FLOATING ORANGE SMOKE SIGNAL 3 MINUTE

WesCom Signal and Rescue Germany GmbH

Chemwatch: **65-6263**
Version No: **3.1.1.1**
Safety Data Sheet according to OSHA HazCom Standard (2012) requirements

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SECTION 1 IDENTIFICATION

Product Identifier

Product name	FLOATING ORANGE SMOKE SIGNAL 3 MINUTE
Synonyms	Comet Lifesmoke, orange, Art.-No. 9192000, 9192007, 9192005, Pains Wessex Lifesmoke, orange, Art.-No. 9537000, 9537007, 9537250, Aurora PW 3 minutes Lifesmoke, orange, Art.-No. 9537020, 9537250
Proper shipping name	Signals, smoke
Other means of identification	Not Available

Recommended use of the chemical and restrictions on use

Relevant identified uses	Use according to manufacturer's directions. Sea distress signal. Sea distress signal providing effective position marking during rescue operations and can be used to indicate wind direction, producing dense orange smoke for a minimum of 3 minutes.

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

Registered company name	**WesCom Signal and Rescue Germany GmbH**
Address	Vieländer Weg 147 Bremerhaven 27574 Germany
Telephone	+49 471 3930
Fax	+49 471 3932 10
Website	www.wescomsignal.com
Email	info@wescomsignal.com

Emergency phone number

Association / Organisation	**Consultant Lutz Harder GmbH**
Emergency telephone numbers	+49 178 433 7434
Other emergency telephone numbers	Not Available

SECTION 2 HAZARD(S) IDENTIFICATION

Classification of the substance or mixture

Classification	Explosive Division 1.4, Eye Irritation Category 2B

Label elements

Hazard pictogram(s)	
SIGNAL WORD	**WARNING**

Hazard statement(s)

H204	Fire or projection hazard.
H320	Causes eye irritation.

Hazard(s) not otherwise specified

Not Applicable

Precautionary statement(s) Prevention

P210	Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P250	Do not subject to grinding/shock/sources of friction.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

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P240	Ground/bond container and receiving equipment.

Precautionary statement(s) Response

P370+P380	In case of fire: Evacuate area.
P372	Explosion risk in case of fire.
P374	Fight fire with normal precautions from a reasonable distance.
P373	DO NOT fight fire when fire reaches explosives.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P337+P313	If eye irritation persists: Get medical advice/attention.

Precautionary statement(s) Storage

P401	Store according to local regulations for explosives.

Precautionary statement(s) Disposal

P501	Dispose of contents/container in accordance with local regulations.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

Substances

See section below for composition of Mixtures

Mixtures

CAS No	%[weight]	Name
		device contains
		polytechnic materials of;
3811-04-9		potassium chlorate
7757-79-1		potassium nitrate
7704-34-9.		sulfur
10022-31-8		barium nitrate
7440-44-0		carbon, activated
9002-88-4		polyethylene
110-30-5		N,N'-ethylenebisstearamide
81-64-1		quinizarin

The specific chemical identity and/or exact percentage (concentration) of composition has been withheld as a trade secret.

SECTION 4 FIRST-AID MEASURES

Description of first aid measures

Eye Contact	If this product comes in contact with eyes: ▸ 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 contact occurs: ▸ Immediately remove all contaminated clothing, including footwear. ▸ Flush skin and hair with running water (and soap if available). ▸ Seek medical attention in event of irritation.
Inhalation	▸ If fumes or combustion products are inhaled remove from contaminated area. ▸ Lay patient down. Keep warm and rested. ▸ Prostheses such as false teeth, which may block airway, should be removed, where possible, prior to initiating first aid procedures. ▸ Apply artificial respiration if not breathing, preferably with a demand valve resuscitator, bag-valve mask device, or pocket mask as trained. Perform CPR if necessary. ▸ Transport to hospital, or doctor, without delay.
Ingestion	▸ Not considered a normal route of entry. ▸ If swallowed do **NOT** induce vomiting. ▸ If vomiting occurs, lean patient forward or place on left side (head-down position, if possible) to maintain open airway and prevent aspiration. ▸ Observe the patient carefully. ▸ Never give liquid to a person showing signs of being sleepy or with reduced awareness; i.e. becoming unconscious. ▸ Give water to rinse out mouth, then provide liquid slowly and as much as casualty can comfortably drink. ▸ Seek medical advice.

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

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Extinguishing media

DANGER: Deliver media remotely.
- For minor fires: Flooding quantities only.
- For large fires: **Do not** attempt to extinguish.

|Apply by mechanical means only.

Special hazards arising from the substrate or mixture

Fire Incompatibility	Avoid contact with other chemicals.

Special protective equipment and precautions for fire-fighters

Fire Fighting	**WARNING**: EXPLOSIVE MATERIALS / ARTICLES PRESENT! - Evacuate all personnel and move upwind. - Prevent re-entry. - Alert Fire Brigade and tell them location and nature of hazard. - May detonate and burning material may be propelled from fire. - Wear full-body protective clothing with breathing apparatus. - Prevent, by any means available, spillage and fire effluent from entering drains and water courses. - Fight fire from safe distances and from protected locations. - Use flooding quantities of water. - **DO NOT** approach containers or packages suspected to be hot. - Cool any exposed containers not involved in fire from a protected location. - Equipment should be thoroughly decontaminated after use. Slight hazard when exposed to heat, flame and oxidisers.
Fire/Explosion Hazard	Division 1.4 Substances, mixtures and articles which present no significant hazard: substances, mixtures and articles which present only a small hazard in the event of ignition or initiation. The effects are largely confined to the package and no projection of fragments of appreciable size or range is to be expected. An external fire shall not cause virtually instantaneous explosion of almost the entire contents of the package.

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	**WARNING!: EXPLOSIVE**. BLAST and/or PROJECTION and/or FIRE HAZARD - Clean up all spills immediately. - Avoid inhalation of the material and avoid contact with eyes and skin. - Wear impervious gloves and safety glasses. - Remove all ignition sources. - Use spark-free tools when handling. - Sweep into non-sparking containers or barrels and moisten with water. - Place spilled material in clean, sealable, labelled container for disposal. - Flush area with large amounts of water.
Major Spills	**WARNING!**: EXPLOSIVE. - Clear area of personnel and move upwind. - Alert Fire Brigade and tell them location and nature of hazard. - May be violently or explosively reactive. - Wear full body protective clothing with breathing apparatus. - Consider evacuation (or protect in place). - In case of transport accident notify Police, Emergency Authority, Competent Explosives Authority or Manufacturer. - No smoking, naked lights, heat or ignition sources. - Increase ventilation. - Use extreme caution to prevent physical shock. - Use only spark-free shovels and explosion-proof equipment. - Collect recoverable material and segregate from spilled material. - Wash spill area with large quantities of water.

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

SECTION 7 HANDLING AND STORAGE

Precautions for safe handling

Safe handling	- Handle gently. Use good occupational work practice. - Observe manufacturer's storage and handling recommendations contained within this SDS. - Avoid all personal contact, including inhalation. - Avoid smoking, naked lights, heat or ignition sources. - Explosives must not be struck with metal implements. - Avoid mechanical and thermal shock and friction. - Use in a well ventilated area. - Avoid contact with incompatible materials. - When handling **DO NOT** eat, drink or smoke. - Avoid physical damage to containers. - Always wash hands with soap and water after handling. - Work clothes should be laundered separately.

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Other information	▸ Store cases in a well ventilated magazine licensed for the appropriate Class, Division and Compatibility Group. ▸ Rotate stock to prevent ageing. Use on FIFO (first in-first out) basis. ▸ Observe manufacturer's storage and handling recommendations contained within this SDS. ▸ Store in a cool place in original containers. ▸ Keep containers securely sealed. ▸ No smoking, naked lights, heat or ignition sources. ▸ Store in an isolated area away from other materials. ▸ Keep storage area free of debris, waste and combustibles. ▸ Protect containers against physical damage. ▸ Check regularly for spills and leaks **NOTE**: If explosives need to be destroyed contact the Competent Authority. ▸ Store away from incompatible materials. Keep out of reach of children.

Conditions for safe storage, including any incompatibilities

Suitable container	▸ All packaging for Class 1 Goods shall be in accordance with the requirements of the relevant Code for the transport of Dangerous Goods. ▸ Class 1 is unique in that the type of packaging used frequently has a very decisive effect on the hazard and therefore on the assignment to a particular division
Storage incompatibility	▸ Avoid contact with other explosives, pyrotechnics, solvents, adhesives, paints, cleaners and unauthorized metals, plastics, packing equipment and materials. ▸ Avoid contamination with acids, alkalis, reducing agents, amines and phosphorus. ▸ Explosion hazard may follow contact with incompatible materials

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)	barium nitrate	Barium dinitrate, Barium(II) nitrate (1:2), Barium salt of nitric acid	0.5 mg/m3	Not Available	Not Available	[*Note: The REL also applies to other soluble barium compounds (as Ba) except Barium sulfate.]
US ACGIH Threshold Limit Values (TLV)	barium nitrate	Barium and soluble compounds, as Ba(1990)	0.5 mg/m3	Not Available	Not Available	TLV® Basis: Eye, skin, & GI irr; muscular stim
US OSHA Permissible Exposure Levels (PELs) - Table Z1	carbon, activated	Graphite, synthetic - Respirable fraction	5 mg/m3	Not Available	Not Available	Not Available
US OSHA Permissible Exposure Levels (PELs) - Table Z1	carbon, activated	Graphite, synthetic	15 mg/m3	Not Available	Not Available	Total dust

EMERGENCY LIMITS

Ingredient	Material name	TEEL-1	TEEL-2	TEEL-3
potassium chlorate	Potassium chlorate	5.6 mg/m3	62 mg/m3	370 mg/m3
potassium nitrate	Potassium nitrate	9 mg/m3	100 mg/m3	600 mg/m3
sulfur	Sulfur	30 mg/m3	330 mg/m3	2,000 mg/m3
barium nitrate	Barium nitrate	2.9 mg/m3	350 mg/m3	2,100 mg/m3
carbon, activated	Carbon; (Graphite, synthetic)	6 mg/m3	16 mg/m3	95 mg/m3
polyethylene	Polyethylene	28 mg/m3	310 mg/m3	1,000 mg/m3

Ingredient	Original IDLH	Revised IDLH
potassium chlorate	Not Available	Not Available
potassium nitrate	Not Available	Not Available
sulfur	Not Available	Not Available
barium nitrate	50 mg/m3	Not Available
carbon, activated	Not Available	Not Available
polyethylene	Not Available	Not Available
N,N'-ethylenebisstearamide	Not Available	Not Available
quinizarin	Not Available	Not Available

MATERIAL DATA

Exposure controls

Appropriate engineering controls	Engineering controls for explosive articles are designed to reduce or eliminate fragmentation and/or blast effects either by suppression of the source of detonation or by protection at the exposed location, or both. Barricades, shields, contained detonation chambers, and “zero quantity-distance (Q-D)” magazines are examples of engineering controls. Engineering controls are designed and tested in a rigorous fashion. The construction of the engineering control must be carefully duplicated in field applications to assure it will function properly. It is thus imperative that engineering controls be built exactly in accordance with the design package, and that they be used only for the articles (e.g.munitions) for which they are authorised.

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Personal protection	
Eye and face protection	▸ Safety glasses with side shields ▸ Chemical goggles
Skin protection	See Hand protection below
Hands/feet protection	▸ Wear chemical protective gloves, e.g. PVC. ▸ Wear safety footwear or safety gumboots, e.g. Rubber
Body protection	See Other protection below
Other protection	▸ Fire resistant/ heat resistant gloves where practical, otherwise ▸ Heavy-duty chemically resistant gloves capable of providing short-term protection against spontaneous ignition. ▸ Safety footwear Hard hat |Ear Protection.
Thermal hazards	Not Available

Respiratory protection

Particulate. (AS/NZS 1716 & 1715, EN 143:2000 & 149:001, 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	-AUS P2	-	-PAPR-AUS / Class 1 P2
up to 50 x ES	-	-AUS / Class 1 P2	-
up to 100 x ES	-	-2 P2	-PAPR-2 P2 ^

^ - 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)

Respiratory protection not normally required due to the physical form of the product.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Orange/yellow outer metal casing pressed with black/grey polytechnical ingredients.

Physical state	Manufactured	**Relative density (Water = 1)**	Not Applicable
Odour	Not Available	**Partition coefficient n-octanol / water**	Not Available
Odour threshold	Not Available	**Auto-ignition temperature (°C)**	Not Available
pH (as supplied)	Not Applicable	**Decomposition temperature**	>160
Melting point / freezing point (°C)	Not Applicable	**Viscosity (cSt)**	Not Applicable
Initial boiling point and boiling range (°C)	Not Applicable	**Molecular weight (g/mol)**	Not Applicable
Flash point (°C)	160	**Taste**	Not Available
Evaporation rate	Not Applicable	**Explosive properties**	Not Available
Flammability	Not Applicable	**Oxidising properties**	Not Available
Upper Explosive Limit (%)	Not Available	**Surface Tension (dyn/cm or mN/m)**	Not Applicable
Lower Explosive Limit (%)	Not Available	**Volatile Component (%vol)**	Not Applicable
Vapour pressure (kPa)	Not Applicable	**Gas group**	Not Available
Solubility in water (g/L)	Immiscible	**pH as a solution (1%)**	Not Applicable
Vapour density (Air = 1)	Not Applicable	**VOC g/L**	Not Available

SECTION 10 STABILITY AND REACTIVITY

Reactivity	See section 7
Chemical stability	▸ Presence of shock and friction ▸ Presence of heat source and ignition source ▸ Product is considered stable under normal handling conditions. ▸ Stable under normal storage conditions. ▸ Hazardous polymerization will not occur. Avoid contact with other chemicals.
Possibility of hazardous reactions	See section 7
Conditions to avoid	See section 7

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Incompatible materials	See section 7
Hazardous decomposition products	See section 5

SECTION 11 TOXICOLOGICAL INFORMATION

Information on toxicological effects

Inhaled	Not normally a hazard due to physical form of product. Inhalation of vapour is more likely at higher than normal temperatures. The vapour is discomforting
Ingestion	Not normally a hazard due to physical form of product. Considered an unlikely route of entry in commercial/industrial environments
Skin Contact	Not normally a hazard due to physical form of product. The vapour is discomforting
Eye	Not normally a hazard due to physical form of product. The vapour is discomforting
Chronic	▸ Generally not applicable. |Principal hazards are related to the explosive/ decomposition by products, if inadvertently discharged or launched without adequate control and safety measures in place. Normal exposure to the article by all route is considered to be practically non-harmful.

FLOATING ORANGE SMOKE SIGNAL 3 MINUTE	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
potassium chlorate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Not Available
	Oral (rat) LD50: 1870 mg/kg[2]	
potassium nitrate	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >5000 mg/kg[1]	Not Available
	Oral (rat) LD50: >2000 mg/kg[1]	
sulfur	**TOXICITY**	**IRRITATION**
	dermal (rat) LD50: >2000 mg/kg[1]	Eye (human): 8 ppm irritant
	Inhalation (rat) LC50: >5.43 mg/l4 h[1]	
	Oral (rat) LD50: >2000 mg/kg[1]	
barium nitrate	**TOXICITY**	**IRRITATION**
	Oral (rat) LD50: 355 mg/kg[2]	Eye (rabbit):100 mg/24h - moderate
		Skin (rabbit): 500 mg/24h - mild
carbon, activated	**TOXICITY**	**IRRITATION**
	Not Available	Not Available
polyethylene	**TOXICITY**	**IRRITATION**
	Dermal (rabbit) LD50: >2000 mg/kg[2]	Not Available
	Inhalation (mouse) LC50: 1.5 mg/l/30m[2]	
	Oral (rat) LD50: >3000 mg/kg[2]	
N,N'-ethylenebisstearamide	**TOXICITY**	**IRRITATION**
	Oral (mouse) LD50: >20000 mg/kg[2]	Non-irritant
		Skin (rabbit) patch in PEG400
		Slight irritant
quinizarin	**TOXICITY**	**IRRITATION**
	Oral (rat) LD50: >5000 mg/kg[2]	Eye (rabbit): 500 mg/24h - mild

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*

BARIUM NITRATE	The material may produce moderate eye irritation leading to inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis. The material may cause skin irritation after prolonged or repeated exposure and may produce a contact dermatitis (nonallergic). This form of dermatitis is often characterised by skin redness (erythema) and swelling epidermis. Histologically there may be intercellular oedema of the spongy layer (spongiosis) and intracellular oedema of the epidermis.

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CARBON, ACTIVATED	No significant acute toxicological data identified in literature search. 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.
N,N'-ETHYLENEBISSTEARAMIDE	Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. 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. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production. For Fatty Nitrogen Derived (FND) Amides (including several high molecular weight alkyl amino acid amides) The chemicals in the Fatty Nitrogen Derived (FND) Amides of surfactants are similar to the class in general as to physical/chemical properties, environmental fate and toxicity. Human exposure to these chemicals is substantially documented. The Fatty nitrogen-derived amides (FND amides) comprise four categories: Subcategory I: Substituted Amides Subcategory II: Fatty Acid Reaction Products with Amino Compounds (Note: Subcategory II chemicals, in many cases, contain Subcategory I chemicals as major components) Subcategory III: Imidazole Derivatives Subcategory IV: FND Amphoterics Acute Toxicity: The low acute oral toxicity of the FND Amides is well established across all Subcategories by the available data. The limited acute toxicity of these chemicals is also confirmed by four acute dermal and two acute inhalation studies. Repeated Dose and Reproductive Toxicity: Two subchronic toxicity studies demonstrating low toxicity are available for Subcategory I chemicals. In addition, a 5-day repeated dose study for a third chemical confirmed the minimal toxicity of these chemicals. Since the Subcategory I chemicals are major components of many Subcategory II chemicals, and based on the low repeat-dose toxicity of the amino compounds (e.g. diethanolamine, triethanolamine) used for producing the Subcategory II derivatives, the Subcategory I repeat-dose toxicity studies adequately support Subcategory II. Two subchronic toxicity studies in Subcategory III confirmed the low order of repeat dose toxicity for the FND Amides Imidazole derivatives. For Subcategory IV, two subchronic toxicity studies for one of the chemicals indicated a low order of repeat-dose toxicity for the FND amphoteric salts similar to that seen in the other categories. Genetic Toxicity in vitro: Based on the lack of effect of one or more chemicals in each subcategory, adequate data for mutagenic activity as measured by the Salmonella reverse mutation assay exist for all of the subcategories. Developmental Toxicity: A developmental toxicity study in Subcategory I and in Subcategory IV and a third study for a chemical in Subcategory III are available. The studies indicate these chemicals are not developmental toxicants, as expected based on their structures, molecular weights, physical properties and knowledge of similar chemicals. As above for repeat-dose toxicity, the data for Subcategory I are adequate to support Subcategory II. In evaluating potential toxicity of the FND Amides chemicals, it is also useful to review the available data for the related FND Cationic and FND Amines Category chemicals. Acute oral toxicity studies (approximately 80 studies for 40 chemicals in the three categories) provide LD50 values from approximately 400 to 10,000 mg/kg with no apparent organ specific toxicity. Similarly, repeated dose toxicity studies (approximately 35 studies for 15 chemicals) provide NOAELs between 10 and 100 mg/kg/day for rats and slightly lower for dogs. More than 60 genetic toxicity studies (in vitro bacterial and mammalian cells as well as in vivo studies) indicated no mutagenic activity among more than 30 chemicals tested. For reproductive evaluations, 14 studies evaluated reproductive endpoints and/or reproductive organs for 11 chemicals, and 15 studies evaluated developmental toxicity for 13 chemicals indicating no reproductive or developmental effects for the FND group as a whole. Some typical applications of FND Amides are: masonry cement additive; curing agent for epoxy resins; closed hydrocarbon systems in oil field production, refineries and chemical plants; and slip and antiblocking additives for polymers. The safety of the FND Amides to humans is recognised by the U.S. FDA, which has approved stearamide, oleamide and/or erucamide for adhesives; coatings for articles in food contact; coatings for polyolefin films; defoaming agents for manufacture of paper and paperboard; animal glue (defoamer in food packaging); in EVA copolymers for food packaging; lubricants for manufacture of metallic food packaging; irradiation of prepared foods; release agents in manufacture of food packaging materials, food contact surface of paper and paperboard; cellophane in food packaging; closure sealing gaskets; and release agents in polymeric resins and petroleum wax. The low order of toxicity indicates that the use of FND Amides does not pose a significant hazard to human health. The differences in chain length, degree of saturation of the carbon chains, source of the natural oils, or addition of an amino group in the chain would not be expected to have an impact on the toxicity profile. This conclusion is supported by a number of studies in the FND family of chemicals (amines, cationics, and amides as separate categories) that show no differences in the length or degree of saturation of the alkyl substituents and is also supported by the limited toxicity of these long-chain substituted chemicals. Fatty acid amides (FAA) are ubiquitous in household and commercial environments. The most common of these are based on coconut oil fatty acids alkanolamides. These are the most widely studied in terms of human exposure. Fatty acid diethanolamides (C8-C18) are classified by Comite Europeen des Agents de Surface et de leurs Intermediaires Organiques (CESIO) as Irritating (Xi) with the risk phrases R38 (Irritating to skin) and R41 (Risk of serious damage to eyes). Fatty acid monoethanolamides are classified as Irritant (Xi) with the risk phrases R41 Several studies of the sensitization potential of cocoamide diethanolamide (DEA) indicate that this FAA induces occupational allergic contact dermatitis and a number of reports on skin allergy patch testing of cocoamide DEA have been published. These tests indicate that allergy to cocoamide DEA is becoming more common. Alkanolamides are manufactured by condensation of diethanolamine and the methylester of long chain fatty acids. Several alkanolamides (especially secondary alkanolamides) are susceptible to nitrosamine formation which constitutes a potential health problem. Nitrosamine contamination is possible either from pre-existing contamination of the diethanolamine used to manufacture cocoamide DEA, or from nitrosamine formation by nitrosating agents in formulations containing cocoamide DEA. According to the Cosmetic Directive (2000) cocoamide DEA must not be used in products with nitrosating agents because of the risk of formation of N-nitrosamines. The maximum content allowed in cosmetics is 5% fatty acid dialkanolamides, and the maximum content of N-nitrosodialkanolamines is 50 mg/kg. The preservative 2-bromo-2-nitropropane-1,3-diol is a known nitrosating agent for secondary and tertiary amines or amides. Model assays have indicated that 2-bromo-2-nitropropane-1,3-diol may lead to the N-nitrosation of diethanolamine forming the carcinogenic compound, N-nitrosodiethanolamine which is a potent liver carcinogen in rats (IARC 1978). Several FAAs have been tested in short-term genotoxicity assays. No indication of any potential to cause genetic damage was seen Lauramide DEA was tested in mutagenicity assays and did not show mutagenic activity in *Salmonella typhimurium* strains or in hamster embryo cells. Cocoamide DEA was not mutagenic in strains of *Salmonella typhimurium* when tested with or without metabolic activation Environmental and Health Assessment of Substances in Household Detergents and Cosmetic Detergent Products, Environment Project, 615, 2001. Miljoministeriet (Danish Environmental Protection Agency)

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QUINIZARIN	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. The material may be irritating to the eye, with prolonged contact causing inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.

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 available but does not fill the criteria for classification*
✔ *– Data available to make classification*
⊘ *– Data Not Available to make classification*

SECTION 12 ECOLOGICAL INFORMATION

Toxicity

FLOATING ORANGE SMOKE SIGNAL 3 MINUTE

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

potassium chlorate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	=13000mg/L	1
EC50	72	Algae or other aquatic plants	1.9mg/L	4
NOEC	72	Algae or other aquatic plants	<0.5mg/L	4

potassium nitrate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	22.5mg/L	4

sulfur

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	<14mg/L	4
EC50	48	Crustacea	>5000mg/L	4
NOEC	504	Crustacea	>0.0025mg/L	2

barium nitrate

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
LC50	96	Fish	>3.5mg/L	2
EC50	72	Algae or other aquatic plants	>1.92mg/L	2
NOEC	72	Algae or other aquatic plants	>=1.92mg/L	2

carbon, activated

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

polyethylene

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

N,N'-ethylenebisstearamide

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

quinizarin

ENDPOINT	TEST DURATION (HR)	SPECIES	VALUE	SOURCE
EC50	48	Crustacea	0.029477344mg/L	4
EC50	72	Algae or other aquatic plants	0.044mg/L	2
NOEC	72	Algae or other aquatic plants	0.00757mg/L	2

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

Continued...

potassium chlorate	HIGH	HIGH
potassium nitrate	LOW	LOW
sulfur	LOW	LOW
polyethylene	LOW	LOW
N,N'-ethylenebisstearamide	HIGH	HIGH
quinizarin	HIGH	HIGH

Bioaccumulative potential

Ingredient	Bioaccumulation
potassium chlorate	LOW (LogKOW = -4.6296)
potassium nitrate	LOW (LogKOW = 0.209)
sulfur	LOW (LogKOW = 0.229)
polyethylene	LOW (LogKOW = 1.2658)
N,N'-ethylenebisstearamide	LOW (BCF = 6.2)
quinizarin	MEDIUM (LogKOW = 3.938)

Mobility in soil

Ingredient	Mobility
potassium chlorate	LOW (KOC = 35.04)
potassium nitrate	LOW (KOC = 14.3)
sulfur	LOW (KOC = 14.3)
polyethylene	LOW (KOC = 14.3)
N,N'-ethylenebisstearamide	LOW (KOC = 5754000000)
quinizarin	LOW (KOC = 507.7)

SECTION 13 DISPOSAL CONSIDERATIONS

Waste treatment methods

Product / Packaging disposal	▸ Explosives must not be thrown away, buried, discarded or placed with garbage. ▸ Explosives which are surplus, deteriorated or considered unsafe for transport, storage or use shall be destroyed and the statutory authorities shall be notified. ▸ This material may be disposed of by burning or detonation but the operation may only be performed under the control of a person trained in the safe destruction of explosives. Refer to local Waste Disposal Authority and supplier for suitable disposal procedure.

SECTION 14 TRANSPORT INFORMATION

Labels Required

	
Marine Pollutant	NO

Land transport (DOT)

UN number	0507
UN proper shipping name	Signals, smoke
Transport hazard class(es)	Class: 1.4S Subrisk: Not Applicable
Packing group	Not Applicable
Environmental hazard	Not Applicable
Special precautions for user	Hazard Label: 1.4S Special provisions: Not Applicable

Air transport (ICAO-IATA / DGR)

UN number	0507
UN proper shipping name	Signals, smoke
Transport hazard class(es)	ICAO/IATA Class: 1.4S ICAO / IATA Subrisk: Not Applicable

Continued...

	ERG Code	3L
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	Special provisions	Not Applicable
	Cargo Only Packing Instructions	135
	Cargo Only Maximum Qty / Pack	100 kg
	Passenger and Cargo Packing Instructions	135
	Passenger and Cargo Maximum Qty / Pack	25 kg
	Passenger and Cargo Limited Quantity Packing Instructions	Forbidden
	Passenger and Cargo Limited Maximum Qty / Pack	Forbidden

Sea transport (IMDG-Code / GGVSee)

UN number	0507	
UN proper shipping name	SIGNALS, SMOKE	
Transport hazard class(es)	IMDG Class	1.4S
	IMDG Subrisk	Not Applicable
Packing group	Not Applicable	
Environmental hazard	Not Applicable	
Special precautions for user	EMS Number	F-B , S-X
	Special provisions	Not Applicable
	Limited Quantities	0

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

Not Applicable

SECTION 15 REGULATORY INFORMATION

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

POTASSIUM CHLORATE(3811-04-9) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
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

POTASSIUM NITRATE(7757-79-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Massachusetts - Right To Know Listed Chemicals
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US EPCRA Section 313 Chemical List
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

SULFUR(7704-34-9.) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
US - Tennessee Occupational Exposure Limits - 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 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

BARIUM NITRATE(10022-31-8) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US - Alaska Limits for Air Contaminants
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Limits for Air Contaminants
US - Massachusetts - Right To Know Listed Chemicals
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
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 (TLV)
US ACGIH Threshold Limit Values (TLV) - Carcinogens
US ATSDR Minimal Risk Levels for Hazardous Substances (MRLs)
US EPA Carcinogens Listing
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 OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

Continued...

CARBON, ACTIVATED(7440-44-0) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Air Transport Association (IATA) Dangerous Goods Regulations - Prohibited List Passenger and Cargo Aircraft
US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs)
US - California Permissible Exposure Limits for Chemical Contaminants
US - Hawaii Air Contaminant Limits
US - Idaho - Toxic and Hazardous Substances - Mineral Dust
US - Michigan Exposure Limits for Air Contaminants
US - Minnesota Permissible Exposure Limits (PELs)
US - Oregon Permissible Exposure Limits (Z-1)
US - Pennsylvania - Hazardous Substance List
US - Rhode Island Hazardous Substance List
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 - Washington Permissible exposure limits of air contaminants
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants
US List of Active Substances Exempt from the TSCA Inventory Notifications (Active-Inactive) Rule
US OSHA Permissible Exposure Levels (PELs) - Table Z1
US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory
US TSCA Chemical Substance Inventory - Interim List of Active Substances

POLYETHYLENE(9002-88-4) IS FOUND ON THE FOLLOWING REGULATORY LISTS

International Agency for Research on Cancer (IARC) - Agents Classified by the IARC Monographs
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

N,N'-ETHYLENEBISSTEARAMIDE(110-30-5) 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

QUINIZARIN(81-64-1) IS FOUND ON THE FOLLOWING REGULATORY LISTS

US Clean Air Act - Hazardous Air Pollutants
US EPCRA Section 313 Chemical List
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

Federal Regulations

Superfund Amendments and Reauthorization Act of 1986 (SARA)

SECTION 311/312 HAZARD CATEGORIES

Immediate (acute) health hazard	Yes
Delayed (chronic) health hazard	No
Fire hazard	No
Pressure hazard	Yes
Reactivity hazard	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
Australia - AICS	Y
Canada - DSL	Y
Canada - NDSL	N (polyethylene; sulfur; barium nitrate; carbon, activated; quinizarin; potassium chlorate; potassium nitrate; N,N'-ethylenebisstearamide)
China - IECSC	Y
Europe - EINEC / ELINCS / NLP	N (polyethylene)
Japan - ENCS	N (sulfur; carbon, activated)
Korea - KECI	Y
New Zealand - NZIoC	Y
Philippines - PICCS	Y
USA - TSCA	Y
Legend:	*Y = All ingredients are on the inventory* *N = Not determined or one or more ingredients are not on the inventory and are not exempt from listing(see specific ingredients in brackets)*

SECTION 16 OTHER INFORMATION

Other information

Ingredients with multiple cas numbers

Name	CAS No
barium nitrate	10022-31-8, 34053-87-7

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.

Continued...

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
BCF: BioConcentration Factors
BEI: Biological Exposure Index