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

**1.1 Product identifier**

Trade name **N,N-Dimethylformamide**

Stock number: A13547
CAS Number: 68-12-2
EC number: 200-679-5
Index number: 616-001-00-X

**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:**
Carechem 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. 3 H226 Flammable liquid and vapour.
- **GHS08 health hazard**
  - Repr. 1B H360D May damage the unborn child.
- **GHS07**
  - Acute Tox. 4 H312 Harmful in contact with skin.
  - Acute Tox. 4 H332 Harmful if inhaled.
  - Eye Irrit. 2 H319 Causes serious eye 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 GHS07 GHS08

Signal word Danger

Hazard statements
- H226 Flammable liquid and vapour.
- H312+H332 Harmful in contact with skin or if inhaled.
- H319 Causes serious eye irritation.
- H360D May damage the unborn child.

Precautionary statements
- P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
- P201 Obtain special instructions before use.
- P303+P361+P333 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.
- 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: 68-12-2 N,N-Dimethylformamide
- Concentration: ≤ 100%
- Identification number(s):
  - EC number: 200-679-5
  - Index number: 616-001-00-X

**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**

Instantly 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.

(Contd. on page 2)
Trade name: N,N-Dimethylformamide

4.2 Most important symptoms and effects, both acute and delayed
Causes serious eye irritation.
Harmful if inhaled.
Harmful in contact with skin.
May damage fertility or the unborn child.

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
Nitrogen oxides (NOx)

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 material to be released to the environment without proper governmental permits.

6.3 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.

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling
Keep containers tightly sealed.
Store in cool, dry place in tightly closed containers.
Ensure good ventilation/exhaustion at the workplace.
Open and handle container with care.

Information about protection against explosions and fires:
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:
No special requirements.

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

Further information about storage conditions:
Keep container tightly sealed.
Store in cool, dry conditions in well sealed containers.
Store in a locked cabinet or with access restricted to technical experts or their assistants.

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters
Components with critical values that require monitoring at the workplace:

<table>
<thead>
<tr>
<th>Component</th>
<th>AGW (Germany)</th>
<th>PEL (USA)</th>
<th>REL (USA)</th>
<th>TLV (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylformamide (100.0%)</td>
<td>Long-term value: 15 mg/m³, 5 ppm</td>
<td>Long-term value: 30 mg/m³, 10 ppm</td>
<td>Long-term value: 30 mg/m³, 10 ppm</td>
<td>Long-term value: 30 mg/m³, 10 ppm</td>
</tr>
<tr>
<td></td>
<td>2(II);EU, DFG, AGS, H, Z</td>
<td>Skin</td>
<td>Skin</td>
<td>Skin, BEI</td>
</tr>
</tbody>
</table>

Ingredients with biological limit values:

<table>
<thead>
<tr>
<th>Component</th>
<th>BEI (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>N,N-Dimethylformamide (100.0%)</td>
<td>35 mg/L</td>
</tr>
<tr>
<td></td>
<td>Medium: urine</td>
</tr>
<tr>
<td></td>
<td>Time: end of shift</td>
</tr>
<tr>
<td></td>
<td>Parameter: N-Methylformamid plus N-Hydroxymethyl-N-methylformamid</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Component</th>
<th>Parameter: N-Acetyl-S-(N-methylcarbamoyl) cysteine (semi-quantitative)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>40 mg/L</td>
</tr>
<tr>
<td></td>
<td>Medium: urine</td>
</tr>
<tr>
<td></td>
<td>Time: prior to last shift of workweek</td>
</tr>
</tbody>
</table>

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.
Store protective clothing separately.
Avoid contact with the eyes.
Avoid contact with the eyes and skin.

(Contd. on page 3)
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
- **Penetration time of glove material (in minutes):** 480
- **Glove thickness:** 0.3 mm

**Eye protection:**

- **Face protection:**
  - Safety glasses with side shields / NIOSH (US) or EN 166 (EU)

**Body protection:**

- **Protective work clothing.**

**SECTION 9: Physical and chemical properties**

### 9.1 Information on basic physical and chemical properties

**General Information**

- **Appearance:** Liquid
- **Odour:** Aminelike
- **Odour threshold:** Not determined.
- **pH-value (200 g/l) at 20 °C:** 7

**Change in condition**

- **Melting point/freezing point:** -61 °C
- **Initial boiling point and boiling range:** 153 °C
- **Sublimation temperature / start:** Not determined

**Flash point:** 57 °C
**Inflammability (solid, gaseous):** Not applicable.
**Ignition temperature:** 440 °C
**Decomposition temperature:** Not determined
**Self-inflammability:** Not determined

**Explosive properties:** Not determined.

**Critical values for explosion:**

- **Lower:** 2.2 Vol %
- **Upper:** 18 Vol %

**Steam pressure at 20 °C:** 3.5 hPa
**Density at 20 °C:** 0.944 g/cm³
**Relative density:** Not determined.
**Vapour density:** Not determined.
**Evaporation rate:** Not determined.
**Solubility in / Miscibility with:**

- **Water:** Fully miscible

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

**Viscosity:**

- **Dynamic at 20 °C:** 0.802 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:

- **Oxidising agents**

10.6 Hazardous decomposition products:

- **Carbon monoxide and carbon dioxide**
- **Nitrogen oxides (NOx)**

**SECTION 11: Toxicological information**

11.1 Information on toxicological effects

**Acute toxicity**

- Harmful if inhaled.
- Harmful in contact with skin.
- Danger by skin resorption.

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

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

- **Oral LD50:** 2000 mg/kg (rat)
- **Dermal LD50:** 4720 mg/kg (rabbit)
- **Inhalative LC50/4H:** 5.9 mg/L/4H (rat)

**Skin irritation or corrosion:**

May cause irritation

**Eye irritation or corrosion:**

Causes serious eye irritation.

**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:**

As per criteria, not classifiable as to carcinogenicity to humans.

ACGIH A4: Not classifiable as a human carcinogen. Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains tumorigenic and/or carcinogenic and/or neoplastic data for this substance.

**Reproductive toxicity:**

- May damage fertility or the unborn child.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains reproductive data for this substance.

**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.

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:
Do not allow material to be released to the environment without proper governmental permits.
Water hazard class 1 (Assessment by list): 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.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings:
Recommendation: Disposal must be made according to official regulations.
Recommended cleaning agent: Water, if necessary with cleaning agent.

SECTION 14: Transport information

UN-Number
ADR, IMDG, IATA
UN2265
14.2 UN proper shipping name
ADR
2265 N,N-DIMETHYLFORMAMIDE
IMDG, IATA
N,N-DIMETHYLFORMAMIDE
14.3 Transport hazard class(es)
ADR
Class
3 (F1) Flammable liquids.
Label
3
IMDG, IATA
Class
3 Flammable liquids.
Label
3
Packing group
ADR, IMDG, IATA
III
14.5 Environmental hazards:
Not applicable.
14.6 Special precautions for user
Kemler Number:
30
EMS Number:
F-E,S-D
Stowage Category
A
14.7 Transport in bulk according to Annex II of Marpol and the IBC Code
Not applicable.
Transport/Additional information:
ADR
Excepted quantities (EQ): E1
Limited quantities (LQ): 5L
Exempted quantities (EQ): Code: E1
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 1000 ml
Transport category
Tunnel restriction code
D/E
IMDG
Limited quantities (LQ): 5L
Exempted quantities (EQ): Code: E1
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 1000 ml
UN "Model Regulation":
UN 2265 N,N-DIMETHYLFORMAMIDE, 3, III

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 listed.
Standard for the Uniform Scheduling of Medicines and Poisons S5, S6
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, 30, 40

(Contd. on page 5)
Trade name N,N-Dimethylformamide

National regulations
Information about limitation of use:
Employment restrictions concerning young persons must be observed.
Employment restrictions concerning women of child-bearing age must be observed.
For use only by technically qualified individuals.
Classification according to VbF: Not applicable

Water hazard class: Water hazard class 1 (Assessment by list): slightly hazardous for water.

Other regulations, limitations and prohibitive regulations
ELINCS (European List of Notified Chemical Substances) Substance is not listed
Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.
This substance is included in the Candidate List of Substances of Very High Concern (SVHC) according to Regulation (EC) No. 1907/2006 (REACH).
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.
15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

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:
ICAO: International Civil Aviation Organisation
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
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
ATA: 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)
VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NOSH: National institute for Occupational Safety
OSHA: Occupational Safety and Health Administration (USA)
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Eye Irrit. 2: Serious eye damage/eye irritation – Category 2
Repr. 1B: Reproductive toxicity – Category 1B