SAFETY DATA SHEET

Magnesium Oxide Pieces

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Magnesium Oxide Pieces
GENERAL USE: Physical vapor deposition of thin films
GENERIC NAME: Magnesia

MANUFACTURER
Kurt J Lesker Company
United States
1925 Route 51
Jefferson Hills, PA 15025
Customer Service: 412-387-9200
E-Mail: msds@lesker.com
Kurt J Lesker Company LTD
United Kingdom
15-16 Burgess Road
Hastings, East Sussex, TN35 4NR
England
Customer Service: +44 (0) 1424 458100

24 HR. EMERGENCY TELEPHONE NUMBERS
24-Hour Emergency Response provided by 3E Global Incident Response Hotline
When calling, refer to Kurt J Lesker Company Global Response Access Code: 333594
North America [USA, Canada, Mexico]: 1-866-519-4752
Mainland China: (+86) 4001 2001 74
Europe: {int'l call prefix}-1-760-476-3961
Asia Pacific: {int'l call prefix}-1-760-476-3960
Middle East & Africa: {int'l call prefix}-1-760-476-3959

2. HAZARDS IDENTIFICATION

GHS CLASSIFICATIONS
Health:
This substance or mixture is not hazardous and is not classified under GHS.

EMERGENCY OVERVIEW
PHYSICAL APPEARANCE: White solid
IMMEDIATE CONCERNS: Dust or vapor irritating to eyes and respiratory tract.

POTENTIAL HEALTH EFFECTS
EYES: Contact may cause eye irritation.
SKIN: May cause skin irritation.
INGESTION: Low ingestion hazard in normal use.
INHALATION: May be harmful if inhaled. May cause respiratory irritation.

REPRODUCTIVE TOXICITY
REPRODUCTIVE EFFECTS: Not Available
TERATOGENIC EFFECTS: Not Available
CARCINOGENICITY: Not listed as a human carcinogen
MUTAGENICITY: Not Available

ROUTES OF ENTRY: Inhalation, ingestion, eye contact, or skin contact.
IRRITANCY: May cause irritation of skin, eyes, and respiratory tract.

PHYSICAL HAZARDS: This substance is not considered hazardous in the form supplied.

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>Chemical Name</th>
<th>Wt.%</th>
<th>CAS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium Oxide</td>
<td>100</td>
<td>1309-48-4</td>
</tr>
</tbody>
</table>

### 4. FIRST AID MEASURES

**EYES:** Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.

**SKIN:** Wash with soap and water. Get medical attention if irritation develops or persists.

**INGESTION:** Rinse mouth. Get medical advice/attention. Low ingestion hazard in normal use.

**INHALATION:** No specific treatment is necessary since this material is not likely to be hazardous by inhalation. If exposed to excessive levels of dusts or fumes, remove to fresh air and get medical attention if cough or other symptoms develop.

**SIGNS AND SYMPTOMS OF OVEREXPOSURE**

**CHRONIC EFFECTS:** Not Available

### 5. FIRE FIGHTING MEASURES

**FLAMMABLE CLASS:** Not flammable.

**EXTINGUISHING MEDIA:** Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

**EXPLOSION HAZARDS:** Dusts at sufficient concentrations can form explosive mixtures with air.

**FIRE FIGHTING PROCEDURES:** As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

**HAZARDOUS DECOMPOSITION PRODUCTS:** Toxic metal fumes

### 6. ACCIDENTAL RELEASE MEASURES

**SMALL SPILL:** Clean up spills immediately, observing precautions in Protective Equipment section.

**LARGE SPILL:** Collect spilled material in appropriate container. Spill may be reportable. Consult section 15 for Reportable Quantities.

**ENVIRONMENTAL PRECAUTIONS**

**WATER SPILL:** This material is a water pollutant and should be prevented from contaminating soil or from entering sewage and drainage systems and bodies of water.

**GENERAL PROCEDURES:** Isolate hazard area. Keep unnecessary and unprotected personnel from entering. Eliminate all ignition sources if safe to do so. Avoid formation of dust. Provide appropriate exhaust ventilation where dust is formed. Avoid breathing (dust, vapor, mist, gas). Practice good chemical hygiene during and after use. Avoid release to the environment.

### 7. HANDLING AND STORAGE

**GENERAL PROCEDURES:** To avoid risks to human health and the environment, comply with the instructions for use.
HANDLING: Keep away from heat and flame. Avoid formation of dust. Provide appropriate exhaust ventilation where dust is formed. Do not breath (dust, vapor, mist, gas). Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

STORAGE: Keep container closed when not in use. Store in a cool dry place.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: Wear safety glasses.

SKIN: Wear protective gloves.

RESPIRATORY: Not normally needed. If ventilation is inadequate and this material is handled at elevated temperatures or dusts/fumes/mists are generated a NIOSH/MSHA approved air purifying respirator with a manufacturers approved cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection.

WORK HYGIENIC PRACTICES: Practice good chemical hygiene during and after use.

COMMENTS:

<table>
<thead>
<tr>
<th>Component</th>
<th>Location, Type</th>
<th>Value (mg/m3)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium oxide</td>
<td>ACGIH TWA</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>OSHA OEL TWA</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Canada TWA</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Europe TWA</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Denmark TWA (Inhalable)</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Denmark STEL (Inhalable)</td>
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</tr>
<tr>
<td></td>
<td>Germany TWA (Inhalable)</td>
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<tr>
<td></td>
<td>Germany STEL (Respirable)</td>
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<td></td>
<td>Hungary TWA (Respirable)</td>
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<td>Hungary STEL (Respirable)</td>
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<tr>
<td></td>
<td>Switzerland TWA</td>
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<td></td>
<td>Australia, NZ, Singapore TWA</td>
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<tr>
<td></td>
<td>UK WEL TWA (Inhalable)</td>
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</tr>
<tr>
<td></td>
<td>UK WEL TWA (Respirable)</td>
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</tr>
</tbody>
</table>

9. PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL STATE: Solid

ODOR: None

COLOR: White

PERCENT VOLATILE: NA = Not Applicable
FLASH POINT AND METHOD: NA = Not Applicable

FLAMMABLE LIMITS: NA = Not Applicable

AUTOIGNITION TEMPERATURE: NA = Not Applicable

BOILING POINT: 3600°C

MELTING POINT: 2852°C

SOLUBILITY IN WATER: .0086 g/100mL at 30°C

DENSITY: 3.58

MOLECULAR WEIGHT: 40.3044

10. STABILITY AND REACTIVITY

STABLE: Yes

HAZARDOUS POLYMERIZATION: No

STABILITY: Hygroscopic

CONDITIONS TO AVOID: Avoid moisture.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic metal fumes

INCOMPATIBLE MATERIALS: Strong acids, Strong bases, Oxidizing materials, Halogens.

11. TOXICOLOGICAL INFORMATION

ACUTE

DERMAL LD₅₀: Not Available

ORAL LD₅₀: 810 mg/kg

Notes: Mouse

INHALATION LC₅₀: Not Available

CARCINOGENICITY

IARC: Not listed

NTP: Not listed

OSHA: Not listed

REPRODUCTIVE EFFECTS: Not Available

TERATOGENIC EFFECTS: Not Available

MUTAGENICITY: Not Available

12. ECOLOGICAL INFORMATION

BIOACCUMULATION/ACCUMULATION: Not Available

AQUATIC TOXICITY (ACUTE): Not Available

CHEMICAL FATE INFORMATION: Not Available

13. DISPOSAL CONSIDERATIONS
DISPOSAL METHOD: Dispose of according to applicable federal, state, provincial, and local regulations.

PRODUCT DISPOSAL: Contact a licensed waste disposal company.

EMPTY CONTAINER: Follow all MSDS/label precautions even after container is emptied because it may retain product residues.

14. TRANSPORT INFORMATION

DOT (DEPARTMENT OF TRANSPORTATION)
   PROPER SHIPPING NAME: Not Regulated

ROAD AND RAIL (ADR/RID)
   PROPER SHIPPING NAME: Not Regulated

AIR (ICAO/IATA)
   SHIPPING NAME: Not Regulated

VESSEL (IMO/IMDG)
   SHIPPING NAME: Not Regulated

CANADA TRANSPORT OF DANGEROUS GOODS
   SHIPPING NAME: Not Regulated

15. REGULATORY INFORMATION

UNITED STATES

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)
   FIRE: No    PRESSURE GENERATING: No    REACTIVITY: No    ACUTE: No    CHRONIC: No

TSCA (TOXIC SUBSTANCE CONTROL ACT)
   TSCA STATUS: All components of this product are included in inventory, exempt, or notified

STATE REGULATIONS:
The following components appear in one or more of the following state hazardous substances lists

<table>
<thead>
<tr>
<th>Component</th>
<th>CAS</th>
<th>CA</th>
<th>MA</th>
<th>MN</th>
<th>NJ</th>
<th>PA</th>
<th>RI</th>
</tr>
</thead>
<tbody>
<tr>
<td>Magnesium Oxide</td>
<td>1309-48-4</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
</tbody>
</table>

CALIFORNIA PROPOSITION 65: This product is not known to contain any components for which the State of California has found to cause cancer, birth defects or other reproductive harm.

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM): Not Regulated

DOMESTIC SUBSTANCE LIST (INVENTORY): All components of this product are included in inventory, exempt, or notified

GENERAL COMMENTS: All components of this product are included in inventory, exempt, or notified: USA TSCA, Philippines PICCS, Korean KECL, European EINECS, Canadian DSL
16. OTHER INFORMATION

APPROVED BY: EHS DEPT
PREPARED BY: E Bolton
INFORMATION CONTACT: msds@lesker.com

HMIS RATING

<table>
<thead>
<tr>
<th>HEALTH</th>
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<tbody>
<tr>
<td>FLAMMABILITY</td>
<td>0</td>
</tr>
<tr>
<td>PHYSICAL HAZARD</td>
<td>0</td>
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<tr>
<td>PERSONAL PROTECTION</td>
<td>C</td>
</tr>
</tbody>
</table>

NFPA CODES

| 2 | 0 | 0 |

GENERAL STATEMENTS: The physical and toxicological properties of this material have not been thoroughly investigated.

MANUFACTURER DISCLAIMER:

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