MATERIAL SAFETY DATA SHEET

according 91/155/EWG – Issue: 01. August 2007

1. Chemical Product and Company Information

1.1 Product Identifier

MARTIN Solder Balls
Art. No. HT00.1101 / HT00.1105 / HT00.1106 / HT00.1108 / HT00.1109 / HT00.1110 / HT00.1104
Alloy: Sn63Pb37

1.3 Supplier

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2. Product Use

2.1 Chemical Characterization

2.2	CAS No.	%/by weight
Lead (Pb)	7439-92-1	approx. 90,0
Tin (Sn)	7440-31-5	approx. 10,0

3. Hazards Identification

3.1 Hazard designation

3.2 Particular information to dangers for man and environment

Lead: According to TRGS*220, no 1 (2), phrase 2, point 2, solid lead is not dangerous but can become dangerous when processed. Lead and its inorganic alloys may be inhaled and/or swallowed and are injurious to health (cumulative defects – substances acc. R 20/22 and R 33*). Mainly erythrocytes, bone marrow and cellular function are endangered. Lead is accumulated in bone.
Organic lead compounds are more dangerous because it can enter human body by the skin. Mortal intoxications possible. Practically all lead compounds are classified as reprotoxic:
R 61 may cause harm to the unborned child
R 62 may be harmful to propagation
Lead swallowed together with food can be fatal for animals of higher evolution.

4. First Aid

4.1 General instruction

Special handling is necessary if Plumbiferous dust and vapours arise that may be inhaled or swallowed

4.2 After Inhalation

Person concerned to be taken away from danger area, care for fresh air; rest

4.3 After Skin Contact

Thorough washing with water and soap

4.4 After Eye Contact

Thorough washing with lots of water*
* (Not applicable for material in the delivery shape)

4.5 After Ingestion
If person is conscious give large quantity of water and let vomiting. **Seek medical attention immediately!**

5. Fire Fighting Measures
5.1 Suitable extinguishing agents
No limitation at regional fires
Liquid lead: dry sand, powders, Co^2
5.2 For safety reasons unsuitable extinguishing agents
Water in case of fluid metal (especially with regard to direct water stream) as well as skimming.
CO^2: observe displacement of breathable air in cellars, caves and shut or narrow rooms.
5.3 Special dangers by the substance, it´s burning products or arising gas
Lead oxide smoke or lead steam (both toxic).
5.4 Special protection equipment at the firefighting
Using recirculating air independent breathing apparatus (isolating equipment). At existence of liquid lead safety helmet with visor, heavily inflammable protective clothing, protection shoes with gaiters, protective gloves.

6. Measures at an Unintentional Release
Protective gloves to be used for material coll.
6.1 Personal-related safety precautions
Breath protection, at least P2, when dealing dusts and smoke are produced.
At strong dust and smokes: Recirculating air independent breathing apparatus.
6.2 Measures for environmental protection
Dust, salt and solvents not to reach waters; damming; protect road drains
If lead compounds entered water, waste waters or soil authorities have to be informed.
Observe regional regulations. Plumbiferous garbage not to be thrown on normal deposits.
Useless material and waste to be returned to producer.
6.3 Measures for cleaning/collecting
Avoid dust when removing dry Plumbiferous scarp (use certified dust exhauster or power sweeper with air filter; regulation ZH 1/487)
Collect solvents by the help of absorbing sand, universal binder, sawdust etc. and duly remove it.

7. Handling and Storage
7.1 Handling
In accordance with § 20 Dangerous Material Restriction (GefStoffV) operating instruction and instruction of the employees to TRGS 555. At emergence of steams, smoking and dusts, suctions at the emergence stove and at exit points, good room ventilating or breath protection (see especially TRGS 505) absolutely imperative.

S – Phrases:	13	Keep away from food, drinks and fodder
	20/21	Do not eat, drink, smoke while working
	53	Avoid exposition
		Prior to use ask for special instruction

7.2 Indications for the Fire and Explosion Protection
No particular measures required.
7.3 Storage
Dry storage recommended.
7.3.1 Information about storage in one common storage facility
No storage together with nitric acid, organic acids.
7.3.2 Further details on the store terms
None

7.3.3 Class of storage
13, according to VCI – concept of storage classes

8. Exposure Controls and Personal Protection

8.1 Additional information for technical systems
Suction necessary if dusts and vapours may arise. Ventilation of working space as per regulation VBG 15. Note TRGS 505, TRGS 402, TRGS 403, TRGS 415; order of protective measures (§19 GefStoffV) to be observed.

8.2.1 Component parts with operating position related limited values:

CAS No.	Description	Type	Value / Unit
7439-92-1	lead	MAK	0.1mg / m³ total dust
	lead (men)	BAT	700µg / L. Blood
	lead (women <45 years)	BAT	300µg / L. Blood

8.2.2 Additional Remarks
Personnel with close contact to lead and its alloys needs regular medical examination to principles G 2 (lead) and G 26 (respirators) of employers liability insurance.
Diseases caused by lead and its alloys are recognized as occupational diseases (no. 1101 of list of occupational diseases).

Personal protection equipment

8.3.1 Protection of breath
Adequate respirator, e.g. P2/P3 to be used (ZH 1/701)

8.3.2 Protection of hands
Protective gloves (ZH 1/706)

8.3.3 Protection of eyes
Wear correctly fitting protective goggles (ZH 1/703).

8.3.4 Protection of body
Safety working clothing (thermic stress to be observed at operating position).

8.3.5 Hygiene measure
Do not eat, drink, sniff or smoke during contact. Washing hands and face before breaks and after work. Keep away from food and drinks.

9. Physical and Chemical Characters

9.1.1 Shape	solid
9.1.2 Color	grey
9.1.3 Odor	no smell of one's own
9.2 Safety relevant data	
Melting point	268 – 302 °C
Boiling point	1740°C (for lead)
Flaming point	not applicable
Ignition temperature	not applicable
Explosion limit	OEG
Steam pressure	3,7 x 10^{-9} hPa (for lead)
Density	10,78 g/cm³
Bulk density	kg/m³
Solubility in water	insoluble mg/l
Explosion hazard	Explosion hazard: Violent reactions with oxidizers, ammonium nitrate and aziedes; explosions possible

9.3 Further Details

10. Stability and reactivity
Below melting point material keeps stable

10.1 Conditions to be avoided
Abnormal heating up to red heat on air (e.g. generation of PbO/Pb steam)

10.2 Substances to be avoided

Abnormal contact with nitric acid, organic acids

10.3 Dangerous products of decomposition

No-one for the metal.

11. Toxicological Information

11.1 Acute toxicity

Acute contamination: No information available concerning material in the state delivered

Pb-alloys: ably for spec. information

Specific symptoms (tested on animals): No information available concerning material in the state delivered

Effects after repeated or long-therm exposition (subacute to chronic contamination): see point 11.3

11.2 Generell Remarks:

An acute contamination upon swallowing or skin contact is not probable. Due to bad reabsorption by stomach – intestine – mucious membrane only a considerably high dose (overdoes) will cause acute contamination symptoms. Absorption of lead by means of sound cuticle is not be expected as per reliable medical realization. At long-therm overdose absorption of plumbiferous dusts concentration of lead in blood my result. Pregnancy means to run most probably the risk of impairment of foetus. Impairment risk is not out of the question for pregnant women exposed to the a/m situation even not at adherence to ma. Working place concentration values. (Max. working place concentration – pregnancy group B, note as well TRGS 900).

Acute effects are of minor importance regarding toxical valuation of anorganic lead than cumulative and long-term effects.

Signals of chemical (lead) effects can be: tiredness, lack of appetite, headaches, constipation and other irritations of intestine, pale grayish – yellow colour of the face skin.

At the very beginning of increased exposure to lead and absorption increased excretion of certain proteins and δ-Aminolaevulinacid in blood and urine already occurs. Classical lead poisoning due to high exposure:

The effects are colics for days or even weeks with severe vonstipation, paralysis of the finger and hand muscles.

12. Ecological Information

Mobility and Bio. Accum. Potential:

As lead ions from alloys difficult to dissolve, their mobility is low.

Contains heavy metals and alloys as sper receipe (regulation no. 76/464/EWG etc.):

Approx. 90,0 weight-% Lead (Pb)

Approx. 10,0 weight-% Tin (Sn)

General Remarks:

Any contamination of soil and waters by lead and its alloys has to be strictly avoided.

13. Disposal considerations

13.1 Recommendation

Any scrap/residual material resulting from production is to be duly utilized (trade of secondary metal; back to producer); never to be thrown in the dust bin.

13.2 Disposal notes

Waste-Product List 2001 (Germany)

Waste Key: 170403 Waste name: Lead Waste Group: Metal

14. Transport Information

No obligatory marking.

15. Regulatory Information

15.1 Marking
No obligatory marking as per Dangerous Material Restriction (GefStoffV, 16th October 1993)

15.2 Regulations in case of interference
To be observed concerning Pb compounds

15.3 Techn. Instruct. Air:
Lead: Emission ≤ 5 mg/m³ by mass flow ≥ 25 g/h
Lead and its alloys are classified in C1. III
Emission ≤ 5 mg/m³ by mass flow ≥ 25 g/h
Tin and its alloys are classified in C1. III

15.4 Additional Regulations, Limits, Prohibitions:
Chemical inhibition order and prohibition regarding manufacture and intended use per annex IV No. 6 of GefStoffV as well as § 15c (work done at home) and § 16 (determination duty) GefStoffV and fodder order.

16. Remarks
Sources: Trade Association order as per table ZH 1 and additionally No. 81 and No. 600.2 TRGS 505 (lead)

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