SAFETY DATA SHEET

In compliance with EC Regulations No.: 1907/2006, 830/2015 and 1272/2008 (CLP).

Date last modified: 19 April 2018 - Version 3.0

1. IDENTIFICATION OF THE SUBSTANCE/PREPARATION AND OF THE COMPANY

1.1 Product Identifier

Product Name: OXYBLOCK D
Product Code #: 673017 (30 lt)

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

Intended Use: Industrial applications; Oxygen scavenger for boiler water treatment.

Uses advised against: This product is not recommended for any industrial, professional or consumer use other than the Intended Uses above and the instructions written in this Safety Data Sheet.

1.3 Details of the supplier of the safety data sheet

Company/undertaking identification

Supplier/Manufacturer:

Marichem Marigases Hellas SA
Sfaktirias 64,
185 45 Piraeus,
Greece
Tel. No.: ++30 210 4148800
Fax No.: ++30 210 4133985
http://www.marichem-marigases.com

e-mail: mail@marichem-marigases.com

1.4 Emergency telephone number

Tel. No.: ++30 210 4148800 (including working hours)

Emergency Information:
Inside U.S. and Canada: (800)-424-9300 (CHEMTREC)
Outside U.S. and Canada: 1-703-527-3887 (CHEMTREC)
National Emergency Centre (Greece): ++30 210 7793777

2. HAZARDS IDENTIFICATION

2.1 Classification of the mixture

Classification under EC 1272/2008 regulation - GHS classification.

Eye Irritation: Category 2A
Germ Cell Mutagen: Category 1B
Respiratory Irritation: Category 3
Skin corrosion/Irritation: Category 2

SIGNAL WORD: DANGER

Hazard Statement(s):

H303: May be harmful if swallowed.
H304: May be fatal if swallowed and enters airways.
H312: Harmful in contact with skin.
H316: Causes mild skin irritation.
H332: Harmful if inhaled.
H340: May cause genetic defects.

Classification under Directives 67/548/EEC, 1999/45/EC and their amendments.

The preparation is classified as dangerous.
Irritating to eyes, respiratory system and skin.

2.2 Label Elements

Labelling according to GHS (1272/2008/EC)
The substance is classified and labelled according to the CLP Regulation.

SYMBOL:

GHS07 GHS08

SIGNAL WORD: DANGER

Hazard Statement(s):

H303: May be harmful if swallowed.
H304: May be fatal if swallowed and enters airways.
H312: Harmful in contact with skin.
H316: Causes mild skin irritation.
H332: Harmful if inhaled.
H340: May cause genetic defects.

Precautionary Statement(s):

Prevention:
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician.
P331 Do NOT induce vomiting.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P363 Wash contaminated clothing before re-use.
P304+P340 IF INHALED: Remove person to fresh air and keep 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.
P391 Collect spillage.

Storage:
P403 + P235 Store in a well-ventilated place. Keep cool.
P405 Store locked up.

Disposal:
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

Product classification and labelling according to Directive 67/548/EEC, European Dangerous Preparations Directive (1999/45/EC), European Regulation 648/2004 and their amendments.

Symbol: C, Corrosive

Xi, Irritant

R-phrases:	36/37/38	Irritating to eyes, respiratory system and skin.
S-phrases:	1/2	Keep locked up and out of the reach of children.
	23	Do not breathe gas/vapour.
	24	Avoid contact with the skin.
	25	Avoid contact with eyes.
	36/37/39	Wear suitable protective clothing, gloves and eye/face protection.

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Chemical Composition:

Ingredients	CAS Number	Proportion	Hazard Code(s)
N,N - Diethylhydroxylamine	3710-84-7	10% - 30%	H226, H303, H304, H312, H316, H332, H340
Other ingredients that do not contribute to the classification of the product	-	70% - 90%	-

*See section 16 for the full text of the Hazard Code(s) declared above.

Occupational Exposure Limits, if available, are listed in section 8.

4. FIRST AID MEASURES

4.1. & 4.2. Description of necessary first-aid measures & Most important symptoms/effects, acute and delayed

General advice:
Under the shower: Take off immediately all contaminated clothing (including shoes).

Inhalation:
Inhalation of mists Move patient from contaminated area to fresh air. Oxygen or artificial respiration if needed. Keep under medical surveillance. In case of problems: Hospitalise.

Skin contact:
Wash immediately, abundantly and thoroughly with water. Consult a physician.

Eye contact:
Wash open eyes immediately, abundantly and thoroughly for at least 15 minutes.

Ingestion:
Do not induce vomiting, rinse mouth and lips with plenty of water if the subject is conscious, then hospitalize.

Protection of first-aiders:
If entering a saturated atmosphere, wear a self contained breathing apparatus. Protective suit.

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

Treatment: None known.

5. FIRE-FIGHTING MEASURES

5.1.Extinguishing media
Suitable extinguishing media: Water spray, Foam, Dry powder, Carbon Dioxide (CO_2)
Unsuitable extinguishing media: High volume water jet.

5.2. Special hazards arising from the substance or mixture

Thermal decomposition giving toxic products: Ammonia, Carbon oxides
Formation of toxic products through combustion: Nitriles, Cyanides

5.3. Advice for fire-fighters
Specific methods:
Use water spray to cool unopened containers. Ensure containers can be rapidly moved. In case of fire nearby, remove exposed containers.

Special protective actions for fire-fighters:
In the event of fire, wear self-contained breathing apparatus. Complete suit protecting against chemicals.

6. ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures
Use personal protective equipment. Avoid contact with skin and eyes and inhalation of vapours. Ensure adequate ventilation. Evacuate personnel to safe areas. Prohibit all sources of sparks and ignition - Do not smoke. Beware of vapours accumulating to form explosive concentrations. Vapours can accumulate in low areas.

6.2. Environmental precautions
Prevent product from entering drains. Dam up with sand or inert earth (do not use combustible materials). Should not be released into the environment.

6.3. Methods and materials for containment and cleaning up

Recovery:
Pump into a labelled inert emergency tank. Moist product : absorb the remainder with an inert absorbent material.
Capture the gas with fine water spray (scrubbing), collect and treat contaminated water.

Neutralisation:
Neutralize with a sodium bisulphate solution.

Elimination:
Destroy the product by incineration (in accordance with local and national regulations).

6.4. Reference to other sections:
None.

7. HANDLING AND STORAGE

7.1. Precautions for safe handling

Technical measures/Precautions
Storage and handling precautions applicable to products: Liquid. Harmful. Irritant. Dangerous for the environment Provide appropriate exhaust ventilation at machinery. Provide fire-blanket nearby. Provide showers, eye-baths. Provide water supplies near the point of use.

Safe handling advice
Take precautionary measures against static discharges. Open drum carefully as content may be under pressure. Prohibit all sources of sparks and ignition - Do not smoke. Use only in an area containing explosion proof equipment. Do not use air for transfers.

Hygiene measures
Avoid contact with the skin and the eyes. Avoid exposure to vapour. When using do not eat, drink or smoke. Wash hands after handling. Remove contaminated clothing and protective equipment before entering eating areas.

7.2. Conditions for safe storage, including any incompatibilities
Keep in a dry, cool and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage.
Store protected from moisture and heat. Remove all sources of ignition. Store under inert and dry atmosphere. Provide a catch-tank in a bunded area. Provide impermeable floor. Provide electrical earthing of equipment and electrical equipment usable in explosive atmospheres.
Do not store above: 50 °C

Packaging material
Recommended: Ordinary steel, High density polyethylene (HDPE)
To be avoided: Light metals and alloys (corrosion), Aluminium and copper alloys, Zinc and alloys, Rubber.

7.3. Specific end use(s)
None.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Name of Substance: N, N - Diethylhydroxylamine

8.1. Control parameters

Exposure Limit Values: Not relevant

Derived No Effect Level (DNEL)

End Use	Inhalation	Ingestion	Skin contact
Workers	3,65 mg/m^3 (LT, SE) 45,6 mg/m^3 (ST, SE) 2,92 mg/m^3 (LT, LE) 8,76 mg/m^3 (ST, LE)		0,26 mg/kg bw/day (LT, SE) 4,7 mg/kg bw/day (ST, SE)
Consumers	0,65 mg/m^3(LT, SE)	0,13 mg/kg bw/day (LT, SE)	

LE: Local effects, **SE:** Systemic effects, **LT:** Long term, **ST:** Short term

Predicted No Effect Concentration (PNEC)

Compartment	Value
Fresh water	0,0082 mg/l
Marine water	0,00082 mg/l
Water (Intermittent release)	0,082 mg/l
Effects on waste water treatment plants	10 mg/l
Fresh water sediment	0,0652 mg/kg dw
Marine sediment	0,00652 mg/kg dw
Soil	0,0082 mg/kg dw

8.2. Exposure controls

General protective measures
Provide sufficient air exchange and/or exhaust in work rooms.

Personal protective equipment
Respiratory protection
High concentrations or prolonged activity: Self contained Breathing Apparatus.
Low concentrations or short activity: Mask with specific cartridge.
Recommended Filter type: A2B2E2K2P3.

Hand protection
Splash contact, intermittent and prolonged PVC glove.
According to permeation index EN 374: 1 (time elapsed > 10 mins).

Eye/face protection
Safety glasses.

Skin and body protection
At the workplace: Protective clothing (cotton).
Intervention at incident: Combination with delayed penetration.

Environmental exposure controls
See chapter 6.

9. PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

9.1.1. Appearance

Physical State:	Liquid
Color:	Light yellow
Odor:	Odorless

9.1.2. Basic data

Boiling Point Range:	Not Available
Melting Point Range:	29°F

Solubility in water:	Complete
Flash Point:	>100^{0}C
Autoignition Temperature:	Not Available
Lower Explosion Limit (vol %):	Not Available
Upper Explosion Limit (vol %):	Not Available
Evaporation Rate:	>1 (Ether = 1)
Relative vapor density (air=1):	Not Available
Specific gravity:	0.98 - 1.00 gr/cm^3 at 20^{o}C
pH value:	10.0 - 11.0

9.2 Other Information: No further relevant information available.

10. STABILITY AND REACTIVITY

10.1. & 10.2. Reactivity & Chemical stability
The product is stable under normal handling and storage conditions.

10.3. Possibility of hazardous reactions
• Very exothermic reaction and possibility of spitting with: Strong acids, Halogens.
Product likely to react violently in alkaline environment
Corrosion with: light metals and alloys

10.4. Conditions to avoid
Temperatures above 50 °C.
Exposure to moisture. Protect from heat.

10.5. Incompatible materials to avoid
• Violent reaction and flammability with:, Oxidizing agents, Nitrates, Peroxides.
• Formation of toxic products (n-nitrosamines) with: Nitrous acid and other nitrosating agents, Nitrites, Oxygen.

10.6. Hazardous decomposition products

Thermal decomposition:
Decomposition temperature: 120 - 130 °C.
Thermal decomposition giving flammable and irritating products: Diethylamine.
Formation of toxic products through combustion: Nitrogen oxides (NO_x), Carbon oxides.

11. TOXICOLOGICAL INFORMATION

Name of Substance: N, N - Diethylhydroxylamine

All available data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

11.1. Information on toxicological effects

Acute toxicity

Inhalation
From its composition, it must be considered as slightly harmful by inhalation.
• In animals: LC50/4 h/rat: 11,4 mg/l (3140 ppm) (Method: OECD Test Guideline 403) (vapour)

Ingestion
According to its composition, can be considered as slightly harmful by ingestion
• In animals: LD50/rat: 2.190 mg/kg

Dermal
From its composition, it must be considered as: Harmful in contact with skin.
• In animals: LD50/rabbit: 1.300 mg/kg

Local effects (Corrosion / Irritation / Serious eye damage):
Skin contact
According to its composition: Slightly irritating to skin.
• In animals: Slightly irritating to skin. (After occlusive contact, rabbit, Exposure time: 4 h)

Eye contact
According to its composition: Slightly irritating to eyes.
• In animals: Mild eye irritation (Draize Test, rabbit).

Respiratory or skin sensitisation

Inhalation: No data available.

Skin contact
According to its composition: Not a skin sensitizer
• In animals: No skin allergy was observed (Method: OECD Test Guideline 406 Buehler method, guinea pig)

CMR effects
Mutagenicity: According to its composition: Overall not genotoxic.

In vitro
Ames test in vitro: Inactive (Method: OECD Test Guideline 471)
In vitro chromosomal abnormality test on human lymphocytes: Active (Method: OECD Test Guideline 473)
In vitro gene mutations test on mammalian cells: Active (Method: OECD Test Guideline 476)

In vivo
Micronucleus test in vivo mouse: Inactive (Method: OECD Test Guideline 474)
DNA repair test on rats hepatocytes: Inactive (Method: OECD Test Guideline 486)

Carcinogenicity
No data available.

Reproductive toxicity

Fertility: No data available.

Foetal development: According to its composition: Absence of toxic effects for foetal development.

• In animals : Exposure during pregnancy: Absence of toxic effects for foetal development.
(Method: OECD Test Guideline 414, rat, By oral route)

NOAEL (Developmental Toxicity): > 568 mg/kg bw/day
NOAEL (Maternal Toxicity): 87 mg/kg bw/day

Specific target organ toxicity

Inhalation: According to its composition: Irritating to respiratory system.

Repeated exposure: According to its composition: The substance or mixture is not classified as specific target organ toxicant, repeated exposure.

• In animals : By inhalation: (Method: OECD Test Guideline 412, rat, 1 Months)
Local irritation of the respiratory system
Target organs: Nasal epithelium, NOAEL = 15ppm
Maximum concentration with no systemic toxic effect 150 ppm.

Aspiration hazard

Not applicable.

12. ECOLOGICAL INFORMATION

Name of Substance: N, N - Diethylhydroxylamine

Ecotoxicology Assessment: All available data on this product and/or the components quoted in section 3 and/or the analogue substances/metabolites have been taken into account for the hazard assessment.

12.1. Toxicity:

Fish: According to its composition, can be considered as: Slightly harmful to fish.
LC50, 96 h (Pimephales promelas (fathead minnow)): > 134 mg/l (Method: OECD Test Guideline 203, pH: 8,4).

Aquatic invertebrates: According to its composition, can be considered as: Toxic to daphnia.
LC50, 48 h (Daphnia magna (Water flea)): = 8,2 mg/l (Method: OECD Test Guideline 202, pH: 8,0, Immobilization).

Aquatic plants: According to its composition, can be considered as: Slightly harmful to algae.
ErC50, 72 h (Pseudokirchneriella subcapitata): > 101 mg/l (Method: OECD Test Guideline 201, pH: 7,8, growth rate).

Microorganisms: NOEC, 28 d (Activated sludge): = 100 mg/l.

Aquatic toxicity/Long term toxicity

Aquatic plants
NOEC r, 72 h (Pseudokirchneriella subcapitata (green algae)): = 26 mg/l (Method: OECD Test Guideline 201, growth rate).

12.2. Persistence and degradability

Biodegradation (In water): According to its composition, can be considered as: Not readily biodegradable.
Aerobic: 11 % after 28 d (Method: OECD Test Guideline 301 F)

12.3. Bioaccumulative potential:

Bioaccumulation: According to its composition, can be considered as: Bioaccumulation is unlikely.
Partition coefficient: n-octanol/water: log Kow: <= 0,5 , at 50 °C (Method: OECD Test Guideline 117).

12.4. Mobility in soil - Distribution among environmental compartments

Henry constant: 5,9E-03 Pa.m^3/mol,
Surface tension: 25,6 mN/m mg/l 20 °C /1.000 mg/l (Method: A5 Method).

12.5. Results of PBT and vPvB assessment:

According to REACH regulation, annex XIII, this mixture contains no substance meeting PBT and vPvB criteria.

12.6. Other adverse effects
None known.

13. DISPOSAL CONSIDERATIONS

13.1. Waste treatment

Disposal of product
Neutralize with a sodium bisulphate solution. Destroy the product by incineration (in accordance with local and national regulations).

Disposal of packaging
Purging of residual gases in empty packaging is obligatory before recovery. Destroy packaging by incineration at an approved waste disposal site. Clean container with water. Recover waste water for processing later.

14. TRANSPORT INFORMATION

14.1 Not classified as hazardous material according to IMDG, ADR/RID, US DOT and IATA/ICAO codes.

15. REGULATORY INFORMATION

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

If other regulatory information applies that is not already provided elsewhere in this safety data sheet, then it is described in this subsection.

15.2 Chemical Safety Assessment

A CSA has been carried out for the raw materials in this product, from the raw materials manufacturers (when needed to be carried out).

16. OTHER INFORMATION

16.1 Full text of Hazard Code(s) referred in Section 3

H226: Flammable liquid and vapor.
H303: May be harmful if swallowed.
H304: May be fatal if swallowed and enters airways.
H312: Harmful in contact with skin.
H316: Causes mild skin irritation.
H332: Harmful if inhaled.
H340: May cause genetic defects.

16.2 Abbreviations and acronyms

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road).
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail).
IMDG: International Maritime Code for Dangerous Goods.
IATA: International Air Transport Association.
ICAO: International Civil Aviation Organization.
bw: Body weight.
Carc.: Carcinogenicity.
CAS number: Chemical Abstracts Service number.
CLP: Classification Labelling Packaging Regulation.
CSA: Chemical Safety Assessment.
CSR: Chemical Safety Report.
DNEL: Derived No Effect Level.
dw: Dry weight.
EC number: EINECS and ELINCS number.
EC: European Commission.
EC50: Half maximal effective concentration.
EINECS: European Inventory of Existing Commercial Chemical Substances.
ELINCS: European List of Notified Chemical Substances.
EmS: Emergency Schedule.
ERC: Environmental Release Category.
ES: Exposure scenario.
food: oral feed.
GHS: Globally Harmonized System of Classification and Labelling of Chemicals.
Irrit.: Irritation.
LC50: Lethal concentration, 50 %.
LD50: Median Lethal dose.
LOAEC: Lowest Observed Adverse Effect Concentration.
LOAEL: Lowest Observed Adverse Effect Level.
MK value: Maximum Concentration value.
NCO: An international corporation that provides customer service contracting.
NOAEC: No Observed Adverse Effect Concentration.
NOAEL: No Observed Adverse Effect Level.
NOEC: No Observed Effect Concentration.
OECD: Organisation for Economic Cooperation and Development.
PBT: Persistent, Bioaccumulative and Toxic.
PNEC: Predicted No Effect Concentration.
PROC: Process category.
REACH: The Registration, Evaluation, Authorisation and Restriction of Chemicals.
Resp.: Respiratory.
Sens.: Sensitization.
STEL value: Short Term Exposure Limit value.

STOT RE: Specific target organ toxicity — repeated exposure.
STOT SE: Specific target organ toxicity — single exposure.
STOT: Specific Target Organ Toxicity.
STP: Sewage Treatment Plant.
SU: Sector of use.
Tox.: Toxicity.
TWA value: Time Weighted Average value.
vPvB: Very Persistent and Very Bioaccumulative.

16.3 Notice to reader

All information, instructions and statements contained in this Material Safety Data Sheet are compiled in accordance with European Directives, corresponding national legislation and on the basis of information given by our suppliers.
The information disclosed in this Material Safety Data Sheet (which supersedes all previous versions) is believed to be correct, at the date of issue, to the best of our current knowledge and experience. It only relates to the specific product designated herein and it may not be valid when said product is used in combination with any other products or in any processed form, unless specified in the text. This document aims to provide the necessary health and safety information of the product and is not to be considered a warranty or quality specification. It is the responsibility of the recipient of this Material Safety Data Sheet to ensure that information given here is read and understood by all who use, handle, dispose of or in any way come in contact with the product.
Also, it is the responsibility of the user to comply with local legislation relating to safety, health, environment and waste management. Data and information provided concerning the product are informative, exclusively presented to the customer.