### Kit Components

<table>
<thead>
<tr>
<th>Product code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J64816</td>
<td>Osteocalcin, human, intact, Enzyme Immunoassay</td>
</tr>
</tbody>
</table>

**Components:**

<table>
<thead>
<tr>
<th>Product code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>J64072</td>
<td>Biotinylated Antiserum</td>
</tr>
<tr>
<td>J64076</td>
<td>Streptavidin-horseradish peroxidase conjugate</td>
</tr>
<tr>
<td>J64059</td>
<td>Conjugate Buffer</td>
</tr>
<tr>
<td>J64053</td>
<td>Phosphate buffered saline, 5x</td>
</tr>
<tr>
<td>J64062</td>
<td>TMB substrate</td>
</tr>
<tr>
<td>J64067</td>
<td>Stop solution</td>
</tr>
<tr>
<td>J64063</td>
<td>Hydrogen peroxide solution</td>
</tr>
<tr>
<td>J64121</td>
<td>96-well plate, precoated with 1-19 monoclonal antibody</td>
</tr>
<tr>
<td>J64093</td>
<td>Osteocalcin standards</td>
</tr>
<tr>
<td>J64077</td>
<td>Human Osteocalcin control, high</td>
</tr>
<tr>
<td>J64078</td>
<td>Human Osteocalcin control, low</td>
</tr>
<tr>
<td>J64073</td>
<td>Native Human Osteocalcin Antiserum</td>
</tr>
</tbody>
</table>
1 Identification

Product identifier

Product name: Biotinylated Antiserum

Stock number: J64072

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

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The substance is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified No information known.

Label elements

GHS label elements Not applicable
Hazard pictograms Not applicable
Signal word Not applicable
Hazard statements Not applicable
WHMIS classification Not controlled

Classification system

HMIS ratings (scale 0-4)

<table>
<thead>
<tr>
<th>Health (acute effects)</th>
<th>Flammability</th>
<th>Physical Hazard</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
</tbody>
</table>

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:
Biotinylated Antiserum

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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 Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Decomposition products are unknown.

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Prevention of secondary hazards: No special measures required.

Reference to other sections

See Section 7 for information on safe handling
See Section 8 for information on personal protective equipment.
See Section 13 for disposal information.
7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.

Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility: Store away from oxidizing agents.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Penetration time of glove material (in minutes) Not determined

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information
Appearance:
Form: Not determined.
Odor: Not determined.
Odor threshold: Not determined.
pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined.
Boiling point/Boiling range: Not determined.
Sublimation temperature / start: Not determined.
Flammability (solid, gaseous): Not determined.
Ignition temperature: Not determined.
Decomposition temperature: Not determined.
Auto igniting: Not determined.

Danger of explosion: Not determined.

Explosion limits:
Lower: Not determined.
Upper: Not determined.

Vapor pressure: Not determined.

Density: Not determined.
Relative density: Not determined.

Vapor density: Not determined.

Evaporation rate: Not determined.

Solubility in / Miscibility with Water: Fully miscible.

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

Viscosity:
dynamic: Not determined.
kinematic: Not determined.

Organic solvents: 0.0 %

Other information
No further relevant information available.

10 Stability and reactivity

Reactivity: No information known.
Chemical stability: Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions: Reacts with strong oxidizing agents

Conditions to avoid: No further relevant information available.

Incompatible materials: Oxidizing agents

Hazardous decomposition products: No decomposition products known.

11 Toxicological information

Information on toxicological effects
Acute toxicity: No effects known.

LD/LC50 values that are relevant for classification: No data
### 12 Ecological information

**Toxicity**
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability: No further relevant information available.
- Bioaccumulative potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- Additional ecological information:
  - General notes:
    - Do not allow material to be released to the environment without proper governmental permits.
    - Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
    - Avoid transfer into the environment.
- 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: Consult state, local or national regulations to ensure proper disposal.

**Uncleaned packagings**
- Recommendation: Disposal must be made according to official regulations.
- Recommended cleansing agent: Water, if necessary with cleansing agents.

### 14 Transport information

**UN-Number**
- DOT, ADN, IMDG, IATA: Not applicable

**DOT proper shipping name**
- DOT, ADN, IMDG, IATA: Not applicable

**Transport hazard class(es)**
- DOT, ADR, ADN, IMDG, IATA: Not applicable

**Packing group**
- DOT, IMDG, IATA: Not applicable

**Environmental hazards:**
- Marine pollutant (IMDG): No

**Special precautions for user**
- Not applicable.

**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**
- Not applicable.

**Transport/Additional information:**
- DOT Marine Pollutant (DOT): No
- UN "Model Regulation": -

### 15 Regulatory information

**Safety, health and environmental regulations/legislation specific for the substance or mixture**
- GHS label elements: Not applicable
- Hazard pictograms: Not applicable
- Signal word: Not applicable
- Hazard statements: Not applicable

**National regulations**
- This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
- This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).
- SARA Section 313 (specific toxic chemical listings)
  - Substance is not listed.
- California Proposition 65
  - Prop 65 - Chemicals known to cause cancer
    - Substance is not listed.
  - Prop 65 - Developmental toxicity
    - Substance is not listed.
  - Prop 65 - Developmental toxicity, female
    - Substance is not listed.
  - Prop 65 - Developmental toxicity, male
    - Substance is not listed.
- Information about limitation of use: For use only by technically qualified individuals.
- Other regulations, limitations and prohibitive regulations
  - Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
    - Substance is not listed.
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)
Substance is not listed.

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

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department
Date of preparation / last revision 11/24/2015 / -

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)
DOT: US Department of Transportation
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Streptavidin-horseradish peroxidase conjugate

Stock number: J64076

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

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number: During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The product is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified No information known.

Label elements

GHS label elements Not applicable

Hazard pictograms Not applicable

Signal word Not applicable

Hazard statements Not applicable

WHMIS classification Not controlled

Classification system

HMIS ratings (scale 0-4) (Hazardous Materials Identification System)

Health (acute effects) = 1

Flammability = 0

Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

Dangerous components: Not applicable

Additional information None known.

Non-Hazardous Ingredients

<table>
<thead>
<tr>
<th>Substance</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-14-5 Sodium chloride</td>
<td>0.7992%</td>
</tr>
<tr>
<td>7558-79-4 Disodium hydrogenorthophosphate</td>
<td>0.1139%</td>
</tr>
<tr>
<td>Streptavidin-horseradish peroxidase</td>
<td>0.1%</td>
</tr>
<tr>
<td>7778-77-0 Potassium dihydrogen phosphate</td>
<td>0.023%</td>
</tr>
<tr>
<td>7447-40-7 Potassium chloride</td>
<td>99.97%</td>
</tr>
<tr>
<td>7732-18-5 Water</td>
<td>98.942%</td>
</tr>
</tbody>
</table>

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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 Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:
Sodium oxide
Phosphorus oxides
Potassium oxide

Additional decomposition products are unknown.

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.
6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Prevention of secondary hazards: No special measures required.

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
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.

Information about protection against explosions and fires: The product is not flammable

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foods, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Penetration time of glove material (in minutes): Not determined

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General information
Appearance:
Form: Liquid
Odor: Not determined
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous): Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Product is not selfignitng.

Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined
Vapor pressure at 20 °C (68 °F): 23 hPa (17 mm Hg)
Density: Not determined
Relative density: Not determined.
Vapor density: Not determined.
Evaporation rate: Not determined.
Solubility in / Miscibility with
Water: Fully miscible
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not determined.
kineatic: Not determined.

Solvent content:
Organic solvents: 0.0 %
Solids content: 1.1 %
10 Stability and reactivity

Reactivity: No information known.
Chemical stability: Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions:
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.
Conditions to avoid: No further relevant information available.
Incompatible materials: No information known.
Hazardous decomposition products:
Sodium oxide
Phosphorus oxides (e.g. P2O5)
Potassium oxide
Additional decomposition products are unknown.

11 Toxicological information

Information on toxicological effects
Acute toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.
LD/LC50 values that are relevant for classification:
7778-77-0 Potassium dihydrogen phosphate
Dermal LD50 >4640 mg/kg (rabbit)
Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause irritation
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for components in this product.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The product is not subject to classification according to internally approved calculation methods for preparations.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Avoid transfer into the environment.
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: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number
DOT, ADN, IMDG, IATA: Not applicable
UN proper shipping name
DOT, ADN, IMDG, IATA: Not applicable
Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA: Not applicable
Class: Not applicable
Packing group
DOT, IMDG, IATA: Not applicable
Environmental hazards:
Marine pollutant (IMDG): No
Special precautions for user: Not applicable
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.
Transport/Additional information:
DOT: Marine Pollutant (DOT): No
UN "Model Regulation": -

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements: Not applicable

(Contd. of page 4)
product name: Streptavidin-horseradish peroxidase conjugate

hazard pictograms Not applicable
signal word Not applicable
hazard statements Not applicable

national regulations
all components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
all components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA section 313 (specific toxic chemical listings)
none of the ingredients are listed.

California Proposition 65
Prop 65 - Chemicals known to cause cancer
none of the ingredients are listed.

Prop 65 - Developmental toxicity
none of the ingredients are listed.

Prop 65 - Developmental toxicity, female
none of the ingredients are listed.

Prop 65 - Developmental toxicity, male
none of the ingredients are listed.

information about limitation of use: For use only by technically qualified individuals.
other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
none of the ingredients are listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
none of the ingredients is listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)
none of the ingredients is listed.

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

16 Other information
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

department issuing SDS: Global Marketing Department
Date of preparation / last revision 11/24/2015 / -

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
AICHA: International Air Transport Association
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
1 Identification
   Product identifier
   Product name: Conjugate Buffer
   Stock number: J64059
   Relevant identified uses of the substance or mixture and uses advised against.
   Identified use: SU24  Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com
Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification
   Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)
   The product is not classified according to the Globally Harmonized System (GHS).
   Hazards not otherwise classified No information known.

Label elements
GHS label elements Not applicable
Hazard pictograms Not applicable
Signal word Not applicable
Hazard statements Not applicable
WHMIS classification Not controlled
Classification system
HMIS ratings (scale 0-4)
(Hazardous Materials Identification System)
\[
\begin{array}{c|c|c|c}
\text{HEALTH} & \text{FIRE} & \text{REACTIVITY} \\
\hline
1 & 0 & 1 \\
\end{array}
\]
Health (acute effects) = 1
Flammability = 0
Physical Hazard = 1
Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients
   Chemical characterization: Mixtures
   Dangerous components:
   7558-79-4 Sodium hydrogen phosphate  Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335 1.42%
   Additional information None known.
   Non-Hazardous Ingredients
   7647-14-5 Sodium chloride 0.01%
   7732-18-5 Water 98.57%

4 First-aid measures
   Description of first aid measures
   After inhalation
   Supply fresh air. If required, provide artificial respiration. Keep patient warm.
   Seek immediate medical advice.
   After skin contact
   Immediately wash with water and soap and rinse thoroughly.
   Seek immediate medical advice.
   After eye contact
   Rinse opened eye for several minutes under running water. Then consult a doctor.
   After swallowing
   Do not induce vomiting.
   Seek medical treatment.
   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
   Product is not flammable. Use fire-fighting measures that suit the surrounding fire.
   Suitable extinguishing agents
   Special hazards arising from the substance or mixture
   If this product is involved in a fire, the following can be released:
   Sodium oxide
   Phosphorus oxides
   Advice for firefighters
   Wear self-contained respirator.
   Wear fully protective impervious suit.

6 Accidental release measures
   Personal precautions, protective equipment and emergency procedures
   Wear protective equipment. Keep unprotected persons away.
   Ensure adequate ventilation
   Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.
   Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

(Contd. on page 2)
7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.

Information about protection against explosions and fires: The product is not flammable

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility:
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Penetration time of glove material (in minutes) Not determined

Eye protection:
Safety glasses

Body protection:
Protective work clothing.
Possibility of hazardous reactions
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.
Conditions to avoid No further relevant information available.
Incompatible materials: No information known.
Hazardous decomposition products:
Sodium oxide
Phosphorus oxides (e.g. P2O5)

11 Toxicological information
Information on toxicological effects
Acute toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.
LD/LC50 values that are relevant for classification: No data
Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause irritation
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The product is not subject to classification according to internally approved calculation methods for preparations.

12 Ecological information
Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Additional ecological information:
General notes: Do not allow material to be released to the environment without proper governmental permits.
Avoid transfer into the environment.
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 Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information
UN-Number
DOT, ADN, IMDG, IATA: Not applicable
UN proper shipping name
DOT, ADN, IMDG, IATA: Not applicable
Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA: Class Not applicable
Packing group
DOT, IMDG, IATA: Not applicable
Environmental hazards:
Marine pollutant (IMDG): No
Special precautions for user: Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.
Transport/Additional information:
DOT Marine Pollutant (DOT): No
UN "Model Regulation": -

15 Regulatory information
Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements: Not applicable
Hazard pictograms: Not applicable
Signal word: Not applicable
Hazard statements: Not applicable
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).
SARA Section 313 (specific toxic chemical listings)
None of the ingredients are listed.
California Proposition 65
Prop 65 - Chemicals known to cause cancer
None of the ingredients are listed.
Safety Data Sheet  
per OSHA HazCom 2012

Product name: Conjugate Buffer

(Contd. of page 3)

<table>
<thead>
<tr>
<th>38.0.2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prop 65 - Developmental toxicity</td>
</tr>
<tr>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

| Prop 65 - Developmental toxicity, female |
| None of the ingredients are listed. |

| Prop 65 - Developmental toxicity, male |
| None of the ingredients are listed. |

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**

None of the ingredients are listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

None of the ingredients is listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)

None of the ingredients is listed.

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

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision:** 11/24/2015 / -

**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

EINECS: European Inventory of Existing Commercial Chemical Substances

ELINCS: European List of Notified Chemical Substances

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

HMIS: Hazardous Materials Identification System (Canada)

WHMIS: Workplace Hazardous Materials Information System (Canada)

LD50: Lethal dose, 50 percent

LC50: Lethal concentration, 50 percent

vPvB: very Persistent and very Bioaccumulative

ACGIH: American Conference of Governmental Industrial Hygienists (USA)

OSHA: Occupational Safety and Health Administration (USA)

NTP: National Toxicology Program (USA)

IARC: International Agency for Research on Cancer

EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier
Product name: Phosphate buffered saline, 5x
Stock number: J64053

Relevant identified uses of the substance or mixture and uses advised against.
Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department
Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)
The product is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified: No information known.

Label elements
GHS label elements: Not applicable
Hazard pictograms: Not applicable
Signal word: Not applicable
Hazard statements: Not applicable
WHMIS classification: Not controlled

Classification system
HMIS ratings (scale 0-4)
HEALTH
FIRE
REACTIVITY
1
0
0

Health (acute effects) = 1
Flammability = 0
Physical Hazard = 0

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures
Dangerous components: Not applicable

Additional information: None known.

Non-Hazardous Ingredients
<table>
<thead>
<tr>
<th>Ingredient</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>7647-14-5 Sodium chloride</td>
<td>4.4%</td>
</tr>
<tr>
<td>7558-79-4 Sodium hydrogen phosphate</td>
<td>0.575%</td>
</tr>
<tr>
<td>7558-80-7 Sodium dihydrogen phosphate</td>
<td>0.115%</td>
</tr>
<tr>
<td>7732-18-5 Water</td>
<td>94.91%</td>
</tr>
</tbody>
</table>

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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
Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Sodium oxide
Hydrogen chloride (HCl)
Phosphorus oxides

Advice for firefighters

Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

(Contd. on page 2)
7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.

Information about protection against explosions and fires: The product is not flammable

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Penetration time of glove material (in minutes) Not determined

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General information

Appearance:
Form: Liquid
Color: Colorless
Odor: Not determined
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous) Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined

Auto igniting: Product is not selfigniting.

Danger of explosion: Not determined.

Exlosion limits:
Lower: Not determined
Upper: Not determined

Vapor pressure at 20 °C (68 °F): 23 hPa (17 mm Hg)
Density: Not determined
Relative density: Not determined.
Vapor density: Not determined.
Evaporation rate Not determined.

Solubility in / Miscibility with
Water: Fully miscible

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

Viscosity:
dynamic: Not determined.
Kinematic: Not determined.

Solvent content:
Organic solvents: 0.0 %
Solids content: 5.1 %
Other information No further relevant information available.
10 Stability and reactivity

Reactivity: No information known.
Chemical stability: Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions:
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Conditions to avoid: No further relevant information available.

Incompatible materials: No information known.

Hazardous decomposition products:
- Sodium oxide
- Hydrogen chloride (HCl)
- Phosphorus oxides (e.g. P2O5)

11 Toxicological information

Information on toxicological effects

Acute toxicity:
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification:

7558-80-7 Sodium dihydrogen phosphate

Oral LD50 8290 mg/kg (rat)

Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause irritation

Sensitization: No sensitizing effects known.

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for components in this product.

Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.

Aspiration hazard: No effects known.

Subacute to chronic toxicity: No effects known.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known. The product is not subject to classification according to internally approved calculation methods for preparations.

12 Ecological information

Toxicity:
Aquatic toxicity: No further relevant information available.

Persistence and degradability: No further relevant information available.

Bioaccumulative potential: No further relevant information available.

Mobility in soil: No further relevant information available.

Additional ecological information:

General notes:
Do not allow material to be released to the environment without proper governmental permits.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.

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: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number:
DOT, ADN, IMDG, IATA: Not applicable
UN proper shipping name:
DOT, ADN, IMDG, IATA: Not applicable

Transport hazard class(es):
DOT, ADR, ADN, IMDG, IATA: Not applicable

Class: Not applicable

Packing group:
DOT, IMDG, IATA: Not applicable

Environmental hazards:
Marine pollutant (IMDG): No

Special precautions for user: Not applicable.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code: Not applicable.

Transport/Additional information:
DOT Marine Pollutant (DOT): No

UN "Model Regulation": -

15 Regulatory information

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

GHS label elements: Not applicable

Hazard pictograms: Not applicable

Signal word: Not applicable

Hazard statements: Not applicable
National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)
None of the ingredients are listed.

California Proposition 65

Prop 65 - Chemicals known to cause cancer
None of the ingredients are listed.

Prop 65 - Developmental toxicity
None of the ingredients are listed.

Prop 65 - Developmental toxicity, female
None of the ingredients are listed.

Prop 65 - Developmental toxicity, male
None of the ingredients are listed.

Information about limitation of use:
For use only by technically qualified individuals.
This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
None of the ingredients are listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
None of the ingredients is listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)
None of the ingredients is listed.

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

16 Other information
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department
Date of preparation / last revision 11/24/2015 / -

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)
DOT: US Department of Transportation
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: TMB substrate

Stock number: J64062

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

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Classification(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS07

Acute Tox. 4 H302 Harmful if swallowed.
Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

GHS pictograms

Signal word Warning

Hazard-determining components of labeling:

3,3',5,5'-Tetramethylbenzidine

Hazard statements

H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary statements

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification

D2B - Toxic material causing other toxic effects

Classification system

HMIS ratings (scale 0-4) (Hazardous Materials Identification System)

HEALTH

Flammability = 1
Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

Dangerous components:

54827-17-7 3,3',5,5'-Tetramethylbenzidine  40.0%

Additional information None known.

Non-Hazardous Ingredients

7732-18-5 Water  60.0%

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.

(Contd. on page 2)
Seek immediate medical advice.
After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.
After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.
After swallowing Seek medical treatment.

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 Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Nitrogen oxides (NOx)

Advice for firefighters
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose of contaminated material as waste according to section 13.
Ensure adequate ventilation.

Prevention of secondary hazards: No special measures required.

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
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation at the workplace.
Prevent formation of aerosols.

Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:
Store away from oxidizing agents.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Penetration time of glove material (in minutes) Not determined

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Liquid
Odor: Not determined

(Contd. of page 3)
### 10 Stability and reactivity

**Reactivity**
No information known.

**Chemical stability**
Stable under recommended storage conditions.

**Thermal decomposition / conditions to be avoided**
Decomposition will not occur if used and stored according to specifications.

**Posibility of hazardous reactions**
React with strong oxidizing agents
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

**Conditions to avoid**
No further relevant information available.

**Incompatible materials**
Oxidizing agents

**Hazardous decomposition products**
Carbon monoxide and carbon dioxide
Nitrogen oxides

### 11 Toxicological information

**Information on toxicological effects**

**Acute toxicity**
Harmful if swallowed.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

**LD/LC50 values that are relevant for classification:**

54827-17-7 3,3',5,5'-Tetramethylbenzidine

**Oral LD50** >316 mg/kg (quail)

**Skin irritation or corrosion:**
Causes skin irritation.

**Eye irritation or corrosion:**
Causes serious eye irritation.

**Sensitization:**
No sensitizing effects known.

**Germ cell mutagenicity:**
The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

**Carcinogenicity:**
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

**Reproductive toxicity:**
No effects known.

**Specific target organ system toxicity - repeated exposure:**
No effects known.

**Aspiration hazard:**
No effects known.

**Subacute to chronic toxicity:**
The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

**Additional toxicological information:**
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

The product shows the following dangers according to internally approved calculation methods for preparations:

**Harmful**

**Irritant**

### 12 Ecological information

**Toxicity**

**Aquatic toxicity:**
No further relevant information available.

**Persistence and degradability:**
No further relevant information available.

**Bioaccumulative potential:**
No further relevant information available.

**Mobility in soil:**
No further relevant information available.

**Additional ecological information:**

**General notes:**
Do not allow material to be released to the environment without proper governmental permits.

Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.

Avoid transfer into the environment.

**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: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number
DOT, ADN, IMDG, IATA: Not applicable

UN proper shipping name
DOT, ADN, IMDG, IATA: Not applicable

Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA: Not applicable

Class: Not applicable

Packing group
DOT, IMDG, IATA: Not applicable

Environmental hazards:
Marine pollutant (IMDG): No

Special precautions for user
Not applicable.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

Transport/Additional information:
DOT: Marine Pollutant (DOT): No

UN "Model Regulation": -

15 Regulatory information

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

GHS label elements
The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms

GHS07

Signal word Warning

Hazard-determining components of labeling:
3,3',5,5'-Tetramethylbenzidine

Hazard statements
H302 Harmful if swallowed.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.

Precautionary statements
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P304+P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory. All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)
None of the ingredients are listed.

California Proposition 65
None of the ingredients are listed.

Prop 65 - Chemicals known to cause cancer
None of the ingredients are listed.

Prop 65 - Developmental toxicity
None of the ingredients are listed.

Prop 65 - Developmental toxicity, female
None of the ingredients are listed.

Prop 65 - Developmental toxicity, male
None of the ingredients are listed.

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
None of the ingredients are listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
None of the ingredients is listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)
None of the ingredients is listed.

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

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.
### Department issuing SDS: Global Marketing Department

**Date of preparation / last revision:** 11/24/2015 / -

**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)
- DOT: US Department of Transportation
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Stop solution

Stock number: J64067

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

Identified use: SU24  Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number: During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

GHS05 Corrosion

Skin Corr. 1B  H314  Causes severe skin burns and eye damage.

Hazard(s) not otherwise classified No information known.

Label elements

GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms

GHS05

Signal word Danger

Hazard-determining components of labeling:

Hydrochloric acid

Hazard statements

H314 Causes severe skin burns and eye damage.

Precautionary statements

P260  Do not breathe dust/fume/gas/mist/vapours/spray.

P303+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.

P405  Store locked up.

P501  Dispose of contents/container in accordance with local/regional/national/international regulations.

WHMIS classification

D2B - Toxic material causing other toxic effects

E - Corrosive material

Classification system

HMIS ratings (scale 0-4)

(Hazardous Materials Identification System)

HEALTH  FUE LD  REACTIVITY

Health (acute effects) = 2

Flammability = 0

Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

Dangerous components:

7664-38-2 Orthophosphoric acid  Skin Corr. 1B, H314  9.8%

7647-01-0 Hydrochloric acid  Skin Corr. 1B, H314; Eye Dam. 1, H318; STOT SE 3, H335  3.64%

Additional information None known.

Non-Hazardous ingredients

7732-18-5 Water  86.56%

4 First-aid measures

Description of first aid measures

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.
5 Fire-fighting measures
Extinguishing media
Suitable extinguishing agents: Product is not flammable. Use fire-fighting measures that suit the surrounding fire.
Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Hydrogen chloride (HCl)
Phosphorus oxides
Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures
Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.
Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Ensure adequate ventilation.
Prevention of secondary hazards: No special measures required.
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
Keep container tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation at the workplace.
Information about protection against explosions and fires: The product is not flammable
Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility:
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.
Further information about storage conditions:
Keep container tightly sealed. Store in cool, dry conditions in well sealed containers.
Specific end use(s): No further relevant information available.

8 Exposure controls/personal protection
Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
Control parameters
Components with limit values that require monitoring at the workplace:
7664-38-2 Orthophosphoric acid (9.8%)
PEL (USA) Long-term value: 1 mg/m³
REL (USA) Short-term value: 3 mg/m³
TLV (USA) Short-term value: 1 mg/m³
EL (Canada) Short-term value: 3 mg/m³
EV (Canada) Short-term value: 1 mg/m³
7647-01-0 Hydrochloric acid (3.64%)
PEL (USA) Ceiling limit value: 7 mg/m³, 5 ppm
REL (USA) Ceiling limit value: 7 mg/m³, 5 ppm
TLV (USA) Ceiling limit value: 2.98 mg/m³, 2 ppm
EL (Canada) Short-term value: C 2 ppm
Additional information: No data
Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed. Keep away from foodstuffs, beverages and feed. Remove all soiled and contaminated clothing immediately. Wash hands before breaks and at the end of work. Do not inhale dust / smoke / mist. Avoid contact with the eyes and skin. Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Penetration time of glove material (in minutes) Not determined

(Contd. of page 1)
38.0.2 Eye protection:
Safety glasses

Body protection:
Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General information

Appearance:
Form: Liquid
Color: Colorless
Odor: Not determined
Odor threshold: Not determined.
pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous): Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Product is not selfigniting.

Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined

Vapor pressure at 20 °C (68 °F):
23 hPa (17 mm Hg)

Density:
Not determined.

Relative density
Not determined.

Vapor density
Not determined.

Evaporation rate
Not determined.

Solubility in / Miscibility with
Water: Fully miscible

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

Viscosity:
dynamic:
Not determined.

kinematic:
Not determined.

Solvent content:
Organic solvents: 0.0%

Other information:
No further relevant information available.

10 Stability and reactivity

Reactivity
No information known.

Chemical stability
Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided:
Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions:
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Conditions to avoid:
No further relevant information available.

Incompatible materials:
Bases

Hazardous decomposition products:
Hydrogen chloride (HCl)
Phosphorus oxides (e.g. P2O5)

11 Toxicological information

Information on toxicological effects

Acute toxicity:
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification:

7664-38-2 Orthophosphoric acid

Oral LD50
1.25 gm/kg (mouse)
1.25 gm/kg (rat)

Inhalative LC50
25.5 mg/m³ (mouse)
25.5 mg/m³ (rat)

Skin irritation or corrosion: Causes skin irritation.
Eye irritation or corrosion: Causes serious eye irritation.
Sensitization: No sensitizing effects known.

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for components in this product.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.

Subacute to chronic toxicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The product shows the following dangers according to internally approved calculation methods for preparations:
Irritant

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.

Additional ecological information:

General notes:
Do not allow material to be released to the environment without proper governmental permits.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
38.0.2 Avoid transfer into the environment.

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 Consult state, local or national regulations to ensure proper disposal.

Uncleaned packaging
Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number
DOT, IMDG, IATA UN1760

UN proper shipping name
DOT Corrosive liquids, n.o.s. (Hydrochloric acid, Phosphoric acid)
IMDG, IATA CORROSIVE LIQUID, N.O.S. (HYDROCHLORIC ACID, PHOSPHORIC ACID)

Transport hazard class(es)

Class
DOT 8 Corrosive substances.
IMDG, IATA 8 (C9) Corrosive substances

Label
DOT 8
IMDG, IATA 8

Packing group
DOT, IMDG, IATA III

Environmental hazards:
Marine pollutant (IMDG): No

Special precautions for user
EMS Number: F-A,S-B

Segregation groups
Acids

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

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements The product is classified and labeled in accordance with 29 CFR 1910 (OSHA HCS)

Hazard pictograms

GHS05

Signal word Danger

Hazard-determining components of labeling:
Hydrochloric acid

Hazard statements
H314 Causes severe skin burns and eye damage.

Precautionary statements
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P305+P361+P353 If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P301+P330+P331 IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

National regulations
All components of this product are listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical substance Inventory.
All components of this product are listed on the Canadian Domestic Substances List (DSL).

SARA Section 313 (specific toxic chemical listings)
7664-38-2 Orthophosphoric acid 9.8%
7647-01-0 Hydrochloric acid 3.64%

California Proposition 65

Prop 65 - Chemicals known to cause cancer
None of the ingredients are listed.

Prop 65 - Developmental toxicity
None of the ingredients are listed.
**Product name:** Stop solution

<table>
<thead>
<tr>
<th>Prop 65 - Developmental toxicity, female</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Prop 65 - Developmental toxicity, male</th>
</tr>
</thead>
<tbody>
<tr>
<td>None of the ingredients are listed.</td>
</tr>
</tbody>
</table>

**Information about limitation of use:**
For use only by technically qualified individuals. This product is subject to the reporting requirements of section 313 of the Emergency Planning and Community Right to Know Act of 1986 and 40CFR372.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**
None of the ingredients are listed.

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**
None of the ingredients is listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)**
None of the ingredients is listed.

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

**16 Other information**
Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision 11/24/2015 / -**

**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
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- HMIS: Hazardous Materials Identification System (USA)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Hydrogen peroxide solution

Stock number: J64063

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

Identified use: SU24  Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The product is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified No information known.

Label elements

GHS label elements Not applicable

Hazard pictograms Not applicable

Signal word Not applicable

Hazard statements Not applicable

WHMIS classification Not controlled

Classification system

HMIS ratings (scale 0-4)

Health (acute effects) = 1

Flammability = 0

Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Mixtures

Dangerous components: Not applicable

Additional information None known.

Non-Hazardous Ingredients

6132-04-3 Trisodium citrate dihydrate 1.3%

7722-84-1 Hydrogen peroxide Ox. Liq. 1, H271; Skin Corr. 1A, H314; Acute Tox. 4, H302; Acute Tox. 4, H332 0.3%

7732-18-5 Water 98.4%

4 First-aid measures

Description of first aid measures

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing

Seek medical treatment.

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 Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Carbon monoxide and carbon dioxide

Sodium oxide

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
7 Handling and storage

Handling
Precautions for safe handling
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.

Information about protection against explosions and fires: The product is not flammable

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: No special requirements.

Information about storage in one common storage facility:
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:

7722-84-1 Hydrogen peroxide (0.3%)

<table>
<thead>
<tr>
<th>Source</th>
<th>Limit Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>PEL (USA)</td>
<td>Long-term value: 1.4 mg/m³, 1 ppm</td>
</tr>
<tr>
<td>REL (USA)</td>
<td>Long-term value: 1.4 mg/m³, 1 ppm</td>
</tr>
<tr>
<td>TLV (USA)</td>
<td>Long-term value: 1.4 mg/m³, 1 ppm</td>
</tr>
<tr>
<td>EL (Canada)</td>
<td>Long-term value: 1 ppm</td>
</tr>
<tr>
<td>EV (Canada)</td>
<td>Long-term value: 1.4 mg/m³, 1 ppm</td>
</tr>
</tbody>
</table>

Additional information: No data

Exposure controls

Personal protective equipment

General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use suitable respirator when high concentrations are present.

Protection of hands:
Impervious gloves

Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.

Eye protection: Safety glasses

Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information

Appearance: Liquid
Form: Liquid
Odor: Not determined
Odor threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous) Not determined
Ignition temperature: Not determined
Decomposition temperature: Not determined

Auto igniting: Product is not selfigniting.

Danger of explosion: Not determined.

Explosion limits:
Lower: Not determined
Upper: Not determined

Vapor pressure at 20 °C (68 °F): 23 hPa (17 mm Hg)

Density: Not determined
Relative density Not determined.
Vapor density Not determined.
Evaporation rate Not determined.

Solubility in / Miscibility with Water: Fully miscible
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not determined.
kinematic: Not determined.

Solvent content:
Organic solvents: 0.0 %

Solids content: 1.3 %
10 Stability and reactivity

Reactivity
No information known.

Chemical stability
Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided
Decomposition will not occur if used and stored according to specifications.

Possibility of hazardous reactions
Water reacts violently with alkali metals.
Water reacts with many metals to give hydrogen, often violently. Water is also incompatible with many reactive organic and inorganic chemicals.

Conditions to avoid
No further relevant information available.

Incompatible materials
No information known.

Hazardous decomposition products
Carbon monoxide and carbon dioxide
Sodium oxide

11 Toxicological information

Information on toxicological effects

Acute toxicity:
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for components in this product.

LD/LC50 values that are relevant for classification
No data

Skin irritation or corrosion
May cause irritation

Eye irritation or corrosion
May cause irritation

Germ cell mutagenicity
The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

Carcinogenicity
No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.

Reproductive toxicity
No effects known.

Specific target organ system toxicity - repeated exposure
No effects known.

Specific target organ system toxicity - single exposure
No effects known.

Aspiration hazard
No effects known.

Subacute to chronic toxicity
The Registry of Toxic Effects of Chemical Substances (RTECS) contains multiple dose toxicity data for this substance.

Additional toxicological information
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.
The product is not subject to classification according to internally approved calculation methods for preparations.

12 Ecological information

Toxicity

Aquatic toxicity
No further relevant information available.

Persistence and degradability
No further relevant information available.

Bioaccumulative potential
No further relevant information available.

Mobility in soil
No further relevant information available.

Additional ecological information:

General notes:
Do not allow material to be released to the environment without proper governmental permits.
Avoid transfer into the environment.

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
Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent
Water, if necessary with cleansing agents.

14 Transport information

UN-Number
DOT, ADN, IMDG, IATA
Not applicable

UN proper shipping name
DOT, ADN, IMDG, IATA
Not applicable

Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA
Not applicable

Class
Not applicable

Packing group
DOT, IMDG, IATA
Not applicable

Environmental hazards:
Marine pollutant (IMDG):
No

Special precautions for user
Not applicable.

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

Transport/Additional information:
DOT
No

Marine Pollutant (DOT):
-
Product name: Hydrogen peroxide solution

All components of this product are listed on the Canadian Domestic Substances List (DSL).

**SARA Section 313 (specific toxic chemical listings)**
None of the ingredients are listed.

**California Proposition 65**
None of the ingredients are listed.

**Prop 65 - Chemicals known to cause cancer**
None of the ingredients are listed.

**Prop 65 - Developmental toxicity**
None of the ingredients are listed.

**Prop 65 - Developmental toxicity, female**
None of the ingredients are listed.

**Prop 65 - Developmental toxicity, male**
None of the ingredients are listed.

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**
None of the ingredients are listed.

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**
None of the ingredients are listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

None of the ingredients is listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)**
None of the ingredients is listed.

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

### 16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision:** 11/24/2015 / -

**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
- EINECS: European Inventory of Existing Commercial Chemical Substances
- ELINCS: European List of Notified Chemical Substances
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier
Product name: 96-well plate, precoated with 1-19 monoclonal antibody

Stock number: J64121

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

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)
The substance is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified No information known

Label elements
GHS label elements Not applicable
Hazard pictograms Not applicable
Signal word Not applicable
Hazard statements Not applicable
WHMIS classification Not controlled

Classification system
HMIS ratings (scale 0-4)

Health (acute effects) = 1
Flammability = 0
Physical Hazard = 1

Other hazards
Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances
CAS# Description:
96-well plate, precoated with 1-19 monoclonal antibody

4 First-aid measures

Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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 Product is not flammable. Use fire-fighting measures that suit the surrounding fire.

Special hazards arising from the substance or mixture
If this product is involved in a fire, the following can be released:
Decomposition products are unknown.

Advice for firefighters
Protective equipment:
Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Pick up mechanically.

Prevention of secondary hazards: No special measures required.

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
Keep container tightly sealed.
Store in cool, dry place in tightly closed containers.
Information about protection against explosions and fires: The product is not flammable
Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: No special requirements.
Information about storage in one common storage facility: No information known.
Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection
Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Additional information: No data
Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Penetration time of glove material (in minutes) Not determined
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties
Information on basic physical and chemical properties
General Information
Appearance: Solid
Odor: Not determined
Odor threshold: Not determined.
pH-value: Not applicable.
Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous) Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Not determined.
Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined
Vapor pressure: Not applicable.
Density: Not determined
Relative density Not determined.
Vapor density Not applicable.
Evaporation rate Not applicable.
Solubility in / Miscibility with Water: Insoluble
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not applicable.
kinematic: Not applicable.
Organic solvents: 0.0 %
Other information No further relevant information available.

10 Stability and reactivity
Reactivity No information known.
Chemical stability Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions No dangerous reactions known
Conditions to avoid No further relevant information available.
Incompatible materials: No information known.
Hazardous decomposition products: No decomposition products known.

11 Toxicological information
Information on toxicological effects
Acute toxicity: No effects known.
LD/LC50 values that are relevant for classification: No data
Safety Data Sheet
per OSHA HazCom 2012

Product name: 96-well plate, precoated with 1-19 monoclonal antibody

(Contd. of page 2)

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.
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: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.

14 Transport information

UN-Number
DOT, ADN, IMDG, IATA: Not applicable

UN proper shipping name
DOT, ADN, IMDG, IATA: Not applicable

Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA: Not applicable

Class: Not applicable

Packing group
DOT, IMDG, IATA: Not applicable

Environmental hazards:
Marine pollutant (IMDG): No

Special precautions for user: Not applicable.

Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

Transport/Additional information:
DOT: No
Marine Pollutant (DOT): No
UN "Model Regulation": -

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements: Not applicable
Hazard pictograms: Not applicable
Signal word: Not applicable
Hazard statements: Not applicable
National regulations:
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

SARA Section 313 (specific toxic chemical listings)
Substance is not listed.

California Proposition 65
Substance is not listed.

Prop 65 - Chemicals known to cause cancer
Substance is not listed.

Prop 65 - Developmental toxicity
Substance is not listed.

Prop 65 - Developmental toxicity, female
Substance is not listed.

Prop 65 - Developmental toxicity, male
Substance is not listed.

Information about limitation of use:
For use only by technically qualified individuals.
Other regulations, limitations and prohibitive regulations
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
Substance is not listed.

(Contd. on page 4)
The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)

Substance is not listed.

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

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Date of preparation / last revision 11/24/2015 / -

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
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- HMIS: Hazardous Materials Identification System (USA)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Osteocalcin standards

Stock number: J64093

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

Identified use: SU24  Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:

During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The substance is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified  No information known.

Label elements

GHS label elements  Not applicable
Hazard pictograms  Not applicable
Signal word  Not applicable
Hazard statements  Not applicable
WHMIS classification  Not controlled

Classification system  HMIS ratings (scale 0-4)

Health (acute effects) = 1
Flammability = 1
Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

Osteocalcin

4 First-aid measures

Description of first aid measures

After inhalation

Supplied fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing

Seek medical treatment.

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 Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)
Calcium oxide
Nitrogen oxides (NOx)

Advice for firefighters

Protective equipment:

Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Pick up mechanically.

Prevention of secondary hazards: No special measures required.

Reference to other sections

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.

(Contd. on page 2)
7 Handling and storage

Handling
Precautions for safe handling: Keep container tightly sealed.
Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Protect from heat.
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Refrigerate
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Solid
Odor: Not determined
Odor threshold: Not determined.
pH-value: Not applicable.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous): Not determined
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Not determined

Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined
Vapor pressure: Not applicable.
Density:
Relative density: Not determined.
Vapor density: Not applicable.
Evaporation rate: Not applicable.
Solubility in / Miscibility with Water: Soluble
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not applicable.
kinematic: Not applicable.
Organic solvents: 0.0 %

Solids content: 100.0 %
Other information No further relevant information available.

10 Stability and reactivity

Reactivity: No information known.
Chemical stability: Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions: Reacts with strong oxidizing agents
Conditions to avoid: No further relevant information available.
Incompatible materials:
Oxidizing agents
Heat

(Contd. of page 3)
Hazardous decomposition products:
Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)
Calcium oxide
Nitrogen oxides

11 Toxicological information

Information on toxicological effects
Acute toxicity: No effects known.
LD/LC50 values that are relevant for classification: No data
Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause irritation
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - repeated exposure: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Subacute to chronic toxicity: No effects known.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Persistence and degradability: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.
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: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number
DOT, ADN, IMDG, IATA: Not applicable
UN proper shipping name
DOT, ADN, IMDG, IATA: Not applicable
Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA: Not applicable
Class: Not applicable
Packing group
DOT, IMDG, IATA: Not applicable
Environmental hazards:
Marine pollutant (IMDG): No
Special precautions for user: Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.
Transport/Additional information:
DOT: Marine Pollutant (DOT): No
UN "Model Regulation": -

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements: Not applicable
Signal pictograms: Not applicable
Signal word: Not applicable
Hazard statements: Not applicable
National regulations:
This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).
SARA Section 313 (specific toxic chemical listings)
Substance is not listed.
California Proposition 65
Prop 65 - Chemicals known to cause cancer
Substance is not listed.
### Prop 65 - Developmental toxicity
**Substance is not listed.**

### Prop 65 - Developmental toxicity, female
**Substance is not listed.**

### Prop 65 - Developmental toxicity, male
**Substance is not listed.**

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**

**Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.**

**Substance is not listed.**

**The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.**

**Substance is not listed.**

**Annex XIV of the REACH Regulations (requiring Authorisation for use)**

**Substance is not listed.**

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

### 16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision** 11/24/2015 / -

**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)
- DOT: US Department of Transportation
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- HMIS: Hazardous Materials Identification System (USA)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Human Osteocalcin control, high

Stock number: J64077

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

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar

Thermo Fisher Scientific Chemicals, Inc.

30 Bond Street

Ward Hill, MA 01835-8099

Tel: 800-343-0660

Fax: 800-322-4757

Email: tech@alfa.com

www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number: During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The substance is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified No information known.

Label elements

GHS label elements Not applicable

Hazard pictograms Not applicable

Signal word Not applicable

Hazard statements Not applicable

WHMIS classification Not controlled

Classification system

HMIS ratings (scale 0-4)

HEALTH

Flammability = 1

Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.

vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

Human Osteocalcin

4 First-aid measures

Description of first aid measures

After inhalation

Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact

Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact

Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing

Seek medical treatment.

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 Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Carbon monoxide and carbon dioxide

Sulfur oxides (SOx)

Calcium oxide

Nitrogen oxides (NOx)

Advice for firefighters

Protective equipment:

Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Pick up mechanically.

Prevention of secondary hazards: No special measures required.

Reference to other sections

See Section 7 for information on safe handling.

See Section 8 for information on personal protection equipment.
7 Handling and storage

Handling
Precautions for safe handling: Keep container tightly sealed.
Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Protect from heat.
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Refrigerate
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance:
Form: Solid
Odor: Not determined
Odor threshold: Not determined.
pH-value: Not applicable.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous) Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Not determined.

Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined
Vapor pressure: Not applicable.
Density: Not determined
Relative density Not determined.
Vapor density Not applicable.
Evaporation rate Not applicable.
Solubility in / Miscibility with Water: Soluble
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not applicable.
kinematic: Not applicable.
Organic solvents: 0.0 %
Solids content: 100.0 %
Other information: No further relevant information available.

10 Stability and reactivity

Reactivity: No information known.
Chemical stability: Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions: Reacts with strong oxidizing agents
Conditions to avoid: No further relevant information available.
Incompatible materials:
Oxidizing agents
Heat
Hazardous decomposition products:
- Carbon monoxide and carbon dioxide
- Sulfur oxides (SOx)
- Calcium oxide
- Nitrogen oxides

11 Toxicological information

Information on toxicological effects:
- Acute toxicity: No effects known.
- LD/LC50 values that are relevant for classification: No data.
- Skin irritation or corrosion: May cause irritation.
- Eye irritation or corrosion: May cause irritation.
- Sensitization: No sensitizing effects known.
- Germ cell mutagenicity: No effects known.
- Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
- Reproductive toxicity: No effects known.
- Specific target organ system toxicity - repeated exposure: No effects known.
- Specific target organ system toxicity - single exposure: No effects known.
- Aspiration hazard: No effects known.
- Subacute to chronic toxicity: No effects known.

Additional toxicological information:
To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12 Ecological information

Toxicity:
- Aquatic toxicity: No further relevant information available.
- Persistence and degradability: No further relevant information available.
- Biological accumulation potential: No further relevant information available.
- Mobility in soil: No further relevant information available.
- General notes:
  - Do not allow material to be released to the environment without proper governmental permits.
  - Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
  - Avoid transfer into the environment.

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: Consult state, local or national regulations to ensure proper disposal.

Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

Recommended cleansing agent:
- Water, if necessary with cleansing agents.

14 Transport information

- UN-Number: Not applicable
- DOT, ADN, IMDG, IATA: Not applicable
- UN proper shipping name: Not applicable
- DOT, ADN, IMDG, IATA: Not applicable
- Transport hazard class(es): Not applicable
- Class: Not applicable
- Packing group: Not applicable
- DOT, IMDG, IATA: Not applicable
- Environmental hazards:
  - Marine pollutant (IMDG): No
- Special precautions for user: Not applicable.
- Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.

Transport/Additional information:
- DOT: Marine Pollutant (DOT): No
- UN "Model Regulation": -

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture:
- GHS label elements: Not applicable
- Hazard pictograms: Not applicable
- Signal word: Not applicable
- Hazard statements: Not applicable

National regulations:
- This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
- This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).

SARA Section 313 (specific toxic chemical listings):
- Substance is not listed.

California Proposition 65:
- Prop 65 - Chemicals known to cause cancer
- Substance is not listed.
Safety Data Sheet
per OSHA HazCom 2012

Product name: Human Osteocalcin control, high

Prop 65 - Developmental toxicity
Substance is not listed.

Prop 65 - Developmental toxicity, female
Substance is not listed.

Prop 65 - Developmental toxicity, male
Substance is not listed.

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations
Substance is not listed.

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
Substance is not listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)
Substance is not listed.

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

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Date of preparation / last revision 11/24/2015 / -

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)
CAS: Chemical Abstracts Service (division of the American Chemical Society)
HMIS: Hazardous Materials Identification System (USA)
WHMIS: Workplace Hazardous Materials Information System (Canada)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OHS: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Human Osteocalcin control, low

Stock number: J64078

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0860
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The substance is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified

No information known.

Label elements

GHS label elements Not applicable

Hazard pictograms Not applicable

Signal word Not applicable

Hazard statements Not applicable

WHMIS classification Not controlled

Classification system

HMIS ratings (scale 0-4)

Health (acute effects) = 1
Flammability = 1
Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

Human Osteocalcin

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly. Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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 Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)
Calcium oxide
Nitrogen oxides (NOx)

Advice for firefighters

Protective equipment:

Wear self-contained respirator.
Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up: Pick up mechanically.

Prevention of secondary hazards: No special measures required.

Reference to other sections

See Section 7 for information on safe handling
See Section 8 for information on personal protection equipment.

(Contd. on page 2)
7 Handling and storage

Handling
Precautions for safe handling: Keep container tightly sealed.
Information about protection against explosions and fires: No information known.

Conditions for safe storage, including any incompatibilities

Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Protect from heat.
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Refrigerate
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters

Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.
Additional information: No data

Exposure controls

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands:
Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties

General Information
Appearance:
Form: Solid
Odor: Not determined
Odor threshold: Not determined.

pH-value:
Not applicable.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous) Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Not determined.

Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined

Vapor pressure:
Not applicable.

Density:
Not determined.

Relative density:
Not determined.

Vapor density:
Not applicable.

Evaporation rate:
Not applicable.

Solubility in / Miscibility with
Water: Soluble
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not applicable.
kinematic: Not applicable.
Organic solvents: 0.0 %

Solids content: 100.0 %

Other information
No further relevant information available.

10 Stability and reactivity

Reactivity: No information known.
Chemical stability: Stable under recommended storage conditions.
Thermal decomposition / conditions to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions: Reacts with strong oxidizing agents
Conditions to avoid: No further relevant information available.
Incompatible materials: Oxidizing agents
Heat
11 Toxicological information

### Information on toxicological effects

- **Acute toxicity**: No effects known.
- **LD/LC50 values that are relevant for classification**: No data
- **Skin irritation or corrosion**: May cause irritation
- **Eye irritation or corrosion**: May cause irritation
- **Sensitization**: No sensitizing effects known.
- **Germ cell mutagenicity**: No effects known.
- **Carcinogenicity**: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
- **Reproductive toxicity**: No effects known.
- **Specific target organ system toxicity - repeated exposure**: No effects known.
- **Specific target organ system toxicity - single exposure**: No effects known.
- **Aspiration hazard**: No effects known.
- **Subacute to chronic toxicity**: No effects known.
- **Additional toxicological information**: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12 Ecological information

- **Toxicity**
  - **Aquatic toxicity**: No further relevant information available.
  - **Persistence and degradability**: No further relevant information available.
  - **Bioaccumulative potential**: No further relevant information available.
  - **Mobility in soil**: No further relevant information available.
- **Additional ecological information**
  - **General notes**: Do not allow material to be released to the environment without proper governmental permits.
  - **Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.**
  - **Avoid transfer into the environment.**
- **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**: Consult state, local or national regulations to ensure proper disposal.
- **Uncleaned packagings**
  - **Recommendation**: Disposal must be made according to official regulations.
  - **Recommended cleansing agent**: Water, if necessary with cleansing agents.

14 Transport information

- **UN-Number**
  - **DOT, ADN, IMDG, IATA**: Not applicable
- **UN proper shipping name**
  - **DOT, ADN, IMDG, IATA**: Not applicable
- **Transport hazard class(es)**
  - **DOT, ADR, ADN, IMDG, IATA**: Not applicable
  - **Class**: Not applicable
- **Packing group**
  - **DOT, IMDG, IATA**: Not applicable
  - **Environmental hazards**
    - **Marine pollutant (IMDG)**: No
- **Special precautions for user**: Not applicable.
- **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**: Not applicable.
- **Transport/Additional information**
  - **DOT**
    - Marine Pollutant (DOT): No
  - **UN "Model Regulation"**: -

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
  - **GHS label elements**: Not applicable
  - **Hazard pictograms**: Not applicable
  - **Signal word**: Not applicable
  - **Hazard statements**: Not applicable
- **National regulations**
  - **This product is not listed in the U.S. Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.**
  - **This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).**
- **SARA Section 313 (specific toxic chemical listings)**
  - Substance is not listed.
- **California Proposition 65**
  - **Prop 65 - Chemicals known to cause cancer**
    - Substance is not listed.
**Product name: Human Osteocalcin control, low**

---

### 38.0.2

**Prop 65 - Developmental toxicity**

Substance is not listed.

**Prop 65 - Developmental toxicity, female**

Substance is not listed.

**Prop 65 - Developmental toxicity, male**

Substance is not listed.

**Information about limitation of use:** For use only by technically qualified individuals.

**Other regulations, limitations and prohibitive regulations**

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.

Substance is not listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

Substance is not listed.

**Annex XIV of the REACH Regulations (requiring Authorisation for use)**

Substance is not listed.

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

---

### 16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

**Department issuing SDS:** Global Marketing Department

**Date of preparation / last revision** 11/24/2015 / -

**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)
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- DOT: US Department of Transportation
- HMIS: Hazardous Materials Identification System (USA)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)
1 Identification

Product identifier

Product name: Native Human Osteocalcin Antiserum

Stock number: J64073

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

Identified use: SU24 Scientific research and development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: Alfa Aesar
Thermo Fisher Scientific Chemicals, Inc.
30 Bond Street
Ward Hill, MA 01835-8099
Tel: 800-343-0660
Fax: 800-322-4757
Email: tech@alfa.com
www.alfa.com

Information Department: Health, Safety and Environmental Department

Emergency telephone number:
During normal business hours (Monday-Friday, 8am-7pm EST), call (800) 343-0660. After normal business hours, call Carechem 24 at (866) 928-0789.

2 Hazard(s) identification

Classification of the substance or mixture in accordance with 29 CFR 1910 (OSHA HCS)

The substance is not classified according to the Globally Harmonized System (GHS).

Hazards not otherwise classified: No information known.

Label elements

GHS label elements: Not applicable

Hazard pictograms: Not applicable

Signal word: Not applicable

Hazard statements: Not applicable

WHMIS classification: Not controlled

Classification system: HMIS ratings (scale 0-4)

Health (acute effects) = 1
Flammability = 1
Physical Hazard = 1

Other hazards

Results of PBT and vPvB assessment

PBT: Not applicable.
vPvB: Not applicable.

3 Composition/information on ingredients

Chemical characterization: Substances

CAS# Description:

Human Osteocalcin Antiserum

4 First-aid measures

Description of first aid measures

After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Seek immediate medical advice.

After skin contact
Immediately wash with water and soap and rinse thoroughly.
Seek immediate medical advice.

After eye contact
Rinse opened eye for several minutes under running water. Then consult a doctor.

After swallowing
Seek medical treatment.

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: Carbon dioxide, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:
Carbon monoxide and carbon dioxide
Sulfur oxides (SOx)
Calcium oxide
Nitrogen oxides (NOx)
Additional decomposition products are unknown.

Advice for firefighters

Protective equipment:
Wear self-contained respirator.

Wear fully protective impervious suit.

6 Accidental release measures

Personal precautions, protective equipment and emergency procedures

Wear protective equipment. Keep unprotected persons away.

Ensure adequate ventilation.

Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

Methods and material for containment and cleaning up:
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Prevention of secondary hazards: No special measures required.

Reference to other sections

See Section 7 for information on safe handling.

(Contd. on page 2)
7 Handling and storage

Handling
Precautions for safe handling: Keep container tightly sealed.
Information about protection against explosions and fires: No information known.
Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and receptacles: Refrigerate
Information about storage in one common storage facility:
Prohibit from heat.
Store away from oxidizing agents.
Further information about storage conditions:
Keep container tightly sealed.
Refrigerate
Specific end use(s) No further relevant information available.

8 Exposure controls/personal protection

Additional information about design of technical systems:
Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.

Control parameters
Components with limit values that require monitoring at the workplace:
The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

Additional information: No data

Exposure controls
Personal protective equipment
General protective and hygienic measures
The usual precautionary measures for handling chemicals should be followed.
Keep away from foodstuffs, beverages and feed.
Remove all soiled and contaminated clothing immediately.
Wash hands before breaks and at the end of work.
Maintain an ergonomically appropriate working environment.
Breathing equipment: Use suitable respirator when high concentrations are present.
Protection of hands: Impervious gloves
Check protective gloves prior to each use for their proper condition.
The selection of suitable gloves not only depends on the material, but also on quality. Quality will vary from manufacturer to manufacturer.
Penetration time of glove material (in minutes) Not determined
Eye protection: Safety glasses
Body protection: Protective work clothing.

9 Physical and chemical properties

Information on basic physical and chemical properties
General Information
Appearance: Liquid
Odor: Not determined
Odor threshold: Not determined.
pH-value: Not determined.

Change in condition
Melting point/Melting range: Not determined
Boiling point/Boiling range: Not determined
Sublimation temperature / start: Not determined
Flammability (solid, gaseous): Not determined.
Ignition temperature: Not determined
Decomposition temperature: Not determined
Auto igniting: Not determined.

Danger of explosion: Not determined.
Explosion limits:
Lower: Not determined
Upper: Not determined
Vapor pressure: Not determined
Density: Not determined.
Relative density: Not determined.
Vapor density: Not determined.
Evaporation rate: Not determined.
Solubility in / Miscibility with
Water: Fully miscible
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
dynamic: Not determined.
kinematic: Not determined.
Organic solvents: 0.0 %

Solids content: 100.0 %

Other information
No further relevant information available.

10 Stability and reactivity

Reactivity No information known.
Chemical stability: Stable under recommended storage conditions.
Thermal decomposition / condition to be avoided: Decomposition will not occur if used and stored according to specifications.
Possibility of hazardous reactions Reacts with strong oxidizing agents
Conditions to avoid: No further relevant information available.
Incompatible materials: Oxidizing agents
Heat
11 Toxicological information

Information on toxicological effects
Acute toxicity: No effects known.
LD/LC50 values that are relevant for classification: No data
Skin irritation or corrosion: May cause irritation
Eye irritation or corrosion: May cause irritation
Sensitization: No sensitizing effects known.
Germ cell mutagenicity: No effects known.
Carcinogenicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Specific target organ system toxicity - single exposure: No effects known.
Aspiration hazard: No effects known.
Additional toxicological information: To the best of our knowledge the acute and chronic toxicity of this substance is not fully known.

12 Ecological information

Toxicity
Aquatic toxicity: No further relevant information available.
Bioaccumulative potential: No further relevant information available.
Mobility in soil: No further relevant information available.
Additional ecological information:
General notes:
Do not allow material to be released to the environment without proper governmental permits.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.
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: Consult state, local or national regulations to ensure proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleansing agent: Water, if necessary with cleansing agents.

14 Transport information

UN-Number
DOT, ADN, IMDG, IATA: Not applicable
DOT proper shipping name
DOT, ADN, IMDG, IATA: Not applicable
Transport hazard class(es)
DOT, ADR, ADN, IMDG, IATA: Not applicable
Class: Not applicable
Packing group
DOT, IMDG, IATA: Not applicable
Environmental hazards:
Marine pollutant (IMDG): No
Special precautions for user: Not applicable.
Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code: Not applicable.
Transport/Additional information:
DOT Marine Pollutant (DOT): No
UN "Model Regulation": -

15 Regulatory information

Safety, health and environmental regulations/legislation specific for the substance or mixture
GHS label elements: Not applicable
Hazard pictograms: Not applicable
Signal word: Not applicable
Hazard statements: Not applicable
National regulations:
This product is not listed in the United States Environmental Protection Agency Toxic Substances Control Act Chemical Substance Inventory. Use of this product is restricted to research and development only. This product must be used by or directly under the supervision of a technically qualified individual as defined by TSCA. This product must not be used for commercial purposes or in formulations for commercial purposes.
This product is not listed on the Canadian Domestic Substances List (DSL) or the Canadian Non-Domestic Substances List (NDSL).
SARA Section 313 (specific toxic chemical listings)
Substance is not listed.
California Proposition 65
Prop 65 - Chemicals known to cause cancer
Substance is not listed.
Product name: Native Human Osteocalcin Antiserum

**Prop 65 - Developmental toxicity**
Substance is not listed.

**Prop 65 - Developmental toxicity, female**
Substance is not listed.

**Prop 65 - Developmental toxicity, male**
Substance is not listed.

Information about limitation of use: For use only by technically qualified individuals.

Other regulations, limitations and prohibitive regulations

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
Substance is not listed.

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.
Substance is not listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)
Substance is not listed.

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

16 Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Date of preparation / last revision 11/24/2015 / -

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)
- DOT: US Department of Transportation
- CAS: Chemical Abstracts Service (division of the American Chemical Society)
- HMIS: Hazardous Materials Identification System (USA)
- WHMIS: Workplace Hazardous Materials Information System (Canada)
- LC50: Lethal concentration, 50 percent
- LD50: Lethal dose, 50 percent
- vPvB: very Persistent and very Bioaccumulative
- ACGIH: American Conference of Governmental Industrial Hygienists (USA)
- OSHA: Occupational Safety and Health Administration (USA)
- NTP: National Toxicology Program (USA)
- IARC: International Agency for Research on Cancer
- EPA: Environmental Protection Agency (USA)