

**Danger**



### SECTION 1: Identification of the hazardous chemical and of the supplier

#### 1.1. Product identifier

Trade name : Nitric Oxide  
Name : Nitric Oxide

#### 1.2. Other means of identification

Product code : ALM/SDS/384

#### 1.3. Recommended use of the chemical and restrictions on use

Recommended use : Industrial and professional use for chemical analysis, calibration, (routine) quality control, laboratory use, under controlled conditions  
Perform risk assessment prior to use.

Restrictions on use : Consumer use.  
Uses other than those listed above are not supported, contact your supplier for more information on other uses.

#### 1.4. Supplier details

AIR LIQUIDE MALAYSIA SDN. BHD.  
Lot PT 2317, No. 21, Jalan PTB 1  
Kawasan Perindustrian Tangga Batu, Mukim Sungai Udang,  
76400 Melaka  
Malaysia

#### 1.5. Emergency phone number

Emergency number : +606-3513512

### SECTION 2: Hazards identification

#### 2.1. Classification of the hazardous chemical

Classification according to Industry Code of Practice on chemicals classification and hazard communication (2019)

Oxidising Gases, Category 1	H270
Gases under pressure : Compressed gas	H280
Acute toxicity (inhalation:gas) Category 1	H330
Skin corrosion or irritation, Category 1B	H314
Serious eye damage or eye irritation, Category 1	H318

#### 2.2. Label elements

Labelling according to Industry Code of Practice on chemicals classification and hazard communication (2019)

Hazard pictograms (GHS MY) :



Signal word (GHS MY) : Danger  
Contains : Nitric oxide  
Hazard statements (GHS MY) : H270 - May cause or intensify fire; oxidizer  
H280 - Contains gas under pressure; may explode if heated

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Precautionary statements (GHS MY)

H314 - Causes severe skin burns and eye damage  
H330 - Fatal if inhaled  
: P220 - Keep/Store away from clothing/.../combustible materials  
P244 - Keep reduction valves free from grease and oil  
P260 - Do not breathe dust/fume/gas/mist/vapours/spray  
P264 - Wash ... thoroughly after handling  
P271 - Use only outdoors or in a well-ventilated area  
P280 - Wear protective gloves/protective clothing/eye protection/face protection  
P284 - Wear respiratory protection  
P301+P330+P331 - IF SWALLOWED: rinse mouth. Do NOT induce vomiting  
P303+P361+P353 - IF ON SKIN (or hair): Remove/take off immediately all contaminated clothing. Rinse skin with water/shower  
P304+P340 - IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing  
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 or doctor/physician  
P320 - Specific treatment is urgent (see ... on this label)  
P321 - Specific treatment (see ... on this label)  
P363 - Wash contaminated clothing before reuse  
P370+P376 - In case of fire: stop leak if safe to do so  
P403 - Store in a well-ventilated place  
P403+P233 - Store in a well-ventilated place. Keep container tightly closed  
P405 - Store locked up  
P410+P403 - Protect from sunlight. Store in a well-ventilated place  
P501 - Dispose of contents/container to ...

### **2.3. Other hazards that do not result in classification**

Other hazards which do not result in classification : Not classified as PBT or vPvB, The substance/mixture has no endocrine disrupting properties.

## **SECTION 3: Composition and information of the ingredients of the hazardous chemical**

### **3.1. Substances**

Not applicable

### **3.2. Mixtures**

Name	Product identifier	%
Nitric oxide	CAS-No.: 10102-43-9	100

## **SECTION 4: First-aid measures**

### **4.1. Description of necessary first aid measures**

First-aid measures after inhalation : Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Perform cardiopulmonary resuscitation if breathing stopped.  
First-aid measures after skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes.  
First-aid measures after eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes.  
First-aid measures after ingestion : Ingestion is not considered a potential route of exposure.

### **4.2. Most important symptoms/effects, acute and delayed**

Most important symptoms and effects, both acute and delayed : May cause severe chemical burns to skin and cornea. Suitable first-aid treatment should be immediately available. Seek medical advice before using product. Material is destructive to tissue of the mucuous membranes and upper respiratory tract. Cough, shortness of breath, headache, nausea. See section 11.

### **4.3. Indication of immediate medical attention and special treatment needed, if necessary**

Other medical advice or treatment : Obtain medical assistance. Treat with corticosteroid spray as soon as possible after inhalation.

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### SECTION 5: Fire-fighting measures

#### 5.1. Suitable extinguishing media

Suitable extinguishing media : Water spray or fog. Product does not burn, use fire control measures appropriate for the surrounding fire.

Unsuitable extinguishing media : Do not use water jet to extinguish.

#### 5.2. Physicochemical hazards arising from the chemical

Reactivity in case of fire : No reactivity hazard other than the effects described in sub-sections below.

#### 5.3. Special protective equipment and precautions for fire fighters

Special protective equipment for fire fighters : Wear gas tight chemically protective clothing in combination with self contained breathing apparatus. Standard EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask.

Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems, If possible, stop flow of product, Use water spray or fog to knock down fire fumes if possible, Move containers away from the fire area if this can be done without risk.

EAC code : 2PE

### SECTION 6: Accidental release measures

#### 6.1. Personal precautions, protective equipment, and emergency procedures

##### 6.1.1. For non-emergency personnel

Emergency procedures : Act in accordance with local emergency plan. Try to stop release. Evacuate area. Ensure adequate air ventilation. Eliminate ignition sources. Stay upwind. See section 8 of the SDS for more information on personal protective equipment.

##### 6.1.2. For emergency responders

Emergency procedures : Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Use chemically protective clothing. Monitor concentration of released product. See section 5.3 of the SDS for more information.

#### 6.2. Environmental precautions

Reduce vapour with fog or fine water spray. Try to stop release.

#### 6.3. Methods and materials for containment and cleaning up

Methods and material for containment and cleaning up : Hose down area with water. Wash contaminated equipment or sites of leaks with copious quantities of water.

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### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

Safe handling of the gas receptacle

: Refer to supplier's container handling instructions. Do not allow backfeed into the container. Protect containers from physical damage; do not drag, roll, slide or drop. When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders. Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use. If user experiences any difficulty operating valve discontinue use and contact supplier. Never attempt to repair or modify container valves or safety relief devices. Damaged valves should be reported immediately to the supplier. Keep container valve outlets clean and free from contaminants particularly oil and water. Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment. Close container valve after each use and when empty, even if still connected to equipment. Never attempt to transfer gases from one cylinder/container to another. Never use direct flame or electrical heating devices to raise the pressure of a container. Do not remove or deface labels provided by the supplier for the identification of the content of the container. Suck back of water into the container must be prevented. Open valve slowly to avoid pressure shock.

Safe use of the product

: Installation of a cross purge assembly between the container and the regulator is recommended. Purge system with dry inert gas (e.g. helium or nitrogen) before gas is introduced and when system is placed out of service. Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <http://www.eiga.eu>. Use no oil or grease. Avoid exposure, obtain special instructions before use. The product must be handled in accordance with good industrial hygiene and safety procedures. Only experienced and properly instructed persons should handle gases under pressure. Consider pressure relief device(s) in gas installations. Ensure the complete gas system was (or is regularly) checked for leaks before use. Do not smoke while handling product. Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt. Avoid suck back of water, acid and alkalis. Do not breathe gas. Avoid release of product into work area.

#### 7.2. Conditions for safe storage, including any incompatibilities

Conditions for safe storage, including any incompatibilities

: Segregate from flammable gases and other flammable materials in store. Observe all regulations and local requirements regarding storage of containers. Containers should not be stored in conditions likely to encourage corrosion. Container valve guards or caps should be in place. Containers should be stored in the vertical position and properly secured to prevent them from falling over. Stored containers should be periodically checked for general condition and leakage. Keep container below 50°C in a well ventilated place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible materials.

### SECTION 8: Exposure controls and personal protection

#### 8.1. Control parameters

Nitric oxide (10102-43-9)	
<b>Malaysia - Occupational Exposure Limits</b>	
Local name	Nitrik oksida # Nitric oxide
PEL (OEL TWA) [1]	31 mg/m <sup>3</sup>
PEL (OEL TWA) [2]	25 ppm
MEL (mg/m <sup>3</sup> )	93 mg/m <sup>3</sup>
MEL (ppm)	75 ppm
<b>USA - ACGIH - Occupational Exposure Limits</b>	
Local name	Nitric oxide
ACGIH OEL TWA [ppm]	25 ppm

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Remark (ACGIH)	Hypoxia/cyanosis; nitrosyl-Hb form
Regulatory reference	ACGIH 2017

### Exposure limit values for the other components

No additional information available

#### 8.1.1 Biological monitoring

No additional information available

#### 8.2. Appropriate engineering controls

Appropriate engineering controls : Provide adequate general and local exhaust ventilation. Consider the use of a work permit system e.g. for maintenance activities. Product to be handled in a closed system and under strictly controlled conditions. Preferably use permanent leak-tight installations (e.g. welded pipes). Gas detectors should be used when toxic gases may be released. Systems under pressure should be regularly checked for leakages. Ensure exposure is below occupational exposure limits (where available).

#### 8.3. Individual protection measures, such as PPE

##### Hand protection:

Wear chemically resistant protective gloves. Standard EN 374 - Protective gloves against chemicals. Consult glove manufacturer's product information on material suitability and material thickness. The breakthrough time of the selected gloves must be greater than the intended use period. Wear working gloves when handling gas containers. Standard EN 388 - Protective gloves against mechanical risk, performance level 1 or higher.

##### Eye protection:

Wear goggles and a face shield when transfilling or breaking transfer connections. Provide readily accessible eye wash stations and safety showers. Standard EN 166 - Personal eye-protection - specifications

##### Respiratory protection:

Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems. Keep self contained breathing apparatus readily available for emergency use. Consult respiratory device supplier's product information for the selection of the appropriate device. Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask. When indicated by a risk assessment, Respiratory Protective Equipment must be used. The selection of the Respiratory Protective Device (RPD) must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected RPD.

#### Personal protective equipment symbol(s):



Thermal hazard protection  
Environmental exposure controls

: None in addition to the above sections.  
: Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment.

## SECTION 9: Physical and chemical properties

Physical state : Gas  
Appearance : No data available  
Colour : Mixture contains one or more component(s) which have the following colour(s):  
Brownish gas.  
Odour : Odourless.  
Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.  
pH : Not applicable for gases and gas mixtures.  
Melting point : Not applicable for gases and gas mixtures.  
Freezing point : No data available

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Boiling point	: .Not applicable for gas mixtures.
Flash point	: Not applicable for gases and gas mixtures.
Evaporation rate	: No data available
Flammability (solid, gas)	: Non flammable.
Explosive limits	: Non flammable.
Vapour pressure	: Vapour pressure: Not applicable. Vapour pressure at 50°C: Not applicable.
Relative vapour density at 20°C	: Not applicable for gases and gas mixtures.
Relative density	: Relative gas density: Lighter or similar to air.
Solubility	: No data available
Partition coefficient n-octanol/water (Log Pow)	: .Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Kow)	: No data available
Auto-ignition temperature	: Non flammable.
Decomposition temperature	: Not applicable.
Viscosity, kinematic	: Not applicable for gases and gas mixtures.
Viscosity, dynamic	: Not applicable for gases and gas mixtures.
Oxidising properties	: Oxidiser.
Additional information	: None.

### SECTION 10: Stability and reactivity

Reactivity	: Data for mixtures are not available
Chemical stability	: Stable under normal conditions.
Possibility of hazardous reactions	: Violently oxidises organic material.
Conditions to avoid	: Avoid moisture in installation systems.
Incompatible materials	: May react violently with combustible materials,May react violently with reducing agents,Keep equipment free from oil and grease. For more guidance, refer to the EIGA Doc. 33 - Cleaning of Equipment for Oxygen Service downloadable at <a href="http://www.eiga.eu">http://www.eiga.eu</a> ,For additional information on compatibility refer to ISO 11114.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

### SECTION 11: Toxicological information

#### 11.1. Information on toxicological effects

Acute toxicity (oral)	: Not classified
Acute toxicity (dermal)	: Not classified
Acute toxicity (inhalation)	: Fatal if inhaled.

Nitric Oxide	
ATE MY (Gases)	57.5 ppmv/4h
Nitric oxide (10102-43-9)	
LC50 Inhalation - Rat [ppm]	57.5 ppm/4h

Skin corrosion or irritation	: Causes severe skin burns. pH: Not applicable for gases and gas mixtures.
Serious eye damage or eye irritation	: Causes serious eye damage.
Respiratory sensitization	: Not classified
Skin sensitization	: Not classified
Germ cell mutagenicity	: Not classified
Carcinogenicity	: Not classified
Reproductive toxicity	: Not classified
Specific target organ toxicity (STOT) – single exposure	: Not classified
Specific target organ toxicity (STOT) – repeated exposure	: Not classified
Aspiration hazard	: Not classified

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<b>Nitric Oxide</b>	
Viscosity, kinematic	Not applicable for gases and gas mixtures.

Other information : The substance/mixture has no endocrine disrupting properties.

### SECTION 12: Ecological information

#### 12.1. Ecotoxicity

Ecology - general : No data available.

Hazardous to the aquatic environment, short-term (acute) : Not classified

Hazardous to the aquatic environment, long-term (chronic) : Not classified

<b>Nitric Oxide</b>	
Partition coefficient n-octanol/water (Log Pow)	.Not applicable for gas mixtures.

<b>Nitric oxide (10102-43-9)</b>	
Partition coefficient n-octanol/water (Log Kow)	.Not applicable for gas mixtures.
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.

#### 12.2. Persistence and degradability

<b>Nitric Oxide</b>	
Persistence and degradability	No data available.

<b>Nitric oxide (10102-43-9)</b>	
Persistence and degradability	No data available.

#### 12.3. Bioaccumulative potential

<b>Nitric Oxide</b>	
Partition coefficient n-octanol/water (Log Pow)	.Not applicable for gas mixtures.
Bioaccumulative potential	No data available.

<b>Nitric oxide (10102-43-9)</b>	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.
Partition coefficient n-octanol/water (Log Kow)	.Not applicable for gas mixtures.
Bioaccumulative potential	No data available.

#### 12.4. Mobility in soil

<b>Nitric Oxide</b>	
Mobility in soil	No additional information available
Partition coefficient n-octanol/water (Log Pow)	.Not applicable for gas mixtures.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

<b>Nitric oxide (10102-43-9)</b>	
Partition coefficient n-octanol/water (Log Pow)	Not applicable for inorganic products.
Partition coefficient n-octanol/water (Log Kow)	.Not applicable for gas mixtures.
Ecology - soil	Because of its high volatility, the product is unlikely to cause ground or water pollution. Partition into soil is unlikely.

#### 12.5. Other adverse effects

Ozone : Not classified

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GWPmix comment : No known effects from this product.  
Effect on the ozone layer : No effect on the ozone layer.  
Other adverse effects : May cause pH changes in aqueous ecological systems.

### SECTION 13: Disposal information

#### 13.1. Disposal methods

Waste treatment methods : Contact supplier if guidance is required. Must not be discharged to atmosphere. Ensure that the emission levels from local regulations or operating permits are not exceeded. Refer to the EIGA code of practice Doc.30 "Disposal of Gases", downloadable at <http://www.eiga.eu> for more guidance on suitable disposal methods. Return unused product in original container to supplier.

Additional information : External treatment and disposal of waste should comply with applicable local and/or national regulations.

### SECTION 14: Transportation information

#### 14.1. UN number

UN-No. (UN RTDG) : 1660  
UN-No. (IMDG) : 1660  
UN-No. (IATA) : 1660

#### 14.2. UN proper shipping name

Proper Shipping Name (UN RTDG) : NITRIC OXIDE, COMPRESSED  
Proper Shipping Name (IMDG) : NITRIC OXIDE, COMPRESSED  
Proper Shipping Name (IATA) : Nitric oxide, compressed

#### 14.3. Transport hazard class(es)

##### UN RTDG

Transport hazard class(es) (UN RTDG) : 2.3 (5.1, 8)  
Danger labels (UN RTDG) : 2, 3, 5.1, 8  
:



##### IMDG

Transport hazard class(es) (IMDG) : 2.3 (5.1, 8)  
Danger labels (IMDG) : 2, 3, 5.1, 8  
:



##### IATA

Transport hazard class(es) (IATA) : 2.3 (5.1, 8)

#### 14.4. Packing Group, if applicable

Packing group (UN RTDG) : Not applicable  
Packing group (IMDG) : Not applicable  
Packing group (IATA) : Not applicable

#### 14.5. Environmental hazards

Dangerous for the environment : No  
Marine pollutant : No  
Other information : No supplementary information available



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### 14.6. Transport in bulk (according to Annex II of MARPOL 73/78 and the IBC Code)

Special transport precautions : Avoid transport on vehicles where the load space is not separated from the driver's compartment, Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency, Before transporting product containers: - Ensure there is adequate ventilation, - Ensure that containers are firmly secured, - Ensure valve is closed and not leaking, - Ensure valve outlet cap nut or plug (where provided) is correctly fitted, - Ensure valve protection device (where provided) is correctly fitted.

### **UN RTDG**

Limited quantities (UN RTDG) : 0  
Excepted quantities (UN RTDG) : E0  
Packing instruction (UN RTDG) : P200

### **IMDG**

Limited quantities (IMDG) : 0  
Excepted quantities (IMDG) : E0  
Packing instructions (IMDG) : P200  
EmS-No. (Fire) : F-C - FIRE SCHEDULE Charlie - NON-FLAMMABLE GASES  
EmS-No. (Spillage) : S-W - SPILLAGE SCHEDULE Whisky - OXIDIZING GASES  
Stowage category (IMDG) : D  
Stowage and handling (IMDG) : SW2  
Segregation (IMDG) : SG6, SG19  
Properties and observations (IMDG) : Non-flammable, toxic and corrosive gas. Strong oxidizing agent. On contact with air, gives off brown fumes which are toxic by inhalation, with delayed effect similar to phosgene. Heavier than air (1.04). Highly irritating to skin, eyes and mucous membranes.

### **IATA**

PCA Limited quantities (IATA) : Forbidden  
PCA limited quantity max net quantity (IATA) : Forbidden  
PCA packing instructions (IATA) : Forbidden  
PCA max net quantity (IATA) : Forbidden  
CAO packing instructions (IATA) : Forbidden  
CAO max net quantity (IATA) : Forbidden  
Special provisions (IATA) : A2  
ERG code (IATA) : 2PX

### 14.7. Special precautions for user

IBC code : Not applicable.

### 14.8. Hazchem or Emergency Action Code

EAC code : 2PE.

## **SECTION 15: Regulatory information**

### 15.1. Safety, health, and environmental regulations specific for the hazardous chemical in question

Regulation	Component/ Mixture
EHS Notification and Registration Scheme	
Environmental Quality (Chlorofluorocarbons Prohibition) Order 1993	Not applicable Nitric Oxide
Environmental Quality (Industrial Effluent) Regulations 2009	Nitric Oxide
Environmental Quality (Scheduled Wastes) Regulations 2007	Nitric Oxide
Control of Industrial Major Accident Hazards Regulations 1996	Nitric Oxide
Prohibition of Use of Substance Order 1999	Nitric Oxide

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Use and Standards of Exposure of Chemical Hazardous to Health Regulations 2000	Nitric Oxide
Chemical Weapons Convention Act	Nitric Oxide
Corrosive and Explosive Substances and Offensive Weapons Act	Nitric Oxide
Dangerous Drugs Act	Nitric Oxide
Pesticides Act	Nitric Oxide
Petroleum (Safety Measures) Act	Nitric Oxide
Poisons Act 1952	Nitric Oxide
Poisons (Psychotropic Substances) Regulations 1989	Nitric Oxide

### 15.2. International agreements

No additional information available

## SECTION 16: Other information

Version : 0.0  
Issue date : 2/15/2023

Abbreviations and acronyms : ATE - Acute Toxicity Estimate  
CLP - Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008  
REACH - Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006  
EINECS - European Inventory of Existing Commercial Chemical Substances  
CAS# - Chemical Abstract Service number  
PPE - Personal Protection Equipment  
LC50 - Lethal Concentration to 50 % of a test population  
RMM - Risk Management Measures  
PBT - Persistent, Bioaccumulative and Toxic  
vPvB - Very Persistent and Very Bioaccumulative  
STOT- SE : Specific Target Organ Toxicity - Single Exposure  
CSA - Chemical Safety Assessment  
EN - European Standard  
UN - United Nations  
ADR - European Agreement concerning the International Carriage of Dangerous Goods by Road  
IATA - International Air Transport Association  
IMDG code - International Maritime Dangerous Goods  
RID - Regulations concerning the International Carriage of Dangerous Goods by Rail  
WGK - Water Hazard Class  
STOT - RE : Specific Target Organ Toxicity - Repeated Exposure  
UFI : Unique Formula Identifier

Training advice : Users of breathing apparatus must be trained. Ensure operators understand the toxicity hazard.

Other information : Classification using data from databases maintained by the European Industrial Gases Association (EIGA). Data is maintained in EIGA doc 169 : 'Classification and Labelling Guide', downloadable at : <http://www.eiga.eu>. Classification in accordance with the procedures and calculation methods of Regulation (EC) 1272/2008 (CLP).

Safety Data Sheet (SDS), Malaysia\_AL

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.