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

1.1 Product identifier
Trade name Valeraldehyde

Stock number: B21389, L12213
CAS Number: 110-62-3
EC number: 203-784-4

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

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier:
Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com
Informing department: Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:
Carechenl 24: +44 (o) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

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

GHS02 flame
Flam. Liq. 2 H225 Highly flammable liquid and vapour.

GHS05 corrosion
Eye Dam. 1 H318 Causes serious eye damage.

GHS07
Acute Tox. 4 H332 Harmful if inhaled.
Skin Irrit. 2 H315 Causes skin irritation.
STOT SE 3 H335 May cause respiratory irritation.

Other hazards that do not result in classification No information known.

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

Hazard pictograms

GHS02 GHS05 GHS07

Signal word Danger
Hazard statements
H225 Highly flammable liquid and vapour.
H332 Harmful if inhaled.
H315 Causes skin irritation.
H335 May cause respiratory irritation.
Precautionary statements
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P361 Avoid breathing dust/inhalation medicine. Keep container tightly closed.
P335+P337+P313 IF ON SKIN of 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.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

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

SECTION 3: Composition/information on ingredients

3.1 Substances
CAS# Designation:
110-62-3 Valeraldehyde
Concentration: ≤100%
Identification number(s):
EC number: 203-784-4

SECTION 4: First aid measures

4.1 Description of first aid measures
After inhalation
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
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 doctor.

After swallowing
Seek medical treatment.
4.2 Most important symptoms and effects, both acute and delayed
Causes skin irritation.
Causes serious eye damage.

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

SECTION 5: Firefighting measures

5.1 Extinguishing media
Suitable extinguishing agents CO2, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.

5.2 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

5.3 Advice for firefighters
Protective equipment:
Wear self-contained breathing apparatus.
Wear full protective suit.

SECTION 6: Accidental release measures

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

6.2 Environmental precautions: Do not allow product to reach sewage system or water bodies.

6.3 Method 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: Keep away from ignition sources.

5.4 Reference to other sections
See Section 7 for information on safe handling
See section 8 for information on personal protection equipment.
See Section 13 for information on disposal.

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Handle under dry protective gas.
Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation/exhaustion at the workplace.

Information about protection against explosions and fires:
Protect against electrostatic charges.
Fumes can combine with air to form an explosive mixture.
Keep ignition sources away - Do not smoke.

7.2 Conditions for safe storage, including any incompatibilities
Storage
Requirements to be met by storerooms and containers: Store in cool location.

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

Further information about storage conditions:
Store under dry inert gas.
This product is air sensitive.
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.

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

SECTION 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.

8.1 Control parameters

Components with critical values that require monitoring at the workplace:

110-62-3 Valeraldehyde (100.0%)
REL (USA) Long-term value: 175 mg/m³, 50 ppm
See Pocket Guid App. C
TLV (USA) Long-term value: 176 mg/m³, 50 ppm

Additional information: No data

8.2 Exposure controls

Personal protective equipment
General protective and hygienic measures
The usual precautionary measures should be adhered to in handling the chemicals.
Keep away from foodstuffs, beverages and food.
Instantly remove any soiled and impregnated garments.
Wash hands during breaks and at the end of the work.
Avoid contact with the eyes and skin.
Maintain an ergonomically appropriate working environment.

Breathing equipment: Use breathing protection with high concentrations.

Recommended filter device for short term use
Use a respirator with multi-purpose combination (US) or type ABEK (EN 14387) as a backup to engineering controls. Risk assessment should be performed to determine if air-purifying respirators are appropriate. Only use equipment tested and approved under appropriate government standards such as NIOSH (USA) or CEN (EU).

Protection of hands:
Check protective gloves prior to each use for their proper condition.
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

Material of gloves Butyl rubber, BR
Eye protection:
Tightly sealed safety glasses.
Face protection
Safety glasses with side shields / NIOSH (US) or EN 166(EU)

Body protection: Protective work clothing.

(Contd. on page 3)
SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information
Appearance:
Form: Liquid
Odour: Like aldehyde
Odour threshold: Not determined.

pH-value: Not determined.

Change in condition
Melting point/freezing point: -92 °C
Initial boiling point and boiling range: 102-103 °C
Sublimation temperature / start: Not determined

Flash point: 8 °C
Inflammability (solid, gaseous) Not determined.
Ignition temperature: 205 °C
Decomposition temperature: Not determined
Self-inflammability: Not determined.

Explosive properties: Product is not explosive. However, formation of explosive air/steam mixtures is possible.

Critical values for explosion:
Lower: 1.7 Vol %
Upper: 6.8 Vol %

Steam pressure at 20 °C: 36 hPa
Density at 20 °C 0.81 g/cm³
Relative density Not determined.
Vapour density Not determined.
Evaporation rate Not determined.

Solubility in / Miscibility with Water at 20 °C: 13.5 g/l
Partition coefficient: n-octanol/water: Not determined.

Viscosity:
dynamic at 20 °C: 0.54 mPas
kinematic: Not determined.

9.2 Other information
No further relevant information available.

SECTION 10: Stability and reactivity

10.1 Reactivity
No information known.

10.2 Chemical stability
Stable under recommended storage conditions.

Thermal decomposition / conditions to be avoided: No decomposition if used and stored according to specifications.

10.3 Possibility of hazardous reactions
Reacts with strong oxidising agents

10.4 Conditions to avoid
No further relevant information available.

10.5 Incompatible materials:
Air
Oxidising agents

10.6 Hazardous decomposition products: Carbon monoxide and carbon dioxide

SECTION 11: Toxicological information

11.1 Information on toxicological effects
Acute toxicity
Harmful if inhaled.
The Registry of Toxic Effects of Chemical Substances (RTECS) contains acute toxicity data for this substance.
Harmful if inhaled.

LD/LC50 values that are relevant for classification:
Oral LD50 3200 mg/kg (rat)
Dermal LD50 4857 mg/kg (rabbit)

Skin irritation or corrosion: Causes skin irritation.
Eye irritation or corrosion: Causes serious eye damage.
Respiratory or skin sensitisation: Based on available data, the classification criteria are not met.

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for this substance.
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: May cause respiratory irritation.

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.

SECTION 12: Ecological information

12.1 Toxicity
Aquatic toxicity: No further relevant information available.

12.2 Persistence and degradability
No further relevant information available.

12.3 Bioaccumulative potential
No further relevant information available.

12.4 Mobility in soil
No further relevant information available.

Additional ecological information:
General notes:
Water hazard class 1 (Self-assessment): slightly hazardous for water.
Do not allow undiluted product or large quantities to reach ground water, water course or sewage system.
Avoid transfer into the environment.

12.5 Results of PBT and vPvB assessment
PBT: Not applicable.
vPvB: Not applicable.

12.6 Other adverse effects
No further relevant information available.

SECTION 13: Disposal considerations

13.1 Waste treatment methods
Recommendation
Hand over to disposers of hazardous waste.
Must be specially treated under adherence to official regulations.
Trade name Valeraldehyde

Consult state, local or national regulations for proper disposal.
Uncleaned packagings: 
Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

UN-Number
ADR, IMDG, IATA UN2058

14.2 UN proper shipping name
ADR IMDG, IATA 2058 VALERALDEHYDE VALERALDEHYDE

14.3 Transport hazard class(es)
ADR
Class Label 3 (F1) Flammable liquids.
IMDG, IATA 3

14.5 Environmental hazards: 
Not applicable.

14.6 Special precautions for user
Warning: Flammable liquids.
Kemler Number: 33
EMS Number: F-E,S-D
Stowage Category B

14.7 Transport in bulk according to Annex II of Marpol and the IBC Code Not applicable.

Transport/Additional information:

ADR
Limited quantities (LQ) 1L
Exempted quantities (EQ) Code: E2
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 500 ml

Transport category 2
Tunnel restriction code D/E

IMDG
Limited quantities (LQ) 1L
Exempted quantities (EQ) Code: E2
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 500 ml

UN "Model Regulation": UN 2058 VALERALDEHYDE, 3, II

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture
Australian Inventory of Chemical Substances Substance is not listed.
Standard for the Uniform Scheduling of Medicines and Poisons Substance is not listed.

Directive 2012/18/EU
Named dangerous substances - ANNEX I Substance is not listed.
Seveso category P5c FLAMMABLE LIQUIDS 
Qualifying quantity (tonnes) for the application of lower-tier requirements 5.000 t
Qualifying quantity (tonnes) for the application of upper-tier requirements 50.000 t
REGULATION (EC) No 1907/2006 ANNEX XVII Conditions of restriction: 3, 40

National regulations
Information about limitation of use:
For use only by technically qualified individuals.
Water hazard class: Water hazard class 1 (Self-assessment); slightly hazardous for water.

Water hazard class: Water hazard class 1 (Self-assessment); slightly hazardous for water.
Water hazard class: Water hazard class 1 (Self-assessment); slightly hazardous for water.

SECTION 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 Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Department issuing SDS: Global Marketing Department

Abbreviations and acronyms:
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonised System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
SVHC: Substances of Very High Concern
vPB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety and Health Administration (USA)
ELV: Threshold Limit Value
PEL: Permissible Exposure Limit
<table>
<thead>
<tr>
<th>REL:</th>
<th>Recommended Exposure Limit</th>
</tr>
</thead>
<tbody>
<tr>
<td>BEI:</td>
<td>Biological Exposure Limit</td>
</tr>
<tr>
<td>Flam. Liq. 2:</td>
<td>Flammable liquids – Category 2</td>
</tr>
<tr>
<td>Acute Tox. 4:</td>
<td>Acute toxicity – Category 4</td>
</tr>
<tr>
<td>Skin Irrit. 2:</td>
<td>Skin corrosion/irritation – Category 2</td>
</tr>
<tr>
<td>Eye Dam. 1:</td>
<td>Serious eye damage/eye irritation – Category 1</td>
</tr>
<tr>
<td>STOT SE 3:</td>
<td>Specific target organ toxicity (single exposure) – Category 3</td>
</tr>
</tbody>
</table>