LD50: 13934 mg/kg[2]	Skin (rabbit): 100 mg/24h-SEVERE

geraniol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Eye: adverse effect observed (irritating)[1]
	Oral (rat) LD50: 2100 mg/kg[2]	Skin (guinea pig):100mg/24hSEVERE
		Skin (man): 16 mg/24h - SEVERE
		Skin (rabbit): 100 mg/24h-SEVERE
		Skin: adverse effect observed (irritating)[1]

Precyclemone B	TOXICITY	IRRITATION
	Not Available	Not Available

cis-3-hexenyl salicylate	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >2000 mg/kg[1]	Eye: no adverse effect observed (not irritating)[1]
	Oral (rat) LD50: 3031 mg/kg[1]	Skin (rabbit): 500 mg/24h - mod
		Skin: no adverse effect observed (not irritating)[1]

linalool tetrahydride	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: >5000 mg/kg[2]	Skin (rabbit): 500 mg/24h - mod
	Oral (rat) LD50: >5000 mg/kg[2]	

beta-citronellol	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 2650 mg/kg[2]	Eye: adverse effect observed (irritating)[1]
	Oral (rat) LD50: 3450 mg/kg[2]	Skin (guin.pig): 100mg/24h-SEVERE
		Skin (man): 16 mg/48h - mod
		Skin (rabbit): 100 mg/24h-SEVERE
		Skin: adverse effect observed (irritating)[1]

citral	TOXICITY	IRRITATION
	Dermal (rabbit) LD50: 2250 mg/kg[2]	Skin (guinea pig): 1%/48h - mod
	Oral (rat) LD50: 3450 mg/kg[2]	Skin (guinea pig):100mg/24hSEVERE
		Skin (human): 40 mg/24h - mild

Continued...

	Skin (man): 16 mg/48h - SEVERE
	Skin (pig): 50 mg/24h - SEVERE
	Skin (rabbit): 100 mg/24h-SEVERE
	Skin (rabbit): 500 mg/24h - mod

orange oil

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
Oral (rat) LD50: >5000 mg/kg[2]	Skin (rabbit): 500mg/24h moderate
	Skin: no adverse effect observed (not irritating)[1]

ylang ylang oil

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >5000 mg/kg[2]	Eye: no adverse effect observed (not irritating)[1]
Oral (rat) LD50: >5000 mg/kg[2]	Skin (rabbit): 500 mg/24h - mild
	Skin: adverse effect observed (irritating)[1]

acetyl diisoamylene

TOXICITY	IRRITATION
Not Available	Not Available

6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone

TOXICITY	IRRITATION
Oral (rat) LD50: 2901 mg/kg[2]	Not Available

2,4-dimethyl-3-cyclohexene-1-carboxaldehyde

TOXICITY	IRRITATION
Not Available	Not Available

celery oil

TOXICITY	IRRITATION
Dermal (rabbit) LD50: >5000 mg/kg[2]	Not Available
Oral (rat) LD50: >5000 mg/kg[2]	

Legend: *1. Value obtained from Europe ECHA Registered Substances - Acute toxicity 2.* Value obtained from manufacturer's SDS. Unless otherwise specified data extracted from RTECS - Register of Toxic Effect of chemical Substances*

3-METHOXY-3-METHYL-1-BUTANOL

For 3-methyl-3-methoxy butanol (MMB):
Acute toxicity: In an acute dermal toxicity study with 3-methoxy-3-methyl-1-butanol (MMB) at 2000 mg/kg bw, there was no death, clinical sign or abnormality at necropsy in SD rats. The acute dermal LD50 was considered to be more than 2000 mg/kg bw. In an acute oral toxicity study [OECD TG 401], Crj:CD SD rats (5 animals/sex/dose) were given MMB by gavage at 0, 2000, 3200, 4000 or 5000 mg/kg bw for males and females. Deaths were found in males and females at 4000 mg/kg and higher. No changes in body weight were recorded for rats that died. The LD50 values were estimated to be 4500 and 4300 mg/kg bw in males and females, respectively. There is no available information on acute inhalation toxicity.
The undiluted MMB showed slight irritation to the skin after prolonged exposure in rabbits. MMB was moderately irritant to rabbit eyes.
There was no evidence of sensitisation of MMB in guinea pigs.
Repeated dose toxicity: In a repeated dose toxicity study, Crj:CD(SD)IGS rats (5 animals/sex/dose) were given MMB by gavage at 0 (vehicle: distilled water), 15, 60, 250 or 1000 mg/kg bw/day. The administration period was 28 days and the recovery period was 14 days after administration. There were no MMB-induced changes in general condition, body weight gain, food consumption, haematological findings, necropsy findings and histopathological findings. A decrease in chloride in males and females at 1000 mg/kg bw/day and increases in A/G ratio and inorganic phosphorus in males at 1000 mg/kg bw/day were detected. An increase in relative weight of the kidneys in males at 250 (11%) and 1000 mg/kg bw/day (15%) and in females at 1000 mg/kg bw/day (16%), and an increase in relative weight of the liver in males (10%) and females (13%) at 1000 mg/kg bw/day after the administration period and in males at 1000 mg/kg bw/day (7%) after the recovery period were detected. The NOAELs for repeated dose toxicity were considered to be 60 mg/kg bw/day for males and 250 mg/kg bw/day for females.
Genotoxicity: In a reverse gene mutation assay [OECD TG 471], MMB was not mutagenic in *Salmonella typhimurium* TA100, TA1535, TA98, TA1537, and TA 1538 or in *Escherichia coli* WP2 uvrA either with or without an exogenous metabolic activation. In a chromosomal aberration test [OECD TG 473], MMB did not induce structural chromosomal aberrations or polyploidy either with or without an exogenous metabolic activation. There is no available information on carcinogenicity.
Reproductive toxicity: In the reproduction/developmental toxicity screening test [OECD TG 421], Crj:CD(SD)IGS rats (12 animals/sex/dose) were given MMB by gavage at 0 (vehicle: distilled water), 8, 40, 200 or 1000 mg/kg bw/day.
Males were dosed for 47 days and females were dosed from day 14 before mating to day 4 of lactation throughout the mating and pregnancy period. Increases in absolute and relative weights of the kidney in males at 200 mg/kg bw/day and higher and relative weight of the liver and kidney in females at 1000 mg/kg bw/day were detected. No effects of MMB on reproductive and developmental parameters were observed. No external or internal malformation was found in pups at any dose. The NOAELs were considered to be 40 mg/kg bw/day in males and 200 mg/kg bw/day in females for general toxicity and 1000 mg/kg bw/day for reproductive and developmental toxicity in rats.
Developmental toxicity: In a developmental toxicity study, Crj:CD(SD) female rats (25 animals/dose) were given MMB by gavage at 0 (vehicle: deionized water), 250, 500 or 2000 mg/kg bw/day on days 6-15 of gestation. Decreased motor activity, excess salivation, ataxia, muscle flaccidity and loss of righting reflex at 2000 mg/kg bw/day and decreases in body weight gains and food consumption at 250 mg/kg bw/day and higher were observed in dams. Foetal body weights were decreased at 2000 mg/kg bw/day. No increases in embryonic/ foetal deaths and fetal malformations were detected after administration of MMB. Increases in skeletal variations and delayed ossification were found at 2000 mg/kg bw/day. The NOAELs were considered to be less than 250 mg/kg bw/day for maternal toxicity and 500 mg/kg bw/day for developmental toxicity in rats.

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METHYL DIHYDROJASMONATE	Current opinion holds that there are no safety concerns for the cyclopentanones and cyclopentenones at reported levels of use and exposure as fragrance ingredients. The cyclopentanones and cyclopentenones have low levels of toxicity and no significant toxicity in repeat dose studies. Minimal evidence of skin irritation in humans is associated with current levels of use. Some of these substances irritate the eye; however, the risk of sensitization under current levels of use is generally small. No evidence of light-mediated toxicity or sensitization has been found. Developmental toxicity was not observed, and in testing using cells from bacteria and mammals, no mutation-causing activity or genetic toxicity was seen.
ALPHA-HEXYLCINNAMALDEHYDE	These substances are generally regarded as safe. Cinnamyl derivatives are natural components of certain foods, and are found in greater amounts there than in flavouring substances. They are rapidly absorbed, broken down and eliminated in the human body, and do not have significant potential to cause genetic toxicity and mutations.
ETHYLENE BRASSYLENE	* Bedoukian MSDS
METHYL CEDRYL KETONE	for Vertofix coeur CAS No: 80449-58-7 RTECS no.: AO6270000
BENZYL ACETATE	Aryl alkyl alcohol simple acid ester derivates (AAASAE) have a low level of acute toxicity. Repeat-dose toxicity tests did not show significant toxicity. Testing did not show any evidence of AAASAE to have potential to cause cancer, mutations or genetic toxicity. At expected exposure levels, there is no evidence that AAASAE causes adverse effects on reproduction or development. In general there are currently no safety concerns regarding AAASAE at current levels of use and exposure. The aryl alkyl alcohol (AAA) fragrance ingredients have diverse chemical structures, with similar metabolic and toxicity profiles. The AAA fragrances demonstrate low acute and subchronic toxicity by skin contact and swallowing. At concentrations likely to be encountered by consumers, AAA fragrance ingredients are non-irritating to the skin. The potential for eye irritation is minimal. With the exception of benzyl alcohol, phenethyl and 2-phenoxyethyl AAA alcohols, testing in humans indicate that AAA fragrance ingredients generally have no or low sensitization potential. Available data indicate that the potential for photosensitization is low. Testing suggests that at current human exposure levels, this group of chemicals does not cause maternal or developmental toxicity. Animal testing shows no cancer-causing evidence, with little or no genetic toxicity. It has been concluded that these materials would not present a safety concern at current levels of use, as fragrance ingredients. The substance is classified by IARC as Group 3: **NOT** classifiable as to its carcinogenicity to humans. Evidence of carcinogenicity may be inadequate or limited in animal testing. Neoplastic by RTECS criteria
P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE	Paternal effects recorded
HEXYL SALICYLATE	* Bedoukian Research Inc.
GALAXOLIDE	Changes in liver weight, maternal effects, foetotoxicity reported.
2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE	The substance is an individual isomer of the fragrance ingredient OTNE [predominant isomer: 1-(1,2,3,4,5,6,7,8-octahydro-2,3,8,8-tetramethyl-2-naphthyl)ethan-1- one; synonyms - tetramethylacetyloctahydronaphthalene, Iso-E Super; other isomers: 1-(1,2,3,4,5,6,7,8-octahydro2,3,8,8,-tetramethyl-2-naphthyl)ethan-1-one, and 1,2,3,4,5,6,7,8-octahydro-2,3,8,8-tetramethyl-2-acetonaphthalenone]. A synthetic terpenoid considered to be a petroleum-derived aroma chemical No data were available regarding chemical disposition, metabolism, or toxicokinetics; acute, short term, subchronic, or chronic toxicity; synergistic or antagonistic activity; reproductive or teratological effects; carcinogenicity; genotoxicity; or immunotoxicity of OTNE Several compounds were considered as structural analogues of OTNE. Data are provided for the tetralin derivatives AHTN (CAS RN: 21145-77-7; Tonalide, 1-(5,6,7,8-tetrahydro-3,5,5,6,8,8 hexamethyl-2-naphthalenyl)ethanone) and AETT, (*CAS RN: 88-29-9; Versalide, 1-(3-ethyl-5,6,7,8-tetrahydro-5,5,8,8 tetramethyl-2-naphthalenyl)ethanone) which are also polycyclic synthetic musks. Both compounds have been detected in human adipose tissue and human milk. In one rat study, AHTN produced acute hepatic damage but in another had no adverse effects when administered to lactating rats beginning the third week of pregnancy at doses producing levels in the milk ~1000 times those reported in human milk. Administered by gavage at 50 mg/kg/day on gestation days 7 through 17, AHTN produced clinical signs and reduced weight gain and feed consumption in dams but had no adverse effect on embryo-fetal viability, growth, or morphology. In female rats, AETT induced classic degenerative changes in the liver and effects on the nucleolus and was neurotoxic. Effects included demyelination, hyperirritability, limb weakness, and gait abnormality that became severe ataxia. AHTN gave negative results in several genotoxicity studies (e.g., the Salmonella typhimurium/Escherichia coli plate incorporation and liquid preincubation assays and in vivo mouse micronucleus assays) Human Data is available ISO-E super (CAS RN: 54464-57-2): In dermatological patients, two cases of an allergic reaction towards Iso-E Super were observed on day 3 or 4 of application (patch test); however, this was not proved to be clinically relevant. Chronic exposure may result in permanent hypersensitivity] In a study with female mice, Iso E Super was positive in the local lymph node assay (LLNA) and irritancy assay (IRR), but negative in the mouse ear swelling test (MEST).
7-ACETYL-1,1,3,4,4,6-HEXAMETHYLTETRALINE	**NOTE:** Substance has been shown to be mutagenic in at least one assay, or belongs to a family of chemicals producing damage or change to cellular DNA. Liver changes, maternal effects recorded.
LYRAL	Lachrymation, somnolence, tremor recorded. 'The available data clearly demonstrate that 4-(4-hydroxy-4-methylpentyl)-3-cyclohexene-1 carboxaldehyde is an important contact allergen. In large European surveys, it has been shown that in patients with eczema 1.9 ? 2.7% react to 4-(4-hydroxy-4-methylpentyl)-3-cyclohexene-1 carboxaldehyde 5% in petrolatum on routine testing. The allergy is often relevant. The frequency of contact allergy in the general population is unknown. The proportion of individuals with eczema who are evaluated by diagnostic patch testing will depend on the accessibility of appropriate facilities within their geographical location in Europe. Therefore, the current use levels of 4-(4-hydroxy-4-methylpentyl)-3-cyclohexene-1-carboxaldehyde are unsafe as current use levels have both caused the induction and elicitation of contact allergy to it. Additionally, although the presence of it in a finished cosmetic product will be identified on ingredient labels if present at 10ppm (0.001%) in leave on products or 100ppm (0.01%) in rinse off cosmetic products, only that unknown proportion of individuals who have been clinically tested will be able to avoid cosmetics that are potentially harmful to them. Industry has recommended that 4-(4-hydroxy-4-methylpentyl)-3-cyclohexene-1-carboxaldehyde should not be used at a level greater than 1.5% in a finished cosmetic product. This recommended level far exceeds levels known to be a risk to the consumer. For lyral (HMPCC) Acute Toxicity: The acute toxicity of HMPCC was reported to be low, with oral LC50s of 3,000 to greater than 5.000 mg/kg bw in rats and dermal LC50s of greater than 5000 mg/kg bw in rabbits. Similar results were reported with the structurally related hydroxycitronellal. Exposure to statistically generated saturated vapor of HMPCC for 6 hours, resulted in no deaths, no toxicity or no remarkable gross pathological lesions in exposed male or female rats Groups of? rats were exposed in a dynamic system to up lo 558 ppm of structurally related 4,4-dimethyl-3-cyclohexenecarboxaldehyde vapour for 4 hours and observed for 14 days. Similarly groups of rats were exposed to up to 402 ppm 4,4-dimethyl-3-cyclohexenecarboxaldehyde vapour for 1 hour in a static system and observed for 14 days. Signs exhibited included lachymation, peri-oral wetness and respiratory difficulties on day of exposure. No clinical signs or macroscopic lesions were reported post exposure. Some deaths occurred on days 1 or 2 post exposure at 558 ppm: however the authors considered the deaths to be related to exposure to acrolein, a reaction precursor and contaminant, since the 1-hour rat LC50 of acrolein is 26 pprn. Therefore, no mortalities were attributed 4,4-dimethyl-3-cyclohexenecarboxaldehyde exposure. Repeat Dose Toxicity: Repeat-dose inhalation and oral studies have been conducted for

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	structural relatives of HMPCC, including 7-hydroxycitronellal, dimethyl-3-cyclohexenecarboxaldehyde, and perilla aldehyde (4-isopropenyl-1-cyclohexenecarboxyaldehyde) derivatives. Numerous animal studies have shown high dietary levels of perilla aldehyde its corresponding alcohol and acid may be protective against known animal carcinogens. The perilla aldehyde metabolite, 4-isopropenyl-1-cyclohexenecarbinol has been shown to inhibit the growth of pancreatic. mammary, and liver tumors in animals. It has been studied in animals as a chemtherapeutic agent for neuroblastoma, prostate and colon cancer, and has possible chemotherapeutic applications for skin and lung cancer Genotoxicity: The genotoxicity database on HMPCC and 7-hydroxycitronellal shows no mutagenic potential in the Ames assay. In a mammalian assay. there was no evidence of an increase in the incidence of chromosomal aberrations in the presence or absence of S9. In whole animals, the genotoxicity results for HMPCC, 7-hydroxycitronellol, and 7-hydroxycitronellal showed no evidence of an i
METHYLIONONE, ISOMERS	Beta-ionone is absorbed after oral exposure. Metabolism takes place mainly in the liver, and beta-ionone is excreted via urine. It produces abnormal liver, kidney and thyroid changes, and may cause depression and tremors. It causes dose dependent eye and skin irritation but no evidence of cancer-causing effect, nerve or genetic toxicity was observed. For ionones and rose ketones, when used as fragrance ingredients: Ionones have low to moderate toxicity if swallowed. Acute toxicity by skin contact is low. Animal testing has not shown subchronic toxicity. Under intended conditions of use as fragrance ingredients, they do not have significant potential for genetic, reproductive or developmental toxicity. Ionones are non-irritating when used as fragrance ingredients, while the rose ketones have limited irritation potential in sensitive subjects. The ionones are considered to be without significant potential to sensitise the skin, while the rose ketones are sensitisers when present at concentrations greater than 0.2%. The safety margin is considered to be high. A member or analogue of EFSA Chemical Group 10 secondary aliphatic saturated or unsaturated alcohols, ketones, ketals and esters with a secondary or tertiary oxygenated functional group used as flavourings No safety concern would arise for the consumer from the use of these compounds up to the highest proposed level in feeds. Hazards for skin and eye contact and respiratory exposure are recognised for the majority of the compounds under application. Most are classified as irritating to the respiratory system. Aliphatic acyclic and alicyclic alpha-diketones and alpha-hydroxyketones are generally used as flavouring agents up to average maximum levels of 200 ppm. In rats and mice, orally administered aliphatic alpha-diketones are rapidly absorbed from the gastrointestinal tract. It is anticipated that at low levels of exposure, humans will metabolize aliphatic acyclic alpha-diketone principally by alpha-hydroxylation and subsequent oxidation of the terminal methyl group to yield the corresponding ketocarboxylic acid. The acid may undergo oxidative decarboxylation to yield carbon dioxide and a simple aliphatic carboxylic acid, which may be completely metabolized in the fatty acid pathway and citric acid cycle. At high concentrations, another detoxification pathway is used which involves reduction to the diol and subsequent conjugation with glucuronic acid. Acyclic alpha-diketones and alpha-hydroxyketones without a terminal methyl group and alicyclic diketones and hydroxyketones are mainly metabolized by reduction to the corresponding diol, followed by glucuronic acid conjugation and excretion Compounds belonging to CG 10 are absorbed from the gastrointestinal tract and share common pathways of metabolism: (i) hydrolysis of esters by carboxylesterases, (ii) reduction of ketones to alcohols, (iii) oxidation of alcohols to acids, (iv) alpha–hydroxylation of the terminal methyl group to yield corresponding ketocarboxylic acids, (v) oxidative decarboxylation to yield carbon dioxide and an aliphatic carboxylic acid, and (vi) conjugation of alpha-hydroxyketones or their diol metabolites with glucuronic acid. Aliphatic acyclic diketones and alpha–hydroxyketones, which contain a carbonyl function at the 2-position (i.e. a methyl ketone) are expected to undergo alpha–hydroxylation and subsequent oxidation of the terminal methyl group to eventually yield corresponding ketocarboxylic acids. These compounds are intermediary metabolites (e.g.alpha-ketoacids), which may undergo oxidative decarboxylation to yield carbon dioxide and an aliphatic carboxylic acid. The acid is then metabolised via beta-oxidation and the citric acid cycle. beta-Ketoacids and derivatives readily undergo decarboxylation to yield breakdown products, which are incorporated into normal biochemical pathways. Alternatively, the methyl-substituted diketones may be successively reduced to the corresponding hydroxyketones and diols, which are excreted in the urine as glucuronic acid conjugates. This pathway is favoured at elevated in vivo concentrations, especially for longer chain length ketones. If the carbonyl function is located elsewhere on the chain, reduction is the predominant pathway. alpha-hydroxyketones or their diol metabolites may be excreted as glucuronic acid conjugates. Low concentrations of aliphatic acyclic methyl ketones are mainly metabolised by oxidation of the terminal methyl group. At higher concentrations, acyclic alpha-diketones are metabolised via a reduction pathway to the diol and subsequent conjugation with glucuronic acid In a 13-week study in rats (males/females, 15 animals/group), 3-hydroxybutan-2-one was administered with the diet at doses of 0, 85, 330 and 1,345 mg/kg bw per day. No treatment-related effects on body weight gain, haematological and urinary parameters, serum chemistry, organ weight and histopathology were seen up to 330 mg/kg bw per day. Several effects were observed at the highest dose tested, i.e. a reduction in body weight gain associated with a reduction in food and water consumption, an increase in relative liver weight and a slight anaemia. From this study, a no observed adverse effect level (NOAEL) of 330 mg/kg bw per day could be derived. A NOAEL of 90 mg/kg bw per day was derived from a 13-week study in rats (15 males/15 females each group), in which diacetyl [07.052] was administered by gavage at nominal doses of 0, 10, 30, 90 and 540 mg/kg bw per day. No adverse effects were seen at the three low doses tested on haematological and urinary parameters, serum chemistry, absolute and relative organ weight and histopathology. Several effects were observed at the highest dose tested (540 mg/kg bw), i.e. a decrease in weight gain associated with an increase in water consumption, anaemia, increased leucocyte count, increased relative weights of the liver, kidneys, adrenals and pituitary glands. At the same dose, stomach lesions seen at necropsy revealed necrosis with in filtration by inflammatory cells. A trial was conducted to assess the chronic toxicity of 3-ethylcyclopentan-1,2-dione ((due to keto-enol tautomerism this substance can exist as two isomers; the keto-isomer is 3-ethylcyclopentan-1,2-dione a synonym for the keto-isomer is ethylcyclopentenolone) on reproduction and development in rats (male and female Charles River CD-COBS) following administration to three successive generations. In each generation, rats received diet containing 3-ethylcyclopentan-1,2-dione corresponding to dose levels of 0 (untreated controls), 0 (propylene glycol vehicle), 30, 80, and 200 mg/kg body weight/day. The F0 group (20 animals/sex/treatment) entered the study at weaning and were mated on day 64. Animals from the control groups and the high-dose group were maintained on trial for 12 months. The F1 generation 50 animals/sex per treatment except control, 100 animals/sex) was exposed to the test substance in utero, via milk until weaning and then through the diet for a further 23 months. The final examination of the F1 generation included ophthalmology, clinical chemistry, haematology and a full histopathology. The F1 generation was bred twice (days 99 and 155) and 20 litters/treatment group from the first mating selected to provide the F2 generation which were in turn mated at day 84. The F3 generation were killed after weaning. Survival, food consumption, growth, reproductive performance, haematological and clinical chemistry parameters were not adversely affected. Gross pathological and histopathological examination revealed no significant treatment-related effects. The incidence of benign or malignant tumours in treated animals was not significantly different to that in controls in the F0 and F1 generations. From this study, it is concluded that ethylcyclopentan-1,2-dione was not carcinogenic in rats under the study conditions and that a NOAEL of 200 mg/kg body weight (the highest dose tested) can be derived for chronic and developmental effects. A structural alert for genotoxicity is overruled for 3-ethyl-2-hydroxy-2-cyclopenten-1-one as well as for the nine structurally related substances (alpha,beta-unsaturated alicyclic ketones and their precursors) Maltol and ethyl maltol were considered separately because in contrast to the other substances in this subgroup they contain a ring-oxygen atom. Ethyl maltol induced gene mutations in bacteria Maltol induced gene mutations in bacteria and sister chromatid exchanges (SCE) in human lymphocytes In vivo, maltol induced micronuclei in mouse bone marrow after intraperitoneal application. Negative results were obtained in a sex-linked

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	recessive lethal mutation assay in Drosophila. However, the micronucleus assay is considered more relevant than the Drosophila assay.Ethyl maltol induced gene mutations in bacteria EFSA Scientific Opinion October 2016: Safety and efficacy of secondary aliphatic saturated or unsaturated alcohols, ketones, ketals and esters with a second secondary or tertiary oxygenated functional group belonging to chemical group 10 when used as flavourings for all animal species Safety Evaluation of Aliphatic, Acyclic and Alicyclic alpha-Diketones and related Hydroxyketones; WHO Food Additive Series Joint FAO/ WHO Expert Committee on Food Additives 1999 The alpha,beta-unsaturated aldehyde and ketone structures are considered by the Panel to be structural alerts for genotoxicity. Flavouring Group Evaluation 213: alpha,beta-Unsaturated alicyclic ketones and precursors from chemical subgroup 2.7 of FGE.19: Scientific Opinion of the Panel on Food Contact Materials, Enzymes, Flavourings and Processing Aids (CEF)
3-HEXENYL BENZOATE	For benzoates: Benzyl alcohol, benzoic acid and its sodium and potassium salt have a common metabolic and excretion pathway. All but benzyl alcohol are considered to be unharmful and of low acute toxicity. They may cause slight irritation by oral, dermal or inhalation exposure except sodium benzoate which doesn't irritate the skin. Studies showed increased mortality, reduced weight gain, liver and kidney effects at higher doses, also, lesions of the brains, thymus and skeletal muscles may occur with benzyl alcohol. However, they do not cause cancer, genetic or reproductive toxicity. Developmental toxicity may occur but only at maternal toxic level.
GAMMA-UNDECALACTONE	Gamma-butyrolactone may cause thymus atrophy, brain damage, severe weakness and low body weight in rats. It causes no foetal development defects but may decrease testicular weight in the male rat. There is insufficient evidence from animal testing to show that gamma-butyrolactone has cancer-causing effects.
OMEGA-PENTADECALACTONE	Skin (rabbit): 100% slight Irritation (dermal, pig)(photoxicity study): Non irritant @ 100% Irritation (dermal)(Human max): Non irritant @ 4% Irritation (dermal, human)(single patch test): Non irritant @ 10% Sensitization (Human max.): Non sensitizing @ 10% Photo-toxicity (rabbit): Effects @ 10%, no effects @ 5% Photo-toxicity (guinea pig): Effects @ 50%, no effects @ 10% Photo-toxicity (guinea pig): No effects @ 20% Photo-toxicity (mouse): No effects @ 100% Photo-toxicity (pig): No effects @ 100% Mutagenicity (OECD 471): Non mutagenic (5 tests) Genotoxicity (Micronucleus test)(OECD 474): No effects * RIFM Monograph 502 Vigon MSDS
TRICYCLODECENYL ACETATE	There are no safety concerns regarding cyclic acetates under the present declared levels of use, for the reasons outlined below. Cyclic acetates have low acute toxicity. Cyclic acetates and cyclic alcohols also have low whole-body toxicity, after repeated application to skin. At concentrations encountered in current use, minimal, if any, skin irritation occurs. These substances have little or no sensitizing potential. Available data does not indicate that these substances cause genetic toxicity or mutations, so they are unlikely to cause cancer. They have a very wide safety margin. 8% Solution produces no irritation or sensitisation in humans. The Good Scents Company MSDS
P-ISOPROPYL-ALPHA-METHYLHYDROCINNAMALDEHYDE	Ataxia, coma, lachrymation, somnolence recorded.
GERANIOL	Geraniol does have sensitising properties, but the response it exhibits tends to be weak and variable. Animal testing revealed an oral semi-lethal dose of more than 3.6 g/kg in rats and an acute semi-lethal dose via skin absorption of over 5.0 g/kg.
LINALOOL TETRAHYDRIDE	The Branched Chain Saturated Alcohol (BCSA) group of fragrance ingredients was evaluated for safety. The fifteen materials tested have low acute toxicity. Following repeated application, seven materials had low whole-body toxicity. In humans, no evidence of skin irritation was found at concentrations of 2-10%. Undiluted, 11 materials evaluated caused moderate to severe eye irritation. As current levels encountered during use are low, eye irritation is unlikely during routine use. The materials have no or low potential to cause sensitization. For individuals who are already sensitized, an elicitation reaction is possible. The BCSA are not expected to cause light-mediated toxicity or allergy. Testing has not shown this group of materials to cause genetic toxicity. Whether this group has a cancer-promoting effect is unclear.
CITRAL	Epoxidation of double bonds is a common bioactivation pathway for alkenes. The allylic epoxides formed were found to be sensitizing. Research has shown that conjugated dienes in or in conjunction with a six-membered ring are prohaptens, while related dienes containing isolated double bonds or an acrylic conjugated diene were weak or non-sensitising. for citral Citral is rapidly absorbed from the gastrointestinal tract. Much of an applied dermal dose is lost due to its extreme volatility, but the citral remaining on the skin was fairly well absorbed. Citral is rapidly metabolised and excreted as metabolites.Urine is the major route of elimination. **Acute toxicity** of this chemical is low in rodents because the oral or dermal LD50 values were more than 1000 mg/kg. This chemical is irritating to skin and not irritating to eyes in rabbits. There is some evidence that this chemical is a human skin sensitiser. **Repeat dose toxicity:** Several repeated dose oral studies show no adverse effect of citral at less than 1,000 mg/kg/day exposure and some histological changes in the nasal cavity or forestomach, the first exposure sites, probably due to irritation, at more than 1,000 mg/kg/day. Male and female F344/N rats received microencapsulated citral in feed at concentrations of 0, 0.63, 1.25, 2.5, 5 and 10% (resultant doses: 0, 142, 285, 570, 1,140 and 2,280 mg/kg/day) for 14 days. Minimal to mild hyperplasia and/or squamous metaplasia of the respiratory epithelium was observed in nasal cavity without inflammatory response at 1,140 and 2,280 mg/kg/day of both sexes. The NOAEL was established at 570 mg/kg/day. In an OECD preliminary reproduction toxicity screening test [TG 421], citral was administered to Crj:CD (SD) rats by gavage at doses of 0, 40, 200 and 1,000 mg/kg/day in males for 46 days and in females for 39-50 days including before and through mating and gestation periods and until day 3 of lactation. Squamous hyperplasia, ulcer and granulation in lamina propria were observed in the forestomach at 1,000 mg/kg/day of both sexes. Therefore, the NOAEL for repeated dose toxicity was 200 mg/kg/day for both sexes. **Developmental toxicity**: in the above preliminary reproductive study, no effects were detected in reproductive ability, organ weights or histopathology of the reproductive organs of both sexes, and delivery or maternal behavior. However, body weights of male and female pups were reduced in the 1000 mg/kg group. Therefore, an oral NOAEL for developmental toxicity was 200 mg/kg/day. In a teratogenicity study, SD pregnant rats were exposed to citral by inhalation for 6 hr/day on gestation days 6-15 at mean concentration of 0, 10 or 34 ppm as vapour, or 68 ppm as an aerosol/vapour mixture. Even in the presence of the maternal effects, no significant teratogenicity was noted at 68 ppm. An inhalation NOAEL of teratogenicity was established at 68 ppm (423 mg/m3). **Genotoxicity:** Seven bacterial reverse mutation studies indicate negative results with and without metabolic activation. As for non-bacterial in vitro study, two chromosomal aberration results in Chinese hamster cells are negative however one positive result in sister chromatid exchange is given in the same cells. Additionally, two in vivo micronucleus tests in rodents indicate negative results. Based on the above information, the genotoxic potential of citral can be considered to be negative. **Carcinogenicity:** A NTP study shows that there was no evidence of carcinogenic activity in male/female rats and male mice but some evidence of malignant lymphoma in female mice (up to 4,000 ppm in feed in rats and up to 2,000 ppm in feed in mice). Dermal application of citral induces prostate hyperplasia with low severity only in some strains of rats. However, the NTP oral carcinogenicity studies in rats and mice found no evidence of lesions (neoplastic or non-neoplastic) in any male reproductive organ, including the prostate. The health significance of the effects seen in the dermal studies in rats is uncertain due to dramatic strain differences and it is noted that the work has primarily been performed in a single laboratory. For dienaldehydes:

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	Dienaldehydes are by-products of peroxidation of polyunsaturated lipids and commonly found in many foods or food-products. Both National Cancer Institute (NCI) and NTP have expressed great concern on the potential genotoxicity and carcinogenicity of dienaldehydes. 2,4-Decadienal and 2,4-hexadienal are autooxidation products of polyunsaturated fatty acids Several researchers have implied there could be a link between exposures to lipid peroxidation products in the diet and the development of human cancers. Lipid hydroperoxides have been shown to give rise to low intracellular levels of 2,4-decadienal and other alpha-beta-unsaturated aldehydes that are known to be reactive with DNA. Ingested lipid oxidation products and oxidized fats have been reported to cause increased excretion of mutagens, cellular injury to liver and kidneys, increased cell proliferation in the gastrointestinal tract, and other nonspecific tissue injury and irritation effects resulting from induced oxidative stress. Treatment related changes following gastric lavage administration for up to 3 months were similar for 2,4-hexadienal and 2,4-decadienal, and in both cases the forestomach and nose were identified as target organs, In two week studies of 2,4-hexadienal and 2,3 decadienal in rats and mice, forestomach lesions included necrosis and ulceration;epithelial hyperplasia was observed in rats and mice in the 2,4-hexadienal studies. In the 3-month studies of 2,4-hexadienal and 2,4-decadienal, forestomach epithelial hyperplasia and degeneration with or without chronic active inflammation occurred i addition to nasal olfactory epithelia atrophy and necrosis. Carcinogenicity and mutagenicity data from testing of dienals are limited. In the two year carcinogenicity studies, 2,4-hexadienal induced significantly increased incidences of forestomach neoplasms in rats and mice. NTP Technical Report 2,4-decadienal Trans, trans-2,4-decadienal (tt-DDE or 2,4-De), a specific type of dienaldehyde, is abundant in heated oils and has been associated with lung adenocarcinoma development in women due to their exposure to oil fumes during cooking. Cultured human bronchial epithelial cells (BEAS-2B cells) were exposed to 0.1 or 1.0 uM tt-DDE for 45 days, and oxidative stress, reactive oxygen species (ROS) production, GSH/GSSG ratio, cell proliferation, and expression of TNFalpha and IL-1beta were measured. The results show that tt-DDE induced oxidative stress, an increase in ROS production, and a decrease in GSH/GSSG ratio (glutathione status) in a dose-dependent manner. Treatment of BEAS-2B cells with 1.0 uM tt-DDE for 45 days increased cell proliferation and the expression and release of pro-inflammatory cytokines TNFalpha and IL-1beta. Cotreatment of BEAS-2B cells with antioxidant N-acetylcysteine prevented tt-DDE-induced cell proliferation and release of cytokines. Therefore, these results suggest that tt-DDE-induced changes may be due to increased ROS production and enhanced oxidative stress. Since increased cell proliferation and the release of TNF-alpha and IL-1beta are believed to be involved in tumor promotion, these results suggest that tt-DDE may play a role in cancer promotion. Previous studies on dienaldehydes have focused on their genotoxic or carcinogenic effects in the gastrointestinal tract; the present study suggests a potential new role of tt-DDE as a tumor promoter in human lung epithelial cells. Trans, Trans-2,4-Decadienal, a Product Found in Cooking Oil Fumes, Induces Cell Proliferation and Cytokine Production Due to Reactive Oxygen Species in Human Bronchial Epithelial Cells Louis W. Chang Wai-Sze Lo Pinpin Lin Toxicological Sciences, Volume 87, Issue 2, 1 October 2005, Pages 337–343, http://doi.org/10.1093/toxsci/kfi258 2,4-Decadienal is produced by the oxidation of linoleic acid. 2,4-Decadienal is found as a contaminant in water.It is generated from polyunsaturated fatty acids by the action of plant lipoxygenases and is produced in mammalian tissues in certain physiological and pathophysiological processes such as lipid peroxidation, arachidonic acid oxidation, and reactions with reactive oxygen species A member or analogue of a group of aliphatic, linear alpha,beta-unsaturated aldehydes and structurally related substances These substances are generally regarded as safe. They are found in flavouring substances in food and are rapidly absorbed and broken down in the body. - Produces maternal effects (oogenesis, ovaries, fallopian tube changes) and effects live-birth index.
ORANGE OIL	The essential oils, oleoresins (solvent-free), and natural extractives (including distillates) derived from citrus fruits are generally recognized as safe (GRAS) for their intended use in foods for human consumption. Botanicals such as citrus are comprised of hundreds of ingredients, some of which have the potential to cause toxic effects; for example, bergapten (5-methoxypsoralen; 5-MOP) is a naturally occurring furocoumarin (psoralen) in bergamot oil that causes light-mediated toxicity. Acute toxicity: Animal testing shows that the acute toxicity of these substances is generally low via skin contact. Skin irritation: In animal testing, undiluted citrus essential oils caused varying degrees of irritation. In humans, no irritation was observed after applying a variety of these oils to skin. Eye irritation: There appeared to be no significant eye irritation in testing with these substances. Sensitisation: Testing in humans have shown that these substances generally do not cause sensitisation. However, among professional food handlers, some proportion (under 10%) had positive reactions to orange and lemon peel. Light-mediated toxicity and sensitization: Testing for this group of substances has yielded mixed results. Light-mediated toxicity and sensitization have been seen in several people exposed to bergamot oil or limes/lime juice. Cancer-causing potential: Animal testing showed that essential oils of citrus fruits promoted tumours. However, most were benign. d-Limonene is readily absorbed by inhalation and swallowing. Absorption through the skin is reported to the lower than by inhalation. It is rapidly distributed to different tissues in the body, readily metabolized and eliminated, primary through the urine. Limonene shows low acute toxicity by all three routes in animals. Limonene is a skin irritant in both experimental animals and humans. Limited data is available on the potential to cause eye and airway irritation. Autooxidised products of d-limonene have the potential to sensitise the skin. Limited data is available on the potential to cause respiratory sensitization in humans. Limonene will automatically oxidize in the presence of light in air, forming a variety of oxygenated monocyclic terpenes. When contact with these oxidation products occurs, the risk of skin sensitization is high. Limonene does not cause genetic toxicity of birth defects, and it is not toxic to the reproductive system.
CELERY OIL	551liper
Interior Cleaner RTU & METHYL DIHYDROJASMONATE & ALPHA-HEXYLCINNAMALDEHYDE & METHYL CEDRYL KETONE & P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE & GALAXOLIDE & 2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE & DIHYDROMYRCENOL & LYRAL & LINALOOL & METHYLIONONE, ISOMERS & GAMMA-UNDECALACTONE & OMEGA-PENTADECALACTONE & LINALYL ACETATE & GERANIOL & LINALOOL TETRAHYDRIDE & BETA-CITRONELLOL & CITRAL & YLANG YLANG OIL & 2,4-DIMETHYL-3-CYCLOHEXENE-1-CARBOXALDEHYDE & CELERY OIL	Adverse reactions to fragrances in perfumes and fragranced cosmetic products include allergic contact dermatitis, irritant contact dermatitis, sensitivity to light, immediate contact reactions, and pigmented contact dermatitis. Airborne and connubial contact dermatitis occurs. Contact allergy is a lifelong condition, so symptoms may occur on re-exposure. Allergic contact dermatitis can be severe and widespread, with significant impairment of quality of life and potential consequences for fitness for work. If the perfume contains a sensitizing component, intolerance to perfumes by inhalation may occur. Symptoms may include general unwellness, coughing, phlegm, wheezing, chest tightness, headache, shortness of breath with exertion, acute respiratory illness, hayfever, asthma and other respiratory diseases. Perfumes can induce excess reactivity of the airway without producing allergy or airway obstruction. Breathing through a carbon filter mask had no protective effect. Occupational asthma caused by perfume substances, such as isoamyl acetate, limonene, cinnamaldehyde and benzaldehyde, tend to give persistent symptoms, even though the exposure is below occupational exposure limits. Prevention of contact sensitization to fragrances is an important objective of public health risk management. Hands: Contact sensitization may be the primary cause of hand eczema or a complication of irritant or atopic hand eczema. However hand eczema is a disease involving many factors, and the clinical significance of fragrance contact allergy in severe, chronic hand eczema may not be clear. Underarm: Skin inflammation of the armpits may be caused by perfume in deodorants and, if the reaction is severe, it may spread down the arms and to other areas of the body. In individuals who consulted a skin specialist, a history of such first-time symptoms was significantly related to the later diagnosis of perfume allergy. Face: An important manifestation of fragrance allergy from the use of cosmetic products is eczema of the face. In men, after-shave products can cause eczema around the beard area and the adjacent part of the neck. Men using wet shaving as opposed to dry have been shown to have an increased risk of allergic to fragrances. Irritant reactions: Some individual fragrance ingredients, such as citral, are known to be irritant. Fragrances may cause a dose-related contact urticaria (hives) which is not allergic; cinnamal, cinnamic alcohol and Myroxylon pereirae are known to

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	cause hives, but others, including menthol, vanillin and benzaldehyde have also been reported. Pigmentary anomalies: Type IV allergy is responsible for “pigmented cosmetic dermatitis”, referring to increased pigmentation on the face and neck. Testing showed a number of fragrance ingredients were associated, including jasmine absolute, ylang-ylang oil, cananga oil, benzyl salicylate, hydroxycitronellal, sandalwood oil, geraniol and geranium oil. Light reactions: Musk ambrette produced a number of allergic reactions mediated by light and was later banned from use in Europe. Furocoumarins (psoralens) in some plant-derived fragrances have caused phototoxic reactions, with redness. There are now limits for the amount of furocoumarins in fragrances. Phototoxic reactions still occur, but are rare. General/respiratory: Fragrances are volatile, and therefore, in addition to skin exposure, a perfume also exposes the eyes and the nose / airway. It is estimated that 2-4% of the adult population is affected by respiratory or eye symptoms by such an exposure. It is known that exposure to fragrances may exacerbate pre-existing asthma. Asthma-like symptoms can be provoked by sensory mechanisms. A significant association was found between respiratory complaints related to fragrances and contact allergy to fragrance ingredients and hand eczema.
Interior Cleaner RTU & 2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE & DIHYDROMYRCENOL & LINALOOL & METHYLIONONE, ISOMERS & LINALYL ACETATE & GERANIOL & LINALOOL TETRAHYDRIDE & BETA-CITRONELLOL & CITRAL & YLANG YLANG OIL & 2,4-DIMETHYL-3-CYCLOHEXENE-1-CARBOXALDEHYDE & CELERY OIL	Fragrance allergens act as haptens, which are small molecules that cause an immune reaction only when attached to a carrier protein. However, not all sensitizing fragrance chemicals are directly reactive, but some require previous activation. A prehapten is a chemical that itself causes little or no sensitization, but it is transformed into a hapten outside the skin by a chemical reaction (oxidation in air or reaction with light) without the requirement of an enzyme. For prehaptens, it is possible to prevent activation outside the body to a certain extent by different measures, for example, prevention of air exposure during handling and storage of the ingredients and the final product, and by the addition of suitable antioxidants. When antioxidants are used, care should be taken that they will not be activated themselves, and thereby form new sensitisers. Prehaptens: Most terpenes with oxidisable allylic positions can be expected to self-oxidise on air exposure. Depending on the stability of the oxidation products that are formed, the oxidized products will have differing levels of sensitization potential. Tests shows that air exposure of lavender oil increased the potential for sensitization. Prohaptens: Compounds that are bioactivated in the skin and thereby form haptens are referred to prohaptens. The possibility of a prohapten being activated cannot be avoided by outside measures. Activation processes increase the risk for cross-reactivity between fragrance substances. Various enzymes play roles in both activating and deactivating prohaptens. Skin-sensitizing prohaptens can be recognized and grouped into chemical classes based on knowledge of xenobiotic bioactivation reactions, clinical observations and/or studies of sensitization. QSAR prediction: Prediction of sensitization activity of these substances is complex, especially for those substances that can act both as pre- and prohaptens.
Interior Cleaner RTU & LINALYL ACETATE & YLANG YLANG OIL	Cross-reactivity is also expected between ester derivatives and their parent alcohols, as the esters will be broken down by esterases in the skin. Esters of important contact allergens that can be activated by hydrolysis in the skin are isoeugenol acetate, eugenyl acetate and geranyl acetate all of which are known to be used as fragrance ingredients.
Interior Cleaner RTU & DIPROPYLENE GLYCOL MONOMETHYL ETHER & PROPYLENE GLYCOL MONOMETHYL ETHER - BETA ISOMER	For propylene glycol ethers (PGEs): Typical propylene glycol ethers include propylene glycol n-butyl ether (PnB); dipropylene glycol n-butyl ether (DPnB); dipropylene glycol methyl ether acetate (DPMA) and tripropylene glycol methyl ether (TPM). Testing of a wide variety of propylene glycol ethers has shown that propylene glycol-based ethers are less toxic than some ethers of the ethylene series. The common toxicities associated with the lower molecular weight homologues of the ethylene series, such as adverse effects on the reproductive organs, the developing embryo and foetus, blood or thymus gland, are not seen with the commercial-grade propylene glycol ethers. In the ethylene series, metabolism of the terminal hydroxyl group produces and alkoxyacetic acid. The reproductive and developmental toxicities of the lower molecular weight homologues in the ethylene series are due specifically to the formation of methoxyacetic and ethoxyacetic acids. Longer chain homologues in the ethylene series are not associated with reproductive toxicity, but can cause haemolysis in sensitive species, also through formation of an alkoxyacetic acid. The predominant alpha isomer of all the PGEs (which is thermodynamically favoured during manufacture of PGEs) is a secondary alcohol incapable of forming an alkoxypropionic acid. In contrast, beta-isomers are able to form the alkoxypropionic acids and these are linked to birth defects (and possibly, haemolytic effects). The alpha isomer comprises more than 95% of the isomeric mixture in the commercial product, and therefore PGEs show relatively little toxicity. One of the main metabolites of the propylene glycol ethers is propylene glycol, which is of low toxicity and completely metabolized in the body. As a class, PGEs have low acute toxicity via swallowing, skin exposure and inhalation. PnB and TPM are moderately irritating to the eyes, in animal testing, while the remaining members of this category caused little or no eye irritation. None caused skin sensitization. Animal testing showed that repeat dosing caused few adverse effects. Animal testing also shows that PGEs do not cause skin effects or reproductive toxicity. Commercially available PGEs have not been shown to cause birth defects. Available instance indicates that propylene glycol ethers are unlikely to possess genetic toxicity.
WATER & ISOTHIAZOLINONES, MIXED & PROPYLENE GLYCOL MONOMETHYL ETHER - BETA ISOMER & 2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE & PIPERONYL PROPANAL & 3-HEXENYL BENZOATE & OMEGA-PENTADECALACTONE & PRECYCLEMONE B & CITRAL & ORANGE OIL & YLANG YLANG OIL & ACETYL DIISOAMYLENE & 2,4-DIMETHYL-3-CYCLOHEXENE-1-CARBOXALDEHYDE & CELERY OIL	No significant acute toxicological data identified in literature search.
ISOTHIAZOLINONES, MIXED & METHYL DIHYDROJASMONATE & ALPHA-HEXYLCINNAMALDEHYDE & METHYL CEDRYL KETONE & P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE & GALAXOLIDE & 2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE & LYRAL & LINALOOL & METHYLIONONE, ISOMERS & PIPERONYL PROPANAL & LINALYL ACETATE & GERANIOL & BETA-CITRONELLOL & CITRAL & ORANGE OIL & YLANG YLANG OIL & 6,7-DIHYDRO-1,1,2,3,3-PENTAMETHYL-4(5H)-INDANONE & 2,4-DIMETHYL-3-CYCLOHEXENE-1-CARBOXALDEHYDE & CELERY OIL	The following information refers to contact allergens as a group and may not be specific to this product. Contact allergies quickly manifest themselves as contact eczema, more rarely as urticaria or Quincke's oedema. The pathogenesis of contact eczema involves a cell-mediated (T lymphocytes) immune reaction of the delayed type. Other allergic skin reactions, e.g. contact urticaria, involve antibody-mediated immune reactions. The significance of the contact allergen is not simply determined by its sensitisation potential: the distribution of the substance and the opportunities for contact with it are equally important. A weakly sensitising substance which is widely distributed can be a more important allergen than one with stronger sensitising potential with which few individuals come into contact. From a clinical point of view, substances are noteworthy if they produce an allergic test reaction in more than 1% of the persons tested.
ISOTHIAZOLINONES, MIXED & DIPROPYLENE GLYCOL MONOMETHYL ETHER & LYRAL & P-ISOPROPYL-ALPHA-	The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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METHYLHYDROCINNAMALDEHYDE	
ISOTHIAZOLINONES, MIXED & DIPROPYLENE GLYCOL MONOMETHYL ETHER & ETHYLENE BRASSYLENE & BENZYL ACETATE & P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE & GALAXOLIDE & DIHYDROMYRCENOL & TRICYCLODECENYL PROPIONATE & P-ISOPROPYL-ALPHA-METHYLHYDROCINNAMALDEHYDE & CIS-3-HEXENYL SALICYLATE & LINALOOL TETRAHYDRIDE & 6,7-DIHYDRO-1,1,2,3,3-PENTAMETHYL-4(5H)-INDANONE	The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
ISOTHIAZOLINONES, MIXED & DIPROPYLENE GLYCOL MONOMETHYL ETHER & PROPYLENE GLYCOL MONOMETHYL ETHER - BETA ISOMER & ETHYLENE BRASSYLENE & BENZYL ACETATE & HEXYL SALICYLATE & PIPERONYL PROPANAL & 3-HEXENYL BENZOATE & GAMMA-UNDECALACTONE & LINALYL ACETATE & GERANIOL & CIS-3-HEXENYL SALICYLATE & LINALOOL TETRAHYDRIDE & BETA-CITRONELLOL & CITRAL & YLANG YLANG OIL & CELERY OIL	Asthma-like symptoms may continue for months or even years after exposure to the material ends. This may be due to a non-allergic condition known as reactive airways dysfunction syndrome (RADS) which can occur after exposure to high levels of highly irritating compound. Main criteria for diagnosing RADS include the absence of previous airways disease in a non-atopic individual, with sudden onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. Other criteria for diagnosis of RADS include a reversible airflow pattern on lung function tests, moderate to severe bronchial hyperreactivity on methacholine challenge testing, and the lack of minimal lymphocytic inflammation, without eosinophilia. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. On the other hand, industrial bronchitis is a disorder that occurs as a result of exposure due to high concentrations of irritating substance (often particles) and is completely reversible after exposure ceases. The disorder is characterized by difficulty breathing, cough and mucus production.
METHYL DIHYDROJASMONATE & ALPHA-HEXYLCINNAMALDEHYDE & METHYL CEDRYL KETONE & P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE & GALAXOLIDE & LYRAL & GAMMA-UNDECALACTONE & OMEGA-PENTADECALACTONE	Fragrance allergens act as haptens, low molecular weight chemicals that cause an immune response only when attached to a carrier protein. However, not all sensitizing fragrance chemicals are directly reactive, but require previous activation. A prehapten is a chemical that itself causes little or no sensitization, but is transformed into a hapten in the skin (bioactivation), usually via enzyme catalysis. It is not always possible to know whether a particular allergen that is not directly reactive acts as a prehapten or a prohapten , or both. Prohaptens: Compounds that are bioactivated in the skin and thereby form haptens are referred to prohaptens. The possibility of a prohapten being activated cannot be avoided by outside measures. Activation processes increase the risk for cross-reactivity between fragrance substances. Various enzymes play roles in both activating and deactivating prohaptens. Skin-sensitizing prohaptens can be recognized and grouped into chemical classes based on knowledge of xenobiotic bioactivation reactions, clinical observations and/or studies of sensitization. QSAR prediction: Prediction of sensitization activity of these substances is complex, especially for those substances that can act both as pre- and prohaptens.
ALPHA-HEXYLCINNAMALDEHYDE & P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE	Animal testing suggests that the toxicity through swallowing cinnamyl aldehyde derivatives is very low. The potential for toxicity through skin exposure is similarly low. Cinnamaldehyde and its alkyl-substituted derivatives do not directly cause mutations or genetic damage. However, animal testing suggests that they may result in poor development of the skull and kidney in the foetus.
ALPHA-HEXYLCINNAMALDEHYDE & LINALOOL & GAMMA-UNDECALACTONE & LINALYL ACETATE & GERANIOL & CITRAL	The material may cause severe skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin. Repeated exposures may produce severe ulceration.
ETHYLENE BRASSYLENE & OMEGA-PENTADECALACTONE	Current opinion holds that there are no safety concerns for the Macrocyclic Lactone and Lactide (MLs, natural and synthetic musks) derivatives at reported levels of use and exposure as fragrance ingredients. · The MLs had low acute toxicity and no significant toxicity in repeat dose oral or dermal toxicity studies. Effects on blood biochemistry were reversible after 2 weeks of no treatment · Human dermatological studies show MLs are generally not irritating after one application. Minor irritation was observed in a few individuals following multiple applications.For high end users, calculated maximum dermal exposures vary from 0.47% to 11.15%; systemic exposures vary from 0.0008 to 0.25 mg/kg/day. . · In animal studies, the MLs are not sensitizers at lower exposures from consumer products. Eleven ML materials were evaluated for human sensitization. Of these, only ethylene brassylate showed evidence of sensitization in 2/27 studies (sensitization frequency 4/2059 total). · At rates consistent with reported levels for current human exposure, no phototoxicity or photosensitization was observed. · No mutagenic or genotoxic activity in bacteria and mammalian cell line assays was observed. The common structural element of the ML group of fragrance ingredients is a mono- or diester-lactone group, R–C (=O) O–R' , contained within a macrocyclic ring of C14 to C16 carbon chain length. . The naturally occurring macrocyclic lactones are generally derived from various plant, rather than animal, sources The macrocyclic lactone fragrance ingredients are generally lipophilic and log Kow increases with increasing ring size. log Kow values range from 6.7 for the mono C16 saturated lactone oxacycloheptadec-10-ene-2-one (CAS RN 28645-51-4) to 3.65 for the saturated C14 diester ethylene dodecanedioate (CAS RN 54982-83.-1). As a class, the macrocyclic lactone fragrance ingredients have a low volatility and are not appreciably water soluble. The initial and primary metabolism would be hydrolysis of the lactone functionality to generate the corresponding long chain open carboxylic acid and alcohol which should undergo fatty acid type beta-oxidation. It is believed that all the materials in this group have similar metabolism and are detoxified in the same manner. Their toxicological profiles would, then, be similar The Research Institute for Fragrance Materials (RIFM) Expert Panel
METHYL CEDRYL KETONE & 2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE & METHYLIONONE, ISOMERS	The alkyl cyclic ketone (ACK) fragrance ingredients are a diverse group of structures with similar metabolic and toxicity profiles. ACK fragrance materials have low acute toxicity. Repeated exposure causes some adverse effects in biochemical tests and blood cell counts. They are not considered to be irritating to the skin of humans. In animals, mild to moderate eye irritation was seen; however, full recovery usually occurred. Human studies showed that ACK fragrance ingredients have low potential for sensitization. Phototoxicity and photosensitization were not demonstrated in humans. Developmental toxicity occurred only when toxicity also appeared in the mother. Tests showed that this group of substances did not cause genetic toxicity.
BENZYL ACETATE & HEXYL SALICYLATE & 3-HEXENYL BENZOATE & CIS-3-HEXENYL SALICYLATE & YLANG YLANG OIL	For certain benzyl derivatives: The members of this group are rapidly absorbed through the gastrointestinal tract, metabolised primarily in the liver, and excreted primarily in the urine either unchanged or as conjugates of benzoic acid derivatives. At high dose levels, gut micro-organisms may act to produce minor amounts of breakdown products. However, no adverse effects have been reported even at repeated high doses. Similarly, no effects were observed on reproduction, foetal development and tumour potential.

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BENZYL ACETATE & 3-HEXENYL BENZOATE	This is a member or analogue of a group of benzyl derivatives generally regarded as safe (GRAS), based partly on their self-limiting properties as flavouring substances in food. In humans and other animals, they are rapidly absorbed, broken down and excreted, with a wide safety margin. They also lack significant potential to cause genetic toxicity and mutations. The intake of benzyl derivatives as natural components of traditional foods is actually higher than the intake as intentionally added flavouring substances.
HEXYL SALICYLATE & CIS-3-HEXENYL SALICYLATE	The salicylates are well absorbed by mouth, and oral bioavailability is assumed to be total. In humans, absorption through skin is more limited. The salicylates are expected to be broken down to salicylic acid, mostly in the liver, and then conjugated with glycine or glucuronide and excreted in the urine. The expected metabolism of the salicylates do not present toxicological concerns. Animal testing shows that acute toxicity by skin contact is very low, while acute toxicity by mouth is moderate. Salicylates do not possess genetic toxicity, and generally do not have the potential to cause cancer. The reproductive and developmental toxicity data on methyl salicylate shows that high doses which are toxic to the mother may cause toxicity to the embryo and birth defects. At concentrations likely to be encountered through their use as fragrance ingredients, salicylates are considered to be non-irritating to the skin. The salicylates in general have no, or very limited, potential to sensitise skin. They do not possess light-mediated toxicity and do not cause light-mediated irritation or allergies.
GALAXOLIDE & 7-ACETYL-1,1,3,4,4,6-HEXAMETHYLTETRALINE & 6,7-DIHYDRO-1,1,2,3,3-PENTAMETHYL-4(5H)-INDANONE	There is increasing evidence emerging that some nitromusks and polycyclic musks, including those commonly used in perfumes, may be capable (either as parent compounds or as metabolites) of interfering with hormone communication systems in fish, amphibians and mammals, and may exacerbate the effects of exposure to other toxic chemicals.
DIHYDROMYRCENOL & LINALOOL & LINALYL ACETATE & LINALOOL TETRAHYDRIDE & YLANG YLANG OIL	For terpenoid tertiary alcohols and their related esters: These substances are metabolised in the liver and excreted primarily in the urine and faeces. A portion is also excreted unchanged. They have low short term toxicity when ingested or applied on the skin. However, repeated and long term use may cause dose dependent harm to both the foetus and mother.
DIHYDROMYRCENOL & LINALOOL & GERANIOL & BETA-CITRONELLOL	Current opinion holds that there are no safety concerns regarding the branched chain unsaturated non-cyclic alcohols, as fragrance ingredients, at current declared levels of use and exposure; however, use of these materials at higher maximum levels of skin or whole-body exposure requires re-evaluation. At current declared levels of use, there was no evidence or only minimal evidence of skin irritation in humans. Sensitising hydroperoxides may be formed by contact with air. It should be ensured that oxidation reactions are prevented in the end product. The use of these materials under the declared levels of use and exposure will not induce sensitization. These compounds generally have low acute toxicity. The branched chain, unsaturated alcohols tested had low whole-body toxicity after repeated application. In animals, repeated exposure at high doses caused liver changes and kidney damage. There was little or no evidence of adverse effects on fertility or development. Data on cancer-causing potential is not available, but they are not of primary concern.
DIHYDROMYRCENOL & LINALOOL & LINALOOL TETRAHYDRIDE & BETA-CITRONELLOL	Alkyl alcohols of chain length C6-13 are absorbed from skin, when inhaled or swallowed but show evidence of little harm. They are broken down and rapidly excreted by the body.
LINALOOL & CITRAL & ORANGE OIL	The terpenoid hydrocarbons are found in needle trees and deciduous plants. This category of chemicals shows very low acute toxicity. They are ecreted in the urine. They are unlikely to cause genetic damage, but animal testing shows that they do cause increased rates of kidney cancer. They have low potential to cause reproductive and developmental toxicity.
LINALOOL & LINALYL ACETATE & YLANG YLANG OIL	Inhalational exposure of mice and man to linalool caused slight sedative effects but a dose dependent response characteristic could not be determined. It may irritate the digestive tract, skin, nose and the eyes but is not considered to be a sensitiser. It is equally shown to cause kidneys and liver damage but no genetic or reproductive defect was observed.
LINALOOL & LINALYL ACETATE	Opinion holds that there are no safety concerns for linalool and the linalyl esters, as fragrance ingredients, under the present declared levels of use and exposure for the following reasons: · Linalool and the linalyl esters have a low order of acute toxicity. · No significant toxicity was observed in subchronic tests; it is concluded that these materials have dermal and oral NOAELS of 50 mg/kg/day or greater. · Based on a critical review of all available mutagenicity and genotoxicity studies,it has been determined that these materials are negative in short-term tests and therefore would have no significant potential to produce genotoxic effects. · The metabolic fate of linalool and the linalyl esters is either known or assumed from analogies with structurally related substances that indicate no production of toxic or persistent metabolites and the structural analogies indicate no concern. · Human dermatological studies show that these materials are not irritating, phototoxic or sensitizing. · These materials are used at low levels of exposure relative to doses that elicit adverse effects. The estimate for maximum systemic exposure by humans using cosmetic products is 0.3 mg/kg/ day for linalool and linalyl acetate and 0.1 mg/ kg/day or lower for the other linalyl esters. Using the NOAELs (50 mg/kg/day or greater) and the maximum exposure estimates and assuming 100% absorption,a margin of safety for the exposure of humans to linalool and the linalyl esters may conservatively be calculated as 167 times the maximum daily exposure for linalool and linalyl acetate (50 mg/kg/day 0.3 mg/kg/day for linalool or linalyl acetate=167) and 500 times the maximum daily exposure for the other individual linalyl esters (50 mg/kg/day / 0.1 mg/kg/day for the other individual linalyl esters=500). In general, linalool esters are hydrolyzed to their corresponding alcohol (linalool) and carboxylic acid. Hydrolysis is catalyzed by carboxylesterases or esterases . Tertiary alcohols such as linalool are metabolized primarily through conjugation with glucuronic acid and are excreted in the urine and to a lesser extent faeces. Alkyl or alkenyl substituents may undergo oxidation to form polar metabolites that may also be excreted free or in the conjugated form. Oxidation is mediated by cytochrome P-450 dependant mono-oxygenases. The carboxylic acids formed by hydrolysis of the linalyl esters included in this summary are all known to be easily and rapidly metabolized. The linear saturated carboxylic acids are metabolized normally as fatty acids that undergo beta-oxidation. The branched-chain carboxylic acids from linalyl isovalerate and isobutyrate are similarly oxidized,but the end product is acetone. The carboxylic acids from linalyl benzoate and phenylacetate are conjugated and excreted. The cinnamic acid from linalyl cinnamate is conjugated and excreted,or metabolized to benzoic acid. No sensitization was observed with linalool in guinea pig sensitization studies at concentrations up to 20%. With linalyl acetate at a concentration of 10%,weak to moderate sensitization effects were observed in guinea pig sensitization studies. Linalyl acetate was non-sensitizing when tested at 5% in these same guinea pig sensitization studies. No sensitization reactions were observed with linalyl isobutyrate and linalyl propionate (data were not available for the other linalyl esters) when tested at 8% in open epicutaneous tests in guinea pigs The Research Institute for Fragrance Materials (RIFM) Expert Panel
LINALOOL & LINALYL ACETATE & LINALOOL TETRAHYDRIDE	A member or analogue of a group of aliphatic and alicyclic terpenoid tertiary alcohols and structurally related substances generally regarded as safe. Animal testing suggests that the acute toxicity of tertiary alcohols and related esters is extremely low. Genetic toxicity: Tests on bacterial and animal cells showed no evidence of genetic toxicity or potential to cause mutations.
LINALOOL & GERANIOL & LINALOOL TETRAHYDRIDE & BETA-CITRONELLOL	With few exceptions* (see below), there are no safety concerns regarding certain cyclic and non-cyclic terpene alcohols **, as fragrance ingredients, under present declared levels of use and exposure, because - They have low acute toxicity - No significant toxicity was observed in repeat dose toxicity tests

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	- They were not found to cause mutations or genetic toxicity - Substances in this group are processed similarly in the body - There is no indication of persistent breakdown products causing severe toxicity - They practically do not irritate the skin - They have a generally low potential for sensitization - The margin of safety is more than 100 times the maximum daily exposure. *Safety concerns exist for the following substances for the following reasons: - 6,7-dihydrogeraniol, hydroabietyl alcohol and 2-isopropyl-2-decahydronapthalenol are potent skin sensitisers. - Farnesol is a weak sensitizer. - Scalerol and linalool may contain impurities and/or oxidation products that are strong sensitisers. - No sensitization test results were available for 2(10)-pinen-3-ol, 2,6-dimethyloct-3,5-dien-2-ol, and 3,7-dimethyl-4,6-octadien-3-ol. These materials should be regarded as potential sensitizers until tested. ** The common characteristic structural element of acyclic -noncyclic- and cyclic terpene alcohols is the typically branched isoprene unit 2-methyl-1,3-butadiene
METHYLIONONE, ISOMERS & GERANIOL	Allergic reactions involving the respiratory tract are usually due to interactions between IgE antibodies and allergens and occur rapidly. Allergic potential of the allergen and period of exposure often determine the severity of symptoms. Some people may be genetically more prone than others, and exposure to other irritants may aggravate symptoms. Allergy causing activity is due to interactions with proteins. Attention should be paid to atopic diathesis, characterised by increased susceptibility to nasal inflammation, asthma and eczema. Exogenous allergic alveolitis is induced essentially by allergen specific immune-complexes of the IgG type; cell-mediated reactions (T lymphocytes) may be involved. Such allergy is of the delayed type with onset up to four hours following exposure.
PIPERONYL PROPANAL & 6,7-DIHYDRO-1,1,2,3,3-PENTAMETHYL-4(5H)-INDANONE	* IFF MSDS
GAMMA-UNDECALACTONE & OMEGA-PENTADECALACTONE	This is a member or analogue of a group of lactones generally considered as safe (GRAS). Aliphatic lactones occur naturally at high concentrations (up to 100 parts per million) in food having a high fat content such as meat, cheese, milk and coconuts.
GERANIOL & BETA-CITRONELLOL	Citronellol, geraniol, nerol, and geranyl acetate are currently generally regarded as safe by the US FDA for their intended use as flavouring substances. They are ubiquitous in the plant kingdom. Terpenoid alcohol, formed in the gastrointestinal tract, as a result of hydrolysis, is rapidly absorbed, metabolised and excreted via the urine. It has no repeat dose effect, no genetic and cancer causing effect but may harm the unborn child of a pregnant woman.

Acute Toxicity	✗	**Carcinogenicity**	✗
Skin Irritation/Corrosion	✗	**Reproductivity**	✗
Serious Eye Damage/Irritation	✗	**STOT - Single Exposure**	✗
Respiratory or Skin sensitisation	✗	**STOT - Repeated Exposure**	✗
Mutagenicity	✗	**Aspiration Hazard**	✗

Legend: ✗ *– Data either not available or does not fill the criteria for classification*
✓ *– Data available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

Interior Cleaner RTU

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

water

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	897.520mg/L	3
EC50	96	Algae or other aquatic plants	8768.874mg/L	3

isothiazolinones, mixed

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.129mg/L	2
EC50	48	Crustacea	0.007mg/L	2
EC50	72	Algae or other aquatic plants	0.0063mg/L	2
NOEC	48	Algae or other aquatic plants	0.00049mg/L	2

Nonionic surfactant

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

Amphoteric surfactant

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

dipropylene glycol monomethyl ether

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	>1-930mg/L	2
EC50	48	Crustacea	1-930mg/L	2
EC50	72	Algae or other aquatic plants	6-999mg/L	2

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	NOEC	528	Crustacea	>=0.5mg/L	2

propylene glycol monomethyl ether - beta isomer

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1005.858mg/L	3
EC50	96	Algae or other aquatic plants	7152.973mg/L	3

3-methoxy-3-methyl-1-butanol

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	>100mg/L	2
EC50	48	Crustacea	>1-mg/L	2
EC50	72	Algae or other aquatic plants	>1-mg/L	2
NOEC	72	Algae or other aquatic plants	1-mg/L	2

methyl dihydrojasmonate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	10.243mg/L	3
EC50	48	Crustacea	8.25mg/L	2
EC50	96	Algae or other aquatic plants	0.845mg/L	3
NOEC	504	Crustacea	0.79mg/L	2

alpha-hexylcinnamaldehyde

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2.360mg/L	3
EC50	96	Algae or other aquatic plants	0.343mg/L	3

ethylene brassylene

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.23mg/L	2
EC50	48	Crustacea	3.65mg/L	2
EC50	96	Algae or other aquatic plants	0.128mg/L	3
NOEC	504	Crustacea	0.088mg/L	2

methyl cedryl ketone

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2.3mg/L	2
EC50	48	Crustacea	0.86mg/L	2
EC50	96	Algae or other aquatic plants	2.8mg/L	2
NOEC	504	Crustacea	0.087mg/L	2

benzyl acetate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	4mg/L	4
EC50	48	Crustacea	17mg/L	2
EC50	96	Algae or other aquatic plants	1.645mg/L	3
NOEC	672	Fish	0.92mg/L	4

p-tert-butyl-alpha-methylhydrocinnamaldehyde

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2.04mg/L	2
EC50	48	Crustacea	2.51mg/L	2
EC50	96	Algae or other aquatic plants	0.827mg/L	3
EC0	48	Crustacea	1.25mg/L	2
NOEC	504	Fish	0.0195mg/L	2

hexyl salicylate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.34mg/L	2
EC50	48	Crustacea	0.357mg/L	2
EC50	72	Algae or other aquatic plants	0.28mg/L	2
EC0	72	Algae or other aquatic plants	0.19mg/L	2
NOEC	24	Crustacea	0.14mg/L	2

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galaxolide

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.039mg/L	3
EC50	48	Crustacea	0.3mg/L	2
EC50	96	Algae or other aquatic plants	0.043mg/L	3
NOEC	132.0	Crustacea	0.037mg/L	2

2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

7-acetyl-1,1,3,4,4,6-hexamethyltetraline

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.033mg/L	3
EC50	96	Algae or other aquatic plants	0.037mg/L	3
NOEC	48	Fish	0.01mg/L	4

dihydromyrcenol

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	27.8mg/L	2
EC50	48	Crustacea	38mg/L	2
EC50	72	Algae or other aquatic plants	65mg/L	2
NOEC	96	Fish	<3.5mg/L	2

lyral

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	6.787mg/L	3
EC50	96	Algae or other aquatic plants	7.091mg/L	3

linalool

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.578mg/L	3
EC50	48	Crustacea	=20mg/L	1
EC50	96	Algae or other aquatic plants	88.3mg/L	2
NOEC	96	Fish	<3.5mg/L	1

methylionone, isomers

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.327mg/L	3
EC50	48	Crustacea	3.7mg/L	2
EC50	96	Algae or other aquatic plants	0.296mg/L	3
EC0	48	Crustacea	2.42mg/L	2
NOEC	96	Fish	0.85mg/L	2

piperonyl propanal

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	5.3mg/L	2
EC50	48	Crustacea	8.3mg/L	2
EC50	72	Algae or other aquatic plants	14mg/L	2
EC0	48	Crustacea	2.9mg/L	2
NOEC	96	Fish	2.4mg/L	2

3-hexenyl benzoate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2.355mg/L	3
EC50	48	Crustacea	1.5mg/L	2
EC50	96	Algae or other aquatic plants	0.202mg/L	3
NOEC	72	Algae or other aquatic plants	0.11mg/L	2

gamma-undecalactone

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	5.5mg/L	2
EC50	48	Crustacea	4mg/L	2
EC50	96	Algae or other aquatic plants	0.626mg/L	3
NOEC	504	Crustacea	0.138mg/L	2

Continued...

omega-pentadecalactone

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.219mg/L	3
EC50	48	Crustacea	>0.17mg/L	2
EC50	96	Algae or other aquatic plants	0.020mg/L	3
NOEC	792	Fish	0.027mg/L	2

tricyclodecenyl acetate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	10.213mg/L	3
EC50	96	Algae or other aquatic plants	0.839mg/L	3

tricyclodecenyl propionate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	5.992mg/L	3
EC50	96	Algae or other aquatic plants	0.501mg/L	3

p-isopropyl-alpha-methylhydrocinnamaldehyde

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.092mg/L	2
EC50	48	Crustacea	1.4mg/L	2
EC50	96	Algae or other aquatic plants	2.7mg/L	2
NOEC	96	Algae or other aquatic plants	0.2mg/L	2

linalyl acetate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.564mg/L	3
EC50	48	Crustacea	15mg/L	2
EC50	96	Algae or other aquatic plants	0.136mg/L	3
EC0	48	Crustacea	10mg/L	2
NOEC	72	Algae or other aquatic plants	9.6mg/L	2

geraniol

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.572mg/L	3
EC50	48	Crustacea	10.8mg/L	2
EC50	72	Algae or other aquatic plants	13.1mg/L	2
EC10	72	Algae or other aquatic plants	3.77mg/L	2
NOEC	72	Algae or other aquatic plants	1mg/L	2

Precyclemone B

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

cis-3-hexenyl salicylate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	3.8mg/L	2
EC50	48	Crustacea	2.7mg/L	2
EC50	72	Algae or other aquatic plants	0.28mg/L	2
EC10	72	Algae or other aquatic plants	0.19mg/L	2
NOEC	72	Algae or other aquatic plants	0.15mg/L	2

linalool tetrahydride

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.826mg/L	3
EC50	48	Crustacea	14.2mg/L	2
EC50	96	Algae or other aquatic plants	3.016mg/L	3
NOEC	96	Fish	5mg/L	2

beta-citronellol

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.928mg/L	3
EC50	48	Crustacea	17.48mg/L	2
EC50	72	Algae or other aquatic plants	2.4mg/L	2
EC20	72	Algae or other aquatic plants	1.1mg/L	2

Continued...

	NOEC	48	Crustacea	3.1mg/L	2

citral

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	4.472mg/L	3
EC50	48	Crustacea	6.8mg/L	2
EC50	96	Algae or other aquatic plants	3.938mg/L	3
EC10	96	Algae or other aquatic plants	=1.9mg/L	1
NOEC	96	Fish	4.6mg/L	1

orange oil

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	0.32mg/L	2
EC50	48	Crustacea	0.45mg/L	2
NOEC	48	Crustacea	7.5mg/L	2

ylang ylang oil

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	32mg/L	2
EC50	48	Crustacea	10.4mg/L	2

acetyl diisoamylene

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	1.381mg/L	3
EC50	96	Algae or other aquatic plants	1.378mg/L	3

6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	2.12mg/L	2
EC50	48	Crustacea	1.5mg/L	2
EC50	72	Algae or other aquatic plants	6.6mg/L	2
NOEC	72	Algae or other aquatic plants	1.4mg/L	2

2,4-dimethyl-3-cyclohexene-1-carboxaldehyde

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	6.265mg/L	3
EC50	96	Algae or other aquatic plants	12.142mg/L	3

celery oil

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
Not Available	Not Available	Not Available	Not Available	Not Available

Legend: *Extracted from 1. IUCLID Toxicity Data 2. Europe ECHA Registered Substances - Ecotoxicological Information - Aquatic Toxicity 3. EPIWIN Suite V3.12 (QSAR) - Aquatic Toxicity Data (Estimated) 4. US EPA, Ecotox database - Aquatic Toxicity Data 5. ECETOC Aquatic Hazard Assessment Data 6. NITE (Japan) - Bioconcentration Data 7. METI (Japan) - Bioconcentration Data 8. Vendor Data*

Persistence and degradability

Ingredient	Persistence: Water/Soil	Persistence: Air
water	LOW	LOW
dipropylene glycol monomethyl ether	HIGH	HIGH
propylene glycol monomethyl ether - beta isomer	LOW	LOW
3-methoxy-3-methyl-1-butanol	LOW	LOW
methyl dihydrojasmonate	LOW	LOW
alpha-hexylcinnamaldehyde	LOW	LOW
ethylene brassylene	LOW	LOW
benzyl acetate	LOW	LOW
p-tert-butyl-alpha-methylhydrocinnamaldehyde	HIGH	HIGH
hexyl salicylate	LOW	LOW
galaxolide	HIGH	HIGH
7-acetyl-1,1,3,4,4,6-hexamethyltetraline	HIGH	HIGH
dihydromyrcenol	HIGH	HIGH
lyral	HIGH	HIGH

Continued...

linalool	HIGH	HIGH
methylionone, isomers	HIGH	HIGH
piperonyl propanal	HIGH	HIGH
3-hexenyl benzoate	LOW	LOW
gamma-undecalactone	LOW	LOW
omega-pentadecalactone	LOW	LOW
tricyclodecenyl acetate	LOW	LOW
tricyclodecenyl propionate	LOW	LOW
linalyl acetate	HIGH	HIGH
geraniol	LOW	LOW
cis-3-hexenyl salicylate	LOW	LOW
linalool tetrahydride	HIGH	HIGH
beta-citronellol	LOW	LOW
citral	LOW	LOW
acetyl diisoamylene	HIGH	HIGH
2,4-dimethyl-3-cyclohexene-1-carboxaldehyde	LOW	LOW

Bioaccumulative potential

Ingredient	Bioaccumulation
water	LOW (LogKOW = -1.38)
dipropylene glycol monomethyl ether	LOW (BCF = 100)
propylene glycol monomethyl ether - beta isomer	LOW (LogKOW = -0.4891)
3-methoxy-3-methyl-1-butanol	LOW (LogKOW = 0.4555)
methyl dihydrojasmonate	LOW (LogKOW = 2.975)
alpha-hexylcinnamaldehyde	HIGH (LogKOW = 4.8208)
ethylene brassylene	HIGH (LogKOW = 4.7123)
benzyl acetate	LOW (LogKOW = 1.96)
p-tert-butyl-alpha-methylhydrocinnamaldehyde	LOW (BCF = 15)
hexyl salicylate	MEDIUM (LogKOW = 3.8035)
galaxolide	HIGH (LogKOW = 5.9183)
7-acetyl-1,1,3,4,4,6-hexamethyltetraline	HIGH (LogKOW = 6.3451)
dihydromyrcenol	LOW (LogKOW = 3.4666)
lyral	LOW (LogKOW = 3.3156)
linalool	LOW (LogKOW = 2.97)
methylionone, isomers	HIGH (LogKOW = 4.9793)
piperonyl propanal	LOW (LogKOW = 2.5125)
3-hexenyl benzoate	MEDIUM (LogKOW = 4.0687)
gamma-undecalactone	LOW (LogKOW = 3.0583)
omega-pentadecalactone	HIGH (LogKOW = 6.1539)
tricyclodecenyl acetate	LOW (LogKOW = 2.847)
tricyclodecenyl propionate	LOW (LogKOW = 3.3381)
linalyl acetate	MEDIUM (LogKOW = 3.93)
geraniol	LOW (LogKOW = 3.47)
cis-3-hexenyl salicylate	LOW (LogKOW = 3.5885)
linalool tetrahydride	LOW (LogKOW = 3.603)
beta-citronellol	MEDIUM (LogKOW = 3.91)
citral	LOW (LogKOW = 3.4453)
acetyl diisoamylene	MEDIUM (LogKOW = 3.8466)
2,4-dimethyl-3-cyclohexene-1-carboxaldehyde	LOW (LogKOW = 2.8536)

Mobility in soil

Ingredient	Mobility
water	LOW (KOC = 14.3)
dipropylene glycol monomethyl ether	LOW (KOC = 10)

Continued...

propylene glycol monomethyl ether - beta isomer	HIGH (KOC = 1)
3-methoxy-3-methyl-1-butanol	HIGH (KOC = 1)
methyl dihydrojasmonate	LOW (KOC = 142.3)
alpha-hexylcinnamaldehyde	LOW (KOC = 4025)
ethylene brassylene	LOW (KOC = 879.2)
benzyl acetate	LOW (KOC = 133.7)
p-tert-butyl-alpha-methylhydrocinnamaldehyde	LOW (KOC = 1285)
hexyl salicylate	LOW (KOC = 2736)
galaxolide	LOW (KOC = 10380)
7-acetyl-1,1,3,4,4,6-hexamethyltetraline	LOW (KOC = 8564)
dihydromyrcenol	LOW (KOC = 54.78)
lyral	LOW (KOC = 42.82)
linalool	LOW (KOC = 56.32)
methylionone, isomers	LOW (KOC = 1034)
piperonyl propanal	LOW (KOC = 56.07)
3-hexenyl benzoate	LOW (KOC = 1655)
gamma-undecalactone	LOW (KOC = 476.5)
omega-pentadecalactone	LOW (KOC = 5994)
tricyclodecenyl acetate	LOW (KOC = 805)
tricyclodecenyl propionate	LOW (KOC = 1556)
linalyl acetate	LOW (KOC = 517.9)
geraniol	LOW (KOC = 70.79)
cis-3-hexenyl salicylate	LOW (KOC = 2736)
linalool tetrahydride	LOW (KOC = 56.32)
beta-citronellol	LOW (KOC = 70.79)
citral	LOW (KOC = 147.7)
acetyl diisoamylene	LOW (KOC = 247.5)
2,4-dimethyl-3-cyclohexene-1-carboxaldehyde	LOW (KOC = 87.49)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked. A Hierarchy of Controls seems to be common - the user should investigate: ▸ Reduction ▸ Reuse ▸ Recycling ▸ Disposal (if all else fails) This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. If it has been contaminated, it may be possible to reclaim the product by filtration, distillation or some other means. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate. ▸ **DO NOT** allow wash water from cleaning or process equipment to enter drains. ▸ It may be necessary to collect all wash water for treatment before disposal. ▸ In all cases disposal to sewer may be subject to local laws and regulations and these should be considered first. ▸ Where in doubt contact the responsible authority. ▸ Recycle wherever possible or consult manufacturer for recycling options. ▸ Consult State Land Waste Authority for disposal. ▸ Bury or incinerate residue at an approved site. ▸ Recycle containers if possible, or dispose of in an authorised landfill.

SECTION 14 TRANSPORT INFORMATION

Labels Required

Marine Pollutant	NO

Land transport (DOT): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Air transport (ICAO-IATA / DGR): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Sea transport (IMDG-Code / GGVSee): NOT REGULATED FOR TRANSPORT OF DANGEROUS GOODS

Transport in bulk according to Annex II of MARPOL and the IBC code

Continued...

Not Applicable

SECTION 15 REGULATORY INFORMATION

Safety, health and environmental regulations / legislation specific for the substance or mixture

WATER IS FOUND ON THE FOLLOWING REGULATORY LISTS

IMO IBC Code Chapter 18: List of products to which the Code does not apply
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

ISOTHIAZOLINONES, MIXED IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US TSCA Section 12(b) - List of Chemical Substances Subject to Export Notification Requirements

NONIONIC SURFACTANT IS FOUND ON THE FOLLOWING REGULATORY LISTS

Not Applicable

AMPHOTERIC SURFACTANT IS FOUND ON THE FOLLOWING REGULATORY LISTS

Not Applicable

DIPROPYLENE GLYCOL MONOMETHYL ETHER IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
US - Alaska Limits for Air Contaminants
US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Idaho Toxic Air Pollutants Non- Carcinogenic Increments - Occupational Exposure Limits
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US ACGIH Threshold Limit Values (Spanish)
US ACGIH Threshold Limit Values (TLV)
US AIHA Workplace Environmental Exposure Levels (WEELs)
US Chemical Footprint Project - Chemicals of High Concern List
US Clean Air Act - Hazardous Air Pollutants
US DOE Temporary Emergency Exposure Limits (TEELs)
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
US EPCRA Section 313 Chemical List
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US NIOSH Recommended Exposure Limits (RELs)
US NIOSH Recommended Exposure Limits (RELs) (Spanish)
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US OSHA Permissible Exposure Limits - Annotated Table Z-1 (Spanish)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances
US TSCA Section 4/12 (b) - Sunset Dates/Status

PROPYLENE GLYCOL MONOMETHYL ETHER - BETA ISOMER IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US - Idaho Toxic Air Pollutants Non- Carcinogenic Increments - Occupational Exposure Limits
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants
US Chemical Footprint Project - Chemicals of High Concern List
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

3-METHOXY-3-METHYL-1-BUTANOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk
IMO MARPOL 73/78 (Annex II) - List of Other Liquid Substances
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

METHYL DIHYDROJASMONATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

ALPHA-HEXYLCINNAMALDEHYDE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

ETHYLENE BRASSYLENE IS FOUND ON THE FOLLOWING REGULATORY LISTS

Continued...

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

METHYL CEDRYL KETONE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

BENZYL ACETATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
US - California Permissible Exposure Limits for Chemical Contaminants
US ACGIH Threshold Limit Values (TLV)
US AIHA Workplace Environmental Exposure Levels (WEELs)
US Coast Guard, Department of Homeland Security Part 153: Ships Carrying Bulk Liquid, Liquefied gas or compressed gas hazardous materials. Table 1 to Part 153 --Summary of Minimum Requirements
US DOE Temporary Emergency Exposure Limits (TEELs)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

P-TERT-BUTYL-ALPHA-METHYLHYDROCINNAMALDEHYDE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

HEXYL SALICYLATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

GALAXOLIDE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US - Oregon Permissible Exposure Limits (Z-3)
US Chemical Footprint Project - Chemicals of High Concern List
US Department of Transportation (DOT), Hazardous Material Table
US OSHA Permissible Exposure Levels (PELs) - Table Z3
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

2-ACETYL-1,2,3,4,6,7,8-OCTAHYDROTETRAMETHYLNAPHTHALENE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

7-ACETYL-1,1,3,4,4,6-HEXAMETHYLTETRALINE IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US - Oregon Permissible Exposure Limits (Z-3)
US Chemical Footprint Project - Chemicals of High Concern List
US Clean Air Act - Hazardous Air Pollutants
US Coast Guard, Department of Homeland Security Part 153: Ships Carrying Bulk Liquid, Liquefied gas or compressed gas hazardous materials. Table 1 to Part 153 --Summary of Minimum Requirements
US Department of Transportation (DOT), Hazardous Material Table
US EPCRA Section 313 Chemical List
US OSHA Permissible Exposure Levels (PELs) - Table Z3
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

DIHYDROMYRCENOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

LYRAL IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

LINALOOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
International Air Transport Association (IATA) Dangerous Goods Regulations
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

Continued...

METHYLIONONE, ISOMERS IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

PIPERONYL PROPANAL IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

3-HEXENYL BENZOATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

GAMMA-UNDECALACTONE IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

OMEGA-PENTADECALACTONE IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US - Oregon Permissible Exposure Limits (Z-3)
US Department of Transportation (DOT), Hazardous Material Table
US OSHA Permissible Exposure Levels (PELs) - Table Z3
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

TRICYCLODECENYL ACETATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

TRICYCLODECENYL PROPIONATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

P-ISOPROPYL-ALPHA-METHYLHYDROCINNAMALDEHYDE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

LINALYL ACETATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

GERANIOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

PRECYCLEMONE B IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

CIS-3-HEXENYL SALICYLATE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

Continued...

LINALOOL TETRAHYDRIDE IS FOUND ON THE FOLLOWING REGULATORY LISTS

IMO IBC Code Chapter 17: Summary of minimum requirements
IMO MARPOL (Annex II) - List of Noxious Liquid Substances Carried in Bulk
IMO Provisional Categorization of Liquid Substances - List 2: Pollutant only mixtures containing at least 99% by weight of components already assessed by IMO
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Coast Guard, Department of Homeland Security Part 153: Ships Carrying Bulk Liquid, Liquefied gas or compressed gas hazardous materials. Table 1 to Part 153 --Summary of Minimum Requirements
US Department of Transportation (DOT), Hazardous Material Table
US DOT Coast Guard Bulk Hazardous Materials - List of Flammable and Combustible Bulk Liquid Cargoes
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

BETA-CITRONELLOL IS FOUND ON THE FOLLOWING REGULATORY LISTS

GESAMP/EHS Composite List - GESAMP Hazard Profiles
IMO IBC Code Chapter 17: Summary of minimum requirements
International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

CITRAL IS FOUND ON THE FOLLOWING REGULATORY LISTS

US ACGIH Threshold Limit Values (TLV)
US AIHA Workplace Environmental Exposure Levels (WEELs)
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

ORANGE OIL IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

YLANG YLANG OIL IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

ACETYL DIISOAMYLENE IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations
International Maritime Dangerous Goods Requirements (IMDG Code)
United Nations Recommendations on the Transport of Dangerous Goods Model Regulations
US Department of Transportation (DOT), Hazardous Material Table
US Postal Service (USPS) Hazardous Materials Table: Postal Service Mailability Guide
US Postal Service (USPS) Numerical Listing of Proper Shipping Names by Identification (ID) Number

6,7-DIHYDRO-1,1,2,3,3-PENTAMETHYL-4(5H)-INDANONE IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Oregon Permissible Exposure Limits (Z-3)
US OSHA Permissible Exposure Levels (PELs) - Table Z3
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

2,4-DIMETHYL-3-CYCLOHEXENE-1-CARBOXALDEHYDE IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

CELERY OIL IS FOUND ON THE FOLLOWING REGULATORY LISTS

US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Flammable (Gases, Aerosols, Liquids, or Solids)	No
Gas under pressure	No
Explosive	No
Self-heating	No
Pyrophoric (Liquid or Solid)	No
Pyrophoric Gas	No
Corrosive to metal	No
Oxidizer (Liquid, Solid or Gas)	No
Organic Peroxide	No
Self-reactive	No
In contact with water emits flammable gas	No
Combustible Dust	No
Carcinogenicity	No

Continued...

Acute toxicity (any route of exposure)	No
Reproductive toxicity	No
Skin Corrosion or Irritation	No
Respiratory or Skin Sensitization	No
Serious eye damage or eye irritation	No
Specific target organ toxicity (single or repeated exposure)	No
Aspiration Hazard	No
Germ cell mutagenicity	No
Simple Asphyxiant	No
Hazards Not Otherwise Classified	No

US. EPA CERCLA HAZARDOUS SUBSTANCES AND REPORTABLE QUANTITIES (40 CFR 302.4)

None Reported

State Regulations

US. CALIFORNIA PROPOSITION 65

None Reported

National Inventory Status

National Inventory	Status
Australia - AICS	No (isothiazolinones, mixed)
Canada - DSL	Yes
Canada - NDSL	No (acetyl diisoamylene; galaxolide; alpha-hexylcinnamaldehyde; dihydromyrcenol; 2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene; lyral; gamma-undecalactone; linalool tetrahydride; beta-citronellol; 3-hexenyl benzoate; methyl cedryl ketone; ethylene brassylene; 7-acetyl-1,1,3,4,4,6-hexamethyltetraline; hexyl salicylate; celery oil; isothiazolinones, mixed; water; linalyl acetate; orange oil; p-tert-butyl-alpha-methylhydrocinnamaldehyde; tricyclodecenyl acetate; 2,4-dimethyl-3-cyclohexene-1-carboxaldehyde; omega-pentadecalactone; methyl dihydrojasmonate; citral; dipropylene glycol monomethyl ether; cis-3-hexenyl salicylate; tricyclodecenyl propionate; ylang ylang oil; benzyl acetate; propylene glycol monomethyl ether - beta isomer; methylionone, isomers; 6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone; 3-methoxy-3-methyl-1-butanol; linalool; piperonyl propanal; p-isopropyl-alpha-methylhydrocinnamaldehyde; Precyclemone B; geraniol)
China - IECSC	Yes
Europe - EINEC / ELINCS / NLP	No (celery oil; isothiazolinones, mixed; orange oil)
Japan - ENCS	No (acetyl diisoamylene; 2-acetyl-1,2,3,4,6,7,8-octahydrotetramethylnaphthalene; celery oil; isothiazolinones, mixed; orange oil; 2,4-dimethyl-3-cyclohexene-1-carboxaldehyde; ylang ylang oil; 6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone; Precyclemone B)
Korea - KECI	No (Precyclemone B)
New Zealand - NZIoC	Yes
Philippines - PICCS	Yes
USA - TSCA	Yes
Taiwan - TCSI	Yes
Mexico - INSQ	No (alpha-hexylcinnamaldehyde; lyral; hexyl salicylate; celery oil; isothiazolinones, mixed; cis-3-hexenyl salicylate; ylang ylang oil; propylene glycol monomethyl ether - beta isomer; p-isopropyl-alpha-methylhydrocinnamaldehyde)
Vietnam - NCI	Yes
Russia - ARIPS	No (acetyl diisoamylene; 3-hexenyl benzoate; celery oil; ylang ylang oil; 6,7-dihydro-1,1,2,3,3-pentamethyl-4(5H)-indanone; Precyclemone B)
Legend:	*Yes = All CAS declared ingredients are on the inventory* *No = One or more of the CAS listed ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Revision Date	12/17/2019
Initial Date	12/18/2019

Other information

Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
The SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

Definitions and abbreviations

PC—TWA: Permissible Concentration-Time Weighted Average
PC—STEL: Permissible Concentration-Short Term Exposure Limit
IARC: International Agency for Research on Cancer
ACGIH: American Conference of Governmental Industrial Hygienists
STEL: Short Term Exposure Limit
TEEL: Temporary Emergency Exposure Limit。
IDLH: Immediately Dangerous to Life or Health Concentrations
OSF: Odour Safety Factor
NOAEL :No Observed Adverse Effect Level
LOAEL: Lowest Observed Adverse Effect Level
TLV: Threshold Limit Value
LOD: Limit Of Detection
OTV: Odour Threshold Value

Continued...

BCF: BioConcentration Factors
BEI: Biological Exposure Index

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