SECTION 1 - IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

Product identifier:

Product name: OZONE

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

Identified uses: Ozone produced at the place of application by the UVO 140 type ozone generator which can be used for deodorization and disinfection.

Uses advised against: None

Details of the supplier of the safety data sheet

Manufacturer:

Air-Filter Kft
1039 Budapest, Czetz János utca 88-90.
Tel.: +36 20 293 23 45
web: www.r-filter.hu

Email address of the responsible person for the MSDS: r-filter@r-filter.hu

Emergency telephone number:

Emergency phone number: **112** **06 80/201-199**
Egészségügyi Toxikológiai Tájékoztató Szolgálat (ETTSZ)
Free calling in 24 hours!

SECTION 2 - HAZARDS IDENTIFICATION

Classification of the substance or mixture:

Oxidising gases, category 1.	H270	May cause or intensify fire; oxidiser.
Skin corrosion, category 1B	H314	Causes severe skin burns and eye damage.
Serious Eye damage, category 1.	H318	Causes serious eye damage.
Acute Toxicity, category 1.	H330	Fatal if inhaled.
STOT, repeated exposure, cat. 1.	H372	Causes damage to organs through prolonged or repeated exposure (inhalation).
Hazardous to the aquatic environment, acute, cat.1.	H400	Very toxic to aquatic life.
Hazardous to the aquatic environment, chronic, cat. 2.	H410	Very toxic to aquatic life with long lasting effects.

The most important adverse physical-chemical, human health and environment impacts:

Physicochemical hazards: Oxidizing gas that can cause a fire or increase the intensity of a fire.

Eyes: Contact with eyes may cause serious eye damage, tearing, redness, burning sensation, pain.

Inhalation: Irritation of the respiratory system, nasal discomfort, dryness / irritation of the throat, chest pain, difficulty breathing, cough, headache, nausea and drowsiness may occur. In high concentrations, pulmonary edema, pneumonia and asthma may also develop.

Skin: Not likely as gaseous.

Ingestion: May not occur as gaseous.

Label elements:

Signal words: Danger!

Hazard statements:

H270	May cause or intensify fire; oxidiser.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.
H372	Causes damage to organs through prolonged or repeated exposure (inhalation).
H400	Very toxic to aquatic life.
H410	Very toxic to aquatic life with long lasting effects.
EUH71	Corrosive to the respiratory tract.

Precautionary statements:

P102	Keep out of reach of children.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P342+P311	If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician.
P501	Dispose of contents / container in accordance with local / regional / national / international regulations.

2.3 Other hazards: The substances do not meet the criteria for classification as PBT or vPvB.

SECTION 3 - COMPOSITION/INFORMATION ON INGREDIENTS

3.2 Mixtures

Chemical name	CAS No.: EK No.: Index No.: Registration No.:	Concentration m/m%	Classification
Ozone	10028-15-6 233-069-2 - -	100 %	Ox. Gas 1, H270 Skin Corr 1B, H 314 Eye Dam. 1, H318 Acute Tox. 1, H330 STOT RE 1, H372 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

The full text of the H statements can be found under section 16.

SECTION 4 - FIRST AID MEASURES

4.1 Description of first aid measures:

General advice: Show this material safety data sheet to the attending physician.
In case of skin contact or ingestion: Not applicable as the ozone is a gas.
In case of eye contact: Rinse eyes thoroughly with plenty of lukewarm flowing water or an eye wash device immediately, also under the eyelids for at least 15 minutes. Consult a physician for safety reasons.
In case of inhalation: The affected person should be taken out into the fresh air their tight clothing should be loosen and care should be taken to keep it warm. In case of respiratory insufficiency, persistent cough or respiratory tract irritation, seek medical advice immediately.

4.2 Most important symptoms and effects:

In case of inhalation: Irritation of the respiratory system, nasal discomfort, dryness / irritation of the throat, chest pain, difficulty breathing, cough, headache, nausea and drowsiness may occur. In high concentrations, pulmonary oedema, pneumonia and asthma may also develop.
In case of skin contact: Not likely as gaseous.
In case of eye contact: Contact with eyes may cause serious eye damage, tearing, redness, burning sensation, pain.
Ingestion: May not occur as gaseous.

4.3 Indication of any immediate medical attention and special treatment needed:
Symptomatic treatment.

SECTION 5 – FIREFIGHTING MEASURES

5.1 Extinguishing media
Ozone is not flammable in itself, but as a strong oxidant, it can cause a fire / explosion or increase the intensity of a fire.
Extinguishing media appropriate to local conditions and the environment should be used.

5.2 Special hazards arising from the substance or mixture:
The substance itself is not combustible and is not explosive.
Ozone can react explosively with easily oxidizable substances and reducing agents.

5.3 Advice for fire fighters:
In accordance with the applicable fire protection regulations, fire protection measures appropriate to the environment and circumstances shall be applied. Personal protective equipment including: suitable protective gloves, goggles and protective clothing. Use self-contained breathing apparatus.

SECTION 6 - ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures:
Turn off the ozone generator or remove the power supply, remove unauthorized persons.
Ventilate the contaminated area for a minimum of 30 minutes.
Do not return to the room until the ozone level has dropped to a safe level.

6.2 Environmental precautions: No need.

6.3 Methods and material for containment and cleaning up:
Not applicable.

6.4 Reference to other sections: -

SECTION 7 - HANDLING AND STORAGE

7.1 Precautions for safe handling
Ozone must be transported in ozone-resistant pipes from the point of origin to the point of application, or generated at the site of application.
Fire-fighting measures: Not combustible, but as a strong oxidizing agent, may cause fire and increase fire intensity.

7.2 Conditions for safe storage, including any incompatibilities
Technical measures and storage conditions
There is virtually no storage. Ozone is produced at the application site by an ozone generator. Due to its strong oxidizing ability, it is very short-lived, decomposes on site and is converted to oxygen, meaning it cannot and should not be stored.

7.3 Specific end use(s): Ozone produced at the site of application by an ozone generator, which can be used for deodorization, mould removal, disinfection, and pest control.

SECTION 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

8.1 Control parameters:

Ingredients with limit values to be considered depending on the workplace [5/2020. (II. 6.) ITM Decree, Annex 1.

CAS-No.	Name of the substance	ÁK value (mg/m3)	CK value (mg/m3)
10028-15-6	Ozone	0,2	0,2

ÁK value: General Concentration Limit Value
CK value: Peak Concentration Limit Value

8.2 Exposure controls

Appropriate engineering controls:
Eyewash facilities should be provided near the use of the ozone generator.
General occupational hygiene protection Do not eat, drink or smoke while working.
Precautions should be taken to avoid contact with eyes and inhalation of the gas.
Personal protection
Respiratory protection: If it is necessary to enter the room while the ozone generator is operating, the use of a qualified respirator (against FFP2 valve activated carbon mask, welding fumes and ozone) is required.
Hand protection: No need.
Eye protection: Eyewash facilities should be provided near the use of the ozone generator.
Body protection: No need.
Environmental protect measurements: No need.
Other specialty: -

SECTION 9 - PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

a)	Physical State:	gas
	Colour:	colourless
b)	Odour:	characteristic, prickly
c)	Odour threshold:	not relevant
d)	pH (at 20 °C):	not applicable
e)	Melting point/freezing point	-193 °C
f)	Initial boiling point and boiling range:	-111,35 °C
g)	Flash point:	not applicable
h)	Evaporation rate:	not applicable
i)	Flammability (solid, gas):	the product is not flammable
j)	Upper/lower flammability or explosive limits:	not applicable
k)	Vapour pressure (at -12°C):	55000 Pa
l)	Vapour density:	not applicable

m)	Relative density (at 20 °C):	1,995 g/L
n)	Solubility(ies) in water:	0,57g/L
o)	Partition coefficient: n-octanol/water:	log Pow: -0,87
p)	Auto-ignition temperature:	not applicable
q)	Decomposition temperature:	not known
r)	Viscosity(dynamic):	not applicable
s)	Explosive properties:	not explosive
t)	Oxidising properties:	oxidizing

9.2 Other information -

SECTION 10 - STABILITY AND REACTIVITY

10.1 Reactivity

Reactivity: Ozone is very unstable. Reacts very quickly with air, surface contaminants, odours and many chemicals. Reacts with any material that may oxidize.

10.2 Chemical stability

Decomposes very rapidly at normal ambient temperatures.
Warmer temperatures and higher humidity, as well as dynamic airflow, radically increase the rate of decomposition.
In colder, drier, static atmospheres, the rate of decomposition decreases.

10.3 Possibility of hazardous reactions

Reacts very quickly with air, surface contaminants, odors and many chemicals. Reacts with any material that may oxidize. Decomposes rapidly to form oxygen (O2).

10.4 Conditions to avoid

Excessive enrichment in the air must be avoided. The concentration of ozone in the atmosphere must not exceed 17% (w / w). Decomposition in high concentrations may be explosive.

10.5 Incompatible materials

Ozone-reactive materials: natural rubber (latex), nitrile rubber (fuel hoses), latex foam rubber, bare steel, nylons and some thin plastics. Objects that need to be removed or covered during ozone disinfection: plants, animals, aquariums, oil paintings (dyes and pigments), some leather (treated for a long time), and tires.

10.6 Hazardous decomposition products

No hazardous decomposition products. During decomposition, oxygen (O2) is formed.

SECTION 11- TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity:

Fatal if inhaled.

Test item	Species	Study	Exposition route	Result mg/kg bw.
Ozone	rat	OECD 401	oral	LD_{50}: n.a. mg/kg tt.
Ozone	rabbit	OECD 402	dermal	LD_{50}: n.a. mg/kg tt
Ozone	rat	OECD 403	inhalation	LC_{50}: 3,6 ppm

(a) Skin corrosion/irritation:

Causes severe skin burns.

(b) Serious eye damage/irritation:

Causes serious eye damage.

(c) Respiratory or skin sensitisation: May cause an allergic skin reaction.

(d) Germ cell mutagenicity:

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

(e) Carcinogenicity:

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

(f) Reproductive toxicity:

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

(g) STOT-single exposure:

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

(h) STOT-repeated exposure:

Causes damage to organs through prolonged or repeated exposure (inhalation).

(i) Aspiration hazard:

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

Information on the likely route of exposure:

The most likely route of exposure is mucous membranes and inhalation.

Symptoms related to the physical, chemical and toxicological characteristics:

In case of inhalation: Irritation of the respiratory system, nasal discomfort, dryness / irritation of the throat, chest pain, difficulty breathing, cough, headache, nausea and drowsiness may occur. In high concentrations, pulmonary oedema, pneumonia and asthma may also develop.

In case of skin contact: Not likely as gaseous.

In case of eye contact: Contact with eyes may cause serious eye damage, tearing, redness, burning sensation, pain.
Ingestion: May not occur as gaseous.

SECTION 12 - ECOLOGICAL INFORMATION

No data is available for this product. Therefore, the results of the ecotoxicological studies available on the components of the product will be given for information purposes only.

12.1 Toxicity

Test item	Species	Period of time	End point	Result LC_{50} / EC_{50} (mg/l)
Ozone	Rainbow trout *(Oncorhynchus mykiss)*	96 ó	mortality	LC_{50} : 0,0093
Ozone	Sea fish	96 ó	mortality	LC_{50} : 0,017
Ozone	Waterflea *(Daphnia similis)*	48 ó	immobilisation	EC_{50}: 0,01
Ozone	Sea invertebrates	48 ó	immobilisation	EC_{50}: 0,32

12.2 Persistence and degradability
Decomposes rapidly to form oxygen (O2).

12.3 Bio accumulative potential
Non-bio accumulative, decomposes rapidly, producing oxygen (O2).

12.4 Mobility in soil:
Decomposes rapidly to form oxygen (O2).

12.5 Results of PBT and vPvB assessment:
The product does not meet the criteria for being a PBT or a vPvB.

12.6 Other adverse effect: Not known.

SECTION 13 - DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods Ozone decomposes rapidly to form oxygen (O2). There is virtually no waste.

SECTION 14 - TRANSPORTATION INFORMATION

Ozone produced by an ozone generator at the site of application, hence, cannot and should not be transported.

14.1 UN number: -
14.2 UN proper shipping name: -

14.3 Transport hazard class(es): -
14.4 Packing group: -
14.5 Environmental hazards: -
14.6 Special precautions for user: -
14.7 Transport in bulk according to Annex II of Marpol and the IBC Code: -

SECTION 15 - REGULATORY INFORMATION

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:
COMMISSION REGULATION (EU) 2015/830 (28 May 2015)
amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
Regulation of the European Parliament and Council 1907/2006/EK (2006. XII. 18.) (REACH)
Regulation (EC) no. 1272/2008 of the European Parliament and of the Council of 16 December 2008 on classification, labelling and packaging of substances and mixtures
Commission Regulation (EU) No 453/2010 of 20 May 2010 amending Regulation (EC) No 1907/2006 of the European Parliament and of the Council on the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH)
Public Act No. XXV. of 2000 on Chemical Safety

15.2 Chemical safety assessment: Not applicable according to Regulation (EC) 1907/2006 [REACH] Article 37 (4).

SECTION 16 - OTHER INFORMATION

Application/restriction: see in product information.
List of the relevant hazard (H) statements which are not written out in full under Sections 3.

H270 May cause or intensify fire; oxidiser.
H314 Causes severe skin burns and eye damage.
H318 Causes serious eye damage.
H330 Fatal if inhaled.
H372 Causes damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.

Explanation of abbreviations and acronyms used in the safety data sheet:
CAS number: An unique numerical identifier assigned by the Chemical Abstracts Service.

EINECS number: This is the number of the substance in the European Inventory of Existing Commercial Chemical Substances.
H -phrases: also called hazard statements. They are intended to form a set of standardized phrases about the hazards of chemical substances and mixtures.
P- phrases: also known as precautionary sentences. They are intended to form a set of standardized phrases giving advice about the correct handling of chemical substances and mixtures.
PBT materials: substances of very high concern substances (SVHC): Persistent (not naturally degradable), Bioaccumulative (accumulate in living organism) and Toxic materials.
vPvB: very Persistent, and very Bioaccumulative properties, substances of very high concern (SVHC).
ld50: this value indicates that dosage amount of a compound, what can cause the death of 50% of the animals within 24 hours.
lc 50: this value shows which concentration of the substance can cause the death of 50% of the animals within 24 hours.
EWC: European Waste Catalogue and hazardous waste list.
The information provided in this safety data sheet is correct to the best of our knowledge, information, and belief at the date of its publication.
MARPOL: MARPOL 73/78 is the International Convention for the Prevention of Pollution from Ships, 1973 as modified by the Protocol of 1978. ("Marpol" is short for marine pollution and 73/78 short for the years 1973 and 1978.)
The information given is designed only as guidance for safe handling, use, processing, storage, transportation, disposal, and release and is not to be considered a warranty or quality specification.
The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any proceed, unless specified in the text.