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

1.1. Product identification

Product Description: Iodine
Cat No.: I/0500/65, I/0500/53, I/0500/60, I/0500/48, I/0500
CAS-No. 7553-56-2
EC-No. 231-442-4
Molecular Formula I2
Reach Registration Number 01-2119485285-30

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

Recommended Use Laboratory chemicals.
Sector of use SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
Product category PC21 - Laboratory chemicals
Process categories PROC15 - Use as a laboratory reagent
Environmental release category ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)
Uses advised against No Information available

1.3. Details of the supplier of the safety data sheet

Company Fisher Scientific UK
Bishop Meadow Road, Loughborough,
Leicestershire LE11 5RG, United Kingdom

E-mail address begel.sdsdesk@thermofisher.com

1.4. Emergency telephone number

Tel: 01509 231166
Chemtrec US: (800) 424-9300
Chemtrec EU: 001 (202) 483-7616

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture

<table>
<thead>
<tr>
<th>Classification Area</th>
<th>Category</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical hazards</td>
<td></td>
</tr>
<tr>
<td>Substances/mixtures corrosive to metal</td>
<td>Category 1</td>
</tr>
<tr>
<td>Health hazards</td>
<td></td>
</tr>
<tr>
<td>Acute oral toxicity</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute dermal toxicity</td>
<td>Category 4</td>
</tr>
<tr>
<td>Acute Inhalation Toxicity - Dusts and Mists</td>
<td>Category 4</td>
</tr>
<tr>
<td>Skin Corrosion/irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Serious Eye Damage/Eye Irritation</td>
<td>Category 2</td>
</tr>
<tr>
<td>Specific target organ toxicity - (single exposure)</td>
<td>Category 3</td>
</tr>
<tr>
<td>Specific target organ toxicity - (repeated exposure)</td>
<td>Category 1</td>
</tr>
<tr>
<td>Environmental hazards</td>
<td></td>
</tr>
<tr>
<td>Acute aquatic toxicity</td>
<td>Category 1</td>
</tr>
</tbody>
</table>
2.2. Label elements

**Signal Word**

**Danger**

**Hazard Statements**

- H290 - May be corrosive to metals
- H302 - Harmful if swallowed
- H312 - Harmful in contact with skin
- H332 - Harmful if inhaled
- H315 - Causes skin irritation
- H319 - Causes serious eye irritation
- H335 - May cause respiratory irritation
- H372 - Causes damage to organs through prolonged or repeated exposure
- H400 - Very toxic to aquatic life

**Precautionary Statements**

- P280 - Wear protective gloves/ protective clothing/ eye protection/ face protection
- P302 + P352 - IF ON SKIN: Wash with plenty of soap and water
- P304 + P340 - IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing
- P305 + P351 + P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing
- P312 - Call a POISON CENTER or doctor/ physician if you feel unwell
- P273 - Avoid release to the environment

2.3. Other hazards

Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB)
Lachrymator (substance which increases the flow of tears)

### SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1. Substances

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS-No</th>
<th>EC-No.</th>
<th>Weight %</th>
<th>CLP Classification - Regulation (EC) No 1272/2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>7553-56-2</td>
<td>EEC No. 231-442-4</td>
<td>&gt;95</td>
<td>Met. Corr. 1 (H290) Acute Tox. 4 (H302) Acute Tox. 4 (H312) Acute Tox. 4 (H332) Skin Irrit. 2 (H315) Eye Irrit. 2 (H319) STOT SE 3 (H335) STOT RE 1 (H372) Aquatic Acute 1 (H400)</td>
</tr>
</tbody>
</table>

Reach Registration Number 01-2119485285-30

*Full text of Hazard Statements: see section 16*
SECTION 4: FIRST AID MEASURES

4.1. Description of first aid measures

**General Advice**
If symptoms persist, call a physician.

**Eye Contact**
Rinse immediately with plenty of water, also under the eyelids, for at least 15 minutes. Obtain medical attention.

**Skin Contact**
Wash off immediately with plenty of water for at least 15 minutes. Obtain medical attention.

**Ingestion**
Clean mouth with water and drink afterwards plenty of water. Get medical attention if symptoms occur.

**Inhalation**
Move to fresh air. If breathing is difficult, give oxygen. Obtain medical attention.

**Protection of First-aiders**
Ensure that medical personnel are aware of the material(s) involved, take precautions to protect themselves and prevent spread of contamination.

4.2. Most important symptoms and effects, both acute and delayed

No information available.

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

**Notes to Physician**
Treat symptomatically.

SECTION 5: FIREFIGHTING MEASURES

5.1. Extinguishing media

**Suitable Extinguishing Media**
Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

**Extinguishing media which must not be used for safety reasons**
No information available.

5.2. Special hazards arising from the substance or mixture

Non-combustible, substance itself does not burn but may decompose upon heating to produce corrosive and/or toxic fumes. Do not allow run-off from fire fighting to enter drains or water courses.

**Hazardous Combustion Products**
Hydrogen iodide.

5.3. Advice for firefighters

As in any fire, wear self-contained breathing apparatus pressure-demand, MSHA/NIOSH (approved or equivalent) and full protective gear.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1. Personal precautions, protective equipment and emergency procedures

Use personal protective equipment. Ensure adequate ventilation. Avoid contact with skin, eyes and inhalation of vapors. Do not breathe dust/fume/gas/mist/vapors/spray.

6.2. Environmental precautions

Do not flush into surface water or sanitary sewer system. Do not allow material to contaminate ground water system. Prevent product from entering drains. Local authorities should be advised if significant spillages cannot be contained. See Section 12 for
additional ecological information. Avoid release to the environment. Collect spillage.

6.3. Methods and material for containment and cleaning up

Sweep up or vacuum up spillage and collect in suitable container for disposal. Keep in suitable, closed containers for disposal.

6.4. Reference to other sections

Refer to protective measures listed in Sections 8 and 13.

SECTION 7: HANDLING AND STORAGE

7.1. Precautions for safe handling

Wear personal protective equipment. Ensure adequate ventilation. Avoid dust formation. Do not get in eyes, on skin, or on clothing. Avoid ingestion and inhalation.

Hygiene Measures
Handle in accordance with good industrial hygiene and safety practice.

7.2. Conditions for safe storage, including any incompatibilities

Keep containers tightly closed in a dry, cool and well-ventilated place. Do not store in metal containers. Keep at temperatures below 25°C.

7.3. Specific end use(s)

Use in laboratories

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

8.1. Control parameters

Exposure limits

<table>
<thead>
<tr>
<th>Component</th>
<th>European Union</th>
<th>The United Kingdom</th>
<th>France</th>
<th>Belgium</th>
<th>Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td></td>
<td>STEL: 0.1 ppm 15 min STEL: 1.1 mg/m³ 15 min</td>
<td>STEL / VLCT: 0.1 ppm STEL / VLCT: 1 mg/m³</td>
<td>TWA: 0.01 ppm 8 uren STEL: 0.1 ppm 15 minuten STEL: 1 mg/m³ 15 minuten</td>
<td>STEL / VLA-EC: 0.1 ppm (15 minutos). STEL / VLA-EC: 1 mg/m³ (15 minutos).</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Italy</th>
<th>Germany</th>
<th>Portugal</th>
<th>The Netherlands</th>
<th>Finland</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Haut</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Austria</th>
<th>Denmark</th>
<th>Switzerland</th>
<th>Poland</th>
<th>Norway</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>Haut</td>
<td>Ceiling: 0.1 ppm Ceiling: 1 mg/m³</td>
<td>Haut/Peau STEL: 0.1 ppm 15 Minuten STEL: 1 mg/m³ 15 Minuten TWA: 0.1 ppm 8 Stunden TWA: 1 mg/m³ 8 Stunden</td>
<td>STEL: 1 mg/m³ 15 minutach TWA: 0.5 mg/m³ 8 godzinach</td>
<td>Ceiling: 0.1 ppm Ceiling: 1 mg/m³</td>
</tr>
</tbody>
</table>
Biological limit values
This product, as supplied, does not contain any hazardous materials with biological limits established by the region specific regulatory bodies.

Monitoring methods
BS EN 14042:2003 Title Identifier: Workplace atmospheres. Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents.
MDHS14/3 General methods for sampling and gravimetric analysis of respirable and inhalable dust
MDHS70 General methods for sampling airborne gases and vapours

<table>
<thead>
<tr>
<th>Derived No Effect Level (DNEL)</th>
<th>See table for values</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Route of exposure</strong></td>
<td><strong>Acute effects (local)</strong></td>
</tr>
<tr>
<td>Oral</td>
<td>0.01 mg/kg/day</td>
</tr>
<tr>
<td>Dermal</td>
<td></td>
</tr>
<tr>
<td>Inhalation</td>
<td>1 mg/m³</td>
</tr>
</tbody>
</table>

Predicted No Effect Concentration (PNEC)
See values below.

<table>
<thead>
<tr>
<th><strong>Route of exposure</strong></th>
<th><strong>Concentration</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Fresh water</td>
<td>18.13 ug/l</td>
</tr>
<tr>
<td>Fresh water sediment</td>
<td>3.99 mg/kg</td>
</tr>
<tr>
<td>Marine water</td>
<td>60.01 ug/l</td>
</tr>
<tr>
<td>Marine water sediment</td>
<td>20.22 mg/kg</td>
</tr>
<tr>
<td>Microorganisms in sewage treatment</td>
<td>11.0 mg/kg</td>
</tr>
<tr>
<td>Soil (Agriculture)</td>
<td>5.95 mg/kg</td>
</tr>
</tbody>
</table>

8.2. Exposure controls
SAFETY DATA SHEET

Iodine

Revision Date 08-Jun-2016

Engineering Measures
Use only under a chemical fume hood. Ensure that eyewash stations and safety showers are close to the workstation location. Wherever possible, engineering control measures such as the isolation or enclosure of the process, the introduction of process or equipment changes to minimise release or contact, and the use of properly designed ventilation systems, should be adopted to control hazardous materials at source.

Personal protective equipment

<table>
<thead>
<tr>
<th></th>
<th>Goggles  (European standard - EN 166)</th>
<th>Protective gloves</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye Protection</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hand Protection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Glove material</th>
<th>Breakthrough time</th>
<th>Glove thickness</th>
<th>EU standard</th>
<th>Glove comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Natural rubber</td>
<td>See manufacturers</td>
<td>-</td>
<td>EN 374</td>
<td>(minimum requirement)</td>
</tr>
<tr>
<td>Nitrile rubber</td>
<td>recommendations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Neoprene</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>PVC</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Skin and body protection

Long sleeved clothing

Inspect gloves before use. Please observe the instructions regarding permeability and breakthrough time which are provided by the supplier of the gloves. (Refer to manufacturer/supplier for information)

Ensure gloves are suitable for the task: Chemical compatibility, Dexterity, Operational conditions, User susceptibility, e.g. sensitisation effects, also take into consideration the specific local conditions under which the product is used, such as the danger of cuts, abrasion.

Remove gloves with care avoiding skin contamination.

Respiratory Protection

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. To protect the wearer, respiratory protective equipment must be the correct fit and be used and maintained properly.

Large scale/emergency use

Use a NIOSH/MSHA or European Standard EN 136 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Recommended Filter type: Particulates filter conforming to EN 143

Small scale/Laboratory use

Use a NIOSH/MSHA or European Standard EN 149:2001 approved respirator if exposure limits are exceeded or if irritation or other symptoms are experienced.

Recommended half mask: Particle filtering; EN149:2001

When RPE is used a face piece Fit Test should be conducted

Environmental exposure controls

Prevent product from entering drains. Do not allow material to contaminate ground water system. Local authorities should be advised if significant spillages cannot be contained.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1. Information on basic physical and chemical properties

| Appearance | Grey |
| Physical State | Solid |
| Odor Threshold | pungent |
| pH | 5.1 |
| Melting Point/Range | 113 °C / 235.4 °F |
| Softening Point | No data available |
| Boiling Point/Range | 185 °C / 365 °F |
| Flash Point | No information available |
| Evaporation Rate | Not applicable |
| Flammability (solid,gas) | No information available |
| Explosion Limits | No data available |
| Vapor Pressure | 0.41 hPa @ 25 °C |
| Vapor Density | 8.8 |
| Specific Gravity / Density | No data available |
| Bulk Density | ~ 2100 kg/m³ |
SAFETY DATA SHEET

Iodine

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2.49</td>
</tr>
</tbody>
</table>

9.2. Other information

<table>
<thead>
<tr>
<th>Molecular Formula</th>
<th>I2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular Weight</td>
<td>253.81</td>
</tr>
</tbody>
</table>

SECTION 10: STABILITY AND REACTIVITY

10.1. Reactivity

None known, based on information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

Hazardous Polymerization does not occur.

Hazardous Reactions

None under normal processing.

10.4. Conditions to avoid


10.5. Incompatible materials


10.6. Hazardous decomposition products

Hydrogen iodide.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Product Information

(a) acute toxicity;

<table>
<thead>
<tr>
<th>Oral</th>
<th>Category 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dermal</td>
<td>Category 4</td>
</tr>
<tr>
<td>Inhalation</td>
<td>Category 4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>LD50 Oral</th>
<th>LD50 Dermal</th>
<th>LC50 Inhalation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>315 mg/kg (Rat)</td>
<td>1425 mg/kg (Rabbit)</td>
<td>4.588 mg/L 4h (Rat)</td>
</tr>
</tbody>
</table>

(b) skin corrosion/irritation;

Category 2

(c) serious eye damage/irritation;

Category 2

(d) respiratory or skin sensitization;

<table>
<thead>
<tr>
<th>Respiratory</th>
<th>Based on available data, the classification criteria are not met</th>
</tr>
</thead>
<tbody>
<tr>
<td>Skin</td>
<td>Based on available data, the classification criteria are not met</td>
</tr>
</tbody>
</table>

(e) germ cell mutagenicity;

Based on available data, the classification criteria are not met
(f) carcinogenicity; Based on available data, the classification criteria are not met
There are no known carcinogenic chemicals in this product

(g) reproductive toxicity; Based on available data, the classification criteria are not met

(h) STOT-single exposure; Category 3
Results / Target organs Respiratory system.

(i) STOT-repeated exposure; Category 1
Target Organs Thyroid.

(j) aspiration hazard; Not applicable
Solid

Symptoms / effects, both acute and delayed No information available

SECTION 12: ECOLOGICAL INFORMATION

12.1. Toxicity
Ecotoxicity effects Very toxic to aquatic organisms. The product contains following substances which are hazardous for the environment.

<table>
<thead>
<tr>
<th>Component</th>
<th>Freshwater Fish</th>
<th>Water Flea</th>
<th>Freshwater Algae</th>
<th>Microtox</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>LC50 = 1.67 mg/L 96h</td>
<td>EC50 = 0.55 mg/L 48h</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12.2. Persistence and degradability
Persistence is unlikely.
Degradability Not relevant for inorganic substances.
Degradation in sewage treatment plant Contains substances known to be hazardous to the environment or not degradable in waste water treatment plants.

12.3. Bioaccumulative potential Bioaccumulation is unlikely

<table>
<thead>
<tr>
<th>Component</th>
<th>log Pow</th>
<th>Bioconcentration factor (BCF)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Iodine</td>
<td>2.49</td>
<td>No data available</td>
</tr>
</tbody>
</table>

12.4. Mobility in soil Spillage unlikely to penetrate soil. Is not likely mobile in the environment due its low water solubility.

12.5. Results of PBT and vPvB assessment Substance is not considered persistent, bioaccumulative and toxic (PBT) / very persistent and very bioaccumulative (vPvB).

12.6. Other adverse effects
Endocrine Disruptor Information This product does not contain any known or suspected endocrine disruptors
Persistent Organic Pollutant This product does not contain any known or suspected substance
Ozone Depletion Potential This product does not contain any known or suspected substance

SECTION 13: DISPOSAL CONSIDERATIONS

13.1. Waste treatment methods
Waste from Residues / Unused Products Should not be released into the environment. Waste is classified as hazardous. Dispose of in accordance with the European Directives on waste and hazardous waste. Dispose of in accordance with local regulations.

Contaminated Packaging Dispose of this container to hazardous or special waste collection point.

European Waste Catalogue (EWC) According to the European Waste Catalogue, Waste Codes are not product specific, but

FSUI0500
SECTION 14: TRANSPORT INFORMATION

IMDG/IMO

14.1. UN number UN3495
14.2. UN proper shipping name IODINE
14.3. Transport hazard class(es) 8
   Subsidiary Hazard Class 6.1
14.4. Packing group III

ADR

14.1. UN number UN3495
14.2. UN proper shipping name IODINE
14.3. Transport hazard class(es) 8
   Subsidiary Hazard Class 6.1
14.4. Packing group III

IATA

14.1. UN number UN3495
14.2. UN proper shipping name IODINE
14.3. Transport hazard class(es) 8
   Subsidiary Hazard Class 6.1
14.4. Packing group III

14.5. Environmental hazards Dangerous for the environment
   Product is a marine pollutant according to the criteria set by IMDG/IMO

14.6. Special precautions for user No special precautions required

14.7. Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code
   Not applicable, packaged goods

SECTION 15: REGULATORY INFORMATION

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

<table>
<thead>
<tr>
<th>International Inventories</th>
<th>X = listed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
<td>EINECS</td>
</tr>
<tr>
<td>Iodine</td>
<td>231-442-4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>National Regulations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Component</td>
</tr>
<tr>
<td>Iodine</td>
</tr>
<tr>
<td></td>
</tr>
</tbody>
</table>

Take note of Control of Substances Hazardous to Health Regulations (COSHH) 2002 and 2005 Amendment.
Take note of Dir 94/33/EC on the protection of young people at work
Take note of Directive 98/24/EC on the protection of the health and safety of workers from the risks related to chemical agents at work

15.2. Chemical safety assessment
SAFETY DATA SHEET

Iodine

A Chemical Safety Assessment/Report (CSA/CSR) has been conducted by the manufacturer/importer

SECTION 16: OTHER INFORMATION

Full Text of H-/EUH-Statements Referred to Under Section 3
H290 - May be corrosive to metals
H302 - Harmful if swallowed
H312 - Harmful in contact with skin
H322 - Harmful if inhaled
H315 - Causes skin irritation
H319 - Causes serious eye irritation
H332 - Harmful if inhaled
H335 - May cause respiratory irritation
H372 - Causes damage to organs through prolonged or repeated exposure
H400 - Very toxic to aquatic life

Legend

CAS - Chemical Abstracts Service
EINECS/ELINCS - European Inventory of Existing Commercial Chemical Substances/EU List of Notified Chemical Substances
PICCS - Philippines Inventory of Chemicals and Chemical Substances
IECSC - Chinese Inventory of Existing Chemical Substances
KECL - Korean Existing and Evaluated Chemical Substances
WEL - Workplace Exposure Limit
ACGIH - American Conference of Governmental Industrial Hygienists
DNEL - Derived No Effect Level
RPE - Respiratory Protective Equipment
LC50 - Lethal Concentration 50%
NOEC - No Observed Effect Concentration
PBT - Persistent, Bioaccumulative, Toxic

ADR - European Agreement Concerning the International Carriage of Dangerous Goods by Road
IMO/IMDG - International Maritime Organization/International Maritime Dangerous Goods Code
OECD - Organisation for Economic Co-operation and Development
BCF - Bioconcentration factor

Key literature references and sources for data
Suppliers safety data sheet, Chemadvisor - LOLI, Merck index, RTECS

Training Advice
Chemical hazard awareness training, incorporating labelling, Safety Data Sheets (SDS), Personal Protective Equipment (PPE) and hygiene.
First aid for chemical exposure, including the use of eye wash and safety showers.
Use of personal protective equipment, covering appropriate selection, compatibility, breakthrough thresholds, care, maintenance, fit and standards.
Chemical incident response training.

Creation Date 20-Oct-2009
Revision Date 08-Jun-2016
Revision Summary Update to Format, SDS sections updated, 4, 7, 8, 9, 11, 12.

This safety data sheet complies with the requirements of Regulation (EC) No. 1907/2006

Disclaimer
The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

End of Safety Data Sheet

FSUI0500