

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

1 Identification

- **Product identifier**
- **Trade name:** CytoCool II
- **Article number:** 72597, 72597-12
- **CAS Number:**
811-97-2
- **EC number:**
212-377-0
- **Application of the substance / the mixture** Laboratory chemicals
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Information department:** Product safety department
- **Emergency telephone number:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS07

STOT SE 3 H336 May cause drowsiness or dizziness.

- **Label elements**
- **GHS label elements**
The substance is classified and labeled according to the Globally Harmonized System (GHS).
- **Hazard pictograms**



GHS07

- **Signal word** Warning
- **Hazard statements**
May cause drowsiness or dizziness.
- **Precautionary statements**
Avoid breathing dust/fume/gas/mist/vapors/spray
Use only outdoors or in a well-ventilated area.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a poison center/doctor if you feel unwell.
Store in a well-ventilated place. Keep container tightly closed.

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Store locked up.

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

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 2

Fire = 1

Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2

Fire = 1

Reactivity = 0

· **Other hazards**

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

3 Composition/information on ingredients

· **Chemical characterization: Substances**

· **CAS No. Description**

811-97-2 1,1,1,2-tetrafluoroethane

· **Identification number(s)**

· **EC number:** 212-377-0

4 First-aid measures

· **Description of first aid measures**

· **After inhalation:** Supply fresh air; consult doctor in case of complaints.

· **After skin contact:** Generally the product does not irritate the skin.

· **After eye contact:** Rinse opened eye for several minutes under running water.

· **After swallowing:** If symptoms persist consult doctor.

· **Information for doctor:**

· **Most important symptoms and effects, both acute and delayed**

No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.

· **Special hazards arising from the substance or mixture**

No further relevant information available.

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- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb liquid components with liquid-binding material.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.
- **Protective Action Criteria for Chemicals**

· PAC-1:

8,000 ppm

· PAC-2:

13,000 ppm

· PAC-3:

27,000 ppm

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Observe official regulations on storing packagings with pressurized containers.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**

· **Components with limit values that require monitoring at the workplace:**

811-97-2 1,1,1,2-tetrafluoroethane

WEEL Long-term value: 1000 ppm

- **Additional information:** The lists that were valid during the creation were used as basis.

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- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Wash hands before breaks and at the end of work.
- **Breathing equipment:** Not required.
- **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** Not required.

9 Physical and chemical properties

- | | |
|--|---|
| · Information on basic physical and chemical properties | |
| · General Information | |
| · Appearance: | |
| Form: | Gaseous |
| Color: | Colorless |
| · Odor: | Petroleum-like |
| · Odor threshold: | Not determined. |
| · pH-value: | Not determined. |
| · Change in condition | |
| Melting point/Melting range: | Undetermined. |
| Boiling point/Boiling range: | -26.2 °C (-15.2 °F) |
| · Flash point: | Not applicable, as aerosol. |
| · Flammability (solid, gaseous): | Not flammable. |
| · Decomposition temperature: | Not determined. |
| · Auto igniting: | Not determined. |
| · Danger of explosion: | Product does not present an explosion hazard. |
| · Explosion limits: | |
| Lower: | Not determined. |
| Upper: | Not determined. |
| · Vapor pressure at 20 °C (68 °F): | 5,716 hPa (4,287.4 mm Hg) |
| · Density at 20 °C (68 °F): | 1,226 g/cm ³ (10.23097 lbs/gal) |

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· Relative density	Not determined.
· Vapor density	Not determined.
· Evaporation rate	Not applicable.
· Solubility in / Miscibility with Water at 20 °C (68 °F):	1.93 g/l
· Partition coefficient (n-octanol/water):	Not determined.
· Viscosity:	
Dynamic at 20 °C (68 °F):	0.22 mPas
Kinematic:	Not determined.
VOC content:	0.00 %
	0.0 g/l / 0.00 lb/gl
Solids content:	0.0 %
· Other information	No further relevant information available.

10 Stability and reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** No irritant effect.
- **on the eye:** No irritating effect.
- **Sensitization:** No sensitizing effects known.
- **Additional toxicological information:**
- **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

Substance is not listed.

· **NTP (National Toxicology Program)**

Substance is not listed.

· **OSHA-Ca (Occupational Safety Health Administration)**

Substance is not listed.

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12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|---|--|
| · UN-Number | |
| · DOT, ADR, IMDG, IATA | UN3159 |
| · UN proper shipping name | |
| · DOT | 1,1,1,2-Tetrafluoroethane |
| · ADR | 3159 1,1,1,2-Tetrafluoroethane |
| · IMDG, IATA | 1, 1, 1, 2 - TETRAFLUOROETHANE
(REFRIGERANT GAS R 134a) |
| · Transport hazard class(es) | |
| · DOT | |
|  | |
| · Class | 2.2 |

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· Label	2.2
· ADR	
	
· Class	2.2 5A
· Label	2.2
· IMDG, IATA	
	
· Class	2.2
· Label	2.2
· Packing group	
· DOT, ADR, IMDG, IATA	Void
· Environmental hazards:	Not applicable.
· Special precautions for user	Not applicable.
· Danger code (Kemler):	-
· EMS Number:	F-C,S-V
· Stowage Category	A
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information:	
· DOT	
· Quantity limitations	On passenger aircraft/rail: 75 kg On cargo aircraft only: 150 kg
· ADR	
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· IMDG	
· Limited quantities (LQ)	1L
· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
· UN "Model Regulation":	UN 3159 1,1,1,2-TETRAFLUOROETHANE, 2.2

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15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**

· Section 355 (extremely hazardous substances):
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Substance is not listed.

· Section 313 (Specific toxic chemical listings):
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Substance is not listed.

· TSCA (Toxic Substances Control Act):

Substance is listed.

· Proposition 65

· Chemicals known to cause cancer:

Substance is not listed.

· Chemicals known to cause reproductive toxicity for females:
--

Substance is not listed.

· Chemicals known to cause reproductive toxicity for males:
--

Substance is not listed.

· Chemicals known to cause developmental toxicity:

Substance is not listed.

· Carcinogenic categories

· EPA (Environmental Protection Agency)
--

Substance is not listed.

· TLV (Threshold Limit Value established by ACGIH)

Substance is not listed.

· NIOSH-Ca (National Institute for Occupational Safety and Health)

Substance is not listed.

· GHS label elements

The substance is classified and labeled according to the Globally Harmonized System (GHS).
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· Hazard pictograms



GHS07

· Signal word Warning

· Hazard statements

May cause drowsiness or dizziness.

· Precautionary statements

Avoid breathing dust/fume/gas/mist/vapors/spray

Use only outdoors or in a well-ventilated area.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.
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- Call a poison center/doctor if you feel unwell.
 Store in a well-ventilated place. Keep container tightly closed.
 Store locked up.
 Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Date of preparation / last revision** 04/30/2018 / -

- **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)

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

ACGIH: American Conference of Governmental Industrial Hygienists

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

NIOSH: National Institute for Occupational Safety

OSHA: Occupational Safety **Health**

TLV: Threshold Limit Value

PEL: Permissible Exposure Limit

REL: Recommended Exposure Limit

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

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1 Identification

- **Product identifier**
- **Trade name:** CytoCool II
- **Article number:** 72597, 72597-12
- **CAS Number:**
811-97-2
- **EC number:**
212-377-0
- **Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Application of the substance / the mixture** Laboratory chemicals
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- ProSciTech Pty Ltd
11 Carlton Street, Kirwan QLD 4817 Australia
Telephone Number: (07) 4773 9444 - 8:30am - 5:00pm, Monday to Friday (excluding Public Holidays)
Emergency Contact: (07) 4773 9444 - 8:30am - 5:00pm, Monday to Friday (excluding Public Holidays)
Website: ems.proscitech.com
- Emgrid Australia Pty. Ltd.
P.O. Box 118
The Patch VIC 3792
Australia
Tel: 03 9752 1785
Fax: 03 9752 1784
Website: www.emgrid.com.au
- **Further information obtainable from:** Product safety department
- **Emergency telephone number:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

2 Hazard(s) Identification

- **Classification of the substance or mixture**



GHS07

STOT SE 3 H336 May cause drowsiness or dizziness.

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- **Label elements**

- **GHS label elements**

The substance is classified and labelled according to the Globally Harmonised System (GHS).

- **Hazard pictograms**



GHS07

- **Signal word** *Warning*

- **Hazard statements**

May cause drowsiness or dizziness.

- **Precautionary statements**

Avoid breathing dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well-ventilated area.

IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.

Call a POISON CENTER/doctor if you feel unwell.

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

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

- **Other hazards**

- **Results of PBT and vPvB assessment**

- **PBT:** Not applicable.

- **vPvB:** Not applicable.

3 Composition and Information on Ingredients

- **Chemical characterisation: Substances**

- **CAS No. Description**

811-97-2 1,1,1,2-tetrafluoroethane

- **Identification number(s)**

- **EC number:** 212-377-0

4 First Aid Measures

- **Description of first aid measures**

- **After inhalation:** Supply fresh air; consult doctor in case of complaints.

- **After skin contact:** Generally the product does not irritate the skin.

- **After eye contact:** Rinse opened eye for several minutes under running water.

- **After swallowing:** If symptoms persist consult doctor.

- **Information for doctor:**

- **Most important symptoms and effects, both acute and delayed**

No further relevant information available.

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- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Fire Fighting Measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
Use fire extinguishing methods suitable to surrounding conditions.
- **Special hazards arising from the substance or mixture**
No further relevant information available.
- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb liquid components with liquid-binding material.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and Storage

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about fire - and explosion protection:** No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Observe official regulations on storing packagings with pressurised containers.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls and personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Control parameters**

- **Ingredients with limit values that require monitoring at the workplace:**

	811-97-2 1,1,1,2-tetrafluoroethane
--	------------------------------------

WES	Long-term value: 4240 mg/m ³ , 1000 ppm
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- **Additional information:** The lists valid during the making were used as basis.

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Trade name: **CytoCool II**

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- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Wash hands before breaks and at the end of work.
- **Respiratory protection:** Not required.
- **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.
- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** Not required.

9 Physical and Chemical Properties

- **Information on basic physical and chemical properties**
- **General Information**
- **Appearance:**

Form:	Gaseous
Colour:	Colourless
Odour:	Petroleum-like
Odour threshold:	Not determined.
- **pH-value:** Not determined.
- **Change in condition**

Melting point/freezing point:	Undetermined.
Initial boiling point and boiling range:	-26.2 °C
- **Flash point:** Not applicable, as aerosol.
- **Flammability (solid, gas):** Not applicable.
- **Decomposition temperature:** Not determined.
- **Auto-ignition temperature:** Not determined.
- **Explosive properties:** Product does not present an explosion hazard.
- **Explosion limits:**

Lower:	Not determined.
Upper:	Not determined.
- **Vapour pressure at 20 °C:** 5,716 hPa
- **Density at 20 °C:** 1.226 g/cm³

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· Relative density	Not determined.
· Vapour density	Not determined.
· Evaporation rate	Not applicable.
· Solubility in / Miscibility with water at 20 °C:	1.93 g/l
· Partition coefficient: n-octanol/water:	Not determined.
· Viscosity:	
Dynamic at 20 °C:	0.22 mPas
Kinematic:	Not determined.
· Solvent content:	
VOC (EC)	100.00 %
Solids content:	0.0 %
· Other information	No further relevant information available.

10 Stability and Reactivity

- **Reactivity** No further relevant information available.
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** No dangerous reactions known.
- **Conditions to avoid** No further relevant information available.
- **Incompatible materials:** No further relevant information available.
- **Hazardous decomposition products:** No dangerous decomposition products known.

11 Toxicological Information

- **Information on toxicological effects**
- **Acute toxicity**
- **Primary irritant effect:**
- **Skin corrosion/irritation** No irritant effect.
- **Serious eye damage/irritation** No irritating effect.
- **Respiratory or skin sensitisation** No sensitising effects known.

12 Ecological Information

- **Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability** No further relevant information available.
- **Behaviour in environmental systems:**
- **Bioaccumulative potential** No further relevant information available.
- **Mobility in soil** No further relevant information available.

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AU

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according to WHS Regulations

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Revision: 30.04.2018

Trade name: **CytoCool II**



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- **Additional ecological information:**
- **General notes:**
Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|---|---|
| · UN-Number | UN3159 |
| · ADG, IMDG, IATA | |
| · UN proper shipping name | 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a) |
| · ADG | |
| · IMDG, IATA | 1, 1, 1, 2 - TETRAFLUOROETHANE (REFRIGERANT GAS R 134a) |
| · Transport hazard class(es) | |
| · ADG | |
|  | |
| · Class | 2.2 5A |
| · Label | 2.2 |
| <hr style="border-top: 1px dashed #000;"/> | |
| · IMDG, IATA | |
|  | |
| · Class | 2.2 |
| · Label | 2.2 |

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· Packing group · ADG, IMDG, IATA	<i>not regulated</i>
· Environmental hazards:	<i>Not applicable.</i>
· Special precautions for user · Danger code (Kemler): · EMS Number: · Stowage Category	<i>Not applicable.</i> - <i>F-C,S-V</i> <i>A</i>
· Transport in bulk according to Annex II of Marpol and the IBC Code	<i>Not applicable.</i>
· Transport/Additional information:	
· ADG · Limited quantities (LQ) · Excepted quantities (EQ)	<i>120 ml</i> <i>Code: E1</i> <i>Maximum net quantity per inner packaging:</i> <i>30 ml</i> <i>Maximum net quantity per outer packaging:</i> <i>1000 ml</i>
· Transport category · Tunnel restriction code	<i>3</i> <i>E</i>
· IMDG · Limited quantities (LQ) · Excepted quantities (EQ)	<i>1L</i> <i>Code: E0</i> <i>Not permitted as Excepted Quantity</i>
· UN "Model Regulation":	<i>UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), 2.2</i>

15 Regulatory information

· **Safety, health and environmental regulations/legislation specific for the substance or mixture**

· **Australian Inventory of Chemical Substances**

Substance is listed.

· **Standard for the Uniform Scheduling of Medicines and Poisons**

Substance is not listed.

· **GHS label elements**

The substance is classified and labelled according to the Globally Harmonised System (GHS).

· **Hazard pictograms**



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- **Signal word** Warning
- **Hazard statements**
May cause drowsiness or dizziness.
- **Precautionary statements**
Avoid breathing dust/fume/gas/mist/vapours/spray.
Use only outdoors or in a well-ventilated area.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER/doctor if you feel unwell.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
Dispose of contents/container in accordance with local/regional/national/international regulations.
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I** Substance is not listed.
- **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **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)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

AU

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

1 Identification

- **Product identifier**
- **Trade name:** CytoCool II
- **Article number:** 72597, 72597-12
- **CAS Number:**
811-97-2
- **EC number:**
212-377-0
- **Application of the substance / the mixture** Laboratory chemicals
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Information department:** Product safety department
- **Emergency telephone number:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

2 Hazard(s) identification

- **Classification of the substance or mixture**



GHS07

Specific Target Organ Toxicity - Single
Exposure - Category 3

H336 May cause drowsiness or dizziness.

- **Label elements**

- **GHS label elements**

The substance is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms**



GHS07

- **Signal word** Warning

- **Hazard statements**

May cause drowsiness or dizziness.

- **Precautionary statements**

Avoid breathing dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well-ventilated area.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a poison center/doctor if you feel unwell.

(Contd. on page 2)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: CytoCool II

(Contd. of page 1)

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

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

· **Classification system:**

· **NFPA ratings (scale 0 - 4)**



Health = 2

Fire = 1

Reactivity = 0

· **HMIS-ratings (scale 0 - 4)**



Health = 2

Fire = 1

Reactivity = 0

3 Composition/information on ingredients

· **Chemical characterization: Substances**

· **CAS No. Description**

811-97-2 1,1,1,2-tetrafluoroethane

· **Identification number(s)**

· **EC number: 212-377-0**

4 First-aid measures

· **Description of first aid measures**

· **After inhalation:** Supply fresh air; consult doctor in case of complaints.

· **After skin contact:** Generally the product does not irritate the skin.

· **After eye contact:** Rinse opened eye for several minutes under running water.

· **After swallowing:** If symptoms persist consult doctor.

· **Information for doctor:**

· **Most important symptoms and effects, both acute and delayed**

No further relevant information available.

· **Indication of any immediate medical attention and special treatment needed**

No further relevant information available.

5 Fire-fighting measures

· **Extinguishing media**

· **Suitable extinguishing agents:** Use fire fighting measures that suit the environment.

· **Special hazards arising from the substance or mixture**

No further relevant information available.

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Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: CytoCool II

(Contd. of page 2)

- **Advice for firefighters**
- **Protective equipment:** No special measures required.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures** Not required.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:**
Absorb liquid components with liquid-binding material.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about protection against explosions and fires:**
No special measures required.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Observe official regulations on storing packagings with pressurized containers.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical systems:** No further data; see item 7.
- **Control parameters**
- **Components with limit values that require monitoring at the workplace:** Not required.
- **Additional information:** The lists that were valid during the creation were used as basis.
- **Exposure controls**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Wash hands before breaks and at the end of work.
- **Breathing equipment:** Not required.
- **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

(Contd. on page 4)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: CytoCool II

(Contd. of page 3)

- **Material of gloves**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

- **Penetration time of glove material**

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

- **Eye protection:** Not required.

9 Physical and chemical properties

- **Information on basic physical and chemical properties**

- **General Information**

- **Appearance:**

Form: Gaseous

Color: Colorless

- **Odor:** Petroleum-like

- **Odor threshold:** Not determined.

- **pH-value:** Not determined.

- **Change in condition**

Melting point/Melting range: Undetermined.

Boiling point/Boiling range: -26.2 °C

- **Flash point:** Not applicable, as aerosol.

- **Flammability (solid, gaseous):** Not flammable.

- **Decomposition temperature:** Not determined.

- **Auto igniting:** Not determined.

- **Danger of explosion:** Product does not present an explosion hazard.

- **Explosion limits:**

Lower: Not determined.

Upper: Not determined.

- **Vapor pressure at 20 °C:** 5,716 hPa

- **Density at 20 °C:** 1.226 g/cm³

- **Relative density** Not determined.

- **Vapor density** Not determined.

- **Evaporation rate** Not applicable.

- **Solubility in / Miscibility with**

Water at 20 °C: 1.93 g/l

- **Partition coefficient (n-octanol/water):** Not determined.

- **Viscosity:**

Dynamic at 20 °C: 0.22 mPas

Kinematic: Not determined.

Solids content: 0.0 %

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CA

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: CytoCool II

(Contd. of page 4)

· **Other information** *No further relevant information available.*

10 Stability and reactivity

- **Reactivity** *No further relevant information available.*
- **Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **Possibility of hazardous reactions** *No dangerous reactions known.*
- **Conditions to avoid** *No further relevant information available.*
- **Incompatible materials:** *No further relevant information available.*
- **Hazardous decomposition products:** *No dangerous decomposition products known.*

11 Toxicological information

- **Information on toxicological effects**
- **Acute toxicity:**
- **Primary irritant effect:**
- **on the skin:** *No irritant effect.*
- **on the eye:** *No irritating effect.*
- **Sensitization:** *No sensitizing effects known.*
- **Additional toxicological information:**
- **Carcinogenic categories**

· **IARC (International Agency for Research on Cancer)**

Substance is not listed.

· **NTP (National Toxicology Program)**

Substance is not listed.

12 Ecological information

- **Toxicity**
- **Aquatic toxicity:** *No further relevant information available.*
- **Persistence and degradability** *No further relevant information available.*
- **Behavior in environmental systems:**
- **Bioaccumulative potential** *No further relevant information available.*
- **Mobility in soil** *No further relevant information available.*
- **Additional ecological information:**
- **General notes:**
*Water hazard class 1 (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.*
- **Results of PBT and vPvB assessment**
- **PBT:** *Not applicable.*
- **vPvB:** *Not applicable.*

(Contd. on page 6)

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: CytoCool II




(Contd. of page 5)

· **Other adverse effects** No further relevant information available.

13 Disposal considerations

- **Waste treatment methods**
- **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|---|---|
| <ul style="list-style-type: none"> · UN-Number · DOT, TDG, IMDG, IATA | <p style="margin-left: 20px;">UN3159</p> |
| <ul style="list-style-type: none"> · UN proper shipping name · DOT · TDG · IMDG, IATA | <p style="margin-left: 20px;">1,1,1,2-Tetrafluoroethane
3159 1,1,1,2-Tetrafluoroethane
1, 1, 1, 2 - TETRAFLUOROETHANE
(REFRIGERANT GAS R 134a)</p> |
| <ul style="list-style-type: none"> · Transport hazard class(es) · DOT | <div style="text-align: center;">  </div> |
| <ul style="list-style-type: none"> · Class · Label · TDG (Transport dangerous goods): | <p style="margin-left: 20px;">2.2
2.2</p> |
| <ul style="list-style-type: none"> · Class · Label | <div style="text-align: center;">  </div> <p style="margin-left: 20px;">2.2 5A
2.2</p> |
| <ul style="list-style-type: none"> · IMDG, IATA | <div style="text-align: center;">  </div> <p style="margin-left: 20px;">2.2
2.2</p> |

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Safety Data Sheet

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Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: **CytoCool II**

(Contd. of page 6)

· Packing group · DOT, TDG, IMDG, IATA	Void
· Environmental hazards:	Not applicable.
· Special precautions for user · Danger code (Kemler): · EMS Number: · Stowage Category	Not applicable. - F-C,S-V A
· Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code	Not applicable.
· Transport/Additional information: · DOT · Quantity limitations	 On passenger aircraft/rail: 75 kg On cargo aircraft only: 150 kg
· TDG · Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· IMDG · Limited quantities (LQ) · Excepted quantities (EQ)	1L Code: E0 Not permitted as Excepted Quantity
· UN "Model Regulation":	UN 3159 1,1,1,2-TETRAFLUOROETHANE, 2.2

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Sara**

· Section 355 (extremely hazardous substances):
--

Substance is not listed.

· Section 313 (Specific toxic chemical listings):
--

Substance is not listed.

· TSCA (Toxic Substances Control Act):

Substance is listed.

· Canadian substance listings:

· Canadian Domestic Substances List (DSL)
--

Substance is listed.

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CA

Safety Data Sheet

acc. to OSHA HCS

Printing date 04/30/2018

Reviewed on 04/30/2018

Trade name: CytoCool II

(Contd. of page 7)

· **Canadian Ingredient Disclosure list (limit 0.1%)**

Substance is not listed.

· **Canadian Ingredient Disclosure list (limit 1%)**

Substance is not listed.

· **GHS label elements**

The substance is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms**



GHS07

· **Signal word** Warning

· **Hazard statements**

May cause drowsiness or dizziness.

· **Precautionary statements**

Avoid breathing dust/fume/gas/mist/vapours/spray.

Use only outdoors or in a well-ventilated area.

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a poison center/doctor if you feel unwell.

Store in a well-ventilated place. Keep container tightly closed.

Store locked up.

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

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Date of preparation / last revision** 04/30/2018 / -

· **Abbreviations and acronyms:**

IMDG: International Maritime Code for Dangerous Goods

DOT: US Department of Transportation

IATA: International Air Transport Association

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

NFPA: National Fire Protection Association (USA)

HMIS: Hazardous Materials Identification System (USA)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 30.04.2018

Revision: 30.04.2018

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

- **1.1 Product identifier**
- **Trade name:** CytoCool II
- **Article number:** 72597, 72597-12
- **CAS Number:**
811-97-2
- **EC number:**
212-377-0
- **1.2 Relevant identified uses of the substance or mixture and uses advised against**
No further relevant information available.
- **Application of the substance / the mixture** Laboratory chemicals
- **1.3 Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Further information obtainable from:** Product safety department
- **1.4 Emergency telephone number:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

SECTION 2: Hazards identification

- **2.1 Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**



GHS07

STOT SE 3 H336 May cause drowsiness or dizziness.

Aerosol 3 H229 Pressurised container: May burst if heated.

- **2.2 Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The substance is classified and labelled according to the CLP regulation.
- **Hazard pictograms**



GHS07

- **Signal word** Warning
- **Hazard statements**
H229 Pressurised container: May burst if heated.
H336 May cause drowsiness or dizziness.

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Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 30.04.2018

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Trade name: CytoCool II

(Contd. of page 1)

- **Precautionary statements**
- P210 *Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.*
- P251 *Do not pierce or burn, even after use.*
- P261 *Avoid breathing dust/fume/gas/mist/vapours/spray.*
- P405 *Store locked up.*
- P410+P412 *Protect from sunlight. Do not expose to temperatures exceeding 50 °C/122 °F.*
- P501 *Dispose of contents/container in accordance with local/regional/national/international regulations.*
- **2.3 Other hazards**
- **Results of PBT and vPvB assessment**
- **PBT:** *Not applicable.*
- **vPvB:** *Not applicable.*

SECTION 3: Composition/information on ingredients

- **3.1 Chemical characterisation: Substances**
- **CAS No. Description**
811-97-2 1,1,1,2-tetrafluoroethane
- **Identification number(s)**
- **EC number:** 212-377-0

SECTION 4: First aid measures

- **4.1 Description of first aid measures**
- **After inhalation:** *Supply fresh air; consult doctor in case of complaints.*
- **After skin contact:** *Generally the product does not irritate the skin.*
- **After eye contact:** *Rinse opened eye for several minutes under running water.*
- **After swallowing:** *If symptoms persist consult doctor.*
- **4.2 Most important symptoms and effects, both acute and delayed**
No further relevant information available.
- **4.3 Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

SECTION 5: Firefighting measures

- **5.1 Extinguishing media**
- **Suitable extinguishing agents:**
Use fire extinguishing methods suitable to surrounding conditions.
- **5.2 Special hazards arising from the substance or mixture**
No further relevant information available.
- **5.3 Advice for firefighters**
- **Protective equipment:** *No special measures required.*

GB

(Contd. on page 3)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 30.04.2018

Revision: 30.04.2018

Trade name: **CytoCool II**

(Contd. of page 2)

SECTION 6: Accidental release measures

- **6.1 Personal precautions, protective equipment and emergency procedures** Not required.
- **6.2 Environmental precautions:** Do not allow to enter sewers/ surface or ground water.
- **6.3 Methods and material for containment and cleaning up:**
Absorb liquid components with liquid-binding material.
- **6.4 Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

SECTION 7: Handling and storage

- **7.1 Precautions for safe handling** No special precautions are necessary if used correctly.
- **Information about fire - and explosion protection:** No special measures required.
- **7.2 Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Observe official regulations on storing packagings with pressurised containers.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:** None.
- **7.3 Specific end use(s)** No further relevant information available.

SECTION 8: Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.

· 8.1 Control parameters

- **Ingredients with limit values that require monitoring at the workplace:**

811-97-2 1,1,1,2-tetrafluoroethane

WEL	Long-term value: 4240 mg/m ³ , 1000 ppm
-----	--

- **Additional information:** The lists valid during the making were used as basis.

· 8.2 Exposure controls

- **Personal protective equipment:**
- **General protective and hygienic measures:**
Wash hands before breaks and at the end of work.
- **Respiratory protection:** Not required.
- **Protection of hands:**
The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation
- **Material of gloves**
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

(Contd. on page 4)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 30.04.2018

Revision: 30.04.2018

Trade name: **CytoCool II**

(Contd. of page 3)

- **Penetration time of glove material**
The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.
- **Eye protection:** Not required.

SECTION 9: Physical and chemical properties

· 9.1 Information on basic physical and chemical properties

· General Information

· Appearance:

Form:	Gaseous
Colour:	Colourless
Odour:	Petroleum-like
Odour threshold:	Not determined.

· **pH-value:** Not determined.

· Change in condition

Melting point/freezing point:	Undetermined.
Initial boiling point and boiling range:	-26.2 °C

· **Flash point:** Not applicable, as aerosol.

· **Flammability (solid, gas):** Not applicable.

· **Decomposition temperature:** Not determined.

· **Auto-ignition temperature:** Not determined.

· **Explosive properties:** Product does not present an explosion hazard.

· Explosion limits:

Lower:	Not determined.
Upper:	Not determined.

· **Vapour pressure at 20 °C:** 5,716 hPa

· **Density at 20 °C:** 1.226 g/cm³

· **Relative density** Not determined.

· **Vapour density** Not determined.

· **Evaporation rate** Not applicable.

· Solubility in / Miscibility with

water at 20 °C: 1.93 g/l

· **Partition coefficient: n-octanol/water:** Not determined.

· Viscosity:

Dynamic at 20 °C:	0.22 mPas
Kinematic:	Not determined.

· Solvent content:

VOC (EC) 100.00 %

Solids content: 0.0 %

(Contd. on page 5)

Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 30.04.2018

Revision: 30.04.2018

Trade name: **CytoCool II**

(Contd. of page 4)

· 9.2 Other information

No further relevant information available.

SECTION 10: Stability and reactivity

- **10.1 Reactivity** No further relevant information available.
- **10.2 Chemical stability**
- **Thermal decomposition / conditions to be avoided:**
No decomposition if used according to specifications.
- **10.3 Possibility of hazardous reactions** No dangerous reactions known.
- **10.4 Conditions to avoid** No further relevant information available.
- **10.5 Incompatible materials:** No further relevant information available.
- **10.6 Hazardous decomposition products:** No dangerous decomposition products known.

SECTION 11: Toxicological information

- **11.1 Information on toxicological effects**
- **Acute toxicity** Based on available data, the classification criteria are not met.
- **Primary irritant effect:**
- **Skin corrosion/irritation** Based on available data, the classification criteria are not met.
- **Serious eye damage/irritation**
Based on available data, the classification criteria are not met.
- **Respiratory or skin sensitisation**
Based on available data, the classification criteria are not met.
- **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)**
- **Germ cell mutagenicity** Based on available data, the classification criteria are not met.
- **Carcinogenicity** Based on available data, the classification criteria are not met.
- **Reproductive toxicity** Based on available data, the classification criteria are not met.
- **STOT-single exposure**
May cause drowsiness or dizziness.
- **STOT-repeated exposure** Based on available data, the classification criteria are not met.
- **Aspiration hazard** Based on available data, the classification criteria are not met.

SECTION 12: Ecological information

- **12.1 Toxicity**
- **Aquatic toxicity:** No further relevant information available.
- **12.2 Persistence and degradability** No further relevant information available.
- **12.3 Bioaccumulative potential** No further relevant information available.
- **12.4 Mobility in soil** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Water hazard class 1 (German Regulation) (Assessment by list): slightly hazardous for water
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.
- **12.5 Results of PBT and vPvB assessment**
- **PBT:** Not applicable.

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Safety data sheet

according to 1907/2006/EC, Article 31

Printing date 30.04.2018

Revision: 30.04.2018

Trade name: **CytoCool II**



(Contd. of page 5)

- **vPvB:** Not applicable.
- **12.6 Other adverse effects** No further relevant information available.

SECTION 13: Disposal considerations

- **13.1 Waste treatment methods**
- **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

SECTION 14: Transport information

- | | |
|---|--|
| · 14.1 UN-Number | UN3159 |
| · ADR, IMDG, IATA | |
| · 14.2 UN proper shipping name | 3159 1,1,1,2-TETRAFLUOROETHANE
(REFRIGERANT GAS R 134a) |
| · ADR | 1, 1, 1, 2 - TETRAFLUOROETHANE
(REFRIGERANT GAS R 134a) |
| · IMDG, IATA | |
| · 14.3 Transport hazard class(es) | |
| · ADR | |
|  | |
| · Class | 2.2 5A |
| · Label | 2.2 |
| · IMDG, IATA | |
|  | |
| · Class | 2.2 |
| · Label | 2.2 |
| · 14.4 Packing group | not regulated |
| · ADR, IMDG, IATA | |
| · 14.5 Environmental hazards: | Not applicable. |
| · 14.6 Special precautions for user | Not applicable. |
| · Danger code (Kemler): | - |
| · EMS Number: | F-C,S-V |

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Safety data sheet
according to 1907/2006/EC, Article 31

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Trade name: CytoCool II

(Contd. of page 6)

· Stowage Category	A
· 14.7 Transport in bulk according to Annex II of Marpol and the IBC Code	Not applicable.
· Transport/Additional information:	
· ADR	
· Limited quantities (LQ)	120 ml
· Excepted quantities (EQ)	Code: E1 Maximum net quantity per inner packaging: 30 ml Maximum net quantity per outer packaging: 1000 ml
· Transport category	3
· Tunnel restriction code	E
· IMDG	
· Limited quantities (LQ)	1L
· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
· UN "Model Regulation":	UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), 2.2

SECTION 15: Regulatory information

- **15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Directive 2012/18/EU**
- **Named dangerous substances - ANNEX I Substance is not listed.**
- **REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3**
- **15.2 Chemical safety assessment:**
A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **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)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Aerosol 3: Aerosols – Category 3

STOT SE 3: Specific target organ toxicity (single exposure) – Category 3

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RUBRIEK 1: Identificatie van de stof of het mengsel en van de vennootschap/onderneming

- **1.1 Productidentificatie**
- **Handelsnaam:** CytoCool II
- **Artikelnummer:** 72597, 72597-12
- **CAS-nummer:**
811-97-2
- **EC-nummer:**
212-377-0
- **1.2 Relevant geïdentificeerd gebruik van de stof of het mengsel en ontraden gebruik**
Geen verdere relevante informatie verkrijgbaar.
- **Toepassing van de stof / van de bereiding** Laboratoriumchemicaliën
- **1.3 Details betreffende de verstrekker van het veiligheidsinformatieblad**
- **Fabrikant/leverancier:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Aurion**
Binnenhaven 5
6709 PD Wageningen
The Netherlands
Tel: 31 317 415094
Fax: 31 317 415955
email: info@aurion.nl
- **Inlichtingengevende sector:** Product safety department
- **1.4 Telefoonnummer voor noodgevallen:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

RUBRIEK 2: Identificatie van de gevaren

- **2.1 Indeling van de stof of het mengsel**
- **Indeling overeenkomstig Verordening (EG) nr. 1272/2008**



GHS07

STOT SE 3 H336 Kan slaperigheid of duizeligheid veroorzaken.

Aerosol 3 H229 Houder onder druk: kan open barsten bij verhitting.

- **2.2 Etiketteringselementen**
- **Etikettering overeenkomstig Verordening (EG) nr. 1272/2008**

De stof product is geclassificeerd en geëtiketteerd volgens de CLP-verordening.

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· Gevarenpictogrammen



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· Signaalwoord Waarschuwing

· Gevarenaanduidingen

H229 Houder onder druk: kan open barsten bij verhitting.

H336 Kan slaperigheid of duizeligheid veroorzaken.

· Veiligheidsaanbevelingen

P210 Verwijderd houden van warmte, hete oppervlakken, vonken, open vuur en andere ontstekingsbronnen. Niet roken.

P251 Ook na gebruik niet doorboren of verbranden.

P261 Inademing van stof/rook/gas/nevel/damp/spuitnevel vermijden.

P405 Achter slot bewaren.

P410+P412 Tegen zonlicht beschermen. Niet blootstellen aan temperaturen boven 50 °C/122 °F.

P501 De inhoud en de verpakking verwerken volgens de plaatselijke/regionale/nationale/internationale voorschriften.

· 2.3 Andere gevaren

· Resultaten van PBT- en zPzB-beoordeling

· **PBT:** Niet bruikbaar.

· **zPzB:** Niet bruikbaar.

RUBRIEK 3: Samenstelling en informatie over de bestanddelen

· 3.1 Chemische karakterisering: Stoffen

· CAS-Nr. omschrijving

811-97-2 1,1,1,2-tetrafluoroethane

· Identificatienummer(s)

· **EC-nummer:** 212-377-0

RUBRIEK 4: Eerstehulpmaatregelen

· 4.1 Beschrijving van de eerstehulpmaatregelen

· **Na het inademen:** Frisse lucht toedienen; bij klachten arts ontbieden.

· **Na huidcontact:** Over het algemeen is het produkt niet prikkelend voor de huid

· **Na oogcontact:** Ogen bij geopend ooglid meerdere minuten met stromend water spoelen

· **Na inslikken:** Als de klachten niet minderen, een arts raadplegen

· 4.2 Belangrijkste acute en uitgestelde symptomen en effecten

Geen verdere relevante informatie verkrijgbaar.

· 4.3 Vermelding van de vereiste onmiddellijke medische verzorging en speciale behandeling

Geen verdere relevante informatie verkrijgbaar.

NL

(Vervolg op blz. 3)

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RUBRIEK 5: Brandbestrijdingsmaatregelen

- **5.1 Blusmiddelen**
- **Geschikte blusmiddelen:** Brandblusmaatregelen op omgeving afstemmen.
- **5.2 Speciale gevaren die door de stof of het mengsel worden veroorzaakt**
Geen verdere relevante informatie verkrijgbaar.
- **5.3 Advies voor brandweerlieden**
- **Speciale beschermende kleding:** Geen bijzondere maatregelen nodig.

RUBRIEK 6: Maatregelen bij het accidenteel vrijkomen van de stof of het mengsel

- **6.1 Persoonlijke voorzorgsmaatregelen, beschermde uitrusting en noodprocedures**
Niet nodig.
- **6.2 Milieuvoorzorgsmaatregelen:**
Niet in de riolering/het oppervlaktewater/het grondwater laten terechtkomen.
- **6.3 Insluitings- en reinigingsmethoden en -materiaal:**
Vloeibare bestanddelen met vloeistofbindend materiaal opnemen.
- **6.4 Verwijzing naar andere rubrieken**
Informatie inzake veilig gebruik - zie hoofdstuk 7.
Informatie inzake persoonlijke beschermingsuitrusting - zie hoofdstuk 8.
Informatie inzake berging - zie hoofdstuk 13.

RUBRIEK 7: Hantering en opslag

- **7.1 Voorzorgsmaatregelen voor het veilig hanteren van de stof of het mengsel**
Bij een deskundig gebruik zijn geen bijzondere maatregelen vereist.
- **Informatie m.b.t. brand- en ontploffingsgevaar:**
Geen bijzondere maatregelen noodzakelijk.
- **7.2 Voorwaarden voor een veilige opslag, met inbegrip van incompatibele producten**
- **Opslag:**
- **Eisen ten opzichte van opslagruimte en tanks:**
De overheidsbepalingen m.b.t. de opslag van drukgaspakkingen moeten in acht genomen worden.
- **Informatie m.b.t. gezamenlijke opslag:** Niet noodzakelijk.
- **Verdere inlichtingen over eisen m.b.t. de opslag:** Geen.
- **7.3 Specifiek eindgebruik** Geen verdere relevante informatie verkrijgbaar.

RUBRIEK 8: Maatregelen ter beheersing van blootstelling/persoonlijke bescherming

- **Aanvullende gegevens m.b.t. de inrichting van technische installaties:**
Geen aanvullende gegevens. Zie 7.

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- **8.1 Controleparameters**
- **Bestanddelen met grenswaarden die m.b.t. de werkruimte in acht genomen moeten worden:**
Vervalt.
- **Aanvullende gegevens:** Als basis dienden lijsten die bij opstelling geldig waren.
- **8.2 Maatregelen ter beheersing van blootstelling**
- **Persoonlijke beschermingsvoorzieningen:**
- **Algemene beschermings- en gezondheidsmaatregelen:**
Vóór de pauze en aan het einde van werktijd handen wassen.
- **Ademhalingsbescherming:** Niet noodzakelijk.
- **Handbescherming:**
Het handschoenmateriaal moet ondoorlatend en bestand zijn tegen het product / de stof / de bereiding.
Op grond van falende testen kan geen aanbeveling voor handschoenmateriaal voor het product / de bereiding / het chemicaliën-mengsel afgegeven worden.
Kies handschoenmateriaal rekening houdend met de penetratietijden, de permeatiegraden en de degradatie.
- **Handschoenmateriaal**
De keuze van een geschikte handschoen is niet alleen afhankelijk van het materiaal, maar ook van andere kwaliteitskenmerken en verschilt van fabrikant tot fabrikant.
- **Doordringingstijd van het handschoenmateriaal**
De precieze penetratietijd kunt u te weten komen bij de handschoenfabrikant; houd er rekening mee.
- **Oogbescherming:** Niet noodzakelijk.

RUBRIEK 9: Fysische en chemische eigenschappen

- **9.1 Informatie over fysische en chemische basiseigenschappen**
- **Algemene gegevens**
- **Voorkomen:**

Vorm:	Gasvormig
Kleur:	Kleurloos
Geur:	Petroleumachtig
Geurdrempelwaarde:	Niet bepaald.
- **pH-waarde:** Niet bepaald.
- **Toestandsverandering**

Smelt-/vriespunt:	Niet bepaald.
Beginkookpunt en kooktraject:	-26,2 °C
- **Vlampunt:** Vanwege aerosol niet bruikbaar.
- **Ontvlambaarheid (vast, gas):** Niet bruikbaar.
- **Ontledingstemperatuur:** Niet bepaald.
- **Zelfontbrandingstemperatuur:** Niet bepaald.
- **Ontploffingseigenschappen:** Het produkt is niet ontploffingsgevaarlijk.

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· Ontploffingsgrenzen:	
Onderste:	Niet bepaald.
Bovenste:	Niet bepaald.
· Dampspanning bij 20 °C:	5.716 hPa
· Dichtheid bij 20 °C:	1,226 g/cm ³
· Relatieve dichtheid	Niet bepaald.
· Dampdichtheid	Niet bepaald.
· Verdampingsnelheid	Niet bruikbaar.
· Oplosbaarheid in/mengbaarheid met Water bij 20 °C:	1,93 g/l
· Verdelingscoëfficiënt: n-octanol/water:	Niet bepaald.
· Viscositeit	
Dynamisch bij 20 °C:	0,22 mPas
Kinematisch:	Niet bepaald.
· Oplosmiddelgehalte:	
VOC (EG)	100,00 %
Gehalte aan vaste bestanddelen:	0,0 %
· 9.2 Overige informatie	Geen verdere relevante informatie verkrijgbaar.

RUBRIEK 10: Stabiliteit en reactiviteit

- **10.1 Reactiviteit** Geen verdere relevante informatie verkrijgbaar.
- **10.2 Chemische stabiliteit**
- **Thermische afbraak / te vermijden omstandigheden:**
Geen afbraak bij gebruik volgens voorschrift.
- **10.3 Mogelijke gevaarlijke reacties** Geen gevaarlijke reacties bekend.
- **10.4 Te vermijden omstandigheden** Geen verdere relevante informatie verkrijgbaar.
- **10.5 Chemisch op elkaar inwerkende materialen:**
Geen verdere relevante informatie verkrijgbaar.
- **10.6 Gevaarlijke ontledingsproducten:** Geen gevaarlijke ontbindingsproducten bekend.

RUBRIEK 11: Toxicologische informatie

- **11.1 Informatie over toxicologische effecten**
- **Acute toxiciteit**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **Primaire aandoening:**
- **Huidcorrosie/-irritatie**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **Ernstig oogletsel/oogirritatie**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **Sensibilisatie van de luchtwegen/de huid**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

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- **CMR-effecten (kankerverwekkendheid, mutageniteit en giftigheid voor de voortplanting)**
- **Mutageniteit in geslachtscellen**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **Kankerverwekkendheid**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **Giftigheid voor de voortplanting**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **STOT bij eenmalige blootstelling**
Kan slaperigheid of duizeligheid veroorzaken.
- **STOT bij herhaalde blootstelling**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.
- **Gevaar bij inademing**
Gebaseerd op beschikbare gegevens; aan de indelingscriteria is niet voldaan.

RUBRIEK 12: Ecologische informatie

- **12.1 Toxiciteit**
- **Aquatische toxiciteit:** Geen verdere relevante informatie verkrijgbaar.
- **12.2 Persistentie en afbreekbaarheid** Geen verdere relevante informatie verkrijgbaar.
- **12.3 Bioaccumulatie** Geen verdere relevante informatie verkrijgbaar.
- **12.4 Mobiliteit in de bodem** Geen verdere relevante informatie verkrijgbaar.
- **Verdere ecologische informatie:**
- **Algemene informatie:**
Waterbezwaarlijkheid (NL): B(4) Weinig schadelijk voor in water levende organismen
Gevaar voor water klasse 1 (D) (Lijstclassificatie): gevaar voor water klein
Niet onverdund of in grote hoeveelheden lozen in grondwater, in oppervlaktewater of in de riolering.
- **12.5 Resultaten van PBT- en zPzB-beoordeling**
- **PBT:** Niet bruikbaar.
- **zPzB:** Niet bruikbaar.
- **12.6 Andere schadelijke effecten** Geen verdere relevante informatie verkrijgbaar.

RUBRIEK 13: Instructies voor verwijdering

- **13.1 Afvalverwerkingsmethoden**
- **Aanbeveling:**
Mag niet tesamen met huisvuil gestort worden of in de riolering terechtkomen.
- **Niet gereinigde verpakkingen:**
- **Aanbeveling:** Afvalverwijdering volgens overheidsbepalingen.

RUBRIEK 14: Informatie met betrekking tot het vervoer

- **14.1 VN-nummer**
- **ADR, IMDG, IATA** UN3159

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- **14.2 Juiste ladingnaam overeenkomstig de modelreglementen van de VN**
- **ADR** 3159 1,1,1,2-TETRAFLUORETHAAN (KOELGAS R 134a)
- **IMDG, IATA** 1, 1, 1, 2 - T E T R A F L U O R O E T H A N E (REFRIGERANT GAS R 134a)

- **14.3 Transportgevarenklasse(n)**

- **ADR**



- **klasse** 2.2 5A
- **Etiket** 2.2

- **IMDG, IATA**



- **Class** 2.2
- **Label** 2.2

- **14.4 Verpakkingsgroep:**

- **ADR, IMDG, IATA** Niet van toepassing

- **14.5 Milieugevaren:** Niet bruikbaar.

- **14.6 Bijzondere voorzorgen voor de gebruiker**

Niet bruikbaar.

- **Kemler-getal:** -
- **EMS-nummer:** F-C,S-V
- **Stowage Category** A

- **14.7 Vervoer in bulk overeenkomstig**

bijlage II bij Marpol en de IBC-code Niet bruikbaar.

- **Transport/verdere gegevens:**

- **ADR**
- **Beperkte hoeveelheden (LQ)** 120 ml
- **Uitzonderde hoeveelheden (EQ)** Code: E1
Grootste netto hoeveelheid per binnenverpakking: 30 ml
Grootste netto hoeveelheid per buitenverpakking: 1000 ml
- **Vervoerscategorie** 3
- **Tunnelbeperkingscode** E

- **IMDG**

- **Limited quantities (LQ)** 1L

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· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
· VN "Model Regulation":	UN 3159 1,1,1,2-TETRAFLUORETHAAN (KOELGAS R 134A), 2.2

RUBRIEK 15: Regelgeving

· **15.1 Specifieke veiligheids-, gezondheids- en milieureglementen en -wetgeving voor de stof of het mengsel**

· **SZW-lijst van kankerverwekkende stoffen**

De stof is niet aanwezig.

· **SZW-lijst van mutagene stoffen**

De stof is niet aanwezig.

· **NIET-limitatieve lijst van voor de voortplanting giftige stoffen - Vruchtbaarheid**

De stof is niet aanwezig.

· **NIET-limitatieve lijst van voor de voortplanting giftige stoffen - Ontwikkeling**

De stof is niet aanwezig.

· **NIET-limitatieve lijst van voor de voortplanting giftige stoffen - Borstvoeding**

De stof is niet aanwezig.

· **Richtlijn 2012/18/EU**

· **Gevaarlijke stoffen die met naam genoemd worden - BIJLAGE I**

De stof is niet aanwezig.

· **Verordening (EG) nr. 1907/2006 BIJLAGE XVII Beperkingsvoorwaarden: 3**

· **Nationale voorschriften:**

· **Gevaarklasse v. water:**

Waterbezwaarlijkheid (NL): B(4) Weinig schadelijk voor in water levende organismen

· **15.2 Chemische veiligheidsbeoordeling:**

Een chemische veiligheidsbeoordeling is niet uitgevoerd.

RUBRIEK 16: Overige informatie

Deze gegevens zijn gebaseerd op de huidige stand van onze kennis. Zij beschrijven echter geen garantie van producteigenschappen en vestigen geen contractuele rechtsbetrekking.

· **Afkortingen en acroniemen:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Aerosol 3: Aerosolen – Categorie 3

STOT SE 3: Specifieke doelorgaantoxiciteit bij eenmalige blootstelling – Categorie 3

Fiche de données de sécurité

selon 1907/2006/CE, Article 31

Date d'impression : 30.04.2018

Révision: 30.04.2018

RUBRIQUE 1: Identification de la substance/du mélange et de la société/l'entreprise

- **1.1 Identificateur de produit**
- **Nom du produit:** CytoCool II
- **Code du produit:** 72597, 72597-12
- **No CAS:**
811-97-2
- **Numéro CE:**
212-377-0
- **1.2 Utilisations identifiées pertinentes de la substance ou du mélange et utilisations déconseillées**
Pas d'autres informations importantes disponibles.
- **Emploi de la substance / de la préparation** Produits chimiques pour laboratoires
- **1.3 Renseignements concernant le fournisseur de la fiche de données de sécurité**
- **Producteur/fournisseur:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Service chargé des renseignements:** Product safety department
- **1.4 Numéro d'appel d'urgence:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

RUBRIQUE 2: Identification des dangers

- **2.1 Classification de la substance ou du mélange**
- **Classification selon le règlement (CE) n° 1272/2008**



GHS07

STOT SE 3 H336 Peut provoquer somnolence ou vertiges.

Aerosol 3 H229 Récipient sous pression: peut éclater sous l'effet de la chaleur.

- **2.2 Éléments d'étiquetage**
- **Étiquetage selon le règlement (CE) n° 1272/2008**
La substance est classifiée et étiquetée selon le règlement CLP.
- **Pictogrammes de danger**



GHS07

- **Mention d'avertissement** Attention
- **Mentions de danger**
H229 Récipient sous pression: peut éclater sous l'effet de la chaleur.

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H336 Peut provoquer somnolence ou vertiges.

· **Conseils de prudence**

P210 Tenir à l'écart de la chaleur, des surfaces chaudes, des étincelles, des flammes nues et de toute autre source d'inflammation. Ne pas fumer.

P251 Ne pas perforer, ni brûler, même après usage.

P261 Éviter de respirer les poussières/fumées/gaz/brouillards/vapeurs/aérosols.

P405 Garder sous clef.

P410+P412 Protéger du rayonnement solaire. Ne pas exposer à une température supérieure à 50 °C/122 °F.

P501 Éliminer le contenu/récipient conformément à la réglementation locale/régionale/nationale/internationale.

· **2.3 Autres dangers**

· **Résultats des évaluations PBT et vPvB**

· **PBT:** Non applicable.

· **vPvB:** Non applicable.

RUBRIQUE 3: Composition/informations sur les composants

· **3.1 Caractérisation chimique: Substances**

· **No CAS Désignation**

811-97-2 1,1,1,2-tetrafluoroethane

· **Code(s) d'identification**

· **Numéro CE:** 212-377-0

RUBRIQUE 4: Premiers secours

· **4.1 Description des premiers secours**

· **Après inhalation:** Donner de l'air frais, consulter un médecin en cas de troubles.

· **Après contact avec la peau:** En règle générale, le produit n'irrite pas la peau.

· **Après contact avec les yeux:**

Rincer les yeux, sous l'eau courante, pendant plusieurs minutes, en écartant bien les paupières.

· **Après ingestion:** Si les troubles persistent, consulter un médecin.

· **4.2 Principaux symptômes et effets, aigus et différés**

Pas d'autres informations importantes disponibles.

· **4.3 Indication des éventuels soins médicaux immédiats et traitements particuliers nécessaires**

Pas d'autres informations importantes disponibles.

RUBRIQUE 5: Mesures de lutte contre l'incendie

· **5.1 Moyens d'extinction**

· **Moyens d'extinction:** Adapter les mesures d'extinction d'incendie à l'environnement.

· **5.2 Dangers particuliers résultant de la substance ou du mélange**

Pas d'autres informations importantes disponibles.

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- **5.3 Conseils aux pompiers**
- **Équipement spécial de sécurité:** Aucune mesure particulière n'est requise.

RUBRIQUE 6: Mesures à prendre en cas de dispersion accidentelle

- **6.1 Précautions individuelles, équipement de protection et procédures d'urgence**
Pas nécessaire.
- **6.2 Précautions pour la protection de l'environnement:**
Ne pas rejeter dans les canalisations, dans les eaux de surface et dans les nappes d'eau souterraines.
- **6.3 Méthodes et matériel de confinement et de nettoyage:**
Recueillir les composants liquides à l'aide d'un produit absorbant.
- **6.4 Référence à d'autres rubriques**
Afin d'obtenir des informations pour une manipulation sûre, consulter le chapitre 7.
Afin d'obtenir des informations sur les équipements de protection personnels, consulter le chapitre 8.
Afin d'obtenir des informations sur l'élimination, consulter le chapitre 13.

RUBRIQUE 7: Manipulation et stockage

- **7.1 Précautions à prendre pour une manipulation sans danger**
Aucune mesure particulière n'est nécessaire en cas de bonne utilisation.
- **Préventions des incendies et des explosions:** Aucune mesure particulière n'est requise.
- **7.2 Conditions d'un stockage sûr, y compris d'éventuelles incompatibilités**
- **Stockage:**
- **Exigences concernant les lieux et conteneurs de stockage:**
Respecter les prescriptions légales pour le stockage des emballages sous pression.
- **Indications concernant le stockage commun:** Pas nécessaire.
- **Autres indications sur les conditions de stockage:** Néant.
- **7.3 Utilisation(s) finale(s) particulière(s)**
Pas d'autres informations importantes disponibles.

RUBRIQUE 8: Contrôles de l'exposition/protection individuelle

- **Indications complémentaires pour l'agencement des installations techniques:**
Sans autre indication, voir point 7.
- **8.1 Paramètres de contrôle**
- **Composants présentant des valeurs-seuil à surveiller par poste de travail:** Néant
- **Remarques supplémentaires:**
Le présent document s'appuie sur les listes en vigueur au moment de son élaboration.
- **8.2 Contrôles de l'exposition**
- **Équipement de protection individuel:**
- **Mesures générales de protection et d'hygiène:**
Se laver les mains avant les pauses et en fin de travail.
- **Protection respiratoire:** N'est pas nécessaire.

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· **Protection des mains:**

Le matériau des gants doit être imperméable et résistant au produit / à la substance / à la préparation.

À cause du manque de tests, aucune recommandation pour un matériau de gants pour le produit / la préparation / le mélange de produits chimiques ne peut être donnée.

Choix du matériau des gants en fonction des temps de pénétration, du taux de perméabilité et de la dégradation.

· **Matériau des gants**

Le choix de gants appropriés ne dépend pas seulement du matériau, mais également d'autres critères de qualité qui peuvent varier d'un fabricant à l'autre.

· **Temps de pénétration du matériau des gants**

Le temps de pénétration exact est à déterminer par le fabricant des gants de protection et à respecter.

· **Protection des yeux:** Pas nécessaire.

RUBRIQUE 9: Propriétés physiques et chimiques

· **9.1 Informations sur les propriétés physiques et chimiques essentielles**

· **Indications générales**

· **Aspect:**

Forme: Gazeuse

Couleur: Incolore

· **Odeur:** De type pétrolier

· **Seuil olfactif:** Non déterminé.

· **valeur du pH:** Non déterminé.

· **Changement d'état**

Point de fusion/point de congélation: Non déterminé.

Point initial d'ébullition et intervalle d'ébullition: -26,2 °C

· **Point d'éclair** Non applicable, s'agissant d'un aérosol.

· **Inflammabilité (solide, gaz):** Non applicable.

· **Température de décomposition:** Non déterminé.

· **Température d'auto-inflammabilité:** Non déterminé.

· **Propriétés explosives:** Le produit n'est pas explosif.

· **Limites d'explosion:**

Inférieure: Non déterminé.

Supérieure: Non déterminé.

· **Pression de vapeur à 20 °C:** 5.716 hPa

· **Densité à 20 °C:** 1,226 g/cm³

· **Densité relative** Non déterminé.

· **Densité de vapeur:** Non déterminé.

· **Taux d'évaporation:** Non applicable.

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· Solubilité dans/miscibilité avec l'eau à 20 °C:	1,93 g/l
· Coefficient de partage: n-octanol/eau:	Non déterminé.
· Viscosité:	
Dynamique à 20 °C:	0,22 mPas
Cinématique:	Non déterminé.
· Teneur en solvants:	
VOC (CE)	100,00 %
Teneur en substances solides:	0,0 %
· 9.2 Autres informations	Pas d'autres informations importantes disponibles.

RUBRIQUE 10: Stabilité et réactivité

- **10.1 Réactivité** Pas d'autres informations importantes disponibles.
- **10.2 Stabilité chimique**
- **Décomposition thermique/conditions à éviter:**
Pas de décomposition en cas d'usage conforme.
- **10.3 Possibilité de réactions dangereuses** Aucune réaction dangereuse connue.
- **10.4 Conditions à éviter** Pas d'autres informations importantes disponibles.
- **10.5 Matières incompatibles:** Pas d'autres informations importantes disponibles.
- **10.6 Produits de décomposition dangereux:**
Pas de produits de décomposition dangereux connus

RUBRIQUE 11: Informations toxicologiques

- **11.1 Informations sur les effets toxicologiques**
- **Toxicité aiguë**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Effet primaire d'irritation:**
- **Corrosion cutanée/irritation cutanée**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Lésions oculaires graves/irritation oculaire**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Sensibilisation respiratoire ou cutanée**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Effets CMR (cancérogène, mutagène et toxique pour la reproduction)**
- **Mutagenicité sur les cellules germinales**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Cancérogénicité**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Toxicité pour la reproduction**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Toxicité spécifique pour certains organes cibles - exposition unique**
Peut provoquer somnolence ou vertiges.

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- **Toxicité spécifique pour certains organes cibles - exposition répétée**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.
- **Danger par aspiration**
Compte tenu des données disponibles, les critères de classification ne sont pas remplis.

RUBRIQUE 12: Informations écologiques

- **12.1 Toxicité**
- **Toxicité aquatique:** Pas d'autres informations importantes disponibles.
- **12.2 Persistance et dégradabilité** Pas d'autres informations importantes disponibles.
- **12.3 Potentiel de bioaccumulation** Pas d'autres informations importantes disponibles.
- **12.4 Mobilité dans le sol** Pas d'autres informations importantes disponibles.
- **Autres indications écologiques:**
- **Indications générales:**
Catégorie de pollution des eaux 1 (D) (classification selon liste): peu polluant
Ne pas laisser le produit, non dilué ou en grande quantité, pénétrer la nappe phréatique, les eaux ou les canalisations.
- **12.5 Résultats des évaluations PBT et VPVB**
- **PBT:** Non applicable.
- **vPvB:** Non applicable.
- **12.6 Autres effets néfastes** Pas d'autres informations importantes disponibles.

RUBRIQUE 13: Considérations relatives à l'élimination

- **13.1 Méthodes de traitement des déchets**
- **Recommandation:**
Ne doit pas être évacué avec les ordures ménagères. Ne pas laisser pénétrer dans les égouts.
- **Emballages non nettoyés:**
- **Recommandation:** Evacuation conformément aux prescriptions légales.

RUBRIQUE 14: Informations relatives au transport

- | | |
|--|--|
| · 14.1 Numéro ONU | |
| · ADR, IMDG, IATA | UN3159 |
| · 14.2 Désignation officielle de transport de l'ONU | |
| · ADR | 3159 TÉTRAFLUORO-1,1,1,2 ÉTHANE (GAZ RÉFRIGÉRANT R 134a) |
| · IMDG, IATA | 1, 1, 1, 2 - TETRAFLUOROETHANE (REFRIGERANT GAS R 134a) |

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· **14.3 Classe(s) de danger pour le transport**

· **ADR**



- **Classe** 2.2 5A
 · **Étiquette** 2.2

· **IMDG, IATA**



- **Class** 2.2
 · **Label** 2.2

· **14.4 Groupe d'emballage**

- **ADR, IMDG, IATA** néant

- **14.5 Dangers pour l'environnement:** Non applicable.

· **14.6 Précautions particulières à prendre par l'utilisateur**

- **Indice Kemler:** Non applicable.
 · **No EMS:** -
 · **Stowage Category** F-C,S-V
 A

· **14.7 Transport en vrac conformément à l'annexe II de la convention Marpol et au recueil IBC**

Non applicable.

· **Indications complémentaires de transport:**

· **ADR**

- **Quantités limitées (LQ)** 120 ml
 · **Quantités exceptées (EQ)** Code: E1
 Quantité maximale nette par emballage intérieur: 30 ml
 Quantité maximale nette par emballage extérieur: 1000 ml
- **Catégorie de transport** 3
 · **Code de restriction en tunnels** E

· **IMDG**

- **Limited quantities (LQ)** 1L
 · **Excepted quantities (EQ)** Code: E0
 Not permitted as Excepted Quantity

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· **"Règlement type" de l'ONU:** UN 3159 TÉTRAFLUORO-1,1,1,2 ÉTHANE
(GAZ RÉFRIGÉRANT R 134A), 2.2

RUBRIQUE 15: Informations relatives à la réglementation

- **15.1 Réglementations/législation particulières à la substance ou au mélange en matière de sécurité, de santé et d'environnement**
- **Directive 2012/18/UE**
- **Substances dangereuses désignées - ANNEXE I** la substance n'est pas comprise
- **RÈGLEMENT (CE) N° 1907/2006 ANNEXE XVII** Conditions de limitation: 3
- **15.2 Évaluation de la sécurité chimique:**
Une évaluation de la sécurité chimique n'a pas été réalisée.

RUBRIQUE 16: Autres informations

Ces indications sont fondées sur l'état actuel de nos connaissances, mais ne constituent pas une garantie quant aux propriétés du produit et ne donnent pas lieu à un rapport juridique contractuel.

· **Acronymes et abréviations:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Aerosol 3: Aérosols – Catégorie 3

STOT SE 3: Toxicité spécifique pour certains organes cibles (exposition unique) – Catégorie 3

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ABSCHNITT 1: Bezeichnung des Stoffs beziehungsweise des Gemischs und des Unternehmens

· **1.1 Produktidentifikator**

· **Handelsname:** CytoCool II

· **Artikelnummer:** 72597, 72597-12

· **CAS-Nummer:**

811-97-2

· **EG-Nummer:**

212-377-0

· **1.2 Relevante identifizierte Verwendungen des Stoffs oder Gemischs und Verwendungen, von denen abgeraten wird**

Keine weiteren relevanten Informationen verfügbar.

· **Verwendung des Stoffs / des Gemisches** Laborchemikalien

· **1.3 Einzelheiten zum Lieferanten, der das Sicherheitsdatenblatt bereitstellt**

· **Hersteller/Lieferant:**

Electron Microscopy Sciences

1560 Industry Road

USA-Hatfield, PA 19440

Tel: 215-412-8400 Fax: 215-412-8450

email: info@emsdiasum.com

www.emsdiasum.com

Science Services GmbH

Unterhachinger Str. 75

81737 München Germany

Tel: +49(0)89 18 93 668-0

safety@scienceservices.de

Deutschland: +49 (0)89 19240, 24h Giftnotruf Munchen, www.toxinfo.org

Osterreich: +43 1406 43 43, Gesundheit Osterreich GmbH, 24 h

· **Auskunftgebender Bereich:** Product safety department

· **1.4 Notrufnummer:**

ChemTrec 1-800-424-9300 Contract CCN7661

1-703-527-3887

ABSCHNITT 2: Mögliche Gefahren

· **2.1 Einstufung des Stoffs oder Gemischs**

· **Einstufung gemäß Verordnung (EG) Nr. 1272/2008**



GHS07

STOT SE 3 H336 Kann Schläfrigkeit und Benommenheit verursachen.

Aerosol 3 H229 Behälter steht unter Druck: kann bei Erwärmung bersten.

· **2.2 Kennzeichnungselemente**

· **Kennzeichnung gemäß Verordnung (EG) Nr. 1272/2008**

Der Stoff ist gemäß CLP-Verordnung eingestuft und gekennzeichnet.

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· Gefahrenpiktogramme


GHS07

· Signalwort Achtung
· Gefahrenhinweise
H229 Behälter steht unter Druck: kann bei Erwärmung bersten.
H336 Kann Schläfrigkeit und Benommenheit verursachen.
· Sicherheitshinweise
P210 Von Hitze, heißen Oberflächen, Funken, offenen Flammen und anderen Zündquellen fernhalten. Nicht rauchen.
P251 Nicht durchstechen oder verbrennen, auch nicht nach Gebrauch.
P261 Einatmen von Staub/Rauch/Gas/Nebel/Dampf/Aerosol vermeiden.
P405 Unter Verschluss aufbewahren.
P410+P412 Vor Sonnenbestrahlung schützen. Nicht Temperaturen über 50 °C/122 °F aussetzen.
P501 Entsorgung des Inhalts / des Behälters gemäß den örtlichen / regionalen / nationalen/ internationalen Vorschriften.
· 2.3 Sonstige Gefahren
· Ergebnisse der PBT- und vPvB-Beurteilung
· PBT: Nicht anwendbar.

· vPvB: Nicht anwendbar.

ABSCHNITT 3: Zusammensetzung/Angaben zu Bestandteilen

· 3.1 Chemische Charakterisierung: Stoffe
· CAS-Nr. Bezeichnung
811-97-2 1,1,1,2-Tetrafluorethan
· Identifikationsnummer(n)
· EG-Nummer: 212-377-0

ABSCHNITT 4: Erste-Hilfe-Maßnahmen

· 4.1 Beschreibung der Erste-Hilfe-Maßnahmen
· Nach Einatmen: Frischluftzufuhr, bei Beschwerden Arzt aufsuchen.

· Nach Hautkontakt: Im allgemeinen ist das Produkt nicht hautreizend.

· Nach Augenkontakt:
Augen bei geöffnetem Lidspalt mehrere Minuten mit fließendem Wasser spülen.
· Nach Verschlucken: Bei anhaltenden Beschwerden Arzt konsultieren.

· 4.2 Wichtigste akute und verzögert auftretende Symptome und Wirkungen
Keine weiteren relevanten Informationen verfügbar.
· 4.3 Hinweise auf ärztliche Soforthilfe oder Spezialbehandlung
Keine weiteren relevanten Informationen verfügbar.

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ABSCHNITT 5: Maßnahmen zur Brandbekämpfung

- **5.1 Löschmittel**
- **Geeignete Löschmittel:** Feuerlöschmaßnahmen auf die Umgebung abstimmen.
- **5.2 Besondere vom Stoff oder Gemisch ausgehende Gefahren**
Keine weiteren relevanten Informationen verfügbar.
- **5.3 Hinweise für die Brandbekämpfung**
- **Besondere Schutzausrüstung:** Keine besonderen Maßnahmen erforderlich.

ABSCHNITT 6: Maßnahmen bei unbeabsichtigter Freisetzung

- **6.1 Personenbezogene Vorsichtsmaßnahmen, Schutzausrüstungen und in Notfällen anzuwendende Verfahren**
Nicht erforderlich.
- **6.2 Umweltschutzmaßnahmen:**
Nicht in die Kanalisation/Oberflächenwasser/Grundwasser gelangen lassen.
- **6.3 Methoden und Material für Rückhaltung und Reinigung:**
Flüssige Bestandteile mit flüssigkeitsbindendem Material aufnehmen.
- **6.4 Verweis auf andere Abschnitte**
Informationen zur sicheren Handhabung siehe Abschnitt 7.
Informationen zur persönlichen Schutzausrüstung siehe Abschnitt 8.
Informationen zur Entsorgung siehe Abschnitt 13.

ABSCHNITT 7: Handhabung und Lagerung

- **7.1 Schutzmaßnahmen zur sicheren Handhabung**
Bei sachgemäßer Verwendung keine besonderen Maßnahmen erforderlich.
- **Hinweise zum Brand- und Explosionsschutz:**
Keine besonderen Maßnahmen erforderlich.
- **7.2 Bedingungen zur sicheren Lagerung unter Berücksichtigung von Unverträglichkeiten**
- **Lagerung:**
- **Anforderung an Lagerräume und Behälter:**
Die behördlichen Vorschriften für das Lagern von Druckgaspackungen sind zu beachten.
- **Zusammenlagerungshinweise:** Nicht erforderlich.
- **Weitere Angaben zu den Lagerbedingungen:** Keine.
- **Lagerklasse:**
- **Klassifizierung nach Betriebsicherheitsverordnung (BetrSichV):** -
- **7.3 Spezifische Endanwendungen** Keine weiteren relevanten Informationen verfügbar.

ABSCHNITT 8: Begrenzung und Überwachung der Exposition/ Persönliche Schutzausrüstungen

- **Zusätzliche Hinweise zur Gestaltung technischer Anlagen:**
Keine weiteren Angaben, siehe Abschnitt 7.

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· 8.1 Zu überwachende Parameter

· Bestandteile mit arbeitsplatzbezogenen, zu überwachenden Grenzwerten:

811-97-2	1,1,1,2-Tetrafluorethan
AGW	Langzeitwert: 4200 mg/m ³ , 1000 ml/m ³ 8(II);DFG, Y

· **Zusätzliche Hinweise:** Als Grundlage dienen die bei der Erstellung gültigen Listen.

· 8.2 Begrenzung und Überwachung der Exposition

· Persönliche Schutzausrüstung:

· Allgemeine Schutz- und Hygienemaßnahmen:

Vor den Pausen und bei Arbeitsende Hände waschen.

· **Atemschutz:** Nicht erforderlich.

· Handschutz:

Das Handschuhmaterial muss undurchlässig und beständig gegen das Produkt / den Stoff / die Zubereitung sein.

Aufgrund fehlender Tests kann keine Empfehlung zum Handschuhmaterial für das Produkt / die Zubereitung / das Chemikaliengemisch abgegeben werden.

Auswahl des Handschuhmaterials unter Beachtung der Durchbruchzeiten, Permeationsraten und der Degradation.

· Handschuhmaterial

Die Auswahl eines geeigneten Handschuhs ist nicht nur vom Material, sondern auch von weiteren Qualitätsmerkmalen abhängig und von Hersteller zu Hersteller unterschiedlich.

· Durchdringungszeit des Handschuhmaterials

Die genaue Durchbruchzeit ist beim Schutzhandschuhhersteller zu erfahren und einzuhalten.

· **Augenschutz:** Nicht erforderlich.

ABSCHNITT 9: Physikalische und chemische Eigenschaften

· 9.1 Angaben zu den grundlegenden physikalischen und chemischen Eigenschaften

· Allgemeine Angaben

· Aussehen:

Form: Gasförmig

Farbe: Farblos

· **Geruch:** Petroleumartig

· **Geruchsschwelle:** Nicht bestimmt.

· **pH-Wert:** Nicht bestimmt.

· Zustandsänderung

Schmelzpunkt/Gefrierpunkt: Nicht bestimmt.

Siedebeginn und Siedebereich: -26,2 °C

· **Flammpunkt:** Nicht anwendbar, da Aerosol.

· **Entzündbarkeit (fest, gasförmig):** Nicht anwendbar.

· **Zersetzungstemperatur:** Nicht bestimmt.

· **Selbstentzündungstemperatur:** Nicht bestimmt.

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· Explosive Eigenschaften:	Das Produkt ist nicht explosionsgefährlich.
· Explosionsgrenzen:	
Untere:	Nicht bestimmt.
Obere:	Nicht bestimmt.
· Dampfdruck bei 20 °C:	5.716 hPa
· Dichte bei 20 °C:	1,226 g/cm ³
· Relative Dichte	Nicht bestimmt.
· Dampfdichte	Nicht bestimmt.
· Verdampfungsgeschwindigkeit	Nicht anwendbar.
· Löslichkeit in / Mischbarkeit mit Wasser bei 20 °C:	1,93 g/l
· Verteilungskoeffizient: n-Octanol/Wasser:	Nicht bestimmt.
· Viskosität:	
Dynamisch bei 20 °C:	0,22 mPas
Kinematisch:	Nicht bestimmt.
· Lösemittelgehalt:	
VOC (EU)	100,00 %
Festkörpergehalt:	0,0 %
· 9.2 Sonstige Angaben	Keine weiteren relevanten Informationen verfügbar.

ABSCHNITT 10: Stabilität und Reaktivität

- **10.1 Reaktivität** Keine weiteren relevanten Informationen verfügbar.
- **10.2 Chemische Stabilität**
- **Thermische Zersetzung / zu vermeidende Bedingungen:**
Keine Zersetzung bei bestimmungsgemäßer Verwendung.
- **10.3 Möglichkeit gefährlicher Reaktionen** Keine gefährlichen Reaktionen bekannt.
- **10.4 Zu vermeidende Bedingungen** Keine weiteren relevanten Informationen verfügbar.
- **10.5 Unverträgliche Materialien:** Keine weiteren relevanten Informationen verfügbar.
- **10.6 Gefährliche Zersetzungsprodukte:** Keine gefährlichen Zersetzungsprodukte bekannt.

ABSCHNITT 11: Toxikologische Angaben

- **11.1 Angaben zu toxikologischen Wirkungen**
- **Akute Toxizität**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **Primäre Reizwirkung:**
- **Ätz-/Reizwirkung auf die Haut**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **Schwere Augenschädigung/-reizung**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

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- **Sensibilisierung der Atemwege/Haut**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **CMR-Wirkungen (krebserzeugende, erbgutverändernde und fortpflanzungsgefährdende Wirkung)**
- **Keimzell-Mutagenität**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **Karzinogenität**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **Reproduktionstoxizität**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **Spezifische Zielorgan-Toxizität bei einmaliger Exposition**
Kann Schläfrigkeit und Benommenheit verursachen.
- **Spezifische Zielorgan-Toxizität bei wiederholter Exposition**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.
- **Aspirationsgefahr**
Aufgrund der verfügbaren Daten sind die Einstufungskriterien nicht erfüllt.

ABSCHNITT 12: Umweltbezogene Angaben

- **12.1 Toxizität**
- **Aquatische Toxizität:** Keine weiteren relevanten Informationen verfügbar.
- **12.2 Persistenz und Abbaubarkeit** Keine weiteren relevanten Informationen verfügbar.
- **12.3 Bioakkumulationspotenzial** Keine weiteren relevanten Informationen verfügbar.
- **12.4 Mobilität im Boden** Keine weiteren relevanten Informationen verfügbar.
- **Weitere ökologische Hinweise:**
- **Allgemeine Hinweise:**
Wassergefährdungsklasse 1 (Listeneinstufung): schwach wassergefährdend
Nicht unverdünnt bzw. in größeren Mengen in das Grundwasser, in Gewässer oder in die Kanalisation gelangen lassen.
- **12.5 Ergebnisse der PBT- und vPvB-Beurteilung**
- **PBT:** Nicht anwendbar.
- **vPvB:** Nicht anwendbar.
- **12.6 Andere schädliche Wirkungen** Keine weiteren relevanten Informationen verfügbar.

ABSCHNITT 13: Hinweise zur Entsorgung

- **13.1 Verfahren der Abfallbehandlung**
- **Empfehlung:**
Darf nicht zusammen mit Hausmüll entsorgt werden. Nicht in die Kanalisation gelangen lassen.
- **Ungereinigte Verpackungen:**
- **Empfehlung:** Entsorgung gemäß den behördlichen Vorschriften.

DE

(Fortsetzung auf Seite 7)

Sicherheitsdatenblatt

gemäß 1907/2006/EG, Artikel 31



Druckdatum: 30.04.2018

überarbeitet am: 30.04.2018

Handelsname: Cytocool II

(Fortsetzung von Seite 6)

ABSCHNITT 14: Angaben zum Transport

· 14.1 UN-Nummer	
· ADR, IMDG, IATA	UN3159
· 14.2 Ordnungsgemäße UN-Versandbezeichnung	
· ADR	3159 1,1,1,2-TETRAFLUORETHAN (GAS ALS KÄLTEMITTEL R 134a)
· IMDG, IATA	1,1,1,2-TETRAFLUROETHANE (REFRIGERANT GAS R 134a)
· 14.3 Transportgefahrenklassen	
· ADR	
	
· Klasse	2.2 5A
· Gefahrzettel	2.2
· IMDG, IATA	
	
· Class	2.2
· Label	2.2
· 14.4 Verpackungsgruppe	
· ADR, IMDG, IATA	entfällt
· 14.5 Umweltgefahren:	Nicht anwendbar.
· 14.6 Besondere Vorsichtsmaßnahmen für den Verwender	Nicht anwendbar.
· Kemler-Zahl:	-
· EMS-Nummer:	F-C,S-V
· Stowage Category	A
· 14.7 Massengutbeförderung gemäß Anhang II des MARPOL-Übereinkommens und gemäß IBC-Code	Nicht anwendbar.
· Transport/weitere Angaben:	
· ADR	
· Begrenzte Menge (LQ)	120 ml
· Freigestellte Mengen (EQ)	Code: E1
	Höchste Nettomenge je Innenverpackung:
	30 ml
	Höchste Nettomenge je Außenverpackung:
	1000 ml
· Beförderungskategorie	3

(Fortsetzung auf Seite 8)

Sicherheitsdatenblatt

gemäß 1907/2006/EG, Artikel 31

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Handelsname: CytoCool II

(Fortsetzung von Seite 7)

· Tunnelbeschränkungscode	E
· IMDG	
· Limited quantities (LQ)	1L
· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
· UN "Model Regulation":	UN 3159 1,1,1,2-TETRAFLUORETHAN (GAS ALS KÄLTEMITTEL R 134A), 2.2

ABSCHNITT 15: Rechtsvorschriften

- **15.1 Vorschriften zu Sicherheit, Gesundheits- und Umweltschutz/spezifische Rechtsvorschriften für den Stoff oder das Gemisch**
- **Richtlinie 2012/18/EU**
- **Namentlich aufgeführte gefährliche Stoffe - ANHANG I** Der Stoff ist nicht enthalten.
- **VERORDNUNG (EG) Nr. 1907/2006 ANHANG XVII** Beschränkungsbedingungen: 3
- **Nationale Vorschriften:**
- **Wassergefährdungsklasse: WGK 1** (Listeneinstufung): schwach wassergefährdend.
- **15.2 Stoffsicherheitsbeurteilung:**
Eine Stoffsicherheitsbeurteilung wurde nicht durchgeführt.

ABSCHNITT 16: Sonstige Angaben

Die Angaben stützen sich auf den heutigen Stand unserer Kenntnisse, sie stellen jedoch keine Zusicherung von Produkteigenschaften dar und begründen kein vertragliches Rechtsverhältnis.

- **Abkürzungen und Akronyme:**
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
VOC: Volatile Organic Compounds (USA, EU)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
Aerosol 3: Aerosole – Kategorie 3
STOT SE 3: Spezifische Zielorgan-Toxizität (einmalige Exposition) – Kategorie 3

Scheda di dati di sicurezza
ai sensi del regolamento 1907/2006/CE, Articolo 31

Stampato il: 30.04.2018

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SEZIONE 1: Identificazione della sostanza o della miscela e della società/impresa

- **1.1 Identificatore del prodotto**
- **Denominazione commerciale:** CytoCool II
- **Articolo numero:** 72597, 72597-12
- **Numero CAS:**
811-97-2
- **Numeri CE:**
212-377-0
- **1.2 Usi identificati pertinenti della sostanza o della miscela e usi sconsigliati**
Non sono disponibili altre informazioni.
- **Utilizzazione della Sostanza / del Preparato** Prodotti chimici per laboratorio
- **1.3 Informazioni sul fornitore della scheda di dati di sicurezza**
- **Produttore/fornitore:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Società Italiana Chimici**
Via Rio Nell Ellba 140
00138 Rome, Italy
Tel: 39 06 8800211
Fax: 39 30 06 8815313
Web: www.sichim.com
- **Informazioni fornite da:** Product safety department
- **1.4 Numero telefonico di emergenza:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

SEZIONE 2: Identificazione dei pericoli

- **2.1 Classificazione della sostanza o della miscela**
- **Classificazione secondo il regolamento (CE) n. 1272/2008**



GHS07

STOT SE 3 H336 Può provocare sonnolenza o vertigini.

Aerosol 3 H229 Contenitore pressurizzato: può esplodere se riscaldato.

- **2.2 Elementi dell'etichetta**
- **Etichettatura secondo il regolamento (CE) n. 1272/2008**

La sostanza è classificata ed etichettata conformemente al regolamento CLP.

(continua a pagina 2)

Scheda di dati di sicurezza

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· **Pittogrammi di pericolo**



GHS07

· **Avvertenza** *Attenzione*

· **Indicazioni di pericolo**

H229 *Contenitore pressurizzato: può esplodere se riscaldato.*

H336 *Può provocare sonnolenza o vertigini.*

· **Consigli di prudenza**

P210 *Tenere lontano da fonti di calore, superfici calde, scintille, fiamme libere o altre fonti di accensione. Non fumare.*

P251 *Non perforare né bruciare, neppure dopo l'uso.*

P261 *Evitare di respirare la polvere/i fumi/i gas/la nebbia/i vapori/gli aerosol.*

P405 *Conservare sotto chiave.*

P410+P412 *Proteggere dai raggi solari. Non esporre a temperature superiori a 50 °C/122 °F.*

P501 *Smaltire il prodotto/recipiente in conformità con le disposizioni locali / regionali / nazionali / internazionali.*

· **2.3 Altri pericoli**

· **Risultati della valutazione PBT e vPvB**

· **PBT:** *Non applicabile.*

· **vPvB:** *Non applicabile.*

SEZIONE 3: Composizione/informazioni sugli ingredienti

· **3.1 Caratteristiche chimiche: Sostanze**

· **Numero CAS**

811-97-2 1,1,1,2-tetrafluoroethane

· **Numero/i di identificazione**

· **Numeri CE:** 212-377-0

SEZIONE 4: Misure di primo soccorso

· **4.1 Descrizione delle misure di primo soccorso**

· **Inalazione:** *Portare in zona ben areata, in caso di disturbi consultare il medico.*

· **Contatto con la pelle:** *Generalmente il prodotto non è irritante per la pelle.*

· **Contatto con gli occhi:**

Lavare con acqua corrente per alcuni minuti tenendo le palpebre ben aperte.

· **Ingestione:** *Se il dolore persiste consultare il medico.*

· **4.2 Principali sintomi ed effetti, sia acuti che ritardati**

Non sono disponibili altre informazioni.

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Scheda di dati di sicurezza **ai sensi del regolamento 1907/2006/CE, Articolo 31**

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- **4.3 Indicazione dell'eventuale necessità di consultare immediatamente un medico e di trattamenti speciali**
Non sono disponibili altre informazioni.

SEZIONE 5: Misure antincendio

- **5.1 Mezzi di estinzione**
- **Mezzi di estinzione idonei:**
Adottare provvedimenti antiincendio nei dintorni della zona colpita.
- **5.2 Pericoli speciali derivanti dalla sostanza o dalla miscela**
Non sono disponibili altre informazioni.
- **5.3 Raccomandazioni per gli addetti all'estinzione degli incendi**
- **Mezzi protettivi specifici:** Non sono richiesti provvedimenti particolari.

SEZIONE 6: Misure in caso di rilascio accidentale

- **6.1 Precauzioni personali, dispositivi di protezione e procedure in caso di emergenza**
Non necessario.
- **6.2 Precauzioni ambientali:**
Impedire infiltrazioni nella fognatura/nelle acque superficiali/nelle acque freatiche.
- **6.3 Metodi e materiali per il contenimento e per la bonifica:**
Raccogliere le componenti liquide con materiale assorbente.
- **6.4 Riferimento ad altre sezioni**
Per informazioni relative ad un manipolazione sicura, vedere capitolo 7.
Per informazioni relative all'equipaggiamento protettivo ad uso personale vedere Capitolo 8.
Per informazioni relative allo smaltimento vedere Capitolo 13.

SEZIONE 7: Manipolazione e immagazzinamento

- **7.1 Precauzioni per la manipolazione sicura**
Per un uso corretto non sono necessari provvedimenti particolari.
- **Indicazioni in caso di incendio ed esplosione:**
Non sono richiesti provvedimenti particolari.
- **7.2 Condizioni per lo stoccaggio sicuro, comprese eventuali incompatibilità**
- **Stoccaggio:**
- **Requisiti dei magazzini e dei recipienti:**
Osservare le disposizioni amministrative relative allo stoccaggio di spray.
- **Indicazioni sullo stoccaggio misto:** Non necessario.
- **Ulteriori indicazioni relative alle condizioni di immagazzinamento:** Nessuno.
- **7.3 Usi finali particolari** Non sono disponibili altre informazioni.

SEZIONE 8: Controllo dell'esposizione/protezione individuale

- **Ulteriori indicazioni sulla struttura di impianti tecnici:**
Nessun dato ulteriore, vedere punto 7.

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Scheda di dati di sicurezza
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- **8.1 Parametri di controllo**
- **Componenti i cui valori limite devono essere tenuti sotto controllo negli ambienti di lavoro:**
Non Necessario.
- **Ulteriori indicazioni:** *Le liste valide alla data di compilazione sono state usate come base.*
- **8.2 Controlli dell'esposizione**
- **Mezzi protettivi individuali:**
- **Norme generali protettive e di igiene del lavoro:**
Lavarsi le mani prima dell'intervallo o a lavoro terminato.
- **Maschera protettiva:** *Non necessario.*
- **Guanti protettivi:**
Il materiale dei guanti deve essere impermeabile e stabile contro il prodotto/ la sostanza/ la formulazione.
A causa della mancanza di tests non può essere consigliato alcun tipo di materiale per i guanti con cui manipolare il prodotto / la formulazione / la miscela di sostanze chimiche.
Scelta del materiale dei guanti in considerazione dei tempi di passaggio, dei tassi di permeazione e della degradazione.
- **Materiale dei guanti**
La scelta dei guanti adatti non dipende soltanto dal materiale bensì anche da altre caratteristiche di qualità variabili da un produttore a un altro.
- **Tempo di permeazione del materiale dei guanti**
Richiedere dal fornitore dei guanti il tempo di passaggio preciso il quale deve essere rispettato.
- **Occhiali protettivi:** *Non necessario.*

SEZIONE 9: Proprietà fisiche e chimiche

· **9.1 Informazioni sulle proprietà fisiche e chimiche fondamentali**

· **Indicazioni generali**

· **Aspetto:**

Forma:	<i>Gassoso</i>
Colore:	<i>Incolore</i>
Odore:	<i>Di petrolio</i>
Soglia olfattiva:	<i>Non definito.</i>

· **valori di pH:** *Non definito.*

· **Cambiamento di stato**

Punto di fusione/punto di congelamento: *Non definito.*

Punto di ebollizione iniziale e intervallo di ebollizione: *-26,2 °C*

· **Punto di infiammabilità:** *Non applicabile a causa di aerosol.*

· **Infiammabilità (solidi, gas):** *Non applicabile.*

· **Temperatura di decomposizione:** *Non definito.*

· **Temperatura di autoaccensione:** *Non definito.*

· **Proprietà esplosive:** *Prodotto non esplosivo.*

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· Limiti di infiammabilità:	
Inferiore:	<i>Non definito.</i>
Superiore:	<i>Non definito.</i>
· Tensione di vapore a 20 °C:	5,716 hPa
· Densità a 20 °C:	1,226 g/cm ³
· Densità relativa	<i>Non definito.</i>
· Densità di vapore:	<i>Non definito.</i>
· Velocità di evaporazione	<i>Non applicabile.</i>
· Solubilità in/Miscibilità con acqua a 20 °C:	1,93 g/l
· Coefficiente di ripartizione: n-ottanolo/acqua:	<i>Non definito.</i>
· Viscosità:	
Dinamica a 20 °C:	0,22 mPas
Cinematica:	<i>Non definito.</i>
· Tenore del solvente:	
VOC (CE)	100,00 %
Contenuto solido:	0,0 %
· 9.2 Altre informazioni	<i>Non sono disponibili altre informazioni.</i>

SEZIONE 10: Stabilità e reattività

- **10.1 Reattività** *Non sono disponibili altre informazioni.*
- **10.2 Stabilità chimica**
- **Decomposizione termica/ condizioni da evitare:**
Il prodotto non si decompone se utilizzato secondo le norme.
- **10.3 Possibilità di reazioni pericolose** *Non sono note reazioni pericolose.*
- **10.4 Condizioni da evitare** *Non sono disponibili altre informazioni.*
- **10.5 Materiali incompatibili:** *Non sono disponibili altre informazioni.*
- **10.6 Prodotti di decomposizione pericolosi:**
Non sono noti prodotti di decomposizione pericolosi.

SEZIONE 11: Informazioni tossicologiche

- **11.1 Informazioni sugli effetti tossicologici**
- **Tossicità acuta**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Irritabilità primaria:**
- **Corrosione/irritazione cutanea**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Lesioni oculari gravi/irritazioni oculari gravi**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Sensibilizzazione respiratoria o cutanea**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.

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- **Effetti CMR (cancerogenicità, mutagenicità e tossicità per la riproduzione)**
- **Mutagenicità delle cellule germinali**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Cancerogenicità**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Tossicità per la riproduzione**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Tossicità specifica per organi bersaglio (STOT) - esposizione singola**
Può provocare sonnolenza o vertigini.
- **Tossicità specifica per organi bersaglio (STOT) - esposizione ripetuta**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.
- **Pericolo in caso di aspirazione**
Basandosi sui dati disponibili i criteri di classificazione non sono soddisfatti.

SEZIONE 12: Informazioni ecologiche

- **12.1 Tossicità**
- **Tossicità acquatica:** Non sono disponibili altre informazioni.
- **12.2 Persistenza e degradabilità** Non sono disponibili altre informazioni.
- **12.3 Potenziale di bioaccumulo** Non sono disponibili altre informazioni.
- **12.4 Mobilità nel suolo** Non sono disponibili altre informazioni.
- **Ulteriori indicazioni in materia ambientale:**
- **Ulteriori indicazioni:**
Pericolosità per le acque classe 1 (D) (Classif. secondo le liste): poco pericoloso
Non immettere nelle acque freatiche, nei corsi d'acqua o nelle fognature non diluito o in grandi quantità.
- **12.5 Risultati della valutazione PBT e vPvB**
- **PBT:** Non applicabile.
- **vPvB:** Non applicabile.
- **12.6 Altri effetti avversi** Non sono disponibili altre informazioni.

SEZIONE 13: Considerazioni sullo smaltimento

- **13.1 Metodi di trattamento dei rifiuti**
- **Consigli:**
Non smaltire il prodotto insieme ai rifiuti domestici Non immettere nelle fognature.
- **Imballaggi non puliti:**
- **Consigli:** Smaltimento in conformità con le disposizioni amministrative.

SEZIONE 14: Informazioni sul trasporto

- **14.1 Numero ONU**
- **ADR, IMDG, IATA** UN3159

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· **14.2 Nome di spedizione dell'ONU**
 · **ADR** 3159 1,1,1,2-TETRAFLUOROETANO (GAS REFRIGERANTE R 134a)
 · **IMDG, IATA** 1, 1, 1, 2 - TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)

· **14.3 Classi di pericolo connesso al trasporto**

· **ADR**



· **Classe** 2.2 5A
 · **Etichetta** 2.2

· **IMDG, IATA**



· **Class** 2.2
 · **Label** 2.2

· **14.4 Gruppo di imballaggio**

· **ADR, IMDG, IATA** non applicabile

· **14.5 Pericoli per l'ambiente:** Non applicabile.

· **14.6 Precauzioni speciali per gli utilizzatori** Non applicabile.

· **Numero Kemler:** -
 · **Numero EMS:** F-C,S-V
 · **Stowage Category** A

· **14.7 Trasporto di rifiuti secondo l'allegato II di MARPOL ed il codice IBC**

Non applicabile.

· **Trasporto/ulteriori indicazioni:**

· **ADR**

· **Quantità limitate (LQ)** 120 ml
 · **Quantità esenti (EQ)** Codice: E1
 Quantità massima netta per imballaggio interno: 30 ml
 Quantità massima netta per imballaggio esterno: 1000 ml

· **Categoria di trasporto** 3
 · **Codice di restrizione in galleria** E

· **IMDG**

· **Limited quantities (LQ)** 1L

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· Excepted quantities (EQ)	Code: E0 Not permitted as Excepted Quantity
· UN "Model Regulation":	UN 3159 1,1,1,2-TETRAFLUOROETANO (GAS REFRIGERANTE R 134A), 2.2

SEZIONE 15: Informazioni sulla regolamentazione

- **15.1 Disposizioni legislative e regolamentari su salute, sicurezza e ambiente specifiche per la sostanza o la miscela**
- **Direttiva 2012/18/UE**
- **Sostanze pericolose specificate - ALLEGATO I** La sostanza non è contenuta
- **REGOLAMENTO (CE) n. 1907/2006 ALLEGATO XVII** Restrizioni: 3
- **15.2 Valutazione della sicurezza chimica:**
Una valutazione della sicurezza chimica non è stata effettuata.

SEZIONE 16: Altre informazioni

I dati sono riportati sulla base delle nostre conoscenze attuali, non rappresentano tuttavia alcuna garanzia delle caratteristiche del prodotto e non motivano alcun rapporto giuridico contrattuale.

· **Abbreviazioni e acronimi:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Aerosol 3: Aerosol – Categoria 3

STOT SE 3: Tossicità specifica per organi bersaglio (esposizione singola) – Categoria 3

물질안전보건자료 GHS에 따라라다

기압점: 2018.04.30

개정: 2018.04.30

1 화학제품과 회사에 관한 정보

제품제품명

- **제품명:** CytoCool II
- **상품번호:** 72597, 72597-12
- **번호번호번호**
811-97-2
- **EC 의번호:**
212-377-0

해당 해당 물질이나 혼합물 관련 관련 용도 및 사용금지용도

- 추가적인 정보가 존재하지 않습니다.
- **제품의 권고 용도와 사용 제한** 관련 시험 실 화 학 품
- **안전데이터표(Safety Data Sheet) 내 공급 업체 관련 관련 정보**
- **제조사/수입자/유통업체 정보**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- Samchang Commercial Co., Ltd.
Yeo Eui Do
PO Box 1110
Seoul, Korea
Tel: 82 2 703 3040
Fax: 82 2 717 3298
- **추가적인 정보** 관련 가능 product safety department
- **비상 연락 전화번호:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

2 유해성·위험성

- **순물질 또는 혼합물 분류**



특정표적장기 독성 - 1회 노출 - 구분 3 H336 졸음 또는 현기증을 일으킬 수 있음

- **라벨 요소**
- **라벨 요소**
본 화학물질은 화학물질의 분류 및 표기에 관한 국제조화시스템(GHS)에 따라 분류 및 표기되었습니다.
- **그림문자**



GHS07

(2 쪽에 계속)

물질안전보건자료 GHS에 따라 라다

기압점: 2018.04.30

개정: 2018.04.30

제품명: CytoCool II

(1 쪽부터 계속)

- **신호어 경고**
- **유해** (유해) (유해) (유해) 문구
- **예방 조치** 문구 (분진·흙·가스·미스트·증기·스프레이)의 흡입을 피하십시오. 흡입하면 신선한 공기가 있는 곳으로 옮기고 호흡하기 쉬운 자세로 안정을 취하십시오. 몸에 이상이 있을 시 독성물질 센터/병원 연락 필요. 용기는 환기가 잘 되는 곳에 단단히 밀폐하여 저장하십시오. 잠금장치가 있는 저장장소에 저장하십시오. 현지/지역/국가/국제 규정에 따라서 내용물/용기 노출
- 기타 기타 **유해성**
- PBT(잔류성, 생물농축성, 물성, 물질 분해) 및 vPvB(고 잔류성, 고 생물농축성, 물성, 분해) 평가 결과 결과 결과
- PBT(잔류성, 생물농축성, 물성, 물질 분해) 당사항 없음.
- vPvB(고 잔류성, 고 생물농축성, 물성, 분해) 당사항 없음.

3 구성성분의 명칭 및 함유량

- **화학적 특성:** 화학물질
- CAS-번호 표시
811-97-2 1,1,1,2-tetrafluoroethane
- 식별식별 번호
- EC 의번호: 212-377-0

4 응급조치 요령

- **응급조치요령 내용 내용**
- **흡입했을 때:** 신선한 공기를 쐬고, 통증이 있을 때는 의료진의 도움을 구한다.
- **피부에 접촉했을 때:** 일반적으로 이 제품은 피부에 자극적이지 않다.
- **눈에 눈에 들어갔을 때:** 흐르는 물에 눈을 몇분동안 씻어낸다.
- **먹었을 때:** 증상이 지속될 경우에는 의사와 상담한다.
- 기타 기타 **과개의 주의사항:**
- 가장 가장 **중요한 단일 또는 복합 위험 영향 영향** 정보가 존재하지 않습니다.
- **즉각적인 의료처리 및 특별치료가 필요함을 시사 하는 징후 징후** 추가적인 정보가 존재하지 않습니다.

5 폭발·화재시 대처방법

- **소화제**
- **적절한 소화제:** 주변 환경에 맞는 화재 진화방법을 사용한다.
- **본 화학물질이나 혼합물에서 발생 특별 특별 위험 특성** 추가적인 정보가 존재하지 않습니다.
- **소방관에 대한 대한 사항**
- 화재 화재 **화재 초기에 초기 사용할 보호구 및 예방조치:** 특별한 조치가 필요없음.

KR

(3 쪽에 계속)

물질안전보건자료 GHS에 따라 라다

기압점: 2018.04.30

개정: 2018.04.30

제품명: CytoCool II

(2 쪽부터 계속)

6 누출 사고 시 대처방법

- 개인적 예방조치, 보호장비 및 응급 처치 절차 없음.
- 환경 오염 방지를 위한 예방 조치: 하수도망/해수면위의물/지하수로도달 하지않게한다.
- 밀폐된 용기에 저장하여 화재 위험을 최소화한다. 혼합물로 액체 성분을 흡수한다.
- **선천 선천 선천** 참조
- 안전 관리에 대한 정보는 제7 장 을 참고하시오.
- 개인 보호 장비에 대한 정보는 제8 장 을 참고하시오.
- 쓰레기 처리에 대한 정보는 제13 장 을 참고하시오.

7 취급 및 저장방법

- 취급 취급 취급
- 안전을 위한 예방 조치를 올바르게 사용할 경우에는 특별한 주의가 필요없다.
- 화재 위험을 최소화하기 위해 화재 발생 시 대피를 위한 예방 조치를 취할 필요가 없다.
- 혼합 위험성 및 안전 주의 사항 조건
- 보관 보관 보관
- 안전을 위한 예방 조치를 올바르게 사용할 경우에는 특별한 주의가 필요없다.
- 하수도망/해수면위의물/지하수로도달 하지않게한다.
- 보관 조건에 관한 추가적인 정보가 없습니다.
- 구매 시 최종 사용자 추가적인 정보가 존재하지 않습니다.

8 누출방지 및 개인보호구

- 첨단시설 디자인에 대한 추가 정보: 더 이상 의 자료는 없음. 항 목 7 을 참고하시오.
- 통제 통제 통제 변수
- 화학물질의 누출기준, 생물학적 누출기준 등:

811-97-2 1,1,1,2-tetrafluoroethane
WEEL (US) 장기간 의값: 1000 ppm

- 추가 정보 참조 할 당시에 유효 한 목록을 기초로 사용했다.

- 누출 통제 통제 통제
- 개인 개인 개인 개인
- 일반적 보호 조치 및 위생 조치: 휴 식 전 이나 작업이 끝날때마다 손을 씻는다.
- 호흡기 보호 보호 없음.
- 눈 보호 보호
- 장갑재질은 제품 / 원료 / 조제를 투과시키지 않아야 하고, 내구성이 있어야 한다. 테스트를 하지 않았기 때문에 제품 / 조제 / 화학 혼합 물에 적합한 장갑재질에 대한 추천이 없다. 투과 시간, 침투율과 저하를 고려해서 장갑 재료를 선택한다.
- 장갑 의 재료
- 적합한 장갑 의 선정은 재질 차이뿐만 아니라 품질 기준 의 차이도 고려 하여 이루어져야 하고 제조업자에 따라서 다르게 선정 되어야 한다.
- 장갑 재 료 의 투과 시간
- 정확한 관통 시간은 보호 장갑 제조자에 의하여 인지 되고, 준수 되어야 한다.

(4 쪽에 계속)

물질안전보건자료 GHS에 따라라다

기압점: 2018.04.30

개정: 2018.04.30

제품명: CytoCool II

보통 보호보호요 없음.

(3 쪽부터계속)

9 물리화학적 특성

기본 물리화학적 특성에 대한 정보

· 일반정보	
외형외형외형	
· 물리적 상태	가스형태의
· 색:	색소가없는
· 냄새	석유종류의
· 후각역치	알맞지않다.
· pH:	알맞지않다.
· 상태변화	
· 녹는점/어는점:	맞지않는
· 초기조기끓는점과 끓는점범위범위	-26.2 °C
· 인화점:	연 무 질 이 기 에 해당사항 없음.
· 인화성 고체/기체/기체	해당사항 없음.
· 분해온도	알맞지않다.
· 자기점화:	알맞지않다.
· 폭발위험:	이제품은폭발위험성이없다
· 인화안화안화폭발 위험성 상한/하한	하한
· 아래로:	알맞지않다.
· 위로위로	알맞지않다.
· 증기압 의경우 20 °C:	5,716 hPa
· 밀도 밀도 의경우 20 °C:	1.226 g/cm ³
· 비중 비중 비중	알맞지않다.
· 증기밀도:	알맞지않다.
· 증발 증발 증발 속도	해당사항 없음.
· 용해도:	
· 물 의경우 20 °C:	1.93 g/l
· n 옥탄올/물 분배계수:	알맞지않다.
· 점도 점도 점도	
· 역학성 의경우 20 °C:	0.22 mPas
· 동점성:	알맞지않다.
· 용매 내용물	
· VOC (EU)	100.00 %
· 고체 양 함량 함량	0.0 %
· 기타 정보	추가적인 정보가 존재하지 않습니다.

KR

(5 쪽에계속)

물질안전보건자료 GHS에 따라라따

기압점: 2018.04.30

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제품명: CytoCool II

(4 쪽부터계속)

10 안정성 및 반응성

- 반응성 추가적인 정보가 존재하지 않습니다.
- 화학적 안정성
- 화학적 안정성 및 유해 반응의 가능성 / 피해 조건 조건
규정에 따라 사용할 경우 해체는 없다
- 유해 반응 가능성 위험한 반응으로는 알려지지 않았다.
- 피해 조건 조건 추가적인 정보가 존재하지 않습니다.
- 혼합 유해물: 추가적인 정보가 존재하지 않습니다.
- 유해 분해 물질: 위험성 있는 분해물들은 알려지지 않았다.

11 독성에 관한 정보

- 독성학적 영향에 대한 정보
- 급성 독성 독성 독성
- 일차적 자극 효과
- 피부 피부 부식성 또는 자극성: 무자극
- 심한 심한 부식성 또는 자극성: 무자극.
- 감각 화: 민감한 영향이 없는 것으로 알려져 있다.

12 환경에 미치는 영향

- 독성 독성 독성
- 수생 독성: 추가적인 정보가 존재하지 않습니다.
- 지속성 및 분해성 추가적인 정보가 존재하지 않습니다.
- 환경 시스템에서의 행동:
- 생물 농축 잠재성 추가적인 정보가 존재하지 않습니다.
- 토양 내 이동성 추가적인 정보가 존재하지 않습니다.
- 추가적인 생태학 정보 정보
- 일반 열 안정성 특징
- 수질 오염 등급 1 (목록 분류): 약하게 수질 오염이 된다
- 희석시키지 않은 채 대량으로 지하수나, 하천으로 그리고 하수도망에도 도달하지 않게 한다.
- PBT(잔류성, 생물 농축성, 물질 분해성) 및 vPvB(고 잔류성, 고 생물 농축성, 물질 분해성) 평가 결과 결과 결과
- PBT(잔류성, 생물 농축성, 물질 분해성) 및 vPvB(고 잔류성, 고 생물 농축성, 물질 분해성) 평가 결과 결과 결과
- vPvB(고 잔류성, 고 생물 농축성, 물질 분해성) 및 vPvB(고 잔류성, 고 생물 농축성, 물질 분해성) 평가 결과 결과 결과
- 기타 기타 기타 추가적인 정보가 존재하지 않습니다.

13 폐기시 주의사항

- 폐기물 처리 방법
- 권고 권고 권고 쓰레기와 함께 처리되어서는 안 된다. 하수도망으로 유입되어서는 안 된다.

(6 쪽에 계속)

물질안전보건자료

GHS에 따라 라다


기압점: 2018.04.30

개정: 2018.04.30

제품명: CytoCool II

(5 쪽부터 계속)

· 비위생적 포장 포장
권고 권고 권고 의지 침에 입각 한 쓰레기 처리.

14 운송에 필요한 정보	
유엔 유엔 유엔 번호 · ADR, IMDG, IATA	UN3159
적정 적정 적정 명 · ADR · IMDG, IATA	3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a) 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134a)
교통 교통 위험 위험 · ADR	
등급 등급 등급 · 위험 라벨 라벨 · IMDG, IATA	2.2 5A 2.2 <hr style="border-top: 1px dashed black;"/> 2.2 2.2
용기 등급 · ADR, IMDG, IATA	누락되다
환경적 유해 물질:	해당 사항 없음.
이동 특별 특별 조치 위험 위험 위험 코드 · E 번호 번호 · Stowage Category	해당 사항 없음. - F-C,S-V A
· MARPOL73/78(선박으로부터의 해양오염 방지 협약) 부속서 2 및 IBC Code 국제 국제 선적 화물 코드에 따른 다른 다른 별 운송 운송	해당 사항 없음.
운송 추가 추가 정보 · ADR	한정 한정 한정 (수량) · Excepted quantities (EQ)
	120 ml Code: E1 Maximum net quantity per inner packaging: 30 ml

(7 쪽에 계속)

물질안전보건자료 GHS에 따라라따

기압점: 2018.04.30

개정: 2018.04.30

제품명: CytoCool II

(6 쪽부터계속)

· 운송용 순용량 구분 터널/터널/터널/터널 코드	Maximum net quantity per outer packaging: 1000 ml 3 E
· IMDG · Limited quantities (LQ) · Excepted quantities (EQ)	1L Code: E0 Not permitted as Excepted Quantity
· UN번호/위험등급/유체	UN 3159 1,1,1,2-TETRAFLUOROETHANE (REFRIGERANT GAS R 134A), 2.2

15 법적 규제현황

· 산업안전보건법에 의해위해규제

제조제조금지물질:

성분이포함되어있지않다

· 허가대상물질:

성분이포함되어있지않다

· 관리대상유해물질:

성분이포함되어있지않다

해당해당수용물질 또는 혼합물/에 대한대한안전보건보건보건보건보건보건보건보건보건보건법률

· Korean Existing Chemical Inventory

KE-33426

· 화학물질관리법

· 사고대비물질

성분이포함되어있지않다

· 금지물질

성분이포함되어있지않다

· 제한물질

성분이포함되어있지않다

· 유독물질

성분이포함되어있지않다

· 허가물질

성분이포함되어있지않다

· 라벨라벨요소

본 화학물질은 화학물질의 분류 및 표기에 관한 국제조화시스템(GHS)에 따라 분류 및 표기되었습니다.

(8 쪽에계속)

물질안전보건자료 GHS에 따라라다

기압점: 2018.04.30

개정: 2018.04.30

제품명: CytoCool II

(7 쪽부터계속)

· 그림문자



GHS07

· 신호어 경고

유해 **유해유독물질** 문구
졸음 또는 현기증을 일으킬 수 있음

· 예방조치 문구문구

- (분진·흙·가스·미스트·증기·스프레이)의 흡입을 피하십시오.
 - 흡입하면 신선한 공기가 있는 곳으로 옮기고 호흡하기 쉬운 자세로 안정을 취하십시오.
 - 몸에 이상이 있을 시 독성물질 센터/병원 연락 필요.
 - 용기는 환기가 잘 되는 곳에 단단히 밀폐하여 저장하십시오.
 - 잠금장치가 있는 저장장소에 저장하십시오.
 - 현지/지역/국가/국제 규정에 따라서 내용물/용기 노출
- 화학물질 안전성 평가** 화학물질 안전성 평가가 수행되지 않음

16 그 밖의 참고사항

이 보고는 우리 지식에 대한 오늘날의 상태에 대하여 평가하고 있다. 하지만 이 보고서는 생
산 특성에 관한 보증은 기술하지 않았으며 계약적인 법률 관계에 기반을 두고 있지 않다

최초 **최초 작성일자:** 2018.04.30
개정 **개정 일자:** 1 / 2018.04.30

· 약어와 두문자어:

- ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
- IMDG: International Maritime Code for Dangerous Goods
- IATA: International Air Transport Association
- EINECS: European Inventory of Existing Commercial Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- VOC: Volatile Organic Compounds (USA, EU)
- PBT: Persistent, Bioaccumulative and Toxic
- vPvB: very Persistent and very Bioaccumulative

KR

Ficha de datos de seguridad

según 1907/2006/CE, Artículo 31

fecha de impresión 30.04.2018

Revisión: 30.04.2018

SECCIÓN 1: Identificación de la sustancia o la mezcla y de la sociedad o la empresa

- **1.1 Identificador del producto**
- **Nombre comercial:** CytoCool II
- **Número del artículo:** 72597, 72597-12
- **Número CAS:**
811-97-2
- **Número CE:**
212-377-0
- **1.2 Usos pertinentes identificados de la sustancia o de la mezcla y usos desaconsejados**
No existen más datos relevantes disponibles.
- **Utilización del producto / de la elaboración** Sustancias químicas de laboratorio
- **1.3 Datos del proveedor de la ficha de datos de seguridad**
- **Fabricante/distribuidor:**
Electron Microscopy Sciences
1560 Industry Road
USA-Hatfield, PA 19440
Tel: 215-412-8400 Fax: 215-412-8450
email: info@emsdiasum.com
www.emsdiasum.com
- **Aname**
C/ Perez Galdos no. 2
28693 Quijorna
Madrid, Spain
Tel: +34.91.816.89.50
Fax: +34.91.816.85.94
email: ventas@aname.es
- **Área de información:** Product safety department
- **1.4 Teléfono de emergencia:**
ChemTrec 1-800-424-9300 Contract CCN7661
1-703-527-3887

SECCIÓN 2: Identificación de los peligros

- **2.1 Clasificación de la sustancia o de la mezcla**
- **Clasificación con arreglo al Reglamento (CE) n° 1272/2008**



GHS07

STOT SE 3 H336 Puede provocar somnolencia o vértigo.

Aerosol 3 H229 Recipiente a presión: Puede reventar si se calienta.

- **2.2 Elementos de la etiqueta**
- **Etiquetado con arreglo al Reglamento (CE) n° 1272/2008**

La sustancia se ha clasificado y etiquetado de conformidad con el reglamento CLP.

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· Pictogramas de peligro


GHS07

· Palabra de advertencia Atención

· Indicaciones de peligro
H229 Recipiente a presión: Puede reventar si se calienta.
H336 Puede provocar somnolencia o vértigo.
· Consejos de prudencia
P210 Mantener alejado del calor, de superficies calientes, de chispas, de llamas abiertas y de cualquier otra fuente de ignición. No fumar.
P251 No perforar ni quemar, incluso después de su uso.
P261 Evitar respirar el polvo/el humo/el gas/la niebla/los vapores/el aerosol.
P405 Guardar bajo llave.
P410+P412 Proteger de la luz del sol. No exponer a temperaturas superiores a 50 °C/122 °F.
P501 Eliminar el contenido o el recipiente conforme a la reglamentación local/regional/nacional/internacional.
· 2.3 Otros peligros
· Resultados de la valoración PBT y mPmB
· PBT: No aplicable.

· mPmB: No aplicable.

SECCIÓN 3: Composición/información sobre los componentes

· 3.1 Caracterización química: Sustancias
· Denominación N° CAS
811-97-2 1,1,1,2-tetrafluoroethane
· Número(s) de identificación
· Número CE: 212-377-0

SECCIÓN 4: Primeros auxilios

· 4.1 Descripción de los primeros auxilios
· En caso de inhalación del producto:
Suministrar aire fresco. En caso de trastornos, consultar al médico.
· En caso de contacto con la piel: Por regla general, el producto no irrita la piel.

· En caso de con los ojos:
Limpia los ojos abiertos durante varios minutos con agua corriente.
· En caso de ingestión: Consultar un médico si los trastornos persisten.

· 4.2 Principales síntomas y efectos, agudos y retardados
No existen más datos relevantes disponibles.

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- **4.3 Indicación de toda atención médica y de los tratamientos especiales que deban dispensarse inmediatamente**
No existen más datos relevantes disponibles.

SECCIÓN 5: Medidas de lucha contra incendios

- **5.1 Medios de extinción**
- **Sustancias extintoras apropiadas:**
Combatir los incendios con medidas adaptados al ambiente circundante.
- **5.2 Peligros específicos derivados de la sustancia o la mezcla**
No existen más datos relevantes disponibles.
- **5.3 Recomendaciones para el personal de lucha contra incendios**
- **Equipo especial de protección:** No se requieren medidas especiales.

SECCIÓN 6: Medidas en caso de vertido accidental

- **6.1 Precauciones personales, equipo de protección y procedimientos de emergencia**
No es necesario.
- **6.2 Precauciones relativas al medio ambiente:**
Evitar que penetre en la canalización /aguas de superficie /agua subterráneas.
- **6.3 Métodos y material de contención y de limpieza:**
Quitar los componentes líquidos con material absorbente de líquidos.
- **6.4 Referencia a otras secciones**
Ver capítulo 7 para mayor información sobre una manipulación segura.
Ver capítulo 8 para mayor información sobre el equipo personal de protección.
Para mayor información sobre cómo desechar el producto, ver capítulo 13.

SECCIÓN 7: Manipulación y almacenamiento

- **7.1 Precauciones para una manipulación segura**
Si se manipulan correctamente, no se requieren medidas especiales.
- **Prevención de incendios y explosiones:** No se requieren medidas especiales.
- **7.2 Condiciones de almacenamiento seguro, incluidas posibles incompatibilidades**
- **Almacenamiento:**
- **Exigencias con respecto al almacén y los recipientes:**
Observar las prescripciones vigentes para el almacenamiento de envases con gas comprimido.
- **Normas en caso de un almacenamiento conjunto:** No es necesario.
- **Indicaciones adicionales sobre las condiciones de almacenamiento:** Ningunos, -as.
- **7.3 Usos específicos finales** No existen más datos relevantes disponibles.

SECCIÓN 8: Controles de exposición/protección individual

- **Instrucciones adicionales para el acondicionamiento de instalaciones técnicas:**
Sin datos adicionales, ver punto 7.

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- **8.1 Parámetros de control**
- **Componentes con valores límite admisibles que deben controlarse en el puesto de trabajo:**
Nulo.
- **Indicaciones adicionales:**
Como base se han utilizado las listas vigentes en el momento de la elaboración.
- **8.2 Controles de la exposición**
- **Equipo de protección individual:**
- **Medidas generales de protección e higiene:**
Lavarse las manos antes de las pausas y al final del trabajo.
- **Protección respiratoria:** No es necesario.
- **Protección de manos:**
El material del guante deberá ser impermeable y resistente al producto / substancia / preparado.
Ante la ausencia de tests específicos, no se puede recomendar ningún material específico para guantes de protección contra el producto / preparado / mezcla de substancias químicas.
Selección del material de los guantes en función de los tiempos de rotura, grado de permeabilidad y degradación.
- **Material de los guantes**
La elección del guante adecuado no depende únicamente del material, sino también de otras características de calidad, que pueden variar de un fabricante a otro.
- **Tiempo de penetración del material de los guantes**
El tiempo de resistencia a la penetración exacto deberá ser pedido al fabricante de los guantes. Este tiempo debe ser respetado.
- **Protección de ojos:** No es necesario.

SECCIÓN 9: Propiedades físicas y químicas

- **9.1 Información sobre propiedades físicas y químicas básicas**
- **Datos generales**
- **Aspecto:**
- **Forma:** Gaseiforme
- **Color:** Incoloro
- **Olor:** Similar al petróleo
- **Umbral olfativo:** No determinado.
- **valor pH:** No determinado.
- **Cambio de estado**
- **Punto de fusión/punto de congelación:** Indeterminado.
- **Punto inicial de ebullición e intervalo de ebullición:** -26,2 °C
- **Punto de inflamación:** No aplicable, ya que se trata de un aerosol.
- **Inflamabilidad (sólido, gas):** No aplicable.
- **Temperatura de descomposición:** No determinado.

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· Temperatura de auto-inflamación:	No determinado.
· Propiedades explosivas:	El producto no es explosivo.
· Límites de explosión:	
Inferior:	No determinado.
Superior:	No determinado.
· Presión de vapor a 20 °C:	5.716 hPa
· Densidad a 20 °C:	1,226 g/cm ³
· Densidad relativa	No determinado.
· Densidad de vapor	No determinado.
· Tasa de evaporación:	No aplicable.
· Solubilidad en / miscibilidad con agua a 20 °C:	1,93 g/l
· Coefficiente de reparto: n-octanol/agua:	No determinado.
· Viscosidad:	
Dinámica a 20 °C:	0,22 mPas
Cinemática:	No determinado.
· Concentración del disolvente:	
VOC (CE)	100,00 %
Contenido de cuerpos sólidos:	0,0 %
· 9.2 Otros datos	No existen más datos relevantes disponibles.

SECCIÓN 10: Estabilidad y reactividad

- **10.1 Reactividad** No existen más datos relevantes disponibles.
- **10.2 Estabilidad química**
- **Descomposición térmica / condiciones que deben evitarse:**
No se descompone al emplearse adecuadamente.
- **10.3 Posibilidad de reacciones peligrosas** No se conocen reacciones peligrosas.
- **10.4 Condiciones que deben evitarse** No existen más datos relevantes disponibles.
- **10.5 Materiales incompatibles:** No existen más datos relevantes disponibles.
- **10.6 Productos de descomposición peligrosos:**
No se conocen productos de descomposición peligrosos.

SECCIÓN 11: Información toxicológica

- **11.1 Información sobre los efectos toxicológicos**
- **Toxicidad aguda**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Efecto estimulante primario:**
- **Corrosión o irritación cutáneas**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Lesiones o irritación ocular graves**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.

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- **Sensibilización respiratoria o cutánea**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Efectos CMR (carcinogenicidad, mutagenicidad y toxicidad para la reproducción)**
- **Mutagenicidad en células germinales**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Carcinogenicidad**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Toxicidad para la reproducción**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Toxicidad específica en determinados órganos (STOT) – exposición única**
Puede provocar somnolencia o vértigo.
- **Toxicidad específica en determinados órganos (STOT) – exposición repetida**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.
- **Peligro de aspiración**
A la vista de los datos disponibles, no se cumplen los criterios de clasificación.

SECCIÓN 12: Información ecológica

- **12.1 Toxicidad**
- **Toxicidad acuática:** No existen más datos relevantes disponibles.
- **12.2 Persistencia y degradabilidad** No existen más datos relevantes disponibles.
- **12.3 Potencial de bioacumulación** No existen más datos relevantes disponibles.
- **12.4 Movilidad en el suelo** No existen más datos relevantes disponibles.
- **Indicaciones medioambientales adicionales:**
- **Indicaciones generales:**
Nivel de riesgo para el agua 1 (clasificación de listas): escasamente peligroso para el agua
En estado no diluido o no neutralizado, no dejar que se infiltre en aguas subterráneas, aguas superficiales o en alcantarillados.
- **12.5 Resultados de la valoración PBT y mPmB**
- **PBT:** No aplicable.
- **mPmB:** No aplicable.
- **12.6 Otros efectos adversos** No existen más datos relevantes disponibles.

SECCIÓN 13: Consideraciones relativas a la eliminación

- **13.1 Métodos para el tratamiento de residuos**
- **Recomendación:**
No debe desecharse con la basura doméstica. No debe llegar al alcantarillado.
- **Embalajes sin limpiar:**
- **Recomendación:** Eliminar conforme a las disposiciones oficiales.

SECCIÓN 14: Información relativa al transporte

- **14.1 Número ONU**
- **ADR, IMDG, IATA** UN3159

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· **14.2 Designación oficial de transporte de las Naciones Unidas**
 · **ADR** 3159 1,1,1,2-TETRAFLUOROETANO (GAS REFRIGERANTE R 134a)
 · **IMDG, IATA** 1,1,1,2-TETRAFLUROETHANE (REFRIGERANT GAS R 134a)

· **14.3 Clase(s) de peligro para el transporte**
 · **ADR**

 · **Clase** 2.2 5A
 · **Etiqueta** 2.2

· **IMDG, IATA**

 · **Class** 2.2
 · **Label** 2.2

· **14.4 Grupo de embalaje**
 · **ADR, IMDG, IATA** *suprimido*

· **14.5 Peligros para el medio ambiente:** *No aplicable.*

· **14.6 Precauciones particulares para los usuarios** *No aplicable.*
 · **Número Kemler:** -
 · **Número EMS:** F-C,S-V
 · **Stowage Category** A

· **14.7 Transporte a granel con arreglo al anexo II del Convenio MARPOL y el Código IBC** *No aplicable.*

· **Transporte/datos adicionales:**
 · **ADR**
 · **Cantidades limitadas (LQ)** 120 ml
 · **Cantidades exceptuadas (EQ)** Código: E1
 Cantidad neta máxima por envase interior: 30 ml
 Cantidad neta máxima por embalaje exterior: 1000 ml
 · **Categoría de transporte** 3
 · **Código de restricción del túnel** E

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· **IMDG**

· **Limited quantities (LQ)**

1L

· **Excepted quantities (EQ)**

Code: E0

Not permitted as Excepted Quantity

· **"Reglamentación Modelo" de la UNECE: UN 3159 1,1,1,2-TETRAFLUOROETANO (GAS REFRIGERANTE R 134A), 2.2**

SECCIÓN 15: Información reglamentaria

· **15.1 Reglamentación y legislación en materia de seguridad, salud y medio ambiente específicas para la sustancia o la mezcla**

· **Directiva 2012/18/UE**

· **Sustancias peligrosas nominadas - ANEXO I** No contiene la sustancia.

· **REGLAMENTO (CE) n° 1907/2006 ANEXO XVII Restricciones: 3**

· **15.2 Evaluación de la seguridad química:**

Una evaluación de la seguridad química no se ha llevado a cabo.

SECCIÓN 16: Otra información

Los datos se fundan en el estado actual de nuestros conocimientos, pero no constituyen garantía alguna de cualidades del producto y no generan ninguna relación jurídica contractual.

· **Abreviaturas y acrónimos:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

GHS: Globally Harmonised System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

VOC: Volatile Organic Compounds (USA, EU)

PBT: Persistent, Bioaccumulative and Toxic

vPvB: very Persistent and very Bioaccumulative

Aerosol 3: Aerosoles – Categoría 3

STOT SE 3: Toxicidad específica en determinados órganos (exposición única) – Categoría 3