1. IDENTIFICATION OF SUBSTANCE AND COMPANY DETAILS

1.1 Product Identifier

Product name:	CryoProtX™
Product number:	MD1-61
EC No.	See section 3
REACH registration No.	See section 3
CAS No.:	See section 3

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

Identified uses	Research and development
Uses advised against	Not for drug, household or uses other than those identified

1.3 Details of the supplier of the Safety Datasheet

Supplier	Molecular Dimensions Limited
Address	The Innovation centre 217 Portobello Sheffield S1 4DP United Kingdom
Telephone:	+44 (0)11422 42257
Email address	enquiries@moleculardimensions.com

1.4 Emergency telephone number

Emergency phone number	999

2. HAZARDS IDENTIFICATION

2.1 Classification of substance or mixture

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

H301	Toxic if swallowed
H302	Harmful if swallowed
H312	Harmful in contact with skin
H314	Causes severe skin burns and eye damage
H315	Causes skin irritation
H318	Causes serious eye damage
H319	Causes serious eye irritation
H331	Toxic if inhaled
H335	May cause respiratory irritation
H360	May damage fertility or the unborn child
H360D	May damage the unborn child
H410	Very toxic to aquatic life with long-lasting effects

2.2 Label elements

Labelling according to Regulation (EC) No. 1277/2008 [CLP]

Pictogram(s):

Hazard statement(s):

See section 2.1.

Precautionary statement(s):

P201	Obtain special instructions before use
P261	Avoid breathing dust/fume/gas/mist/vapours/spray
P273	Avoid release to the environment
P280	Wear protective gloves/protective clothing/eye protection/face protection
P301+P310	IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician
P305+P351+P338	IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing
P308+P313	IF exposed or concerned: Get medical advice/attention
P310	Immediately call a POISON CENTER or doctor/physician
P311	Call a POISON CENTER or doctor/physician
P501	Dispose of contents/container according to instructions on SDS

2.3 Other hazards

No data available

3. COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Mixtures

Chemical	EC No.	REACH No.	CAS No.	Concentration	P-code(s)	H-code(s)
1,2-Propanediol	200-338-0	-	57-55-6	12.5 - 100 %v/v		
3-(1-Pyridino)-1-propanesulfonate	239-491-3	-	15471-17-7	0.0125 - 0.1 M		
ADA	-	-	26239-55-4	1M		
BICINE	-	-	150-25-4	1M		
BIS-TRIS propane	-	-	64431-96-5	1M		
Boric acid	233-139-2	01-2119486683-25-XXXX	10043-35-3	1M	P201, P308+P313	H360
CHES	203-115-6	-	103-47-9	1M	P305+P351+P338	H319
Citric acid	201-069-1	-	77-92-9	1M	P305+P351+P338	H319
D-(+)-Glucose	-	-	50-99-7	0.3 - 30 %w/v		
D-(+)-Maltose monohydrate	-	-	6363-53-7	0.3 - 30 %w/v		
D-(+)-Trehalose dihydrate	-	-	6138-23-4	0.3 - 30 %w/v		
Diethylene glycol	203-872-2	-	111-46-6	12.5 - 50 %v/v		H302
Dimethyl sulfoxide	200-664-3	-	67-58-5	12.5 - 100 %v/v		
DL-Malic acid	230-022-8	-	6915-15-7	1M	P261, P280, P305+P351+P338	H302, H315, H318, H335
Ethylene glycol	203-473-3	-	107-21-1	12.5 - 100 %v/v		H302
Glycerol	200-289-5	-	56-81-5	12.5 - 100 %v/v		
HEPES	-	-	7365-45-9	1M		
Hexylene glycol	203-489-0	-	107-41-5	12.5 - 100 %v/v	P305+P351+P338	H315, H319

Chemical	EC No.	REACH No.	CAS No.	Concentration	P-code(s)	H-code(s)
Imidazole	206-019-2	01-2119485825-24-XXXX	288-32-4	1M	P201, P280, P305+P351+P338, P310	H302, H314, H360D
Lithium formate monohydrate	209-133-0	-	6108-23-2	2.5M	P261, P305+P351+P338	H315, H319, H335
Lithium sulfate	233-820-4	-	10102-25-7	2.5M		H302
MES monohydrate	224-632-3	-	145224-94-8	1M	P261, P305+P351+P338	H315, H319, H335
Poly(ethylene glycol) 1000	500-038-2	-	25322-68-3	50%w/v		
Poly(ethylene glycol) 10000	500-038-2	-	25322-68-3	50%w/v		
Poly(ethylene glycol) 3350	500-038-2	-	25322-68-3	50%w/v		
Poly(ethylene glycol) 400	500-038-2	-	25322-68-3	100%v/v		
Poly(ethylene glycol) 8000	500-038-2	-	25322-68-3	50%w/v		
Poly(ethylene glycol) methyl ether 500	-	-	9004-74-4	50%v/v		
Poly(ethylene glycol) methyl ether 5000	-	-	9004-74-4	50%w/v		
Sodium acetate trihydrate	-	-	6131-90-4	1M		
Sodium cacodylate trihydrate	204-708-2	-	6131-99-3	1M	P261, P273, P301+P310, P311, P501	H301, H410, H331
Sodium formate	205-488-0	-	141-53-7	0.3 - 2.5 M		
Sodium malonate dibasic monohydrate	-	-	26522-85-0	0.3 - 2.5 M		
Sodium propionate	205-290-4	-	137-40-6	1M	P280	H312
Sodium sulfate	231-820-9	-	7757-82-6	0.3 - 1 M		
Sucrose	-	-	57-50-1	0.3 - 30 %w/v		
Trizma® base	201-064-4	-	77-86-1	1M	P261, P305+P351+P338	H315, H319, H335
Xylitol	201-788-0	-	87-99-0	0.3 - 30 %w/v		

4. FIRST AID MEASURES

4.1 Description of first aid measures

General notes
Consult a doctor. Show this safety datasheet to the doctor in attendance.

Following inhalation
Move to fresh air. If not breathing, give artificial respiration. Consult a doctor.

Following skin contact
Wash off with soap & water. Consult a doctor. Take off contaminated clothing & shoes immediately.

Following eye contact
Rinse thoroughly for at least 15 minutes. Consult a doctor. Flush eyes with water.

Following ingestion
Rinse mouth with water. Consult a doctor. Do NOT induce vomiting.

Self-protection for first aider
Always use recommended PPE when treating patient.

4.2 Most important symptoms and effects, both acute and delayed

The most important known effects are detailed in section 2.2 and section 11

4.3 Indication of any immediate medical attention and special treatment needed

No data available

5. FIRE-FIGHTING METHODS

5.1 Extinguishing media

Use water spray, alcohol resistant foam, dry chemical or carbon dioxide.

5.2 Special hazards arising from the substance or mixture

Carbon oxides. Sulfur oxides. Nitrogen oxides. Boron oxides. Hydrogen cyanide gas. Lithium oxides. Metal oxides. Sodium oxides. Arsenic oxides.

5.3 Advice for firefighters

Wear breathing apparatus. Use water spray to cool unopened containers.

6. ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Avoid breathing vapours. Use personal protective equipment including respiratory protection.

6.2 Environmental precautions

Do not let product enter drains

6.3 Methods and materials for containment and clean up

Use spill kit to contain spillage & use wet brushing to place in a suitable container for disposal. Do not flush with water. Evacuate personnel to safe areas. Remove all sources of ignition.

6.4 Reference to any other sections

For disposal, see section 13

7. HANDLING AND STORAGE

7.1 Precautions for safe handling

For precautions, see section 2.2

7.2 Conditions for safe storage, including any incompatibilities.

Store in cool place. Keep container tightly closed in well-ventilated place. Containers which are opened must be carefully resealed and stored upright to prevent leakage.

7.3 Specific end use

Apart from uses in Section 1.2, no other specific uses are stipulated.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1 Control parameters

Chemical	CAS No.	Country	Limit value		Basis
			STEL	TWA	
1,2-Propanediol	57-55-6	UK		150 ppm	EH40 WEL - Workplace Exposure Limit
Diethylene glycol	111-46-6	UK		23 mg/m^3	EH40 WEL - Workplace Exposure Limit
Ethylene glycol	107-21-1	UK	40 ppm	20 ppm	EH40 WEL - Workplace Exposure Limit
Glycerol	56-81-5	UK		10 mg/m^3	EH40 WEL - Workplace Exposure Limit
Hexylene glycol	107-41-5	UK	25 mg/m^3	25 mg/m^3	EH40 WEL - Workplace Exposure Limit
Sodium cacodylate trihydrate	6131-99-3	UK		0.1 mg/m^3	EH40 WEL - Workplace Exposure Limit

8.2 Exposure controls

8.2.1 Appropriate engineering controls

Wash hands before work break and at the end of the day

8.2.2 Personal protection

Eye/face protection
Face shield & safety specs.

Skin Protection
Nitrile gloves (splash protection only) and lab coat

Respiratory protection
Use respirators and components tested and approved under appropriate government standards such as CEN (EU) as back up to engineering control

Environmental exposure controls
Do not let product enter drains

9. PHYSICAL AND CHEMICAL PROPERTIES

a) Appearance	Transparent liquid
b) Odour	No data available
c) Odour threshold	No data available
d) pH	No data available
e) Melting point / freezing point	No data available
f) Initial boiling point and boiling range	No data available
g) Flash point	No data available
h) Evaporation rate	No data available
i) Flammability	No data available
j) Upper / lower flammability or exposure limits	No data available
k) Vapour pressure	No data available
l) Vapour density	No data available
m) Relative density	No data available
n) Solubility(ies)	No data available
o) Partition coefficient: n-octanol / water	No data available
p) Auto-ignition temperature	No data available
q) Decomposition temperature	No data available
r) Viscosity	No data available
s) Explosive properties	No data available
t) Oxidising properties	No data available

10. STABILITY AND REACTIVITY

10.1 Reactivity	No data available
10.2 Chemical stability	No data available
10.3 Possibility of hazardous reactions	No data available
10.4 Conditions to avoid	No data available
10.5 Incompatible materials	Strong oxidising agents, strong acids, strong bases
10.6 Hazardous decomposition materials	No data available. In case of fire see section 5

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

a) Acute toxicity	No data available
b) Skin corrosion / irritation	No data available
c) Serious eye damage / irritation	No data available
d) Respiratory or skin sensitization	No data available
e) Germ cell mutagenicity	No data available
f) Carcinogenicity	No data available
g) Reproductive toxicity	No data available
h) STOT - single exposure	No data available
i) STOT - repeated exposure	No data available
j) Aspiration hazard	No data available

11.2 Delayed and immediate effects as well as chronic effects from short to long term exposure

Symptoms
Gastrointestinal disturbance, nausea, headache, vomiting, central nervous system depression. By ingestion/absorption: Nausea, vomiting, diarrhoea, abdominal cramps, and lesions on skin & mucous membranes. Circulatory collapse, tachycardia, delirium, convulsions, coma, death. Vomiting, diarrhoea, damage to tooth enamel, dermatitis. Confusion, dizziness, kidney injury, unconsciousness, convulsions, pulmonary edema, nausea, headaches, vomiting. Effects may be delayed. Nausea, headache, fatigue. Burning sensation, coughing, wheezing, laryngitis, shortness of breath, headache, nausea, vomiting. Early symptoms of ingestion similar to drunkenness, leading to nausea, vomiting, abdominal pain, weakness, muscle tenderness, respiratory failure, convulsions, cardiovascular, collapse, pulmonary edema. Without treatment, death may occur in 2h to 24h. Long term affects include renal failure, brain and liver damage. Consumption of alcohol may increase toxic effects. Headache, nausea, vomiting. May cause kidney irregularities. Material is extremely destructive to mucous membranes & upper respiratory tract. Dizziness, procrastination, can cause kidney damage if sodium intake is limited. Dehydration, weight loss, dermatological effects, thyroid disturbances. Central nervous system effects including: blurred vision, sensory loss, slurred speech, ataxia, convul. Diarrhoea, vomiting, neuromuscular effects such as tremors, clonus, hyperactive reflexes. Drowsiness, tremors, convulsions.

12. ECOLOGICAL INFORMATION

12.1 Toxicity	No data available
12.2 Persistence and degradability	No data available
12.3 Bioaccumulative potential	No data available
12.4 Mobility in soil	No data available
12.5 Results of PBT and vPvB assessment	No data available
12.6 Other adverse effects	No data available

13. DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods

Product / packaging disposal
Dispose of packaging as unused product. Offer surplus and non-recyclable solutions to a licensed disposal company.
Observe all EU and local environmental regulations

14. TRANSPORT INFORMATION

14.1 UN number

A.R.D./R.I.D.	3082	I.M.D.G.	3082	I.C.A.O.-T.I.	3082	A.D.N.	3082

14.2 UN proper shipping name

A.R.D./R.I.D.	Environmentally hazardous substance, liquid, n.o.s.	I.M.D.G.	Environmentally hazardous substance, liquid, n.o.s.
I.C.A.O.-T.I.	Environmentally hazardous substance, liquid, n.o.s.	A.D.N.	Environmentally hazardous substance, liquid, n.o.s.

14.3 Transport hazard class(es)

A.R.D./R.I.D.	9	I.M.D.G.	9	I.C.A.O.-T.I.	9	A.D.N.	9

14.4 Packaging group

A.R.D./R.I.D.	II	I.M.D.G.	II	I.C.A.O.-T.I.	II	A.D.N.	II

14.5 Environmental hazards

A.R.D./R.I.D.	Yes	I.M.D.G.	Yes	I.C.A.O.-T.I.	Yes	A.D.N.	Yes

14.6 Special precautions for user

A.R.D./R.I.D.	No data available	I.M.D.G.	No data available
I.C.A.O.-T.I.	No data available	A.D.N.	No data available

15. REGULATORY INFORMATION

15.1 Safety, health and environmental regulations

No data available.

15.2 Chemical safety assessment

For this product a chemical safety assessment was not carried out.

16. OTHER INFORMATION

a) Changes since last revision

First issue

b) Key to any abbreviations used

PPE	Personal protective equipment
A.R.D./R.I.D.	International Carriage of Dangerous Goods by Road / Rail
I.M.D.G.	International Maritime Dangerous Goods
I.C.A.O.-T.I.	Technical Instructions for the Safe Transport of Dangerous Goods by Air
A.D.N.	International Carriage of Dangerous Goods by Inland Waterways
TWA	Time-weighted average
STEL	Short-term exposure limit

c) References and sources for data

sigma-aldrich.com

fishersci.co.uk

anatrace.com

d) Indication of methods used for classification (mixtures only)

No data available

e) List of Hazard and Precautionary phrase not listed in full in other sections

See Section 2.1.

f) Advice for training

Disclaimer:

The above information is believed to be correct but does not purport to be all inclusive and shall be used only as a guide. The information in this document is based on the present state of our knowledge and is applicable to the product with regard to appropriate safety precautions. It does not represent any guarantee of the properties of the product. Molecular Dimensions Ltd., shall not be held liable for any damage resulting from handling or from contact with the above product.