

## Safety Data Sheet

in accordance with Article 31 Regulation (EC) No 1907/2006 of the European Parliament and of the Council of 18 December 2006

Name of the substance:

**MERCURY/RTU**

Date of issue: 1.6.2008

Revision date:

### 1. Identification of the substance or preparation and of the company/undertaking

1.1 **Identification of the substance or preparation:** Mercury/Rtu

CAS number: 7439 - 97 - 6

ES (EINECS) number: 231 - 106 - 7

Registration number assigned under Article 20(1):

Another names of the substance: **dental mercury; technical mercury; polarographic mercury**

1.2 **Use of the substance/preparation:** polarography; dental amalgam; manufacturing of industrial thermometers; chlor-alkali manufacturing; mercury compounds production; mercury vapour lamps production; etc.

### 1.3 Company/under taking identification:

Manufacturer: **BOME Ltd.**

Address: Parkány 550, 391 65 Bechyn  
Czech Republic

Telephone number: + 420 381 213 440;  
+ 420 267 750 058

Fax: + 420 381 213 440;  
+ 420 267 750 011

Competent person responsible for the Safety Data Sheet :  
Ing. Vladimír Borek

e-mail: info@bome.cz

### 1.4 Emergency telephone:

Toxicological info centrum:  
(Toxikologické informa ní st edisko) Na Boji-ti 1,128 08 Prague 2  
Czech Republic

## 2. Hazards identification:

### Classification of the substance :

Symbols of danger: T, N

R - phrases : R23, R,33, R50-53

### **The most significant health effects on humans by use of metallic mercury**

- inhalation of concentrated mercury vapours can lead to acute mercury intoxication; Symptoms after consumption: mouth-burn, aphagopraxia, sternodynia and splachnodynia, salivation, colics, bloody diarrhea and spasmus; in the case of the large dose becomes death;
- **chronic intoxication**: possibility of digestive tract damage and follow-up past-pointing; stomatitis, chronic common cold, rhinorrhagia and inflammation; possible ulcers and cheilitis and face inflammation; dysaphia, dysacousia, dysequilibrium, typical large somnolence; neurotoxicity

### **The most significant environmental effects by use of metallic mercury**

- once released mercury persists (is persistent) in the environment, where is circulating among air, water, sediments, soil and biota in various forms;
- majority mercury emissions released in the air in the form elemental mercury vapours are transported far from emission resources;
- once deposited mercury and mercury compounds (in soil, water, sediments) can be changed by microbial metabolism to methylmercury which has the capacity to collect in organisms (bioaccumulate) and to concentrate up food chains especially in the aquatic food chain (fish and marine mammals)

from this results following:

- especially danger to aquatic organisms and animals
- can cause long-term harmful effects in aquatic environment
- cumulative hazard effects

### **Possible incorrect use of the substance:**

- long-term storage in open containers
- storage in the fragile containers on the much-frequented places

## 3. Composition/information on Ingredients

3.1 Concentration: max. 99,9995 % Hg

Eliminate contaminated environment

### **On inhalation:**

Symptoms: headache; metal taste in the mouth; vertigo; inarticulate speech; tipsy walk; sometimes excessive salivation; on a heavy intoxication convulsions and kidney insult.

- transport the handicapped person out of the danger area
- in the case that the handicapped person is in consciousness/cognition, let sit comfortably or lay down; do not let him/her do a physical activity
- on accelerated or wheezy breathing let the handicapped person sit with soft supported back and underlaid knees; if possible administer oxygen
- **transport the handicapped person to hospital as soon as possible**

### **In contact with skin:**

Symptoms: mercury is slightly absorbed by skin; an intoxication by mercury comes up from droplets, which have penetrated under the skin of fingers;

- take away the contaminated clothes
- wash carefully contaminated part of skin with soap and water during at least 10 minutes; use normal soap **do not use detergent**;

### **Eyes affection:**

Symptoms: slight irritation; (some compounds of mercury can cause burn of cornea); if possible take away contact lens;

- rinse wide opened eyelids with plenty of water during at least 10 minutes;
- transport the handicapped person to hospital for examination

### **On ingestion:**

Symptoms: at slight intoxication put in an appearance, diarrhoea and metal taste in mouth; at heavy intoxication put in an appearance splanchnodynia, shock, blood diarrhoea; kidney insult occurs;

- never urge the handicapped person to vomiting!
- insure yourself if the handicapped person is in consciousness/cognition; if he/she has not any reaction, press the tendon of Achilles; if there is not any reaction either, he/she is in unconsciousness;

### **In unconsciousness: nothing put into mouth**

- check breathing and pulse; in the case of necessity carry out reanimation of mouth to mouth respiration and heart massage
- fix the handicapped person in stabilized position

If the handicapped person is in consciousness/cognition:

- let him drink about ½ litre of water
- do not evoke vomiting;

**Ensure immediate transport to hospital!**

- in many serious cases of the intoxication with a chemical substance occur convulsions; their intensity used to be different ó from severe muscle clonus along the whole body to slight shivering, which may appear along the whole body or possibly only in one or two limbs; beginning of convulsions may be accompanied by apsygia, which may last even several hours;
- it is necessary to check a patency of air passages; to pull out glossoptosis (sunken tongue), if the handicapped person does not respire; begin immediately with mouth to mouth artificial respiration; if the pulse on the neck (collum) is not palpable, make cardiac massage;
- if convulsions persist, do not hold the handicapped person by force on the ground, by reason that it is possible to cause him/her more serious injury;
- do not introduce any objects to his/her mouth, which might prevent tongue from bite; it is less effective and it can cause broken teeth; optionally can cause an obliteration of air passages.

## 5. Fire ó fighting measures:

### Suitable fire extinguishing mediums/agents:

- recommended extinguishing medium/agent ó water fogs or water spray

### Unsuitable fire extinguishing mediums/agents :

- water stream, extinguishing snow and foam

### Particular risks:

- risk of mercury vapours inhalation
- risk of rinsing down the chemical substance by water flux to sewerage

### Special protective equipment for firemen:

- breathing apparatus

### Other data:

to prevent mercury packagings by water spray cooling in the case of fire

**Mercury itself is non-flammable, inexplosive; during extinguishing activity it is necessary to prevent the chemical substance does not rinse down into sewerage or water stream.**

#### **Precautionary measures for protection of persons:**

- Ensure the withdrawal of unengaged workers to safe distance
- Ensure an intensive ventilation of the contaminated area
- Apply protective equipment in the contaminated area
- In accordance with internal instructions decide whether:
  - you can manager/remove small escape of mercury with your own force
  - you will initiate fire alarm and call fireemergency, eventually you evacuate the whole object.

#### **Precautionary measures for protection of the environment**

Removal mercury (Hg) spilt in larger volumes: ensure exhaustion of mercury vapours; gather together removals/spills of mercury and if it is possible remove liquid mercury (Hg) in a lockable nonmetallic container/containers; do not let the chemical substance rinse down into sewerage; do not let the chemical substance to enter into environment; use chemical protective clothing, including self-supporting breathing apparatus;

- In accordance with internal instructions ensure the contaminated water does not penetrate sewage;
- According to the range of mercury escape decide whether the contaminated mould should be transported to processing with the aim to separate the mercury and mercury compounds;

#### **Recommended methods of cleaning and deactivation:**

- Exhaust escaped mercury spills
- Sprinkle area of mercury releases (floor, etc.) by zinc powder; eventually spread the place of releases by a paste (a mixture of the same amounts of solid sulphur and calcium hydroxide with addition of water) in large amount; this mixture keep on the contaminated surface and let dry for 12 hours at least; then wash down the (yellow) mixture with clear water; in case of necessity the procedure repeat again;
- If the release of mercury is the small one and the mercury would penetrate into floor rents and gaps, it is necessary immediately to prevent from its evaporation by sprinkling these places by the zinc powder;
- For amalgamation it is possible accordingly to apply copper powder;
- The most effective way of deactivation is the use of tin powder, which is activated with 10% hydrochloric acid for 163 minutes before the application; sprinkle the contaminated area by the activated tin and bray; the particles of arised amalgam whip away and decontaminate the surface by solution of calcium polysulphide;

#### **Other data:**

- Solid residuals liquidate chemically or by pyrolysis
- All used decontamination equipments (dustpans, brushes, swabs, etc.) rinse with solution of calcium polysulphide or natrium sulphid;

#### 7.1 Handling.

- Use the prescribed protection equipment
- It is forbidden to eat, drink and smoke during handling with mercury
- Keep principles of the personal hygiene
- Do not handle mercury out of the designated area
- Do not work in civil clothes
- Switch on the ventilation 30 minutes before you start working
- Provide effective ventilation during the work with mercury
- Work with mercury only above the captured vessels

#### 7.2 Storage:

- Storage area have to be located out of the working place, where the mercury is processed
- Mercury can be stored only in authorized containers
- Temperature in the storage area can be 35 °C at maximum
- The closing device of mercury containers have to be always leakproof enough
- Never store mercury in conjunction with foodstuffs

#### 7.3 Specific use(s):

Mercury 99,999% is given among others for dental use for preparing amalgams directly in dental surgery;

Packaging: 390 mg ó 1 kg

### 8. Exposure control/Personal protection

#### 8.1 Exposure limit values:

PEL: average value = 0,05 mg.m<sup>-3</sup>

NPK: threshold limit value = 0,15 mg.m<sup>-3</sup>

Notes D, P:

D ó at the exposure substance penetration invokes by the skin significantly

P ó by the substance it is impossible exclude significant late impacts

#### 8.2.1 Occupational exposure controls

- a) Protection of respiratory apparatus/breathing organs: respirator (in dust environment), breathing apparatus (in the case of an accident, or fire), filter standard Hg-P3
- b) Hands protection: rubber gloves standard G106 made of latex with cotton coat for a middle level of risk
- c) Eye protection: protective glasses or protective shield
- d) Skin protection: impermeable protective working clothes; closed footwear (leather, rubber)

**Do not carry working clothes and footwear at home !!!!!!!!!!!!!!!!!!!!!!!**  
**Strict hygiene! It is necessary keep pregnant women, children and adolescents from exposure of mercury.**

#### Technical measures:

- \* Persons working with mercury undergo regular medical examination.
- \* Measuring of mercury level in blood and in urine at the medical examination and attendance.

#### Warning:

The following limits of high intoxication are indicated for mercury:

- \* 1 g Hg - quick poisoning to death
- \* 150-200 mg Hg - acute and often deadly poisoning
- \* 0.1-1 mg daily - chronic poisoning after several weeks
- \* less than 0.005 mg daily - poison symptoms only with particularly sensitive persons

#### 8.2.2 Environmental exposure controls :

In conformity with the Act no. 86/2002 Coll. about air protection as amended by the latest regulations/degrees by mercury releases reduction and elimination from the industrial production and looking for substitution its use in industrial processes and products

### 9. Physical and chemical properties:

#### 9.1 General information

Appearance: Elemental mercury is a shiny, silver-white and high mobile metal that is a liquid at room temperature; in solid state is soft and draw; is stable in the air; reacts to a great extent with elemental sulphur and halogens; with some metals makes up liquid as well as solid alloys ó amalgams; elemental mercury clearly volatilizes already at room temperature; (in 1 m<sup>3</sup> of air saturated by mercury vapours óat 20°C is 14 mg Hg;

odourless

9.2 **Important health, safety and environmental information**

pH:	.
Boiling point/boiling range:	376,73°C
Flash point:	.
Flammability (solid, gas):	non-flammable
Explosive properties:	inexplosive at room conditions and storage
Oxidising properties:	.
Vapour pressure (at 20°C/at 30°C):	0,16 Pa/0,37 Pa
Relative density: (water = 1):	13,5459 kg.m <sup>-3</sup> at 20 °C
Solubility:	<b>soluble in acidic environment</b> (in particular in nitric acid, concentrated sulphuric acid, concentrated hydrochloric acid)
Water solubility:	imperceptibly soluble
Partition coefficient: n-octanol/water	.
Viscosity (dynamic):	1,55 mPa.s <sup>-1</sup> at 20°C
Viscosity (kinetic):	0,118 10 <sup>-6</sup> m <sup>2</sup> .s <sup>-1</sup> at 21,1°C
Vapour density (relative): (air = 1):	6,93 kg.m <sup>-3</sup>
Relative density of the liquid: (water = 1):	13,5459 at 20°C
Evaporation rate:	.

9.3 **Other information:**

Miscibility:	.
Fat solubility:	insoluble
Conductivity:	conduct electric current/ flux
Melting point/Melting range:	-38,83°C

Atomic number: 80

Molar weight: 200,59 g.mol<sup>-1</sup>

## 10. Stability and reactivity

### 10.1 Conditions to avoid:

high temperature, flames, ignition resources (mercury is stable at room temperature conditions use and storage); in the case of blazing up releases toxic fumes, there is a threat of explosion;

### 10.2 Materials to avoid: metallic surfaces

### 10.3 Hazardous decomposition products

Upon heating toxic fumes are formed, they react violently with ammonia and halogens, causing fire and explosion hazard; attacks aluminium and many others metals forming amalgams;

## 11. Toxicological information:

Toxicity elemental mercury on its own is practically zero; more harmful is mercury vapours inhalation, see chapter 2 about mercury releases and its circulation;

Acute toxicity: LC<sub>50</sub> by inhalation, rat, for gases and fumes:  
0,5 < LC<sub>50</sub> ≤ 2 mg.l<sup>-1</sup> per 4 hrs.

Subchronic - chronic toxicity: aquatic environment  
high toxic for aquatic organisms:  
LC<sub>50</sub> (96 hrs., fishes) ≤ 1 mg.l<sup>-1</sup>  
EC<sub>50</sub> (48 hrs., dafnia) ≤ 1 mg.l<sup>-1</sup>  
IC<sub>50</sub> (72 hrs., algae) ≤ 1 mg.l<sup>-1</sup>

Sensibilisation: has not been find out (the substance is obligatory classified in accordance to Directive 67/548/EES about convergency legal and administrative documents/regulations with referece to classification, packaging and labeling dangerous substances concern as amended by the latest regulations/degrees)

Carcinogeny: EPA/IRIS classification: Group D1 ó not classifiable as a human carcinogen; (NTP carcinogen - IARC cathegory 3 )

Mutageny: has not been find out (the substance is obligatory classified Directive 67/548/EES about convergency legal and administrative documents/regulations with reference to classification, packaging and labeling dangerous substances concern as amended by the latest regulations/degrees)

Reproduction toxicity: has not been find out decisive effects on reproduction at elemental mercury vapours inhalation; hereto is however known all mercury forms can cause through placenta on fetus; these conclusions comes mostly from experiments on animals

documents/regulations with reference to classification, packaging and labeling dangerous substances concern as amended by the latest regulations/degrees)

Human expiriences:

**Short term exposure effects:**

The substance irritates the skin; inhalation of the vapours may cause pneumonitis; the substance may cause effects on the central nervous system and kidneys; the effects may be delayed; medical observation is indicated;

**Long term exposure effects:**

The substance may have effects on the central nervous system, resulting in irritability, emotional instability, tremors, mental and memory disturbances and speech disorders; may have effects on kidneys; may cause inflammation and discoloration of the gums; danger of cumulative effects; animal tests show that this substance possibly causes toxic effects upon human reproduction.

Performance of tests on animals: mercury effects were researched in the frame of longterm (c. ½ century) international reaserch and were used as well as animal tests.

**12. Ecological information:**

12.1 **Ecotoxicity:** the substance is high toxic for aquaticplants and animals

Leuciscus idus LC <sub>50</sub> :	0,5 mg.l <sup>-1</sup> (48 hrs.) - fishes
Daphnia magna EC <sub>50</sub> :	0,005 - 3,6 mg.l <sup>-1</sup> (48 hrs.) - dafnia
Chlorella pyrenoidosa EC <sub>50</sub> :	0,3 mg.l <sup>-1</sup> (5 hrs.)
Pseudomonas fluorescens IC <sub>50</sub> :	0,005 mg.l <sup>-1</sup> - algae

Toxicity for aquatic organisms depends on hardness of water (source: IPCS), pH a redox potential of water and sort, age and size of fishes;

12.2 **Mobility:**

Elemental mercury has in the case of release into the environment an abilitydiverse in large distance, espacially in the air; current Hg emissions are from the global point of view continuously deposited into the soil, water and sediments and remobilised again; once deposited, the mercury form can change by microbial metabolism to methylmercury, which has the capacity to bioaccumulate in organisms and consequently through up food chin in the human organism;

12.3 **Persistence and degradability**

Once released elemental mercury is persistent in the environment, where it circulates between air, water, sediments, soil and biota in various forms (fauna and flora, all organisms in given biotope);

12.4 **Bioaccumulative potential:**

This substance has been by experiment laid down factor BCF higher than 100  
This substance issignificantly bioacumulative in the environment;

**12.6 Other adverse effects:**

There is not any odour warning for the presence toxic concentration of the substance;

**13. Disposal considerations**

At spillage a small volume of mercury - amalgamation by zinc or copper powder; in the case, that the unusable substance becomes a waste it is necessary in conformity with the Act no. 106/2005 Coll. about waste as amended by the latest regulations/degrees pass down to an authorized person; in the Czech republic is used as well chemical method mercury stabilisation in a broken waste by calc polysulphid (other details see chapter no. 6); in this way processed waste is possible dispose;

Methods of the contaminated packaging disposal:

Standardized PE, metal and glass packaging after use rinse out by solution Na<sub>2</sub>S; after drying it is possible to use repeatedly them again for packaging of chemical substance, or dispose by authorized person;

Other datas:

Mercury, which becomes a waste, it is possible categorize under waste code :

06 0404 - waste with mercury content category **N**

20 0121 - florescent lamp and/or other waste with mercury content, category **N**

( Note : **N** is equal like dangerous )

**14. Transport information:**

Marine transport:

IMDG: Class: **8** UN : **2809** Packaging group: **III**

Marine pollutant: mercury Propershipping name/Description: **MERCURY**

Overland transport:

ADR/RID: Class: **8** UN : **2809** Packaging group: **III**

Kemler No.: **66**

Inland water transport:

ADN/ADNR: Class: **8** UN : **2809** Packaging group: **III**

Air transport:

ICAO/IATA: Class: **8** UN : **2809** Packaging group: **III**

Technical name: **MERCURY**

Hazard label for all kinds of transport: **8 - CORROSIVE**

- Classification and labelling is pursued se provádí in conformity with the Act no. 356/2003 Coll., about chemical substances and chemical preparations amended by the latest regulations/degrees (the Act no. 186/2004 Coll., the Act no. 125/2005 Coll., the Act no. 345/2005 Coll., the Act no. 434/2005 Coll.,) and continuing implementing regulations
- Degree no. 232/2004 Coll. + Annex, by which are implemented some assignments of the Act about chemical substances and chemical preparations amended by some the latest Acts, regarded to classification, packaging and labelling of chemical substances and chemical preparations amended by the Degrees no. 369/2005 Coll. and no. 28/2007 Coll.
- the Act no. 477/2001 Coll., about packaging as amended by the latest regulations/degrees
- the Act no.185/2001 Coll., about waste as amended by the latest regulations/degrees
- the Act no.309/2006 Coll., by which are set up others demands for health and safety at work in labour relations and about safeguarding health and safety in activities or rendition of services beyond labour relations and carrying out the Act no. 262/2006 Coll., the Code of work, amended by the latest regulations/degrees and continuing implementing Czech government regulation no. 361/2007 Coll., by which are set up conditions safeguarding helth at work;
- the Act no. 86/2002 Coll., about air protection, as amended by the latest regulations/degrees
- Directive 67/548/ES (about convergency legal and administrative documents/regulations with referece to classification, packaging and labeling dangerous substances concern as amended by the latest regulations/degrees)
- The European Agreements about international transports dangerous goods: On the roads (ADR), on the railway (RID), on the inland water(ADN/ADNR), on the seas (IMDG), in the air (ICAO/IATA;)

#### **Information on the label :**

##### **Manufacturer:**

BOME,s.r.o. tel.: 267750010  
V jezírku 544 fax.: 267750011  
252 43 Pr honice e-mail: [info@bome.cz](mailto:info@bome.cz)

**MERCURY** 99,99 - 99,9995 %

kg  
CAS: 7439-97-6 EINECS: 231-106-7

Number of charge/batch

**Date of expiry:**

**Phrases:**

R - phrases : R23-33-50/53

S - phrases : (1/2-)7-45-60-61

R 23 Toxic by inhalation  
R 33 Danger of cumulative effects  
R 50/53 Very toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

S (1/2-) Keep locked up and out of the reach of children  
S 7 Keep container tightly closed  
S 45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).  
S 60 This material and its container must be disposed of as hazardous waste  
S 61 Avoid release to the environment. Refer to special instructions/Safety data sheets

Symbols of danger: T, N

EC labelling:



**16. Other information:**

In the case of an injury or at an indisposition immediately call for medical aid (if it is possible show this safety data sheet); mercury and their packaging/packageings have to be disposed of as a dangerous waste; hinder releases into the environment; ask for instructions because of the manipulation and treatment with mercury; come from data introduced in the safety data sheet;

General training for safety work with chemical substances and preparations, in conformity with the Act no. 262/2006 Coll., Title II, article 103 paragraph. 2 (the Code of work)

*Recommended restrictions on use*

**The substance does not allowed to contact foodstuffs, beverages and feedstuffs!**

*Sources of key data used to compile the Safety Data Sheet:*

- 1) UNEP Chemicals ó Global Mercury Assessment ó 12/2002
- 2) Concise International Chemical Assessment Dokument 50/Elemental Mercury and Inorganic Mercury compounds: Human Health Aspects (WHO 2003)
- 3) Database of physical properties - PHYSPROP
- 4) Encyklopedia Wikipedia
- 5) Degree no. 232/2004 Coll., as amended by the latest regulations/degrees, Annex 1 ó List of obligatory classified dangerous chemical substances
- 6) Internet Database DANCE (Ministry of Industry and Trade, Czech Republic)
- 7) Ecology and Environment Protection /technical English Czech and Czech ó English Dictionary 1. Edition ó 1999/LOXIA
- 8) HSDB ó Hazardous SubstanceData Base/TOXNET - USA

Note:

Safety Data Sheet contents data/information needed for safeguarding health and safety at work and environment protection.. Introduced data/information correspond to the state of our knowledge. They nevertheless have to be comprehensive in full.



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