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

1.1 Product identifier
2,6-Dimethyl-4-heptanone, (sum of 2,6-Dimethyl-4-heptanone & 4,6-Dimethyl-2-heptanone)

1.3 Details of the supplier of the safety data sheet
Manufacturer/Supplier: Alfa Aesar GmbH & Co.KG
A Johnson Matthey Company
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.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC
Xi; Irritant R37: Irritating to respiratory system.
R10: Flammable.

STOT SE 3 H335 May cause respiratory irritation.

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

Hazard pictograms
GHS02, GHS07

Signal word Warning

Hazard statements
H226 Flammable liquid and vapour.
H335 May cause respiratory irritation.

Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. - No smoking.
P241 Use explosion-proof electrical/ventilating/lighting/equipment.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P303+P361+P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
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

3.2 Mixtures
Dangerous components:

CAS: 108-83-8 EINECS: 203-620-1 2,6-Dimethyl-4-heptanone
CAS: 19549-80-5 4,6-Dimethyl-4-heptanone

Additional information None known.

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.
After skin contact Seek immediate medical advice.
After eye contact Instantly wash with water and soap and rinse thoroughly.
After swallowing Rinse opened eye for several minutes under running water. Then consult doctor.

4.2 Most important symptoms and effects, both acute and delayed

After swallowing Seek medical treatment.

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 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

(Contd. on page 2)
Trade name: 2,6-Dimethyl-4-heptanone, (sum of 2,6-Dimethyl-4-heptanone & 4,6-Dimethyl-2-heptanone)

5.3 Advice for firefighters

SECTION 6: Accidental release measures
6.1 Personal precautions, protective equipment and emergency procedures
Wear protective equipment. Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.

6.2 Environmental precautions:
Do not allow material to be released to the environment without proper governmental permits. Do not allow to enter the ground/soil.

6.3 Methods and material for containment and cleaning up:
Keep away from ignition sources. Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).

Prevention of secondary hazards:
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. Keep away from heat and direct sunlight. Ensure good ventilation/exhaustion at the workplace.

Information about protection against explosions and fires:
Protect from heat. Protect against electrostatic charges.

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 oxidizing agents.

Further information about storage conditions:
Keep container tightly sealed. Store in cool, dry conditions in well sealed containers. Protect from heat and direct sunlight.

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:

108-83-8 2,6-Dimethyl-4-heptanone (66,0%)

<table>
<thead>
<tr>
<th>MAK (Germany)</th>
<th>MAK (TRGS 900) (Germany)</th>
<th>PEL (USA)</th>
<th>REL (USA)</th>
<th>TLV (USA)</th>
</tr>
</thead>
<tbody>
<tr>
<td>vgl.Abschn.1fb</td>
<td>200 mg/m³, 50 ppm</td>
<td>200 mg/m³, 50 ppm</td>
<td>150 mg/m³, 25 ppm</td>
<td>145 mg/m³, 25 ppm</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. Do not inhale dust / smoke / mist.

Maintain an ergonomically appropriate working environment.

Breathing equipment:
Protection of hands: Use breathing protection with high concentrations. 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: Impervious
Penetration time of glove material: Not determined
Eye protection: Safety glasses
Face protection
Body protection: Protective work clothing.

SECTION 9: Physical and chemical properties
9.1 Information on basic physical and chemical properties
General Information

Appearance: Liquid
Colour: Colourless
Smell: Unpleasant
Odour threshold: Not determined

pH-value: Not determined

Change in condition
Melting point/Melting range: -42 °C
Boiling point/Boiling range: 163-173 °C
Sublimation temperature / start: Not determined

Flash point: 49 °C
Inflammability (solid, gaseous): Not determined.
Ignition temperature: 345 °C
Trade name: 2,6-Dimethyl-4-heptanone, (sum of 2,6-Dimethyl-4-heptanone & 4,6-Dimethyl-2-heptanone)

Decomposition temperature: Not determined
Self-inflammability: Product is not self-igniting.
Critical values for explosion:
Lower: 0.8 Vol %
Upper: 6.2 Vol %
Steam pressure at 20 °C: 2.6 hPa
Density at 20 °C: 0.808 g/cm³
Relative density: Not determined.
Vapour density: Not determined.
Evaporation rate: Not determined.
Solubility in / Miscibility with Water: Not miscible or difficult to mix
Partition coefficient (n-octanol/water): Not determined.
Viscosity:
  dynamic: Not determined.
  kinematic: Not determined.
Solvency content: Organic solvents: 66.0 %

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 oxidizing agents
10.5 Incompatible materials: Oxidizing agents
10.6 Hazardous decomposition products: Carbon monoxide and carbon dioxide

SECTION 11: Toxicological information
11.1 Information on toxicological effects: LD/LC50 values that are relevant for classification:
Oral LD50 [5750 mg/kg (rat)]
Skin irritation or corrosion: May cause irritation.
Eye irritation or corrosion: May cause irritation.
Sensitization: No sensitizing effect known.
Genotoxicity: No classification data on carcinogenic properties of this material is available from the EPA, IARC, NTP, OSHA or ACGIH.
Reproductive toxicity: No effects known.
Carcinogenicity: No 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.
Carcinogenicity: No effects known.
Specific target organ system toxicity - single exposure: The product shows the following dangers according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version: Irritant.

SECTION 12: Ecological information
12.1 Persistence and degradability: No further relevant information available.
12.2 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 (Self-assessment): slightly hazardous for water.
Do not allow undiluted product or large quantities of it to reach ground water, water bodies 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: Hand over to disposers of hazardous waste.
Recommendation: Must be specially treated under adherence to official regulations.
Consult state, local or national regulations for proper disposal.
Uncleaned packagings: Disposal must be made according to official regulations.

SECTION 14: Transport information
UN-Number: UN1224
ADR, IMDG, IATA: 1224 KETONES, LIQUID, N.O.S. (DIISOBUTYL KETONE, 4,6-Dimethyl-4-heptanone)

(Contd. on page 4)
Safety data sheet  
according to 1907/2006/EC, Article 31

Trade name 2,6-Dimethyl-4-heptanone, (sum of 2,6-Dimethyl-4-heptanone & 4,6-Dimethyl-2-heptanone)

(Contd. of page 3)

14.3 Transport hazard class(es)
ADR

Class
Label
IMDG, IATA

3 (F1) Flammable liquids.
3

Class
Label
IMDG, IATA

3 Flammable liquids.
3

Packing group
ADR, IMDG, IATA
III

14.5 Environmental hazards:
Marine pollutant: No

14.6 Special precautions for user
Warning: Flammable liquids.
Kemler Number:
30
EMS Number:
F-E,S-D

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

14.5 Environmental hazards:
Marine pollutant: No

14.6 Special precautions for user
Warning: Flammable liquids.
Kemler Number:
30
EMS Number:
F-E,S-D

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

Transport/Additional information:

ADR
Excepted quantities (EQ):
E1
Limited quantities (LQ):
5L
Tunnel restriction code:
D/E
UN "Model Regulation":
UN1224, KETONES, LIQUID, N.O.S. (DIISOBUTYL KETONE, 4,6-Dimethyl-4-heptanone), 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
108-83-8 2,6-Dimethyl-4-heptanone

Standard for the Uniform Scheduling of Drugs and Poisons
None of the ingredients is listed.

Classification according to VbF:
A II

Technical instructions (air):
Class Share in %
NK 66.0

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

Other regulations, limitations and prohibitive regulations
ELINCS (European List of Notified Chemical Substances)
None of the ingredients are listed.

Substances of very high concern (SVHC) according to REACH, Article 57
None of the ingredients are listed.

REACH - Pre-registered substances
All ingredients are 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 Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Relevant phrases
H226 Flammable liquid and vapour.
H335 May cause respiratory irritation.
R10 Flammable.
R37 Irritating to respiratory system.

Department issuing SDS:
Health, Safety and Environmental 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)
IMO: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LD50: Lethal dose, 50 percent