n-Heptane

IDENTIFICATION

n-Heptane
Heptane

ZVG No: 13820
CAS No: 142-82-5
EC No: 205-563-8
INDEX No: 601-008-00-2

CHARACTERISATION

SUBSTANCE GROUP CODE

140110 Hydrocarbons, aliphatic, saturated

STATE OF AGGREGATION

The substance is liquid.

PROPERTIES

Colour: colourless

Odour:
slight, benzine-like

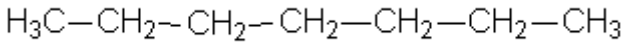
CHEMICAL CHARACTERISATION

Highly flammable liquid.
Vapours form explosive mixtures with air.
Practically insoluble in water.
Lighter than water.
Highly volatile.

Acute or chronic health hazards result from the substance.
The substance is hazardous to the aquatic environment.
(see: chapter REGULATIONS).

FORMULA

C7H16



Molar mass: 100,20 g/mol
Conversion factor (gaseous phase) at 1013 mbar and 20 °C:
1 ml/m³ = 4,17 mg/m³

TOXICOLOGY / ECOTOXICOLOGY

ECOTOXICOLOGICAL DATA

LC50 Fish (96 hours)

Minimum:	375 mg/l
Maximum:	375 mg/l
Median:	375 mg/l
Study number:	1

Reference for median:
Ghatak, D.B., M.M. Hossain, and S.K. Konar 1988. Acute Toxicity of n-Heptane and n-Hexane on Worm and Fish. Environ.Ecol. 6(4):943-947

Reference: 02072

PHYSICAL AND CHEMICAL PROPERTIES

MELTING POINT

Melting point: -91 °C

BOILING POINT

Boiling Point: 98 °C

DENSITY

DENSITY

Value:	0,68 g/cm³
Temperature:	20 °C

RELATIVE VAPOUR DENSITY
Ratio of the density to dry air at the same temperature and pressure
Value: 3,46

RELATIVE DENSITY OF THE VAPOUR-AIR-MIXTURE
Ratio of the density to dry air at 20 °C and standard pressure
Value: 1,11

VAPOUR PRESSURE

Vapour pressure: 47,4 mbar
Temperature: 20 °C

Vapour pressure: 78,1 mbar
Temperature: 30 °C

Vapour pressure: 124 mbar
Temperature: 40 °C

Vapour pressure: 189 mbar
Temperature: 50 °C

FLASH POINT

Flash point: -7 °C
Closed cup

IGNITION TEMPERATURE

Ignition temperature: 220,4 °C
Temperature class: T3
Minimum ignition energy: 0,24 mJ
Max. exper. safe gap (MESG): 0,91 mm
Explosion group: IIA

EXPLOSION LIMITS

Lower explosion limit:
0,84 vol. %
35 g/m³
Upper explosion limit:
6,7 vol. %
280 g/m³
Maximum explosion pressure:
9,4 bar

SOLUBILITY IN WATER

Concentration:	2,2 mg/l
Temperature:	25 °C

PARTITION COEFFICIENT (octanol/water)

log Kow: 4,66
Recommended value of LOG KOW Databank.

HAZARDOUS REACTIONS

Thermal decomposition:
Decomposition when heated.

Decompositon products:
Ethene; methane; ethane; propene; higher alkenes;

Hazardous chemical reactions:

The substance can react dangerously with:
strong oxidizing agents
phosphorus + chlorine

Electrostatic charging possible.

The substance forms an explosive mixture with air.

OCCUPATIONAL HEALTH AND FIRST AID

ROUTES OF EXPOSURE

Main Routes of exposure:
Under occupational conditions, the main intake pathway for n-heptane (H.) proceeds via the respiratory tract.[07619]

Respiratory tract:
From 2 independent kinetic studies on volunteers, pulmonary retention of 25 (+/- 5) and 29 % was estimated.[07619]

Skin:
H. is poorly absorbed via the skin.[99997]
0.14 µg/cm2 x h was determined as flux for liquid H. in a permeation study on isolated skin of rats.[07619]
This small absorption probably results from the extremely low solubility in water.[99999]

Gastrointestinal tract:
No quantitative data on absorption is available.[99983]
However, in the few oral tests available (with repeated administration), systemic effects

were demonstrated. This indicates effective absorption.[00408]

TOXIC EFFECTS

Main toxic effects:
Acute:
Slight irritation to the eyes and airways, irritation to the skin through prolonged contact, disturbance to the central-nervous system[07619]
Chronic:
Skin damage following frequent contact,[08012]
no valid substance-specific data available for humans[99983]

Acute toxicity:
High concentrations of vapors and aerosols and direct contact with the liquid are assumed to irritate the eyes and promote inflammation.[07729]
This assumption is probably based on (plausible) conclusions by analogy to other aliphatic hydrocarbons but this is neither confirmed by reports of experience nor by animal experiments.[99983]
Application of liquid H. to the forearms of 5 volunteers for about 1 hour led to reddening, pruritus, pigmentation, swelling and pains at the sites contacted. Pain generally disappeared 2 hours after the end of contact. When the contact lasted for more than 5 hours, blistering was observed.[08012]
There is a lack of information on the potential to sensitize. It cannot be derived from conclusions by analogy.[99983]
Based on the generally relatively low toxicity of the noxa and its limited capability to penetrate the intact skin, absorptive-toxic effects are hardly expected, not even following massive (short-term) skin contact. However, it should be taken into account that there is an increased inhalative risk in such situations due to the high volatility.[99999]
According to on various studies, the threshold of the gasoline-like odor of the vapors is between 50 and 414 ppm. Only a few valid animal experimental data are available on the irritating action to the airways. Irritative effects to the upper airways of mice were measured by the decrease of the respiratory frequency through stimulation of receptors in nerve endings of the trigeminus. They appeared at between 5600 and 21750 ppm at all concentrations within 5 minutes. 17400 ppm was derived as the RD50 value (50 % decrease of the respiratory frequency) and 175 ppm as the irritation threshold for humans.[99997]
The basis for the calculation of a threshold limit in workplaces was the RD0 value for mice. It was estimated to be 5450 ppm from the experiment mentioned above.[07619]
However, it is not the irritative action but the potential action to the CNS which is considered to be the most important toxicological endpoint following poisoning with H.[08012]
Such acute effects to humans were observed in several older studies but they were considered not to be valid information.[07619]
The statement that exposure of volunteers to 5000 ppm H. for 15 min would have caused "high-spirited happiness" or stupor lasting for about 30 minutes seems to be more reliable.
Later these persons suffered from anorexia, slight nausea, weakness, lethargy and a

gasoline-like taste for several hours.[08012]
Mice and rats exposed to 8000 - 15000 ppm for 30 - 60 minutes or to 13000 - 19000 ppm for 15 - 40 minutes fell into narcosis or died.[07619]
Neither reports on experience of humans nor animal experiments are available for the acute oral exposure.[99983]
Gastrointestinal irritation with vomiting and later headache, vertigo, nausea, excitation, functional disturbances to the heart and respiratory paralysis are to be expected.[07729]
However, the risk of serious lung damage due to aspiration of the liquid is probably higher than the risk through the systemic effect.[99999]

Chronic toxicity:
Repeated direct contact of the liquid with the skin leads to degreasing.[08012]
This promotes dermatitis which can be conditioned irritatively or through other factors.
Neurotoxic effects are discussed as the main issue. On the other hand, studies available on this do not provide any evidence for the assumption that H., analogous to its homologue n-hexane, could produce a typical peripheral neuropathy resulting in peripheral paralysis. Inhalative chronic studies on rats (up to 26 weeks) also did not provide any such evidence.[07619]
Furthermore, apparently no nerve damage was registered in an subchronic oral study on rats which received a total dose of 260 g H./kg bw intermittently over 13 weeks. Changed bladder weights, hypoglycemia and loss of body weight were the only symptoms mentioned.[00408]
In a 28-day study on rats, ototoxic action through H. was found by registration of a dose-proportional incidence of a hearing threshold increase of 10 dB.[99997]

Reproductive toxicity, Mutagenicity, Carcinogenicity:
Reproductive toxicity:
No data is available.
Mutagenicity:
Several in-vitro studies on microorganisms and cell preparations did not provide any indication of a genotoxic potential.[07619]
Carcinogenicity:
No studies are available.[99983]

Biotransformation and Excretion:
The substance is rapidly distributed in the whole body and is temporary accumulated in the fatty tissue in particular.
In the organism, H. is oxidized by monooxigenases. Above 35 ppm the kinetics of this metabolic pathway are apparently changed by saturation. The main metabolite is 2-heptanol; 3-heptanol, 2-heptanone and 4-heptanone were identified as further products in humans and rats.
2,5-Heptandione occurred in such a small amount that this observation can explain that a gamma-diketo-neuropathy, as through n-hexane, can generally not be set off by H.[07619]

Annotation:
This occupational health information was compiled on 11.11.05.
It will be updated if necessary.[99999]

FIRST AID

Eyes:
Rinse the affected eye with widely spread lids for 10 minutes under running water whilst protecting the unimpaired eye.
Arrange medical treatment.

Skin:
Remove contaminated clothing while protecting yourself.
Cleanse the affected skin areas with soap under running water.
Following massive contamination:[99999]
Arrange medical treatment.

Respiratory tract:
Whilst protecting yourself remove the casualty from the hazardous area and take him to the fresh air.
Lay the casualty down in a quiet place and protect him against hypothermia.
In the case of breathing difficulties have the casualty inhale oxygen.
If the casualty is unconscious but breathing lay him in a stable manner on his side.
Arrange medical treatment.

Swallowing:
During swallowing or during vomiting there is a high danger of aspiration. Therefore, never provoke vomiting.[02050]
Have the casualty slowly drink 1 glass of water (without charcoal or other additives).[00022]
Arrange medical treatment.
During spontaneous vomiting be absolutely sure to hold the head of the casualty low with the body in a prone position in order to avoid aspiration.[99999]

Information for physicians:
In comparison to the homologous n-hexane, the substance is not very toxic. However, there is a high danger of aspiration if the liquid is ingested.[08011]
- Symptoms of acute poisoning:
Eyes: following short-term direct contact probably only slight irritation, probable promotion of inflammation, potential to damage the cornea is unknown[07729]
Skin: reddening, pruritus, pigmentation, swelling, pain, probable blistering (severity of symptoms particularly dependent on the duration of the contact);[08012]
absorptive-toxic effects more likely through vaporization -> inhalation[99999]
Inhalation: irritation to the airways and systemic effects through high vapor concentrations
Ingestion: damage to the lung following aspiration (highly probable); following swallowing of large doses probably gastrointestinal irritation, vomiting, absorptive-toxic effects[08012]
Absorption: central-nervous effects (nausea, headache, vertigo, narcosis in single cases), functional disturbances to the heart, dyspnoea up to respiratory paralysis.
- Medical advice:
To be on the safe side, ophthalmologic post-treatment is recommended in every case following contact of the eyes with the liquid.

Carefully rerinse contaminated skin with soap and water. Regreasing through a dermatic is probably sufficient as a therapy.
Following inhalation of vapors, the functions of the heart/circulatory system and lung should initially be observed carefully.[07729]
For dyspnoea, give the patient additonal oxygen. Irritation, which can mainly occur following inhalation of aerosols, should be initially treated with antitussiva and antipyretic agents.[99997]
Following oral intake of the liquid, therapy for possible aspiration is the main issue. This is noticeable by persistent cough, signs of suffocation, tachypnoea, somnolence, increased respiratory sounds, bronchospasm and cyanosis. These symptoms can initially be alleviated by application of oxygen. If this is not successful, rapid intubation is indicated. Because arrhythmia can occur, start monitoring the heart/circulatory functions as soon as possible. Bronchospasm should not be treated with epinephrine because sensitization of the myocard to catecholamines can be present or can develop. Inhalable beta-sympathomimetic agents (eg salbutamol, fenoterol) are recommended.
Primary elimination of ingested liquid by means of emesis is contraindicated because of a danger of secondary aspiration. The same applies to charcoal because it can hardly bind aliphatic hydrocarbons but can act as an emetic. Gastrolavage, if absolutely necessary, can be carried out (following intubation).
Following hospitalization of the casualty, x-ray diagnostics should be carried out as soon as possible.[08011]

Recommendations:
Provide the physician information about the substance/product and treatment already administered.
[99999]
According to an older report, the use of corticosteroids for therapy of pneumonia (of low to moderate degree of severity), which was triggered by aspiration of hydrocarbons, was shown to have been unsuccessful in a double-blind study on children.
[08011,99996]

Annotation:
This first aid information was compiled on 12.09.05.
It will be updated if necessary.

OCCUPATIONAL HEALTH CHECK

Prophylaxis offer: For activities involving this substance occupational medical prevention has to be offered.

Deadlines: Occupational medical prevention has to be offered to employees prior to taking up work. Deadlines for the proposal of regularly recurrent occupational medical prevention are to gather from the Occupational Health Rule (Arbeitsmedizinische Regel) “AMR Nummer 2.1”.

SAFE HANDLING

TECHNICAL MEASURES - HANDLING

Workplace:
Provision of very good ventilation in the working area.
Vapour/air mixtures are heavier than air. Adequate ventilation at the floor area must be ensured as well.
The floor must be solvent resistant.
The floor should not have a floor drain.
Washing facility at the workplace required.
When handling excessive amounts of the substance an emergency shower is required.

Equipment:
Use only closed apparatus.
If release of the substance cannot be prevented, then it should be suctioned off at the point of exit.
Consider emission limit values, a purification of waste gases if necessary.
Label containers and pipelines clearly.

Suitable materials:
Stainless steel

Advice on safer handling:
Take care to maintain clean working place.
The substance must not be present at workplaces in quantities above that required for work to be progressed.
Do not leave container open.
Use leak-proof equipment with exhaust for refilling or transfer.
Do not transport with/using compressed air.
Avoid splashing.
Fill only into labelled container.
Use solvent resistant utensils.
Avoid any contact when handling the substance.
Prevent seepage into flooring (use of a steel tub).
Use an appropriate exterior vessel when transporting in fragile containers.

Cleaning and maintenance:
Use protective equipment while cleaning if necessary.
Only conduct maintenance and other work on or in the vessel or closed spaces after obtaining written permission.

TECHNICAL MEASURES - STORAGE

Storage:
Do not use any food containers - risk of mistake.
Containers have to be labelled clearly and permanently.
Store in the original container as much as possible.
Use breakable containers only up to 2 litres content.
Keep container tightly closed.
Store in a cool place.

Keep container in a well-ventilated place.
Store smaller vessels in cabinets with collecting tubs.
The maximum permissible stored quantities are to be found in the Technische Regel für Gefahrstoffe "Lagerung von Gefahrstoffen in ortsbeweglichen Behältern" (TRGS 510).
Storage is not permissible in hallways, thoroughfare, stairways, public hallways and corridors, on the roof, in attics, and in workrooms.

Conditions of collocated storage:
Storage class 3 (Flammable liquid substances)
Only substances of the same storage class should be stored together.
Collocated storage with the following substances is prohibited:
- Pharmaceuticals, foods, and animal feeds including additives.
- Infectious, radioactive und explosive substances.
- Gases.
- Other explosive substances of storage class 4.1A.
- Flammable solid substances or desensitized substances of storage class 4.1B.
- Spontaneously flammable substances.
- Substances liberating flammable gases in contact with water.
- Strongly oxidizing substances of storage class 5.1A.
- Ammonium nitrate and preparations containing ammonium nitrate.
- Organic peroxides and self reactive substances.
- Non combustible acutely toxic substances of storage class 6.1B.

Under certain conditions the collocated storage with the following sub-stances is permitted (For more details see TRGS 510):
- Oxidizing substances of storage class 5.1B.
- Noncombustible toxic or chronically acting substances of storage class 6.1D.
- Combustible solids of storage class 11.

The substance should not be stored with substances with which ha-zardous chemical reactions are possible.

TECHNICAL MEASURES - FIRE AND EXPLOSION PROTECTION

Technical, constructive measures:
Substance is combustible.
Fire fighting equipment must be available.
Measures required by the "Explosionsschutz-Richtlinie":
- Preventing the formation of an explosive atmosphere (limiting and monitoring the concentration, making inert, sealing, ventilation, warning systems, etc.)
- Preventing the ignition of an explosive atmosphere (separation into zones, removal of sources of ignition, explosion-proof electrical installation, grounding, etc.)
- Architectural measures to limit the effects of an explosion (explosive-force-proof construction, release of explosive pressure, explosion suppression, etc.)

Take precautionary measures against static discharges.
Earth all parts which can be electrically charged.
Use explosion-protected electrical operating systems, pumps, controls, and valves.

Precaution on handling:
The vapour-air-mixture is explosive.

Area with explosion risk.
Keep at a distance from sources of ignition (e.g. electrical devices, open flames, heat sources, sparks).
Observe the smoking prohibition!
Absolutely no welding in the working area.
Only work with vessels and lines after these have been thoroughly rinsed.
Work done with fire or open flame should only be carried out with written permission if the risk of fire or explosion cannot be completely eliminated.
Use caution with empty vessels; explosion is possible in case of ignition.
Do not use any tools that cause sparks.
It must be avoided that gases or vapours can escape into other rooms where sources of ignition are present.
Creeping gases from afar may cause ignition.

ORGANISATIONAL MEASURES

Instruction on the hazards and the protective measures using instruction manual (TRGS 555) are required with signature if just more than one minor hazard was detected.
Instruction must be provided before employment and then at a minimum of once per annum thereafter.
An escape and rescue plan must be prepared when the location, scale, and use of the work-site so demand.
It must be assured that the workplace limit values are being maintained. If the limit values are exceeded, additional protection measures are necessary.
The measurements must be recorded and kept on file.
Observe the restrictions on juvenile employment as defined in the "Jugendarbeitsschutzgesetz".
Observe the restrictions on the employment of expectant and nursing mothers as defined in the "Mutterschutzverordnung".
Only employees are permitted to enter the work areas. Signposting to this effect must be displayed.

PERSONAL PROTECTION

Body protection:
Depending on the risk, wear a tight protective clothing or a suitable chemical protection suit.
The protection clothing should be solvent resistant.
Wear flameproof, antistatic protective clothing.

Respiratory protection:
In an emergency (e.g.: unintentional release of the substance, exceeding the occupational exposure limit value) respiratory protection must be worn. Consider the maximum period for wear.
Respiratory protection: Gas filter A, Colour code brown.
Use insulating device for concentrations above the usage limits for filter devices, for oxygen concentrations below 17% volume, or in circumstances which are unclear.

Eye protection:
Sufficient eye protection should be worn.
Wear glasses with side protection.

Hand protection:
Use protective gloves. The glove material must be sufficiently impermeable and resistant to the substance. Check the tightness before wear. Gloves should be well cleaned before being removed, then stored in a well ventilated location. Pay attention to skin care.
Skin protection cremes do not protect sufficiently against the substance.
Textile or leather gloves are completely unsuitable.
The following materials are suitable for protective gloves (Permeation time >= 8 hours):
Nitrile rubber/Nitrile latex - NBR (0,35 mm)
Fluoro carbon rubber - FKM (0,4 mm)
Protective gloves of the following materials should not be worn longer than 1 hour continually (Permeation time >= 1 hour):
Polychloroprene - CR (0,5 mm)
Following materials are unsuitable for protective gloves because of degradation, severe swelling or low permeation time:
Natural rubber/Natural latex - NR
Butyl rubber - Butyl
Polyvinyl chloride - PVC

The times listed are suggested by measurements taken at 22 °C and constant contact. Temperatures raised by warmed substances, body heat, etc. and a weakening of the effective layer thickness caused by expansion can lead to a significantly shorter breakthrough time. In case of doubt contact the gloves' manufacturer. A 1.5-times increase / decrease in the layer thickness doubles / halves the breakthrough time. This data only applies to the pure substance. Transferred to mixtures of substances, these figures should only be taken as an aid to orientation.

Occupational hygiene:
Foods, beverages and other articles of consumption must not be consumed at the work areas. Suitable areas are to be designated for these purposes.
Avoid contact with skin. In case of contact wash skin.
Avoid inhalation of vapour or mist.
Avoid contact with clothing. Contaminated clothes must be exchanged and cleaned carefully.
Increased risk of combustion from wicking.
Provide washrooms with showers and if possible rooms with separate storage for street clothing and work clothing.
The skin must be washed with soap and water before breaks and at the end of work.
Apply fatty skin-care products after washing.

DISPOSAL CONSIDERATIONS

Hazardous waste according to Waste Catalogue Ordinance (AVV).
If there is no way of recycling it must be disposed of in compliance with the respective

national and local regulations.

Collection of small amounts of substance:
Do not put/place waste into sink or dust bin.
Place in a collection container for halogen-free organic solvents and solutions of halogen-free organic substances.
Collection vessels must be clearly labelled with a systematic description of their contents. Store the vessels in a well-ventilated location. Entrust them to the appropriate authorities for disposal.

ACCIDENTAL RELEASE MEASURES

Shut off all sources of ignition.
Evacuate area. Warn affected surroundings.
Wear respiratory protection, eye protection, hand protection and body protection (see chapter Personal Protection).
Absorb any spilt liquid with an absorbent (e.g. diatomite, vermiculite, sand) and dispose of according to regulations.
Use non-sparking tools.
Afterwards ventilate area and wash spill site.

Endangerment of watert:
Severe hazard to waters. Avoid penetration into water, drainage, sewer, or the ground.
Inform the responsible authorities about penetration of even small quantities.

FIRE FIGHTING MEASURES

Classes of fires:

B liquid or melting substances

Suitable extinguishing media:
Dry extinguishing powder
Carbon dioxide

Instructions:
Cool surrounding containers with water spray.
If possible, take container out of dangerous zone.
Heating causes a rise in pressure, risk of bursting and explosion.
Shut off sources of ignition.
Beware of backfire.
Use only explosion proved equipment.
Explosion danger by penetration into sewerage.
Do not allow runoff to get into the sewage system.

Special protective equipment:
Attention! Hazardous decomposition products may occur.
Carbon monoxide and carbon dioxide
Wear self-contained breathing apparatus.

REGULATIONS

Classification:
Flammable liquids, Category 2; H225
Aspiration hazard, Category 1; H304
Skin irritation, Category 2; H315
Specific Target Organ Toxicity (single exposure), Category 3; H336
Hazardous to the aquatic environment, Acute Category 1; H400
Hazardous to the aquatic environment, Chronic Category 1; H410

Signal Word: "Danger"

Hazard Statement - H-phrases:
H225: Highly flammable liquid and vapour.
H304: May be fatal if swallowed and enters airways.
H315: Causes skin irritation.
H336: May cause drowsiness or dizziness.
H410: Very toxic to aquatic life with long lasting effects.

Precautionary Statement - P-phrases:
P210: Keep away from heat, hot surfaces, sparks, open flames and other sources of ignition. No smoking.
P273: Avoid release to the environment.
P301+P310: IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
P331: Do NOT induce vomiting.
P302+P352: IF ON SKIN: Wash with plenty of soap and water.
P403+P235: Store in a well-ventilated place. Keep cool.

Manufacturer's specification by Merck

Reference: 01211

The substance is listed in appendix VI, table 3.1 of CLP regulation.
The given classification can deviate from the listed classification, since this classification is to be complemented concerning missing or divergent danger classes and categories for the respective substance.

Reference: 99999

GHS-CLASSIFICATION OF MIXTURES

The classification of mixtures containing this substance results from Annex 1 of Regulation (EC) 1272/2008.

Reference: 07501

OLD CLASSIFICATION

F; R11
Xn; R65
Xi; R38
R67
N; R50/53

F Highly flammable

Xn Harmful

N Dangerous for the environment

Risk phrases (R-phrases):

R 11	Highly flammable
R 38	Irritating to skin
R 65	Harmful: may cause lung damage if swallowed
R 67	Vapours may cause drowsiness and dizziness
R 50/53	Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment

EU classification according to GHS regulation, appendix VI, table 3.2
Scope:
Heptane and isomers

Reference: 07501

OLD CLASSIFICATION OF MIXTURES

Note 4
Preparations containing these substances have to be classified as harmful according to R65 if they meet the criteria in section 3.2.3 in Annex VI.

Reference: 07501

WORKPLACE LABELLING ACCORDING TO GERMAN ASR A1.3

Prohibition label:

No open flame; fire, open ignition sources and smoking prohibited

No admittance for unauthorized persons

Warning label:

Caution - inflammable material

Precept label:

Use safety goggles

Wear safety gloves

GERMAN WATER HAZARD CLASS

Substance No: 120
WGK 2 - hazard to waters
Heptane and isomers
Classification according to the Administrative Regulation of Substances Hazardous to Water (VwVwS)
Classification of the Commission for the Evaluation of Substances Hazardous to Water (KBwS)

TECHNICAL INSTRUCTIONS ON AIR QUALITY CONTROL (TA LUFT)

Chapter 5.2.5 Organic Substances, except dusts.
The following values, specified as overall carbon, are in all not allowed to be exceeded

in exhaust gas:

Mass flow: 0,50 kg/hr

or

Mass conc.: 50 mg/m³

At old units with an annual mass flow till 1,5 Mg/a, specified as total carbon, the emissions in exhaust gas are not allowed to exceed 1,5 kg/h.

TRANSPORT REGULATIONS

UN Number: 1206
Shipping name: Heptanes
Hazard Identification Number: 33
Class: 3 (Flammable Liquids)
Packing Group: II (medium danger)
Danger Label: 3

Special labelling: Symbol (fish and tree)

Tunnel restrictions:
Transports in bulk or in tanks: passage forbidden through tunnels of category D and E.
Other transports: passage forbidden through tunnels of category E.

TRGS 900 - GERMAN OCCUPATIONAL EXPOSURE LIMIT VALUES

500 ml/m³
2100 mg/m³

Peak limitation: Excursion factor 1

Duration 15 min, mean; 4 times per shift; interval 1 hour
Category I - Substances for which local irritant effects determine the exposure limit value, also respiratory allegens

Source: DFG

Scope:
Heptane, all isomers

Reference: 05350

EC OCCUPATIONAL EXPOSURE LIMIT VALUES

Commission Directive 2000/39/EC
Recommended indicative occupational exposure limit value for the European Community
A national occupational exposure limit value has to be set.
8 hours limit value: 2085 mg/m³ (500 ppm)

RECOMMENDATIONS OF MAK-COMMISSION

This data is recommended by scientific experience and is not established law.

500 ml/m³
2100 mg/m³

Limitation of exposure peaks:
Excursion factor 1
Duration 15 min, mean; 4 times per shift; interval 1 hour

Pregnancy: Group D
A classification according to groups A-C is not possible, because either there is no data available or the available data is insufficient for a final evaluation.

Reference: 08100

GERMAN BIOLOGICAL EXPOSURE INDICES

Parameter:	n-Heptane
Assay material:	Whole blood
	There is at present insufficient data for the derivation of a BAT value; however, documentation for this substance has been published.

Reference: 08100

Parameter:	2,5-Heptanedion
Assay material:	Urine
	There is at present insufficient data for the derivation of a BAT value; however, documentation for this substance has been published.

Reference: 08100

GERMAN ORDINANCE OF FAILURE

Data still refer to the old hazard classification, because this Ordinance has not yet been converted to GHS.

Annex I, No: 9a

Threshold for operating range to §1 sec. 1

Record 1:	100000 kg
Record 2:	200000 kg

Scope: substances dangerous for the environment (risk phrases R 50 or R 50/53)

Please note: In the GESTIS database only the lowest amount threshold of a substance is given. If a substance has several classifications, use must be made of the amount threshold from appendix I which corresponds to the respective classification.

RESTRICTIONS OF USE / BANS OF USE

REACH Regulation (EC) No 1907/2006 Annex XVII; status - September 2012
Annex XVII, Point 3
1. The putting into circulation and the utilisation of the substance is not allowed in decorative objects, games and joke articles.
2. Substances labelled with R 65 which can be utilised as fuels in decorative lamps and are put in circulation in amounts of 15 l or less must not contain a dye and/or a perfume.
Further information on prohibitions can be taken from the regulation.

Prohibitions of Chemicals Ordinance; status - November 2010
Annex to §1, Section 5
See entry to Annex XVII, Point 3 of REACH Regulation (EC) No 552/2009.

Annex to §1, Section 21
It is prohibited to release to private end-consumers:
1. the substance in aerosol packages for purposes of entertainment and decoration as well as
2. the substance as component of a formulation in aerosol packages for purposes of entertainment and decoration
Further information on prohibitions and exceptions can be taken from the Prohibition of Chemicals Ordinance and the REACH Regulation (EC) No 552/2009 Annex XVII, Point 40.

Directives on Safety in School (BGR/GUV-SR 2003)
Activity ban for pupils till grade 4 (form) inclusive.
Substance list to GUV-SR 2004 (as of 11.2010)

Consumer Goods Ordinance; status - February 2011
Attachment 1 to § 3, Point 5
The substance must not be utilised for the production or treatment of joke articles.

FURTHER REGULATIONS

TRGS 200
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