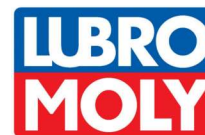


Material Safety Data Sheet



LM 508 Anti-Seize Compound

1. Product and company identification

| | |
|------------------------------|--|
| Product name | : LM 508 Anti-Seize Compound |
| Material uses | : Lubricants |
| Code | : 2012 |
| Supplier/Manufacturer | : LIQUI MOLY GmbH Jerg-Wieland-Strasse 4 D-89081 Ulm-Lehr, Germany Tel.: +49(0)731 / 1420-0 Fax: +49(0)731 / 1420-88 |
| Validation date | : 08/30/2010. |
| Prepared by | : Chemical Check GmbH |
| In case of emergency | : +49(0)731 / 1420-0 |

2. Hazards identification

| | |
|---|--|
| Physical state | : Solid. [Paste.] |
| Color | : Copper. |
| Odor | : Characteristic. |
| Emergency overview | |
| Signal word | : WARNING! |
| Hazard statements | : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA. |
| Precautions | : Do not ingest. Do not get on skin or clothing. Avoid contact with eyes. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling. |
| Routes of entry | : Dermal contact. Eye contact. Inhalation. |
| Potential acute health effects | |
| Inhalation | : Irritating to respiratory system. |
| Ingestion | : Harmful if swallowed. |
| Skin | : Irritating to skin. May cause sensitization by skin contact. |
| Eyes | : Irritating to eyes. |
| Potential chronic health effects | |
| Chronic effects | : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels. Prolonged or repeated contact can defat the skin and lead to irritation, cracking and/or dermatitis. |
| Carcinogenicity | : No known significant effects or critical hazards. |
| Mutagenicity | : No known significant effects or critical hazards. |
| Teratogenicity | : No known significant effects or critical hazards. |
| Developmental effects | : No known significant effects or critical hazards. |
| Fertility effects | : No known significant effects or critical hazards. |
| Target organs | : Contains material which may cause damage to the following organs: kidneys, liver, upper respiratory tract, skin, eyes. |

2. Hazards identification

Over-exposure signs/symptoms

- Inhalation** : Adverse symptoms may include the following:
respiratory tract irritation
coughing
- Ingestion** : No specific data.
- Skin** : Adverse symptoms may include the following:
irritation
redness
dryness
cracking
- Eyes** : Adverse symptoms may include the following:
pain or irritation
watering
redness
- Medical conditions aggravated by over-exposure** : Pre-existing skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

3. Composition/information on ingredients

| Name | CAS number | % |
|--------------------------------|------------|-------|
| Paraffin oils | 8012-95-1 | 30-60 |
| Calcium hydrogenorthophosphate | 7757-93-9 | 10-30 |
| Copper | 7440-50-8 | 10-30 |
| White mineral oil (petroleum) | 8042-47-5 | 1-5 |
| 2,6-Di-tert-butyl-p-cresol | 128-37-0 | 0.1-1 |

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

4. First aid measures

- Eye contact** : Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.
- Skin contact** : In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.
- Inhalation** : Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.
- Ingestion** : Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

Antidote information

| Product/ingredient name | Antidote information |
|-------------------------------|----------------------|
| No antidote information known | |

4. First aid measures

Notes to physician : No specific treatment. Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

5. Fire-fighting measures

Flammability of the product : No specific fire or explosion hazard.

Extinguishing media

Suitable : Use dry chemical powder. Sand. Foam.
Not suitable : Do not use water. CO₂
Special exposure hazards : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
phosphorus oxides
halogenated compounds
metal oxide/oxides
nitrogen oxides
Toxic pyrolysis products

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see section 8).

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up

Small spill : Move containers from spill area. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor.

Large spill : Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Vacuum or sweep up material and place in a designated, labeled waste container. Dispose of via a licensed waste disposal contractor. Note: see section 1 for emergency contact information and section 13 for waste disposal.

7. Handling and storage

Handling : Put on appropriate personal protective equipment (see section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

7. Handling and storage

Storage : Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

| <u>Occupational exposure limits</u> | | TWA (8 hours) | | | STEL (15 mins) | | | Ceiling | | | |
|-------------------------------------|-----------------|---------------|-------------------|-------|----------------|-------------------|-------|---------|-------------------|-------|-----------|
| Ingredient | List name | ppm | mg/m ³ | Other | ppm | mg/m ³ | Other | ppm | mg/m ³ | Other | Notations |
| Paraffin oils | US ACGIH 1/2009 | - | 5 | - | - | 10 | - | - | - | - | [a] |
| | AB 4/2009 | - | 5 | - | - | 10 | - | - | - | - | [a] |
| | ON 8/2008 | - | 5 | - | - | 10 | - | - | - | - | [b] |
| | QC 6/2008 | - | 5 | - | - | 10 | - | - | - | - | [b] |
| Copper, as Cu | US ACGIH 1/2009 | - | 1 | - | - | - | - | - | - | - | - |
| | AB 4/2009 | - | 0.2 | - | - | - | - | - | - | - | [c] |
| | BC 10/2009 | - | 1 | - | - | - | - | - | - | - | [d] |
| | QC 6/2008 | - | 0.2 | - | - | - | - | - | - | - | [c] |
| Copper, as copper | ON 8/2008 | - | 1 | - | - | - | - | - | - | - | [e] |
| | QC 6/2008 | - | 0.2 | - | - | - | - | - | - | - | [c] |
| Copper, as Cu | ON 8/2008 | - | 1 | - | - | - | - | - | - | - | [f] |
| | QC 6/2008 | - | 0.2 | - | - | - | - | - | - | - | [g] |
| 2,6-Di-tert-butyl-p-cresol | US ACGIH 1/2009 | - | 2 | - | - | - | - | - | - | - | [h] |
| | AB 4/2009 | - | 10 | - | - | - | - | - | - | - | [g] |
| | BC 10/2009 | - | 2 | - | - | - | - | - | - | - | [i] |
| | ON 8/2008 | - | 2 | - | - | - | - | - | - | - | [j] |
| White mineral oil (petroleum) | QC 6/2008 | - | 10 | - | - | - | - | - | - | - | [k] |
| | BC 10/2009 | - | 1 | - | - | - | - | - | - | - | [3] |
| | ON 8/2008 | - | 5 | - | - | 10 | - | - | - | - | [j] |
| | QC 6/2008 | - | 5 | - | - | 10 | - | - | - | - | [b] |

[3]Skin sensitization

Form: [a]Mist [b]mist [c]Fume [d]Dusts and Mists [e]Dusts and mists [f]dust and mists [g]fume [h]dusts & mists [i]Vapour and aerosols [j]Inhalable vapour and aerosol [k]inhalable, vapour and aerosol

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures : If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures : Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory : Use a properly fitted, air-purifying or air-fed respirator complying with an approved standard if a risk assessment indicates this is necessary. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator. Recommended: Use appropriate respiratory protection if there is a risk of exceeding any exposure limits. Filter A2 P2.

Hands : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

8. Exposure controls/personal protection

- Recommended: Nitrile gloves.
- Eyes** : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts. Recommended: Tight fitting protective goggles with side shields.
- Skin** : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
Recommended: Safety shoes. Long-sleeved protective clothing.
- Environmental exposure controls** : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

9. Physical and chemical properties

- Physical state** : Solid. [Paste.]
- Flash point** : >100°C (>212°F)
- Auto-ignition temperature** : Not available.
- Flammable limits** : Not available.
- Color** : Copper.
- Odor** : Characteristic.
- pH** : Not available.
- Boiling/condensation point** : Not available.
- Melting/freezing point** : 180°C (356°F)
- Density** : ~ 1.4 g/cm³
- Vapor pressure** : Not available.
- Vapor density** : Not available.
- Odor threshold** : Not available.
- Evaporation rate** : Not available.
- Viscosity** : Kinematic (40°C (104°F)): >0.07 cm²/s (>7 cSt)
- Solubility** : Insoluble in the following materials: cold water.
- LogK_{ow}** : Not available.

10. Stability and reactivity

- Chemical stability** : The product is stable.
- Conditions to avoid** : Protect from moisture.
- Incompatible materials** : Reactive or incompatible with the following materials: oxidizing materials, acids and alkalis.
- Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
- Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- Under normal conditions of storage and use, hazardous polymerization will not occur.

11. Toxicological information

Acute toxicity

| Product/ingredient name | Result | Species | Dose | Exposure |
|----------------------------|-------------|---------|-------------|----------|
| Paraffin oils | LD50 Dermal | Rabbit | >2000 mg/kg | - |
| | LD50 Oral | Rat | >2000 mg/kg | - |
| 2,6-Di-tert-butyl-p-cresol | LD50 Oral | Rat | 890 mg/kg | - |

Chronic toxicity

Not available.

Irritation/Corrosion

Not available.

Sensitizer

Not available.

Conclusion/Summary

Skin : May cause sensitization by skin contact.

Carcinogenicity

Classification

| Product/ingredient name | ACGIH | IARC | EPA | NIOSH | NTP | OSHA |
|----------------------------|-------|------|-----|-------|-----|------|
| 2,6-Di-tert-butyl-p-cresol | A4 | 3 | - | - | - | - |

Mutagenicity

Not available.

Teratogenicity

Not available.

Reproductive toxicity

Not available.

12. Ecological information

Ecotoxicity : This material is very toxic to aquatic life.

Aquatic ecotoxicity

| Product/ingredient name | Result | Species | Exposure |
|----------------------------|------------------------------------|--|----------|
| Paraffin oils | Acute EC50 >100 mg/l | Daphnia | 48 hours |
| | Acute IC50 >100 mg/l | Algae | 96 hours |
| | Acute LC50 >100 ppm Fresh water | Fish - Oncorhynchus mykiss | 96 hours |
| Copper | Acute EC50 9.2 ug/L Fresh water | Crustaceans - Bosmina longirostris - Juvenile (Fledgling, Hatchling, Weanling) - <48 hours | 48 hours |
| | Acute EC50 1.6 ug/L Fresh water | Daphnia - Ceriodaphnia dubia - Neonate - <24 hours - 0.25 mm | 48 hours |
| | Acute LC50 9.4 ug/L Fresh water | Fish - Pimephales promelas - Juvenile (Fledgling, Hatchling, Weanling) - <1 months | 96 hours |
| | Chronic NOEC 7.43 ug/L Fresh water | Fish - Salmo trutta - IMMATURE - 14 cm - 26.3 g | 4 days |
| 2,6-Di-tert-butyl-p-cresol | Acute EC50 1440 ug/L Fresh water | Daphnia - Daphnia pulex - Neonate - <24 hours | 48 hours |

12. Ecological information

Persistence/degradability

Not available.

| | |
|---|---|
| Octanol/water partition coefficient | : Not available. |
| Bioconcentration factor | : Not available. |
| Mobility | : Not available. |
| Toxicity of the products of biodegradation | : Not available. |
| Other adverse effects | : No known significant effects or critical hazards. |

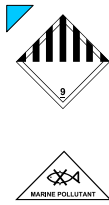
13. Disposal considerations

| | |
|-----------------------|---|
| Waste disposal | : The generation of waste should be avoided or minimized wherever possible. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe way. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. |
|-----------------------|---|

Disposal should be in accordance with applicable regional, national and local laws and regulations.

Refer to Section 7: HANDLING AND STORAGE and Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION for additional handling information and protection of employees.

14. Transport information

| Regulatory information | UN number | Proper shipping name | Classes | PG* | Label | Additional information |
|---------------------------|----------------|---|---------|-----|---|---|
| TDG Classification | UN3077 | ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (Copper). Marine pollutant (Copper) | 9 | III |  | Marine pollutant Explosive Limit and Limited Quantity Index 5 Special provisions 16 |
| IMDG Class | Not regulated. | - | - | - | | - |
| IATA-DGR Class | Not regulated. | - | - | - | | - |

PG* : Packing group

15. Regulatory information

| | |
|--|---|
| United States inventory (TSCA 8b) | : Not determined. |
| WHMIS (Canada) | : Class D-2B: Material causing other toxic effects (Toxic). |
| <u>Canadian lists</u> | |
| Canadian NPRI | : The following components are listed: Copper; White mineral oil; 2,6-Di-t-butyl-4-methylphenol |
| CEPA Toxic substances | : None of the components are listed. |

15. Regulatory information

Canada inventory : Not determined.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International regulations

International lists :

- Australia inventory (AICS)**: Not determined.
- China inventory (IECSC)**: Not determined.
- Japan inventory**: Not determined.
- Korea inventory**: Not determined.
- New Zealand Inventory of Chemicals (NZIoC)**: Not determined.
- Philippines inventory (PICCS)**: Not determined.

Chemical Weapons Convention List Schedule I Chemicals : Not listed

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

16. Other information

Label requirements : CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. PROLONGED OR REPEATED CONTACT MAY DRY SKIN AND CAUSE IRRITATION. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

Hazardous Material Information System (U.S.A.) :

| | | |
|------------------|---|---|
| Health | * | 2 |
| Flammability | | 1 |
| Physical hazards | | 0 |
| | | |

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on MSDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

Date of issue : 08/30/2010.

Date of previous issue : 07/12/2010.

Version : 2

☑ Indicates information that has changed from previously issued version.

Notice to reader

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.