Acetic Anhydride

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Section 1: Identification of the substance/mixture and of the company/undertaking

1.1. Product identifier

Product name:	Acetic Anhydride
CAS Number:	108-24-7
EC Number:	203-564-8

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

Product use:	Laboratory chemicals, Manufacture of substances

1.3 Details of the supplier of the safety data sheet

Company name:	East Harbour Group Ltd 20 Clough Road, Severalls Industrial Park Colchester, Essex, CO4 9QS United Kingdom
Telephone:	+44 (0) 333 242 0100
Email:	info@eastharbourgroup.com

1.4 Emergency telephone number

Emergency telephone:	0800 246 1274

Section 2: Hazardous identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567

Flammable liquids, (Category 3)	H226	Flammable liquid and vapor.
Acute toxicity, (Category 4)	H302	Harmful if swallowed.
Acute toxicity, (Category 2)	H330	Fatal if inhaled.
Skin corrosion, (Sub-category 1B)	H314	Causes severe skin burns and eye damage.
Serious eye damage, (Category 1)	H318	Causes serious eye damage.

2.2 Label elements

Labelling according Regulation (EC) No 1272/2008 as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567

Pictogram

Signal word Danger

Acetic Anhydride

Hazard Statements

H226	Flammable liquid and vapor.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H330	Fatal if inhaled.

Precautionary Statements

P210	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.
P301 + P312	IF SWALLOWED: Call a POISON CENTER/ doctor if you feel unwell.
P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/ doctor.
P305 + P351 + P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Supplemental Hazard Statements
none

2.3 Other hazards
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

Ecological information
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

Toxicological information
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher. Lachrymator., Reacts violently with water.

Section 3: Composition/information on ingredients

3.1 Substances

Formula:	$C_4H_6O_3$
Molecular weight:	102.09 g/mol
CAS-No.:	108-24-7
EC-No.:	203-564-8
Index-No.:	607-008-00-9

Component	Classification	Concentration
Acetic anhydride		
CAS-No. 108-24-7 EC-No. 203-564-8 Index-No. 607-008-00-9	Flam. Liq. 3; Acute Tox. 4; Acute Tox. 2; Skin Corr.1B; Eye Dam. 1; H226, H302, H330, H314, H318 Concentration limits: >= 25 %: Skin Corr. 1B, H314; 5 - < 25 %: Skin Irrit. 2, H315; 5 - < 25	<= 100 %

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	%: Eye Dam. 1, H318; 1 - < 5 %: Eye Irrit. 2, H319; >= 5 %: STOT SE 3, 335;	

For the full text of the H-Statements mentioned in this Section, see Section 16.

Section 4: First aid measures

4.1 Description of first aid measures
General advice
First aiders need to protect themselves. Show this material safety data sheet to the doctor in attendance.

If inhaled
After inhalation: fresh air. Immediately call-in physician. If breathing stops immediately apply artificial respiration, if necessary also oxygen.

In case of skin contact
In case of skin contact: Take off immediately all contaminated clothing. Rinse skin with water/ shower. Call a physician immediately.

In case of eye contact
After eye contact: rinse out with plenty of water. Immediately call in ophthalmologist. Remove contact lenses.

If swallowed
After swallowing: make victim drink water (two glasses at most), avoid vomiting (risk of perforation). Call a physician immediately. Do not attempt to neutralise.

4.2 Most important symptoms and effects, both acute and delayed
The most important known symptoms and effects are described in the labelling (see section 2.2) and/or in section 11

4.3 Indication of any immediate medical attention and special treatment needed
No data available

Section 5: Fire-fighting measures

5.1 Fire Fighting Media and Instructions:
Suitable extinguishing media
Dry powder Carbon dioxide (CO2)

Unsuitable extinguishing media
Water Foam

5.2 Special hazards arising from the substance or mixture
Carbon oxides
Combustible.
Vapors are heavier than air and may spread along floors.
Forms explosive mixtures with air at elevated temperatures.
Development of hazardous combustion gases or vapours possible in the event of fire.

5.3 Advice for firefighters

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Stay in danger area only with self-contained breathing apparatus. Prevent skin contact by keeping a safe distance or by wearing suitable protective clothing.

5.4 Further information
Remove container from danger zone and cool with water. Prevent fire extinguishing water from contaminating surface water or the ground water system.

Section 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures
Advice for non-emergency personnel: Do not breathe vapors, aerosols. Avoid substance contact. Ensure adequate ventilation. Keep away from heat and sources of ignition. Evacuate the danger area, observe emergency procedures, consult an expert. For personal protection see section 8.

6.2 Environmental precautions
Do not let product enter drains. Risk of explosion.

6.3 Methods and materials for containment and cleaning up
Cover drains. Collect, bind, and pump off spills. Observe possible material restrictions (see sections 7 and 10). Take up carefully with liquid-absorbent material (e.g. Chemizorb®). Dispose of properly. Clean up affected area.

6.4 Reference to other sections
For disposal see section 13.

Section 7: Handling and storage

7.1 Precautions for safe handling
Advice on safe handling
Work under hood. Do not inhale substance/mixture. Avoid generation of vapours/aerosols.

Advice on protection against fire and explosion
Keep away from open flames, hot surfaces and sources of ignition. Take precautionary measures against static discharge.

Hygiene measures
Immediately change contaminated clothing. Apply preventive skin protection. Wash hands and face after working with substance. For precautions see section 2.2.

7.2 Conditions for safe storage, including any incompatibilities
Storage conditions
Keep container tightly closed in a dry and well-ventilated place. Keep away from heat and sources of ignition. Keep locked up or in an area accessible only to qualified or authorized persons. Reacts violently with water.

Storage class
Storage class (TRGS 510): 3: Flammable liquids

7.3 Specific end use(s)
Apart from the uses mentioned in section 1.2 no other specific uses are stipulated

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Section 8: Exposure controls/personal protection

8.1 Control parameters
Ingredients with workplace control parameters

Component	CAS-No.	Control parameters	Value	Basis
Acetic anhydride	108-24-7	STEL	2 ppm 10 mg/m3	UK. EH40 WEL - Workplace Exposure Limits
		TWA	0.5 ppm 2.5 g/m3	UK. EH40 WEL - Workplace Exposure Limits

Derived No Effect Level (DNEL)

Application Area	Routes of exposure	Health effect	Value
Worker DNEL, acute	inhalation	Local effects	12.6 mg/m3
Worker DNEL, long-term	inhalation	Systemic effects	4.2 mg/m3
Worker DNEL, long-term	inhalation	Local effects	4.2 mg/m3
Worker DNEL, long-term	dermal	Systemic effects	-

Predicted No Effect Concentration (PNEC)

Compartment	Value
Fresh water	3.058 mg/l
Sea water	0.3058 mg/l
Aquatic intermittent release	30.58 mg/l
Fresh water sediment	11.36 mg/kg
Sea sediment	1.136 mg/kg
Soil	0.47 mg/kg
Sewage treatment plant	115 mg/l

8.2 Exposure controls /
Appropriate engineering controls
Eye/face protection
Use equipment for eye protection tested and approved under appropriate government standards such as NIOSH (US) or EN 166(EU). Tightly fitting safety goggles

Skin protection
This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Full contact
Material: butyl-rubber
Minimum layer thickness: 0.7 mm
Break through time: 480 min
Material tested:Butoject® (KCL 898)

This recommendation applies only to the product stated in the safety data sheet, supplied by us and for the designated use. When dissolving in or mixing with other substances and under conditions deviating from those stated in EN 16523-1 please contact the supplier of CE-approved gloves (e.g. KCL GmbH, D-36124 Eichenzell, Internet: www.kcl.de).
Splash contact
Material: Latex gloves

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Minimum layer thickness: 0.6 mm
Break through time: 60 min
Material tested:Lapren® (KCL 706 / Aldrich Z677558, Size M)

Body Protection
Flame retardant antistatic protective clothing.

Respiratory protection
required when vapours/aerosols are generated.
Our recommendations on filtering respiratory protection are based on the following standards: DIN EN 143, DIN 14387 and other accompanying standards relating to the used respiratory protection system. Recommended Filter type: Filter type ABEK

The entrepeneur has to ensure that maintenance, cleaning and testing of respiratory protective devices are carried out according to the instructions of the producer. These measures have to be properly documented.

Control of environmental exposure
Do not let product enter drains. Risk of explosion.

Section 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	liquid
Colour	colourless
Odor	pungent
Melting point/freezing point	Melting point/range: -73 °C - lit.
Initial boiling point and boiling range	138 - 140 °C - lit.
Flammability (solid, gas)	No data available
Upper/lower flammability or explosive limits	Upper explosion limit: 10.3 %(V) Lower explosion limit: 2.7 %(V)
Flash point	49 °C - closed cup
Autoignition temperature	316 °C at 1,013.25 hPa
Decomposition temperature	No data available
pH	No data available
Viscosity	Viscosity, kinematic: No data available Viscosity, dynamic: 0.84 mPa.s at 25 °C
Water solubility	107 g/l at 15 °C - slightly solubleHydrolysis
Partition coefficient: n-octanol/water	log Pow: ca.-0.5 at 20 °C - Bioaccumulation is not expected.
Vapor pressure	13 hPa at 36 °C
Density	1.08 g/cm3 - lit.
Relative density	No data available
Relative vapor density	No data available
Particle characteristics	No data available
Explosive properties	No data available
Oxidizing properties	none

9.2 Other safety information

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Surface tension	31.93 mN/m at 25 °C

Section 10: Stability and Reactivity

10.1 Reactivity
Can violently decompose at elevated temperatures Vapor/air-mixtures are explosive at intense warming.

10.2 Chemical stability
Decomposes when moist.
The product is chemically stable under standard ambient conditions (room temperature).

10.3 Possibility of hazardous reactions
Risk of explosion with:
ethanol
potassium permanganate
Strong oxidizing agents
perchloric acid
Nitric acid
hydrogen peroxide
chromium(VI) oxide
barium peroxide
peroxi compounds
ammonium nitrate
with
Nitric acid
Exothermic reaction with:
Ammonia
Potassium hydroxide
nitrates
Sodium hydroxide
Acetic acid, diluted
Violent reactions possible with:
Water
Possible formation of:
acetic acid

10.4 Conditions to avoid
Do not allow water to enter container because of violent reaction.
Heating.

10.5 Incompatible materials
No data available

10.6 Hazardous decomposition products
In the event of fire: see section 5

Section 11: Toxicological Information

11.1 Toxicological effects:
Acute toxicity

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LD50 Oral - Rat - male and female - 630 mg/kg
Remarks: (ECHA)
Acute toxicity estimate Oral - 630 mg/kg
(ATE value derived from LD50/LC50 value)
LC50 Inhalation - Rat - 4 h - > 0.5 - < 2 mg/l – vapor

(OECD Test Guideline 412)
Remarks: (ECHA)
Acute toxicity estimate Inhalation - 0.5001 mg/l – vapor

(ATE value derived from LD50/LC50 value)
Dermal: No data available

Skin corrosion/irritation
Skin - in vitro test
Result: Causes burns. - 4 h
Remarks: (ECHA)

Serious eye damage/eye irritation
Eyes - Rat
Result: Corrosive - 24 h
Remarks: (ECHA)
Remarks: Causes serious eye damage.

Respiratory or skin sensitization
No data available

Germ cell mutagenicity
Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
Test Type: Ames test
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative
Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Test Type: Micronucleus test
Species: Rat
Cell type: Bone marrow
Application Route: inhalation (vapor)
Method: OECD Test Guideline 474
Result: negative

Carcinogenicity
No data available

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Reproductive toxicity
No data available

Specific target organ toxicity - single exposure
No data available

Specific target organ toxicity - repeated exposure
No data available

Aspiration hazard
No data available

11.2 Additional Information
Endocrine disrupting properties
Product:
Assessment
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

RTECS: AK1925000
burning sensation, Cough, wheezing, laryngitis, Shortness of breath, spasm, inflammation and edema of the larynx, spasm, inflammation and edema of the bronchi, pneumonitis, pulmonary edema, Material is extremely destructive to tissue of the mucous membranes and upper respiratory tract, eyes, and skin., To the best of our knowledge, the chemical, physical, and toxicological properties have not been thoroughly investigated.

Section 12: Ecological Information

12.1 Toxicity
Toxicity to fish
semi-static test LC50 - Oncorhynchus mykiss (rainbow trout) - > 300.82 mg/l - 96 h
(OECD Test Guideline 203)
Remarks: (in analogy to similar products)

Toxicity to daphnia and other aquatic invertebrates
static test EC50 - Daphnia magna (Water flea) - > 1,000 mg/l - 48 h (OECD Test Guideline 202)

Toxicity to algae
static test ErC50 - Skeletonema costatum - > 300.82 mg/l - 72 h (ISO 10253)

Toxicity to bacteria
static test NOEC - Pseudomonas putida - 1,150 mg/l - 16 h Remarks: (ECHA)

12.2 Persistence and degradability
Biodegradability
Zahn-Wellens Test - Exposure time 5 d Result: > 95 % - Readily biodegradable. (OECD Test Guideline 302B)

12.3 Bioaccumulative potential
No bioaccumulation is to be expected (log Pow <= 4).

12.4 Mobility in soil

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No data available

12.5 Results of PBT and vPvB assessment
This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Endocrine disrupting properties
Product:
Assessment
The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher.

12.7 Other adverse effects
No data available

Section 13: Disposal considerations

13.1 Waste treatment methods
Product
Waste material must be disposed of in accordance with the national and local regulations. Leave chemicals in original containers. No mixing with other waste. Handle uncleaned containers like the product itself. Notice Directive on waste 2008/98/EC.

Section 14: Transport Information

14.1 UN number

ADR/RID:	1715
IMDG:	1715
IATA:	1715

14.2 UN proper shipping name

ADR/RID:	ACETIC ANHYDRIDE
IMDG:	ACETIC ANHYDRIDE
IATA:	Acetic anhydride

14.3 Transport hazard class(es)

ADR/RID:	8 (3)
IMDG:	8 (3)
IATA:	8 (3)

14.4 Packaging group

ADR/RID:	II
IMDG:	II
IATA:	II

14.5 Environmental hazards

ADR/RID:	no
IMDG Marine pollutant:	no
IATA:	no

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14.6 Special precautions for user
Tunnel restriction code: (D/E)
Further information: No data available

Section 15: Regulatory Information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
This material safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006.

National legislation

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.	H2	ACUTE TOXIC
	P5c	FLAMMABLE LIQUIDS

Other regulations
Observe work restrictions regarding maternity protection in accordance to Dir 92/85/EEC or stricter national regulations where applicable. Take note of Dir 94/33/EC on the protection of young people at work.

15.2 Chemical Safety Assessment
A Chemical Safety Assessment has been carried out for this substance.

Section 16: Other Information

Full text of H-Statements

H226	Flammable liquid and vapor.
H302	Harmful if swallowed.
H314	Causes severe skin burns and eye damage.
H315	Causes skin irritation.
H318	Causes serious eye damage.

Full text of other abbreviations

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways;
ADR	Agreement concerning the International Carriage of Dangerous Goods by Road;
AIIC	Australian Inventory of Industrial Chemicals;
ASTM	American Society for the Testing of Materials;
bw	Body weight;
CMR	Carcinogen, Mutagen or Reproductive Toxicant;
DIN	Standard of the German Institute for Standardisation;
DSL	Domestic Substances List (Canada);
ECx	Concentration associated with x% response;
ELx	Loading rate associated with x% response;
EmS	Emergency Schedule;
ENCS	Existing and New Chemical Substances (Japan);
ErCx	Concentration associated with x% growth rate response;
GHS	Globally Harmonized System;
GLP	Good Laboratory Practice;
IARC	International Agency for Research on Cancer;

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IATA	International Air Transport Association;
IBC	International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk;
IC50	Half maximal inhibitory concentration;
ICAO	International Civil Aviation Organization;
IECSC	Inventory of Existing Chemical Substances in China;
IMDG	International Maritime Dangerous Goods;
IMO	International Maritime Organization;
ISHL	Industrial Safety and Health Law (Japan);
ISO	International Organisation for Standardization;
KECI	Korea Existing Chemicals Inventory;
LC50	Lethal Concentration to 50 % of a test population;
LD50	Lethal Dose to 50% of a test population (Median Lethal Dose);
MARPOL	International Convention for the Prevention of Pollution from Ships;
n.o.s.	Not Otherwise Specified;
NO(A)EC	No Observed (Adverse) Effect Concentration;
NO(A)EL	No Observed (Adverse) Effect Level;
NOELR	No Observable Effect Loading Rate;
NZIoC	New Zealand Inventory of Chemicals;
OECD	Organization for Economic Co-operation and Development;
OPPTS	Office of Chemical Safety and Pollution Prevention;
PBT	Persistent, Bioaccumulative and Toxic substance;
PICCS	Philippines Inventory of Chemicals and Chemical Substances;
(Q)SAR	(Quantitative) Structure Activity Relationship;
REACH	Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals;
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail;
SADT	Self-Accelerating Decomposition Temperature;
SDS	Safety Data Sheet;
TCSI	Taiwan Chemical Substance Inventory;
TECI	Thailand Existing Chemicals Inventory;
TSCA	Toxic Substances Control Act (United States);
UN	United Nations;
UNRTDG	United Nations Recommendations on the Transport of Dangerous Goods;
vPvB	Very Persistent and Very Bioaccumulative