SAFETY DATA SHEET
(REACH regulation (EC) n° 1907/2006 - n° 2015/830)

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

1.1. Product identifier
Product name: LMM14 BLACK LASER MARKING PASTE
Product code: LMM14.

1.2. Relevant identified uses of the substance or mixture and uses advised against
N/A

1.3. Details of the supplier of the safety data sheet
Registered company name: GRAVOTECH MARKING SAS.
Address: 56, avenue Jean Jaurès. 10600 La Chapelle Saint Luc. France.
Telephone: +33 (0)3 25 41 65 65. Fax: +33 (0)3 25 79 04 25.
e-mail: info@gravograph.fr
http://www.gravograph.com

1.4. Emergency telephone number: +33 (0)1 45 42 59 59.

SECTION 2: HAZARDS IDENTIFICATION

2.1. Classification of the substance or mixture
In compliance with EC regulation No. 1272/2008 and its amendments.
Eye irritation, Category 2 (Eye Irrit. 2, H319).
May produce an allergic reaction (EUH208).
Carcinogenicity, Category 2 (Carc. 2, H351).
Specific target organ toxicity (single exposure), Category 3 (STOT SE 3, H335).
This mixture does not present a physical hazard. Refer to the recommendations regarding the other products present on the site.
This mixture does not present an environmental hazard. No known or foreseeable environmental damage under standard conditions of use.

2.2. Label elements
In compliance with EC regulation No. 1272/2008 and its amendments.

Hazard pictograms:

GHS07
GHS08

Signal Word:
WARNING

Product identifiers:
042-001-00-9 MOLYBDENUM TRIOXIDE

Additional labeling:
EUH208 Contains NICKEL. May produce an allergic reaction.

Hazard statements:
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H351 Suspected of causing cancer.

Precautionary statements - Prevention:
P201 Obtain special instructions before use.
P202 Do not handle until all safety precautions have been read and understood.
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Precautionary statements - Response:
P304 + P340 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P308 + P313 IF exposed or concerned: Get medical advice/attention.
P312 Call a POISON CENTER/doctor if you feel unwell.
P337 + P313 If eye irritation persists: Get medical advice/attention.

Precautionary statements - Disposal:
P501 Dispose of contents/container at a disposal facility in accordance with local regulations.

Other information:

2.3. Other hazards
In the event of dust formed by mechanical action (sanding, sawing, etc...), this dust may cause irritation by inhalation and contact with eyes.
The mixture does not contain substances classified as 'Substances of Very High Concern' (SVHC) >= 0.1% published by the European Chemicals Agency (ECHA) under article 57 of REACH: http://echa.europa.eu/fr/candidate-list-table
The mixture fulfils neither the PBT nor the vPvB criteria for mixtures in accordance with annexe XIII of the REACH regulations EC 1907/2006.

SECTION 3 : COMPOSITION/INFORMATION ON INGREDIENTS

3.2. Mixtures
Composition:

<table>
<thead>
<tr>
<th>Identification</th>
<th>(EC) 1272/2008</th>
<th>Note</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>INDEX: 042-001-00-9</td>
<td>GHS08, GHS07</td>
<td>[1]</td>
<td>25 &lt;= x % &lt; 50</td>
</tr>
<tr>
<td>EC: 215-204-7</td>
<td>MOLYBDENUM TRIOXIDE</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS: 14808-60-7</td>
<td>GHS08, GHS07</td>
<td>[1]</td>
<td>2.5 &lt;= x % &lt; 10</td>
</tr>
<tr>
<td>EC: 238-878-4</td>
<td>Wng, Carc. 2, H351</td>
<td></td>
<td></td>
</tr>
<tr>
<td>QUARTZ (SIO2)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CAS: 12001-26-2</td>
<td>GHS08, GHS07</td>
<td>[1]</td>
<td>2.5 &lt;= x % &lt; 10</td>
</tr>
<tr>
<td>MICA</td>
<td>Wng, Carc. 2, H351, STOT RE 1, H372, Skin Sens. 1, H317</td>
<td></td>
<td></td>
</tr>
<tr>
<td>INDEX: 028-002-00-7</td>
<td>GHS08, GHS07</td>
<td>[1]</td>
<td>0 &lt;= x % &lt; 1</td>
</tr>
<tr>
<td>CAS: 7440-02-0</td>
<td>Dgr</td>
<td>[2]</td>
<td></td>
</tr>
<tr>
<td>EC: 231-111-4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>REACH: 01-2119438727-29</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>NICKEL</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Information on ingredients:
[1] Substance for which maximum workplace exposure limits are available.

SECTION 4 : FIRST AID MEASURES

As a general rule, in case of doubt or if symptoms persist, always call a doctor.
NEVER induce swallowing by an unconscious person.

4.1. Description of first aid measures

In the event of exposure by inhalation:
In the event of massive inhalation of dust, remove the person exposed to fresh air. Keep warm and at rest.
If the person is unconscious, place in recovery position. Notify a doctor in all events, to ascertain whether observation and supportive hospital care will be necessary.
If breathing is irregular or has stopped, effect mouth-to-mouth resuscitation and call a doctor.
In the event of an allergic reaction, seek medical attention.

In the event of splashes or contact with eyes:
Wash thoroughly with fresh, clean water for 15 minutes holding the eyelids open.
If there is any redness, pain or visual impairment, consult an ophthalmologist.

In the event of splashes or contact with skin:
Watch out for any remaining product between skin and clothing, watches, shoes, etc.
In the event of an allergic reaction, seek medical attention.

**In the event of swallowing:**
- Do not give the patient anything orally.
- In the event of swallowing, if the quantity is small (no more than one mouthful), rinse the mouth with water and consult a doctor.
- Seek medical attention immediately, showing the label.

4.2. **Most important symptoms and effects, both acute and delayed**
- No data available.

4.3. **Indication of any immediate medical attention and special treatment needed**
- No data available.

**SECTION 5: FIREFIGHTING MEASURES**

- Non-flammable.

5.1. **Extinguishing media**
- No data available.

5.2. **Special hazards arising from the substance or mixture**
- A fire will often produce a thick black smoke. Exposure to decomposition products may be hazardous to health.
- Do not breathe in smoke.

5.3. **Advice for firefighters**
- Due to the toxicity of the gas emitted on thermal decomposition of the products, fire-fighting personnel are to be equipped with autonomous insulating breathing apparatus.

**SECTION 6: ACCIDENTAL RELEASE MEASURES**

6.1. **Personal precautions, protective equipment and emergency procedures**
- Consult the safety measures listed under headings 7 and 8.

**For non first aid worker**
- Avoid any contact with the skin and eyes.
- Avoid inhaling dust.
- If a large quantity has been spilled, evacuate all personnel and only allow intervention by trained operators equipped with safety apparatus.

**For first aid worker**
- First aid workers will be equipped with suitable personal protective equipment (See section 8).

6.2. **Environmental precautions**
- Prevent any material from entering drains or waterways.

6.3. **Methods and material for containment and cleaning up**
- No data available.

6.4. **Reference to other sections**
- No data available.

**SECTION 7: HANDLING AND STORAGE**

Requirements relating to storage premises apply to all facilities where the mixture is handled.

7.1. **Precautions for safe handling**
- Always wash hands after handling.
- Remove and wash contaminated clothing before re-using.

**Fire prevention:**
- Handle in well-ventilated areas.
- Prevent access by unauthorised personnel.

**Recommended equipment and procedures:**
- For personal protection, see section 8.
- Observe precautions stated on label and also industrial safety regulations.
- Avoid inhaling dust.
- Also provide breathing apparatus for certain short tasks of an exceptional nature and for emergency interventions.
- In all cases, recover emissions at source.
- Avoid eye contact with this mixture.
- Avoid exposure - obtain special instructions before use.

**Prohibited equipment and procedures:**
- No smoking, eating or drinking in areas where the mixture is used.

7.2. **Conditions for safe storage, including any incompatibilities**
No data available.

Storage
Keep the container tightly closed in a dry, well-ventilated place.

Packaging
Always keep in packaging made of an identical material to the original.

7.3. Specific end use(s)
Contra-indicated packaging material: Steel, iron, tin.

SECTION 8: EXPOSURE CONTROLS/PERSOANL PROTECTION

8.1. Control parameters

Occupational exposure limits :
- ACGIH TLV (American Conference of Governmental Industrial Hygienists, Threshold Limit Values, 2010):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
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</thead>
<tbody>
<tr>
<td>14808-60-7</td>
<td>0.05 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>R</td>
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<tr>
<td>12001-26-2</td>
<td>3 (R) mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>I</td>
</tr>
<tr>
<td>7440-02-0</td>
<td>1.5 mg/m³</td>
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<td></td>
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- Germany - AGW (BAuA - TRGS 900, 29/01/2018):

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<th>CAS</th>
<th>VME</th>
<th>VME</th>
<th>Excess</th>
<th>Notes</th>
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</thead>
<tbody>
<tr>
<td>7440-02-0</td>
<td>0.006 A mg/m³</td>
<td>8(I)</td>
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</table>

- Belgium (Arrêté du 09/03/2014, 2014):

<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-27-5</td>
<td>0.5 mg/m³</td>
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</tr>
<tr>
<td>14808-60-7</td>
<td>0.1 mg/m³</td>
<td>-</td>
<td>-</td>
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</tr>
<tr>
<td>12001-26-2</td>
<td>3 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7440-02-0</td>
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<td>-</td>
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- France (INRS - ED984 :2016):

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<tr>
<th>CAS</th>
<th>VME-ppm</th>
<th>VME-mg/m³</th>
<th>VLE-ppm</th>
<th>VLE-mg/m³</th>
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<th>TMP No</th>
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<tbody>
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<td>-</td>
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<td>25</td>
<td>-</td>
</tr>
<tr>
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<td>-</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>C3</td>
<td>-</td>
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</table>

- Switzerland (SUVAPRO 2017):

<table>
<thead>
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<th>VME</th>
<th>VLE</th>
<th>Valeur plafond</th>
<th>Notations</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-27-5</td>
<td>5 i mg/m³</td>
<td>-</td>
<td>P C1 SSC</td>
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</tr>
<tr>
<td>14808-60-7</td>
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<tr>
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<td>-</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7440-02-0</td>
<td>0.05 i mg/m³</td>
<td>-</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>


<table>
<thead>
<tr>
<th>CAS</th>
<th>TWA</th>
<th>STEL</th>
<th>Ceiling</th>
<th>Definition</th>
<th>Criteria</th>
</tr>
</thead>
<tbody>
<tr>
<td>1313-27-5</td>
<td>5 mg/m³</td>
<td>10 mg/m³</td>
<td>-</td>
<td>-</td>
<td>R</td>
</tr>
<tr>
<td>14808-60-7</td>
<td>0.3 mg/m³</td>
<td>- ppm</td>
<td>- ppm</td>
<td>-</td>
<td></td>
</tr>
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<td>12001-26-2</td>
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<td>- mg/m³</td>
<td>- mg/m³</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>7440-02-0</td>
<td>0.1 mg/m³</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

8.2. Exposure controls

Personal protection measures, such as personal protective equipment

Pictogram(s) indicating the obligation of wearing personal protective equipment (PPE):

Use personal protective equipment that is clean and has been properly maintained.
Store personal protective equipment in a clean place, away from the work area.
Never eat, drink or smoke during use. Remove and wash contaminated clothing before re-using. Ensure that there is adequate ventilation, especially in confined areas.

- Eye / face protection
Avoid contact with eyes.
Before handling powders or dust emission, wear mask goggles in accordance with standard EN166.
Prescription glasses are not considered as protection.
Provide eyewash stations in facilities where the product is handled constantly.

- Hand protection
Wear suitable protective gloves in the event of prolonged or repeated skin contact.
Use suitable protective gloves that are resistant to chemical agents in accordance with standard EN374.
Gloves must be selected according to the application and duration of use at the workstation.
Protective gloves need to be selected according to their suitability for the workstation in question: other chemical products that may be handled, necessary physical protections (cutting, pricking, heat protection), level of dexterity required.

- **Type of gloves recommended:**
  - Natural latex
  - Nitrile rubber (butadiene-acrylonitrile copolymer rubber (NBR))
  - PVC (polyvinyl chloride)
  - Butyl Rubber (isobutylene-isoprene copolymer)

- **Recommended properties:**
  - Impervious gloves in accordance with standard EN374

In the event of prolonged or repeated contact with the hands, use appropriate gloves.

- **Body protection**
  Work clothing worn by personnel shall be laundered regularly.
  After contact with the product, all parts of the body that have been soiled must be washed.

- **Respiratory protection**
  Avoid breathing dust.
  If the ventilation is insufficient, wear appropriate breathing apparatus.
  When workers are confronted with concentrations that are above occupational exposure limits, they must wear a suitable, approved, respiratory protection device.
  **Type of FFP mask:**
  Wear a disposable half-mask dust filter in accordance with standard EN149.
  **Category:**
  - FFP1
  With this preparation, particularly avoid inhaling dust.

---

### SECTION 9 : PHYSICAL AND CHEMICAL PROPERTIES

#### 9.1. Information on basic physical and chemical properties

**General information:**

<table>
<thead>
<tr>
<th>Physical state :</th>
<th>Paste.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Colour:</td>
<td>Gray - Yellow.</td>
</tr>
</tbody>
</table>

**Important health, safety and environmental information**

<table>
<thead>
<tr>
<th>pH :</th>
<th>Not relevant.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boiling point/boiling range :</td>
<td>100 °C.</td>
</tr>
<tr>
<td>Flash point interval :</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Vapour pressure (50°C) :</td>
<td>Not relevant.</td>
</tr>
<tr>
<td>Vapour density :</td>
<td>20 g/m3 (Air=1)</td>
</tr>
<tr>
<td>Density :</td>
<td>1.55 g/ml</td>
</tr>
<tr>
<td>Water solubility :</td>
<td>Partially soluble.</td>
</tr>
<tr>
<td>Evaporation rate :</td>
<td>&lt; 1 (BuAc=1)</td>
</tr>
<tr>
<td>% VOC :</td>
<td>0</td>
</tr>
</tbody>
</table>

#### 9.2. Other information

No data available.

---

### SECTION 10 : STABILITY AND REACTIVITY

#### 10.1. Reactivity

No data available.

#### 10.2. Chemical stability

This mixture is stable under the recommended handling and storage conditions in section 7.

#### 10.3. Possibility of hazardous reactions

No data available.

#### 10.4. Conditions to avoid

Avoid:
- formation of dusts
- frost

#### 10.5. Incompatible materials

No data available.

#### 10.6. Hazardous decomposition products
SECTION 11 : TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects
May have reversible effects on the eyes, such as eye irritation which is totally reversible by the end of observation at 21 days.
Respiratory tract irritation may occur, together with symptoms such as coughing, choking and breathing difficulties.
In the event of dust formed by mechanical action (sanding, sawing, etc..), this dust may cause irritation by inhalation and contact with eyes.
Suspected human carcinogen.

11.1.1. Substances
No toxicological data available for the substances.

11.1.2. Mixture
Respiratory or skin sensitisation:
Contains at least one sensitising substance. May cause an allergic reaction.

Monograph(s) from the IARC (International Agency for Research on Cancer):
CAS 14808-60-7 : IARC Group 1 : The agent is carcinogenic to humans.
CAS 1313-27-5 : IARC Group 2B : The agent is possibly carcinogenic to humans.
CAS 7440-02-0 : IARC Group 2B : The agent is possibly carcinogenic to humans.

SECTION 12 : ECOLOGICAL INFORMATION

12.1. Toxicity
12.1.2. Mixtures
No aquatic toxicity data available for the mixture.

12.2. Persistence and degradability
No data available.

12.3. Bioaccumulative potential
No data available.

12.4. Mobility in soil
No data available.

12.5. Results of PBT and vPvB assessment
No data available.

12.6. Other adverse effects
No data available.

German regulations concerning the classification of hazards for water (WGK):
WGK 1 (VwVwS vom 27/07/2005, KBws) : Slightly hazardous for water.

SECTION 13 : DISPOSAL CONSIDERATIONS

Proper waste management of the mixture and/or its container must be determined in accordance with Directive 2008/98/EC.

13.1. Waste treatment methods
Do not pour into drains or waterways.

Waste:
Waste management is carried out without endangering human health, without harming the environment and, in particular without risk to water, air, soil, plants or animals.
Recycle or dispose of waste in compliance with current legislation, preferably via a certified collector or company.
Do not contaminate the ground or water with waste, do not dispose of waste into the environment.

Soiled packaging:
Empty container completely. Keep label(s) on container.
Give to a certified disposal contractor.

SECTION 14 : TRANSPORT INFORMATION

Exempt from transport classification and labelling.

14.1. UN number
- 

14.2. UN proper shipping name
- 

14.3. Transport hazard class(es)
SAFETY DATA SHEET (REGULATION (EC) n° 1907/2006 - REACH) - LMM14 BLACK LASER MARKING PASTE - LMM14

14.4. Packing group

14.5. Environmental hazards

14.6. Special precautions for user

SECTION 15 : REGULATORY INFORMATION

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture

- Classification and labelling information included in section 2:
  The following regulations have been used:
  - EU Regulation No. 1272/2008 amended by EU Regulation No. 2017/776 (ATP 10)
  - Container information:
    No data available.
    For professional users only.
  - Particular provisions:
    No data available.
  - German regulations concerning the classification of hazards for water (WGK):
    WGK 1 (VwVwS vom 27/07/2005, KBws): Slightly hazardous for water.
  - Standardised American system for the identification of hazards presented by the product in view of emergency procedures (NFPA 704):
    NFPA 704, Labelling: Health=2 Inflammability=1 Instability/Reactivity=1 Specific Risk=None

15.2. Chemical safety assessment

No data available.

SECTION 16 : OTHER INFORMATION

Since the user's working conditions are not known by us, the information supplied on this safety data sheet is based on our current level of knowledge and on national and community regulations.

The mixture must not be used for other uses than those specified in section 1 without having first obtained written handling instructions.

It is at all times the responsibility of the user to take all necessary measures to comply with legal requirements and local regulations.

The information in this safety data sheet must be regarded as a description of the safety requirements relating to the mixture and not as a guarantee of the properties thereof.

Wording of the phrases mentioned in section 3:

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>H317</td>
<td>May cause an allergic skin reaction.</td>
</tr>
<tr>
<td>H319</td>
<td>Causes serious eye irritation.</td>
</tr>
<tr>
<td>H335</td>
<td>May cause respiratory irritation.</td>
</tr>
<tr>
<td>H351</td>
<td>Suspected of causing cancer.</td>
</tr>
<tr>
<td>H372</td>
<td>Causes damage to organs through prolonged or repeated exposure.</td>
</tr>
</tbody>
</table>

Abbreviations:

- CMR: Carcinogenic, mutagenic or reprotoxic.
- ADR: European agreement concerning the international carriage of dangerous goods by Road.
- IATA: International Air Transport Association.
- ICAO: International Civil Aviation Organisation
- RID: Regulations concerning the International carriage of Dangerous goods by rail.
- WGK: Wassergefahrdungsklasse (Water Hazard Class).
GHS07 : Exclamation mark
GHS08 : Health hazard
PBT: Persistent, bioaccumulable and toxic.
vPvB : Very persistent, very bioaccumulable.
SVHC : Substances of very high concern.