according to Regulation 2018/830



Print date: 20180515

Trade name:LFP Lithium Ion Battery

Version 1.0 Issue Date:20180515

SECTION 1. Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : LFP Lithium Ion Battery

Specifications : PF25 / US2000 / US2000 PLUS / PHANTOM-S / EXTRA2000 /

FB500 / H48050

1.2 Relevant identified uses of the substance or mixture and uses advised against

Use of the : Energy storage / telecommunication backup power supply / electric car

Substance/Mixture

1.3 Details of the supplier of the safety data sheet

Company : Pylon Technologies Co., Ltd.

Address : No. 73, Lane 887, Zu Chongzhi Road, Zhangjiang Hi-Tech Park Pudong,

Shanghai 201203, China

Telephone : +86 21-51317697

Telefax : +86 21-51317698

E-mail address : stella.mao@pylontech.com.cn

1.4 Emergency telephone number

Emergency telephone

+86 21-51317697

number

SECTION 2. Hazards identification

2.1 Classification of the substance or mixture

2.1.1 Classification according to Regulation (EC) No 1272/2008 (CLP)

 Skin Irrit. 2
 H315

 Eye Dam. 1
 H318

 STOT RE 2
 H373

 Flam. Liq. 3
 H226

2.1.2 Additional information:

For full text of Hazard- and EU Hazard-statements: see SECTION 16.

according to Regulation 2018/830



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2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP]

Hazard pictograms



Signal word: Danger

Hazard statements:

H315 Causes skin irritation

H318 Causes serious eye damage

H373 May cause damage to organs through prolonged or repeated exposure

H226 Flammable liquid and vapour

Precautionary statements:

P264 Wash exposed skin thoroughly after handling.

P280 Wear protective gloves / protective clothing / eye protection / face

protection.

P260 Do not breathe dust/fume/gas/mist/ vapours/spray.

P210 Keep away from heat, hot surfaces, sparks, open flames and other

ignition sources. No smoking.

P233 Keep container tightly closed.

P240 Ground and bond container and receiving equipment.

P241 Use explosion-proof [electrical/ventilating/lighting] equipment.

P242 Use non-sparking tools.

P243 Take action to prevent static discharges. P302 + P352 IF ON SKIN: Wash with plenty water

P321 Specific treatment (see section 4 on this SDS)

P323 + P213 If skip irritation accurs: Cot modical adviso/atto

P332 + P313 If skin irritation occurs: Get medical advice/attention.
P362 Take off contaminated clothing and wash before reuse.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove

contact lenses, if present and easy to do. Continue rinsing.

P310 Immediately call a POISON CENTER/doctor.
P314 Get medical advice/attention if you feel unwell.

P303 + P361 + P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing.

Rinse skin with water [or shower].

P370 + P378 In case of fire: Use dry chemical fire extinguishers, carbon dioxide fire

extinguishers, foam to extinguish.

P403 + P235 Store in a well-ventilated place. Keep cool.

according to Regulation 2018/830



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P501

Dispose of contents/container in accordance with local/regional/national/international regulations

Supplemental Hazard information (EU): Not applicable.

2.3 Other hazards

no information available.

SECTION 3. Composition/information on ingredients

3.1 Substances

Not applicable

3.2 Mixtures

Registration number	Classification according to	Concentration
	Regulation (EU) 1272/2008	(% w/w)
	(CLP)	
Lithium iron phosphate(CAS	S No:15365-14-7)(EC No:604-917-2)	
		40-50%
Graphite (CAS No:7782-42-	5)(EC No:231-955-3)	
		15-25%
Copper (CAS No:7440-50-8)(EC No:231-159-6)	
		5-10%
aluminium(CAS No:7429-90	0-5)(EC No:231-072-3)	
		5-10%
Poly(vinylidene fluoride)(CA	S No:24937-79-9)(EC No:607-458-6)	
		5-10%
Carbon black (CAS No:1333	3-86-4)(EC No:215-609-9)	
		1-10%
(PAA)/2-PROPENOIC ACID), HOMOPOLYMER(CAS No:9003-01-4)(EC	No:618-347-7)
		1-5%
Lithium hexafluorophosphat	e(1-) (CAS No:21324-40-3)(EC No:244-334-7	7)
	Acute Tox. 3,H301	1-5%
	Skin Corr. 1A,H314	
	Eye Dam. 1,H318	
	STOT RE 1,H372 (Tooth, Bone)	

according to Regulation 2018/830



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nickel(CAS No:7440-02-0)(E	EC No:231-111-4)		
		0.1-1.0%	
Carboxymethyl cellulose so	dium salt(CAS No:9004-32-4)(EC No:618-378	3-6)	
		0.1-1.0%	
Ethylene carbonate(CAS No:96-49-1)(EC No:202-510-0)			
	Eye Irrit. 2,H319	0.1-1.0%	
dimethyl carbonate (CAS No:616-38-6)(EC No:210-478-4)			
	Flam. Liq. 2,H225	0.1-1.0%	
Carbonic acid, ethyl methyl	ester (CAS No:623-53-0)(EC No:613-014-2)		
	Flam. Liq. 3,H226	0.1-1.0%	
	Skin Irrit. 2,H315		
	Eye Irrit. 2,H319		
	STOT SE 3,H335		

SECTION 4. First aid measures

4.1 Description of first aid measures

General advice : If potential for exposure exists refer to Section 8 for specific personal

protective equipment.

If inhaled : Move person to fresh air; If symptoms persist, consult a physician.

On skin contact : Take off contaminated clothing and shoes immediately. Flush contact

area with lukewarm water. If irritation persists, consult a physician.

On contact with eyes : If you use contact lenses, remove the lenses first. Wash affected eyes for

at least 15 minutes under running water with eyelids held open. If symptoms occur, consult a physician, preferably an ophthalmologist.

On ingestion : Rinse mouth immediately and then drink plenty of water, seek medical

attention.

4.2 Most important symptoms and effects, both acute and delayed

Symptoms : Aside from the information found under Description of first aid measures

(above) and Indication of immediate medical attention and special treatment needed (below), any additional important symptoms and

effects are described in Section 11: Toxicology Information.

4.3 Indication of any immediate medical attention and special treatment needed

according to Regulation 2018/830



Trade name:LFP Lithium Ion Battery Version 1.0

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Treatment : Treatment of exposure should be directed at the the clinical condition of

the patient.

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing

media

Dry chemical fire extinguishers. Carbon dioxide fire extinguishers. Foam.

5.2 Special hazards arising from the substance or mixture

Specific hazards during :

firefighting

During a fire, smoke may contain the original material in addition to combustion products of varying composition which may be toxic and/or irritating. Combustion generates toxic fumes of the following:

oxides.

5.3 Advice for firefighters

Special protective

equipment

Wear positive-pressure self-contained breathing apparatus (SCBA) and protective fire fighting clothing (includes fire fighting helmet, coat, trousers, boots, and gloves). If protective equipment is not available or

not used, fight fire from a protected location or safe distance.

Further information : No information available.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Avoid breathing vapor. Avoid skin contact. Ensure adequate

ventilation. Remove all sources of ignition. Use personal protective

equipment.

6.2 Environmental precautions

Environmental precautions

Prevent from entering into soil, ditches, sewers, waterways and/or

groundwater.

6.3 Methods and materials for containment and cleaning up

Methods for cleaning up : Contain spilled material if possible. Collect in suitable and properly

labeled containers. Then store and dispose of according to local

regulations.

according to Regulation 2018/830



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6.4 Reference to other sections

References to other sections, if applicable, have been provided in the previous sub-sections.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid breathing vapors. Avoid contact with the skin, eyes and

clothing. Wear safety glasses with side shields.

Advice on protection against fire and explosion

Sources of ignition should be kept well clear.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for

storage

areas and containers

Keep container tightly closed in a cool, well-ventilated place. Keep away

from heat, sparks and flames.

7.3 Specific end use(s)

no data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Chemical name	Occ	upational Exposure Limits	Regulation
Graphite	TWA	2 mg/m3	Belgium
Graphite	TWA	2 mg/m3,5 mg/m3 respirable aerosol	Denmark
Graphite	STEL	5 mg/m3 respirable aerosol	Denmark
Graphite	TWA	2 mg/m3	Finland
Graphite	TWA	2 mg/m3 respirable aerosol	France
Graphite	TWA	4 mg/m3 inhalable aerosol,1 mg/m3,5 mg/m3 respirable aerosol	Germany (DFG)

according to Regulation 2018/830



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on 1.0			Issue Date:2018051
Graphite	TWA	10 mg/m3,4 mg/m3	Ireland
Graphite	TWA	2 mg/m3 (1	Latvia
Graphite	TWA	2 mg/m3 inhalable aerosol	Spain
Graphite	TWA	5 mg/m3 inhalable aerosol	Sweden
Graphite	TWA	5 mg/m3 inhalable aerosol,2 mg/m3,5 mg/m3 respirable aerosol	Switzerland
Graphite	TWA	10 mg/m3 inhalable aerosol,4 mg/m3 respirable aerosol	United Kingdom
Aluminium metal	TWA	5 mg/m3 inhalable aerosol,2 mg/m3 respirable aerosol	Denmark
Aluminium metal	STEL	10 mg/m3 inhalable aerosol,4 mg/m3 respirable aerosol	Denmark
Aluminium metal	TWA	10 mg/m3 inhalable aerosol,5 mg/m3 respirable aerosol	France
Aluminium metal	TWA	4 mg/m3 inhalable aerosol,1 mg/m3,5 mg/m3 respirable aerosol	Germany (DFG)
Aluminium metal	TWA	6 mg/m3 respirable aerosol	Hungary
Aluminium metal	TWA	1 mg/m3	Ireland
Aluminium metal	TWA	2 mg/m3	Latvia
Aluminium metal	TWA	10 mg/m3	New Zealand
Aluminium metal	TWA	10 mg/m3 inhalable aerosol,5 mg/m3 respirable aerosol	Spain
Aluminium metal	TWA	3 mg/m3 respirable aerosol	Switzerland
Aluminium metal	TWA	10 mg/m3 inhalable aerosol,4 mg/m3 respirable aerosol	United Kingdom
Carbon black	TWA	3 mg/m3,5 mg/m3	Belgium
Carbon black	TWA	3 mg/m3,5 mg/m3	Denmark
Carbon black	STEL	7 mg/m3,0 mg/m3	Denmark
Carbon black	TWA	3 mg/m3,5 mg/m3	Finland
Carbon black	STEL	7 mg/m3	Finland
Carbon black	TWA	3 mg/m3,5 mg/m3	France
Carbon black	TWA	3 mg/m3,5 mg/m3	Ireland
Carbon black	STEL	7 mg/m3	Ireland
		10 10 - 10	

8.2 Exposure controls

Carbon black

TWA

Eye protection : Not required under normal conditions. If battery case is damaged, wear

chemical goggles or face shield.

Hand protection : None required under normal conditions. Wear safety glasses if handling

a damaged battery.

3 mg/m3,5 mg/m3

Body and skin protection: Where there is potential for skin contact, have available and wear as

appropriate, impervious gloves, apron, pants, jacket, hood and boots.

Spain

according to Regulation 2018/830



Trade name:LFP Lithium Ion Battery Version 1.0

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General safety and hygiene measures

Wash hands before breaks and after handling the product.

Respiratory protection : None required under normal conditions.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance: : Solid

Odour : no data available

Odour threshold : no data available

pH : no data available

Melting point : not applicable

Boiling point : not applicable

Flash point : 33℃

Evaporation rate : no data available

Flammability (solid, gas) : not applicable

Upper/lower flammability:

or explosive limits

no data available

Vapour pressure : no data available

Vapour density : no data available

Relative density : no data available

Water solubility : insoluble

Partition coefficient: n-

octanol/water

no data available

Auto-ignition

temperature

no data available

Decomposition

temperature

no data available

according to Regulation 2018/830



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Trade name:LFP Lithium Ion Battery Version 1.0

Explosive properties none

Oxidising properties none

9.2 Other information

no data available

Viscosity, dynamic

SECTION 10: Stability and Reactivity

No hazardous reactions if stored and handled as prescribed/indicated. 10.1 Reactivity

10.2 Chemical stability Stable under recommended storage conditions.

no data available

10.3 Possibility of hazardous reactions This product is considered stable. However, avoid contact with ignition

sources (e.g. sparks, open flame, heated surfaces).

10.4 Conditions to

avoid

Avoid all sources of ignition: heat, sparks, open flame.

10.5 Incompatible

materials

Strong oxidizers.

10.6 Hazardous decomposition

products

No hazardous decomposition products if stored and handled as

prescribed/indicated.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Information on toxicological effects

Acute toxicity

Acute Toxicity: oral

Nickel

LD50/rat:> 9 000 mg/kg bw

Lithium hexafluorophosphate(1-) LD50/rat:50 - 300 mg/kg bw

according to Regulation 2018/830



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Trade name:LFP Lithium Ion Battery Version 1.0

Graphite

LD50/rat:> 2 000 mg/kg bw

Ethylene carbonate LD50/rat:10 400 mg/kg bw

Dimethyl carbonate LD50/rat:> 5 000 mg/kg bw

Copper LD50/rat:300 - 500 mg/kg bw

Carbon black LD50/rat:> 8 000 mg/kg bw

Aluminium LD50/rat:> 15 900 mg/kg bw

Acute Toxicity: inhalation

Nickel NOAEC/66 min/rat:>= 10.2 mg/L air

Graphite LC50/4 h/rat:> 2 000 mg/m3; air

Ethylene carbonate LC0/8 h/rat:730 mg/m3; air

Dimethyl carbonate LC50/4 h/rat:> 5.36 mg/L air (analytical)

Copper LC50/4 h/rat:> 5.11 mg/L air

Aluminium LC0/4 h/rat:0.888 mg/L air (analytical)

Acute Toxicity: dermal

Ethylene carbonate LD50/rat:> 2 000 mg/kg bw

Dimethyl carbonate LD50/rabbit:> 2 000 mg/kg bw

according to Regulation 2018/830



Trade name:LFP Lithium Ion Battery Version 1.0

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Copper LD50/rat:> 2 000 mg/kg bw

Skin irritation/corrosion

Nickel rabbit not irritating

Lithium hexafluorophosphate(1-) human corrosive

Graphite rabbit not irritating

Ethylene carbonate rabbit not irritating

Dimethyl carbonate rabbit not irritating

Copper rabbit not irritating

Aluminium rabbit not irritating

Serious eye damage/irritation

Nickel rabbit not irritating

Lithium hexafluorophosphate(1-) Fresh, fertilised brown leghorn chicken eggs severe irritant

Graphite rabbit not irritating

according to Regulation 2018/830



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Ethylene carbonate rabbit Category 2 (irritating to eyes) based on GHS criteria

Dimethyl carbonate rabbit not irritating

Copper rabbit slightly irritating

Carbon black rabbit not irritating

Aluminium rabbit not irritating

Respiratory or skin sensitisation

Lithium hexafluorophosphate(1-) mouse not sensitising

Graphite mouse not sensitising

Ethylene carbonate guinea pig non-sensitizer

Dimethyl carbonate guinea pig not sensitising

Copper guinea pig not sensitising

Carbon black guinea pig not sensitising

according to Regulation 2018/830



Trade name:LFP Lithium Ion Battery Version 1.0

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Aluminium guinea pig not sensitising

Germ cell mutagenicity: in vitro

Lithium hexafluorophosphate(1-) negative

Graphite negative

Ethylene carbonate negative

Dimethyl carbonate negative

Copper negative

Carbon black negative

Aluminium negative

Germ cell mutagenicity: in vivo

Lithium hexafluorophosphate(1-) negative

Dimethyl carbonate negative

Copper negative

Carbon black negative

Aluminium negative

Carcinogenicity

according to Regulation 2015/830



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Nickel

Suspected of causing cancer.

Ethylene carbonate

No evidence of carcinogenicity in the study animals was observed.

Carbon black

No evidence of carcinogenicity in the study animals was observed.

Aluminium

No evidence of carcinogenicity in the study animals was observed.

Reproductive toxicity

Lithium hexafluorophosphate(1-)

Animal tests showed no developmental toxicity

Graphite

Animal tests showed no developmental toxicity

Ethylene carbonate

Animal tests showed no developmental toxicity

Dimethyl carbonate

Animal tests showed no developmental toxicity

Copper

Animal tests showed no developmental toxicity

Carbon black

Animal tests showed no developmental toxicity

Aluminium

Animal tests showed no developmental toxicity

STOT-single exposure

No information available

STOT-repeated exposure

No information available

Aspiration hazard

according to Regulation 2018/830



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Trade name:LFP Lithium Ion Battery Version 1.0

No information available

SECTION 12: Ecological information

12.1 Toxicity

Short-term toxicity to fish

Nickel

LC50/96 h/Oncorhynchus mykiss (previous name: Salmo gairdneri):15.3 mg/L

Lithium hexafluorophosphate(1-)

EC50/96 h/other: Oncorhynchus mykiss, Salmo Trutta:51 mg/L

Graphite

LC50/96 h/Danio rerio (previous name: Brachydanio rerio):> 100 mg/L

Carbon black

LC0/96 h/Danio rerio (previous name: Brachydanio rerio):1 000 mg/L

Aluminium

LC50/96 h/Pimephales promelas:1.16 mg/L

Long-term toxicity to fish

Nickel

NOEC/32 d/Pimephales promelas:0.057 mg/L

Lithium hexafluorophosphate(1-)

LC50/20 d/other: Rainbow trout (Neuhold and Sigler, 1960). Rainbow and brown trout (Camargo, 1966).

Aluminium

NOEC/7 d/Pimephales promelas:0.4 mg/L

Short-term toxicity to aquatic invertebrates

Nickel

LC50/48 h/Ceriodaphnia dubia:276 µg/L

Lithium hexafluorophosphate(1-)

LC50/48 h/Daphnia magna:> 100 mg/L

Graphite

NOEC/48 h/Daphnia magna:>= 100 mg/L

Carbon black

according to Regulation 2018/830



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EC100/24 h/Daphnia magna:10 000 mg/L

Aluminium

LC50/48 h/Ceriodaphnia dubia:0.72 mg/L

Long-term toxicity to aquatic invertebrates

Nickel

EC10/10 d/other: Chironomus tentans (now known as Chironomus dilutus):404.3 µg/L

Lithium hexafluorophosphate(1-)

NOEC/21 d/Daphnia magna:3.7 mg/L

Aluminium

NOEC/6 d/Ceriodaphnia dubia:1.02 mg/L

Toxicity to microorganisms

Nickel

EC50/30 min/activated sludge:33 mg/L

Lithium hexafluorophosphate(1-)

EC50/3 h/activated sludge of a predominantly domestic sewage:> 1 000 mg/L

Graphite

EC20/3 h/activated sludge of a predominantly domestic sewage:> 1 012.5 mg/L

Carbon black

EC10/3 h/activated sludge, domestic:ca. 800 mg/L

12.2 Persistence and degradability

Lithium hexafluorophosphate(1-)

Rapid reaction with water releases HF and LiF, leading to production of dissolved F- ions; subsequently, release of Li+ and PO4(3-) ions will follow.

12.3 Bioaccumulative potential

No data available

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

according to Regulation 2018/830



Trade name:LFP Lithium Ion Battery Version 1.0

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No data available

12.6 Other adverse effects

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Observe national and local legal requirements.

Contaminated packaging

Uncontaminated packaging can be re-used.

SECTION 14: Transport Information

Land transport

ADR

14.1. UN number : 3480

14.2. UN proper shipping: LITHIUM ION BATTERIES

name:

14.3. Transport hazard : 9

class(es):

14.4. Packing group : II 14.5. Environmental : Yes

hazards

14.6. Special : none

precautions for user

Sea transport

IMDG

14.1. UN number : 3480

14.2. UN proper shipping: LITHIUM ION BATTERIES

name:

14.3. Transport hazard : 9

class(es):

14.4. Packing group : II 14.5. Environmental : Yes

hazards

according to Regulation 2018/830



Print date: 20180515 Issue Date:20180515

Trade name:LFP Lithium Ion Battery Version 1.0

: none

precautions for user

Air transport

14.6. Special

IATA/ICAO

14.1. UN number: : 3480

14.2.UN proper shipping : LITHIUM ION BATTERIES

name:

14.3. Transport hazard : 9

class(es):

14.4. Packing group: : II 14.5. Environmental : Yes

hazards:

14.6. Special : none

precautions for user

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code Not applicable

SECTION 15: Regulatory information

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

Other regulations : Take note of Directive 98/24/EC on the protection of the health and

safety of workers from the risks related to chemical agents at work.

15.2 Chemical Safety Assessment

A Chemical Safety Assessment/Chemical Safety Report may not be required because: substance(s) are exempted from being registered under REACH, are not yet registered under REACH, are registered under another regulatory process (biocide uses, plant protection products), the volume is below the 10 tons/year threshold specified under Art.14(1) of REACH, the concentration of substance(s) in a mixture is/are below the limits specified under Art. 14(2) of REACH.

SECTION 16: Other information

Full text of H-Statements referred to under section 3.

H301 Toxic if swallowed

H314 Causes severe skin burns and eye damage

H315 Causes skin irritation

according to Regulation 2018/830



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H318 Causes serious eye damage
H319 Causes serious eye irritation
H225 Highly flammable liquid and vapour
H226 Flammable liquid and vapour
H335 May cause respiratory irritation

H372 Causes damage to organs through prolonged or repeated exposure

Abbreviations and acronyms

ADR European Agreement concerning the International Carriage of

Dangerous Goods by Road

ATE Acute toxicity estimate

CAS-No. Chemical Abstracts Service number CLP Classification, Labelling and Packaging

EbC50 Concentration at which 50% reduction of biomass is observed

EC50 Median effective concentration

EN European Norm

EPA Environmental Protection Agency

ErC50 Concentration at which a 50% inhibition of growth rate is observed

EyC50 Concentration at which 50 % inhibition of yield is observed

IATA_C International Air Transport Association (Cargo)

IBCInternational Bulk Chemical CodeICAOInternational Civil Aviation OrganizationISOInternational Standard OrganizationIMDGInternational Maritime Dangerous Goods

LC50 Median Lethal Concentration

LD50 Median Lethal Dose

LOEC Lowest Observed Effect Concentration

LOEL Lowest observed effect level

MARPOL International Convention for the Prevention of Marine Pollution from

n.o.s. Not Otherwise Specified

NOAEC No Observed Adverse Effect Concentration

NOAEL No observed adverse effect level NOEC No Observed Effect Concentration

NOEL No Observed Effect Level

OECD Organisation for Economic Co-operation and Development OPPTS Office of Prevention, Pesticides and Toxic Substances

PBT Persistent, Bioaccumulative and Toxic

STEL Short term exposure limit
TWA Time Weighted Average (TWA)

vPvB very Persistent and very Bioaccumulative

according to Regulation 2018/830



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