

# Safety Data Sheet

## AKCELA N.1 ENGINE OIL 15W-40 CJ-4

Revision Date: 20/3/2019

version 2



### 1. IDENTIFICATION

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#### GHS PRODUCT IDENTIFIER

MIXTURE IDENTIFICATION:

TRADE NAME:

**AKCELA N.1 ENGINE OIL 15W-40 CJ-4**

TRADE CODE: 74501

#### RECOMMENDED USE OF THE CHEMICAL AND RESTRICTIONS ON USE

RECOMMENDED USE:

Engine oil.

USES ADVISED AGAINST:

This product should not be used for other purposes than those specified without the advice of an expert.

#### SUPPLIER'S DETAILS

COMPANY:

PLI AUSTRALIA PTY. LIMITED

Suite 2, Level 6,

85 George Street

Parramatta, NSW 2150

Australia

Telephone: 1800 834 081

COMPETENT PERSON FOR SAFETY DATA OF PRODUCT:

Information on the legislation compliance [info-regulation.eu@pli-petronas.com](mailto:info-regulation.eu@pli-petronas.com)

#### EMERGENCY PHONE NUMBER

Emergency Answer Service (24/24 h, 7/7 d):

+61 2 8014 4558

18000 74234 (access from Australia only)

### 2. HAZARD IDENTIFICATION

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#### CLASSIFICATION OF THE HAZARDOUS CHEMICAL

0 The product is not classified as dangerous according to Australia WHS 2012.

ADVERSE PHYSICOCHEMICAL, HUMAN HEALTH AND ENVIRONMENTAL EFFECTS:

No other hazards

#### GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS

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The product is not classified as dangerous according to Australia WHS 2012.

### OTHER HAZARDS WHICH DO NOT RESULT IN A CLASSIFICATION

Other Hazards: No other hazards

### 3. COMPOSITION/INFORMATION ON INGREDIENTS

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#### SUBSTANCES

no data available

#### MIXTURES

Glycols, additives, water.

Severely refined mineral and/or synthetic oils, additives.

Hazardous components within the meaning of the "Australian Work Health and Safety (WHS)" regulation and related classification:

QUANTITY	NAME	IDENT. NUMB.	CLASSIFICATION
1.0-<1.5 %	Phosphorodithioic acid, mixed O,O-bis (sec-Bu and isooctyl) esters, zinc salts	CAS:93819-94-4 EC:298-577-9	Skin Irrit. 2, H315; Eye Dam. 1, H318; Aquatic Chronic 2, H411
0.05-<0.1 %	Phenol, dodecyl-, branched (impurity)	CAS:121158-58-5 EC:310-154-3 Index:604-092-00-9	Skin Corr. 1C, H314; Eye Dam. 1, H318; Repr. 1B, H360F; Aquatic Acute 1, H400; Aquatic Chronic 1, H410
70.0-<90.0 %	Not dangerous oils		

H-phrases and list of abbreviations: see heading 16.

### 4. FIRST-AID MEASURES

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#### DESCRIPTION OF NECESSARY FIRST-AID MEASURES

##### IN CASE OF INGESTION:

Do not induce vomiting to avoid aspiration into the respiratory tracts. Wash out thoroughly the mouth with water. Obtain immediate medical attention.

##### IN CASE OF EYES CONTACT:

Rinse thoroughly with plenty of water for at least 10 minutes keeping eyelids open. Remove contact lenses if this can be done easily. Obtain medical attention in case of development and persistence of pain and redness. In case of contact with hot product, rinse thoroughly with plenty of water to dissipate heat. Obtain immediate medical attention to assess eye conditions and the correct treatment to be practiced.

##### IN CASE OF SKIN CONTACT:

Remove contaminated clothes and shoes and rinse thoroughly with plenty of water and soap.

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IN CASE OF INHALATION:

Expose affected person to fresh air and obtain medical attention if necessary.

### SYMPTOMS CAUSED BY EXPOSURE

Refer to section 11.

### MEDICAL ATTENTION AND SPECIAL TREATMENT

Refer to section 4.1.

## 5. FIRE-FIGHTING MEASURES

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### 5.1. EXTINGUISHING MEDIA

This product has no special fire risk. In case of fire use foam, carbon dioxide, dry chemical powder and water mist.

Cool down with water the containers don't get involved in fire to avoid their possible explosion.

Avoid high pressure water jet. Use water jet only to cool down surfaces exposed to fire.

SUITABLE EXTINGUISHING MEDIA:

Water.

Carbon dioxide (CO<sub>2</sub>).

EXTINGUISHING MEDIA WHICH MUST NOT BE USED FOR SAFETY REASONS:

None in particular.

### SPECIFIC HAZARDS ARISING FROM THE CHEMICAL

Do not inhale explosion and combustion gases.

Burning produces heavy smoke.

Hazardous combustion products:

Oxides of carbon, compounds of nitrogen and products of incomplete combustion.

### SPECIAL PROTECTIVE EQUIPMENT AND PRECAUTIONS FOR FIRE-FIGHTERS

Use suitable breathing apparatus .

Move undamaged containers from immediate hazard area if it can be done safely.

Collect contaminated fire extinguishing water separately. This must not be discharged into drains.

HAZCHEM CODE/EMERGENCY ACTION CODE

N.A.

## 6. ACCIDENTAL RELEASE MEASURES

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### PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES

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Avoid ingestion of product. Avoid contact with skin and eyes by wearing appropriate protective clothing. Avoid to breathe fumes and aereosols.

Surfaces on which the product has been spilled may become slippery.

Wear personal protection equipment.

See protective measures under point 7 and 8.

### ENVIRONMENTAL PRECAUTIONS

Do not allow to enter into soil/subsoil. Do not allow to enter into surface water or drains.

Retain contaminated washing water and dispose it.

In case of gas escape or of entry into waterways, soil or drains, inform the responsible authorities.

### METHODS AND MATERIAL FOR CONTAINMENT AND CLEANING UP

Avoid flame and/or spark near leak and produced waste. Do not smoke. In case of large spills dike, absorb and shovel up into suitable containers for disposal. Contain small spills with absorbent material. Put dirty material in suitable container. Dispose of dirty material in accordance with local or national regulations.

### 6.4. REFERENCE TO OTHER SECTIONS

See also section 8 and 13

## **7. HANDLING AND STORAGE**

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### PRECAUTIONS FOR SAFE HANDLING

Avoid ingestion. Avoid frequent and prolonged skin contact and contact with eyes. Provide adequate ventilation to avoid mist or aereosol. Don't smoke or use spare flames; avoid contct with spark or other sources of ignition. Don't work near open container to avoid high concentration of vapours. Don't eat or drink during use.

### CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES

Avoid moisture pick up. Moisture has an adverse effect on the properties of brake fluids. Store under cover in the original container securely closed away from heat and sources of ignition. Keep out of reach of children and away from food and drink.

This product must be kept far from heat sources and spare flames. Do not smoke. Pressurized container. Protect from sunlight and do not expose to temperature exceeding 50°C. Do not pierce or burn, even after use. Do not spray on flames, anything incandescent or hot surface or electrical installation. Assure a correct ventilation.

Store under cover in the original container securely closed away from heat and sources of ignition. Do not store in the open air. Assure a correct ventilation of premises and the control of possible leak. Keep out of flame or spark and avoid the accumulation of electrostatic charges. Keep out of reach of children and away from food and drink.

Storage class (TRGS 510, Germany): 10

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### 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

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#### CONTROL PARAMETERS – EXPOSURE STANDARDS, BIOLOGICAL MONITORING

OEL: oil mists - TLV/TWA (8 h) : 5 mg/m<sup>3</sup> - TLV/STEL: 10 mg/m<sup>3</sup>

No Data Available

#### APPROPRIATE ENGINEERING CONTROLS

Avoid production and diffusion of mist and aerosol with utilization of localized ventilation/aspiration or other required precautions. Adopt all required precaution to avoid product immission in environment (e.g., blasting systems, catch basins, ...).

#### INDIVIDUAL PROTECTION MEASURES, SUCH AS PERSONAL PROTECTIVE EQUIPMENT (PPE)

##### EYE PROTECTION:

Chemical goggles and face shield in case of oil splashes.

##### PROTECTION FOR SKIN:

Wear suitable protective clothing (for further information, refer to CEN-EN 14605); change it immediately in case of large contamination and wash it before subsequent use.

Practice reasonable personal cleanliness.

##### PROTECTION FOR HANDS:

Wear suitable gloves (i.e. neoprene, nitrile). Gloves should be changed when they show wear. The kind of gloves and the term of use must be decided from employer with regard to processing and to allow for DPI legislation and glove producer's indications. Wear gloves only with clean hands.

##### RESPIRATORY PROTECTION:

None required under normal conditions of use. Use approved full face respirator with organic vapour filter cartridge if the recommended exposure limits are exceeded.

##### ENVIRONMENTAL EXPOSURE CONTROLS:

Refer to technical precautions and also to sections 6.2, 6.3, 7.2, 12 and 13.

### 9. PHYSICAL AND CHEMICAL PROPERTIES

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#### 9.1. INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

CHEMICAL-PHYSICAL PROPERTY	VALUE	METHOD
PHYSICAL STATE	LIQUID	
APPEARANCE AND COLOUR	VISCOUS	
ODOUR	NOT RELEVANT	
ODOUR THRESHOLD	NOT RELEVANT	
PH	N.A.	
MELTING POINT / FREEZING POINT	N.A.	
INITIAL BOILING POINT AND BOILING RANGE	>300 °C (572 °F)	( ASTM D1120 )
FLASH POINT	>200.0 °C (392.0 °F)	( ASTM D92 )

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EVAPORATION RATE	N.A.	
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	N.A.	
VAPOUR DENSITY	N.A.	
VAPOUR PRESSURE	N.A.	
DENSITY	0.87 g/cm3	( ASTM D4052 )
SOLUBILITY IN WATER	IMMISCIBLE	
SOLUBILITY IN OIL	N.A.	
PARTITION COEFFICIENT (N-OCTANOL/WATER)	N.A.	
AUTO-IGNITION TEMPERATURE	N.A.	
DECOMPOSITION TEMPERATURE	N.A.	
KINEMATIC VISCOSITY AT 100°C	15.4 cSt	( ASTM D445 )
KINEMATIC VISCOSITY AT 40°C	119 cSt	( ASTM D445 )
EXPLOSIVE PROPERTIES	N.A.	
OXIDIZING PROPERTIES	N.A.	
SOLID/GAS FLAMMABILITY	N.A.	
9.2. OTHER INFORMATION		

### CHEMICAL-PHYSICAL PROPERTY

CHEMICAL-PHYSICAL PROPERTY	VALUE	METHOD
SUBSTANCE GROUPS RELEVANT PROPERTIES	N.A.	
MISCIBILITY	N.A.	
CONDUCTIVITY	N.A.	
FREEZING POINT:	N.A.	
POUR POINT	N.A.	
DROPPING POINT	N.A.	

### VALUE

### METHOD

## 10. STABILITY AND REACTIVITY

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### REACTIVITY

Read carefully all information provided in other sections of heading 10.

### CHEMICAL STABILITY

The product is stable under normal conditions of use.

### POSSIBILITY OF HAZARDOUS REACTIONS

Not expected under normal conditions of use.

### CONDITIONS TO AVOID

This product must be kept far from heat sources. In any case, it is suggested to avoid temperatures above 100°C to prevent evaporation of product water.

This product must be kept far from heat sources. In any case, avoid exposing product to temperatures above the flash point.

### INCOMPATIBLE MATERIALS

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Strong oxidizing agents, hard acids and bases.

### HAZARDOUS DECOMPOSITION PRODUCTS

Oxides of carbon, compounds of sulphur, phosphorus, nitrogen and hydrogen sulfide.

## **SECTION 11: TOXICOLOGICAL INFORMATION**

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### 11.1. INFORMATION ON TOXICOLOGICAL EFFECTS

#### ACUTE TOXICITY:

This product is not classified in this hazard class.

Unlike to cause harm if accidentally swallowed in small doses, though ingestion of large quantities may cause gastro-intestinal effects.

#### SKIN CORROSION OR IRRITATION:

This product is not classified in this hazard class, but prolonged or repeated skin contact sometimes may cause irritations and dermatitis.

Zinc bis[O-(6-methylheptyl)] bis[O-(sec-butyl)] bis(dithiophosphate) CAS n° 93819-94-4: Skin irritant - Specific Concentration Limit (SCL) Skin Irrit. 2 H315  $\geq$  6.25 - 100% (OECD 404, Acute Dermal Irritation / Corrosion, New Zealand White rabbit).

#### SERIOUS EYE DAMAGE OR EYE IRRITATION:

This product is not classified in this hazard class, but direct contact may cause slight irritations.

Zinc bis[O-(6-methylheptyl)] bis[O-(sec-butyl)] bis(dithiophosphate) CAS n° 93819-94-4: Eye irritant - Specific Concentration Limit (SCL) Eye Dam. 1 H318  $>12.5$  - 100%, Eye Irrit. 2 H319  $>10$  -  $\leq 12.5\%$  (16 CFR Section 1500.42 Federal Hazardous Substance Act Regulations, New Zealand White rabbit).

#### RESPIRATORY SENSITIZATION:

This product is not classified in this hazard class.

#### SKIN SENSITIZATION:

This product is not classified in this hazard class.

#### GERM CELL MUTAGENICITY:

Based on available data, the classification criteria are not met.

#### CARCINOGENICITY:

Based on available data, the classification criteria are not met.

#### REPRODUCTIVE TOXICITY:

Based on available data, the classification criteria are not met.

#### SPECIFIC TARGET ORGAN TOXICITY (STOT) – SINGLE EXPOSURE:

This product is not classified in this hazard class, but inhalation of mists and vapours generated at elevated temperatures sometimes may cause respiratory irritation.

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### SPECIFIC TARGET ORGAN TOXICITY (STOT) – REPEATED EXPOSURE:

This product is not classified in this hazard class.

### ASPIRATION HAZARD:

This product is not classified in this hazard class.

### Toxicological information of the mixture:

There is no toxicological data available on the mixture. Consider the individual concentration of each component to assess toxicological effects resulting from exposure to the mixture.

### Toxicological information on main components of the mixture:

Phenol, dodecyl-, g) reproductive No Observed Adverse Effect Level Oral two-generation study  
branched (impurity) toxicity Rat = 15.00000 mg/kg 24h

If not differently specified, the information required in the regulation and listed below must be considered as N.A.

- a) acute toxicity
- b) skin corrosion/irritation
- c) serious eye damage/irritation
- d) respiratory or skin sensitisation
- e) germ cell mutagenicity
- f) carcinogenicity
- g) reproductive toxicity
- h) STOT-single exposure
- i) STOT-repeated exposure
- j) aspiration hazard

## 12. ECOLOGICAL INFORMATION

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### ECOTOXICITY

#### Eco-Toxicological Information:

This product is not classified dangerous for the environment.

#### List of components with eco-toxicological properties

QUANTITY	COMPONENT	IDENT. NUMB.	ECOTOX INFOS
1.0-<1.5 %	Phosphorodithioic acid, mixed O,O-bis (sec-Bu and isooctyl) esters, zinc salts	CAS: 93819-94-4 - EINECS: 298-577-9	b) Aquatic chronic toxicity : LC50 Fish = 4.50000 mg/L 96h

### PERSISTENCE AND DEGRADABILITY



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Data on biodegradability of product are not available.

### BIOACCUMULATIVE POTENTIAL

Not available.

### MOBILITY IN SOIL

Because the dispersion in the environment may result in contamination of environmental matrix (soil, subsoil, surface water and groundwater), do not release in the environment.

### OTHER ADVERSE EFFECTS

This material contains one or more components that have a branched alkylphenol impurity, highly toxic to aquatic organisms. The components containing the impurity have been tested and they are not toxic to aquatic organisms. Therefore, the alkylphenol impurity should not be used in the summation approach to classify the product for aquatic toxicity.

## **13. DISPOSAL CONSIDERATIONS**

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### DISPOSAL METHODS

Prevent contamination of soil, drains and surface waters. Do not discharge in sewers, tunnels or water courses. Dispose in accordance with local or national regulations via authorised person/licensed waste disposal contractor.

Recover if possible. In so doing, comply with the local and national regulations currently in force.

The used product and its package have to be treated in accordance with the local council and /or state environment authority.

The package is disposed as waste only after it has been rendered incapable of containing any substance. Packages may be reused or recycled only if it has been treated to remove any residual contents of the hazardous substance.

When the product or its dirty package are discharged as waste or deposited into a landfill, take care that there is no ignition or explosion source in the vicinity of the disposal site at any time that is capable of igniting the substance. If the substance were to ignite accidentally, take care that no person, or place where a person may legally be, would be exposed to an unsafe level of heat radiation.

## **14. TRANSPORT INFORMATION**

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### UN NUMBER

N/A

### UN PROPER SHIPPING NAME

ADG-Shipping Name: N.A.

ADR-Shipping Name: N/A

IATA-Technical name: N/A

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IMDG-Technical name: N/A

### TRANSPORT HAZARD CLASS(ES)

ADG-Class: -

ADR-Class: N/A

IATA-Class: N/A

IMDG-Class: N/A

### PACKING GROUP, IF APPLICABLE

ADG-Packing Group: N/A

ADR-Packing Group: N/A

IATA-Packing group: N/A

IMDG-Packing group: N/A

### ENVIRONMENTAL HAZARDS

ADG-Environmental Pollutant: No

Marine pollutant: No

### SPECIAL PRECAUTIONS FOR USER

ADG-Subsidiary risks: -

ADG-S.P.: -

### Road and Rail (ADR-RID):

ADR-Label: N/A

ADR - Hazard identification number: N/A

ADR-Special Provisions: N/A

ADR-Transport category (Tunnel restriction code): N/A

### Air (IATA):

IATA-Passenger Aircraft: N/A

IATA-Cargo Aircraft: N/A

IATA-Label: N/A

IATA-Subrisk: N/A

IATA-Erg: N/A

IATA-Special Provisions: N/A

### Sea (IMDG):

IMDG-Stowage Code: N/A

IMDG-Stowage Note: N/A

IMDG-Subrisk: N/A

IMDG-Special Provisions: N/A

IMDG-EMS: N/A

### ADDITIONAL INFORMATION

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no data available

### 14.8. HAZCHEM CODE/EMERGENCY ACTION CODE

N.A.

no data available

## 15. REGULATORY INFORMATION

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### SAFETY, HEALTH AND ENVIRONMENTAL REGULATIONS SPECIFIC FOR THE PRODUCT IN QUESTION

#### REGULATORY REFERENCES:

Work Health and Safety Act and Regulations (WHS Act and Regulations)

Code of Practice - Labelling of Workplace Hazardous Chemicals (Safe Work Australia)

Code of Practice - Preparation of Safety Data Sheets for Hazardous Chemicals (Safe Work Australia)

Standard for the Uniform Scheduling of Medicines and Poisons - Poisons Standard (SUSMP)

Australian Inventory of Chemical Substances (AICS)

Globally Harmonized System of Classification and Labeling of Chemicals (GHS), Rev. 4th

Regulation (EC) No 1272/2008, with all National and European related legislations, on classification, labelling and packaging of substances and mixtures (CLP)

Regulation (EC) No 1907/2006, with all National and European related legislations, concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)

This Safety Data Sheet has been prepared according to the Australian Work Health and Safety (WHS) act and the Code of Practice on preparation of safety data sheets for Hazardous Chemicals.

#### LIST OF SUBSTANCES INCLUDED IN THE NICNAS:

All components are in compliance with the National Industrial Chemicals Notification and Assessment Scheme (NICNAS).

#### LIST OF SUBSTANCES INCLUDED IN THE AICS INVENTORY:

All components are in compliance with the Australian Inventory of Chemical Substances (AICS).

#### POISON SCHEDULE (SUSMP):

None Specified

## 16. OTHER INFORMATION

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The mineral base oils contained in this product are severely refined and are therefore not to be considered as carcinogen. They contain less than 3% DMSO extract according to IP 346 method ("Determination of polycyclic aromatics in unused lubricating base oils and asphaltene free petroleum fractions – Dimethyl sulphoxide extraction refractive index method", Institute of Petroleum, London).

Sheet complies with the criteria of Code of Practice - Preparation of SDS for Hazardous Chemicals and Global

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Harmonized System (GHS) standards.

This document was prepared by a competent person who has received appropriate training.

This product must not be used in applications other than recommended without first seeking the advice of the Technical Department.

Date of preparation of the first SDS: 8/8/2018

Date of revision of this SDS: 3/20/2019

This SDS cancels and replaces any preceding release.

This product must be stored, handled and used according to correct industrial hygienic practices and in compliance with laws in force.

The information contained herein is based on the present state of our knowledge and is intended to describe our products from the point of view of safety requirements. It should not therefore be considered as any guarantee of specific properties.

Key literature references and sources:

None

Caption about heading 3 and H-statements:

<b>CODE</b>	<b>DESCRIPTION</b>
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.
H360F	May damage fertility.
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
H411	Toxic to aquatic life with long lasting effects.

Legend to abbreviations and acronyms used in the safety data sheet:

ACGIH: American Conference of Governmental Industrial Hygienists

ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road.

ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways

ATE: Acute Toxicity Estimate

ATEmix: Acute toxicity Estimate (Mixtures)

BCF: Biological Concentration Factor

BEI: Biological Exposure Index

BOD: Biochemical Oxygen Demand

CAS: Chemical Abstracts Service (division of the American Chemical Society).

CAV: Poison Center

CE: European Community

CLP: Classification, Labeling, Packaging.

CMR: Carcinogenic, Mutagenic and Reprotoxic

COD: Chemical Oxygen Demand

COV: Volatile Organic Compound

CSA: Chemical Safety Assessment

CSR: Chemical Safety Report

DMEL: Derived Minimal Effect Level

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DNEL: Derived No Effect Level.  
DPD: Dangerous Preparations Directive  
DSD: Dangerous Substances Directive  
EC50: Half Maximal Effective Concentration  
ECHA: European Chemicals Agency  
EINECS: European Inventory of Existing Commercial Chemical Substances.  
ES: Exposure Scenario  
GefStoffVO: Ordinance on Hazardous Substances, Germany.  
GHS: Globally Harmonized System of Classification and Labeling of Chemicals.  
IARC: International Agency for Research on Cancer  
IATA: International Air Transport Association.  
IATA-DGR: Dangerous Goods Regulation by the "International Air Transport Association" (IATA).  
IC50: half maximal inhibitory concentration  
ICAO: International Civil Aviation Organization.  
ICAO-TI: Technical Instructions by the "International Civil Aviation Organization" (ICAO).  
IMDG: International Maritime Code for Dangerous Goods.  
INCI: International Nomenclature of Cosmetic Ingredients.  
IRCCS: Scientific Institute for Research, Hospitalization and Health Care  
KAFH: Keep away from heat  
KSt: Explosion coefficient.  
LC50: Lethal concentration, for 50 percent of test population.  
LD50: Lethal dose, for 50 percent of test population.  
LDLo: Leathal Dose Low  
N.A.: Not Applicable  
N/A: Not Applicable  
N/D: Not defined/ Not available  
NA: Not available  
NIOSH: National Institute for Occupational Safety and Health  
NOAEL: No Observed Adverse Effect Level  
OSHA: Occupational Safety and Health Administration.  
PBT: Persistent, Bioaccumulative and Toxic  
PGK: Packaging Instruction  
PNEC: Predicted No Effect Concentration.  
PSG: Passengers  
RID: Regulation Concerning the International Transport of Dangerous Goods by Rail.  
STEL: Short Term Exposure limit.  
STOT: Specific Target Organ Toxicity.  
TLV: Threshold Limiting Value.  
TWATLV: Threshold Limit Value for the Time Weighted Average 8 hour day. (ACGIH Standard).  
vPvB: Very Persistent, Very Bioaccumulative.  
WGK: German Water Hazard Class.

### Paragraphs modified from the previous revision:

- SECTION 1: Identification of the substance/mixture and of the company/undertaking
- SECTION 3: Composition/information on ingredients
- SECTION 12: Ecological information