SAFETY DATA SHEET
Lanthanum Titanium Oxide (pieces)

1. Identification

Product identifier
Product name Lanthanum Titanium Oxide (pieces)
Internal identification Replaces M-3000-128

Recommended use of the chemical and restrictions on use
Application Physical vapor deposition of thin films
Uses advised against No specific uses advised against are identified.

Details of the supplier of the safety data sheet
Supplier Kurt J Lesker Company
Manufacturer Kurt J Lesker Company
1925 Route 51
Jefferson Hills, PA 15025
+1 412-387-9200
Kurt J Lesker Company LTD
United Kingdom
15-16 Burgess Road
Hastings, East Sussex, TN35 4NR
England
Customer Service: +44 (0) 1424 458100
msds@lesker.com

Emergency telephone number
Emergency telephone 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
Access Code - 333594

2. Hazard(s) identification

Classification of the substance or mixture
Physical hazards Not Classified
Health hazards Not Classified
Environmental hazards Not Classified

Label elements
Hazard statements NC Not Classified
Other hazards
Lanthanum Titanium Oxide (pieces)

This product does not contain any substances classified as PBT or vPvB. Based on available knowledge of this material, it has been determined to be non-hazardous and will not pose a risk to persons or the environment in its provided form. However, any cutting, welding, melting, grinding, or use for deposition will produce dust, fume, or particulates containing component elements of this material. Exposure to these components may present significant health hazards. Note: Fine particulate may be a combustible dust which, when dispersed in air, may present an explosion hazard.

### 3. Composition/Information on ingredients

<table>
<thead>
<tr>
<th>Mixtures</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lanthanum Oxide (pieces)</td>
<td>CAS number: 1312-81-8</td>
</tr>
<tr>
<td>Classification</td>
<td>Not Classified</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Composition/Information on ingredients</th>
<th>0 - 100%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Titanium Oxide (TiO, TiO2, Ti2O3, Ti3O5 powder and pieces)</td>
<td>CAS number: 13463-67-7</td>
</tr>
<tr>
<td>Classification</td>
<td>Not Classified</td>
</tr>
</tbody>
</table>

The full text for all hazard statements is displayed in Section 16.

**Composition comments**
The exact percentage is withheld as a trade secret in accordance with 29 CFR 1910.1200.

### 4. First-aid measures

**Description of first aid measures**

**General information**
If in doubt, get medical attention promptly. Show this Safety Data Sheet to the medical personnel.

**Inhalation**
No specific recommendations. If throat irritation or coughing persists, proceed as follows. Move affected person to fresh air and keep warm and at rest in a position comfortable for breathing. Loosen tight clothing such as collar, tie or belt. Get medical attention if any discomfort continues.

**Ingestion**
No specific recommendations. If throat irritation or coughing persists, proceed as follows. Rinse mouth. Get medical attention if any discomfort continues.

**Skin Contact**
No specific recommendations. Rinse with water. Get medical attention if any discomfort continues.

**Eye contact**
Rinse with water. Get medical attention if any discomfort continues.

**Protection of first aiders**
Use protective equipment appropriate for surrounding materials.

**Most important symptoms and effects, both acute and delayed**

**General information**
The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

**Inhalation**
No specific symptoms known.

**Ingestion**
No specific symptoms known. May cause discomfort if swallowed.

**Skin contact**
Prolonged contact may cause dryness of the skin.

**Eye contact**
No specific symptoms known. May be slightly irritating to eyes.
Lanthanum Titanium Oxide (pieces)

**Indication of immediate medical attention and special treatment needed**

<table>
<thead>
<tr>
<th>Notes for the doctor</th>
<th>Treat symptomatically.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Specific treatments</td>
<td>No special treatment required.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5. Fire-fighting measures</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Extinguishing media</strong></td>
</tr>
<tr>
<td><strong>Suitable extinguishing media</strong></td>
</tr>
<tr>
<td><strong>Unsuitable extinguishing media</strong></td>
</tr>
</tbody>
</table>

**Special hazards arising from the substance or mixture**

<table>
<thead>
<tr>
<th>Specific hazards</th>
<th>None known.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hazardous combustion products</td>
<td>Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors.</td>
</tr>
</tbody>
</table>

**Advice for firefighters**

| Protective actions during firefighting | Avoid breathing fire gases or vapors. Evacuate area. Cool containers exposed to heat with water spray and remove them from the fire area if it can be done without risk. Cool containers exposed to flames with water until well after the fire is out. |
| Special protective equipment for firefighters | Wear positive-pressure self-contained breathing apparatus (SCBA) and appropriate protective clothing. Standard Firefighter's clothing including helmets, protective boots and gloves will provide a basic level of protection for chemical incidents. |

<table>
<thead>
<tr>
<th>6. Accidental release measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal precautions, protective equipment and emergency procedures</td>
</tr>
<tr>
<td><strong>Personal precautions</strong></td>
</tr>
<tr>
<td><strong>Environmental precautions</strong></td>
</tr>
</tbody>
</table>

**Methods and material for containment and cleaning up**

| Methods for cleaning up | Reuse or recycle products wherever possible. Collect spillage with a shovel and broom, or similar and reuse, if possible. Collect and place in suitable waste disposal containers and seal securely. Flush contaminated area with plenty of water. Wash thoroughly after dealing with a spillage. Dispose of contents/container in accordance with national regulations. |

| Reference to other sections | For personal protection, see Section 8. |

<table>
<thead>
<tr>
<th>7. Handling and storage</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Precautions for safe handling</strong></td>
</tr>
<tr>
<td><strong>Usage precautions</strong></td>
</tr>
<tr>
<td><strong>Advice on general occupational hygiene</strong></td>
</tr>
</tbody>
</table>

**Conditions for safe storage, including any incompatibilities**

| Storage precautions | No specific recommendations. |
Lanthanum Titanium Oxide (pieces)

Storage class
Unspecified storage.

Specific end uses(s)
The identified uses for this product are detailed in Section 1.

8. Exposure controls/Personal protection

Control parameters

Occupational exposure limits
Titanium Oxide (TiO, TiO2, Ti2O3, Ti3O5 powder and pieces)
Long-term exposure limit (8-hour TWA): ACGIH 10 mg/m³
A4
Long-term exposure limit (8-hour TWA): OSHA 15 mg/m³ total dust
ACGIH = American Conference of Governmental Industrial Hygienists.
A4 = Not Classifiable as a Human Carcinogen.
OSHA = Occupational Safety and Health Administration.

Immediate danger to life and health
5000 mg/m³

Exposure controls

Appropriate engineering controls
No specific ventilation requirements.

Eye/face protection
No specific eye protection required during normal use. Large Spillages: Eyewear complying with an approved standard should be worn if a risk assessment indicates eye contact is possible.

Hand protection
No specific hand protection recommended. Large Spillages: Wear protective gloves.

Hygiene measures
Wash hands thoroughly after handling. Wash at the end of each work shift and before eating, smoking and using the toilet. Do not eat, drink or smoke when using this product.

Respiratory protection
No specific recommendations. Provide adequate ventilation. Large Spillages: If ventilation is inadequate, suitable respiratory protection must be worn.

Environmental exposure controls
Not regarded as dangerous for the environment.

9. Physical and chemical properties

Information on basic physical and chemical properties

Appearance
Solid.

Color
Various colors.

Odor
No characteristic odor.

Odor threshold
Not applicable.

pH
Not applicable.

Melting point
Not available.

Initial boiling point and range
Not available.

Flash point
Not applicable.

Evaporation rate
Not applicable.
Lanthanum Titanium Oxide (pieces)

Flammability (solid, gas) Not applicable.
Upper/lower flammability or explosive limits Not applicable.
Vapor pressure Not available.
Vapor density Not available.
Relative density Not available.
Bulk density Not available.
Solubility(ies) Insoluble in water.
Partition coefficient Not applicable.
Auto-ignition temperature Not applicable.
Decomposition Temperature Not available.
Viscosity Not applicable.
Molecular weight Not available.

10. Stability and reactivity
Reactivity There are no known reactivity hazards associated with this product.
Stability Stable at normal ambient temperatures and when used as recommended. Stable under the prescribed storage conditions.
Possibility of hazardous reactions No potentially hazardous reactions known.
Conditions to avoid There are no known conditions that are likely to result in a hazardous situation.
Materials to avoid No specific material or group of materials is likely to react with the product to produce a hazardous situation.
Hazardous decomposition products Does not decompose when used and stored as recommended. Thermal decomposition or combustion products may include the following substances: Harmful gases or vapors.

11. Toxicological information
Information on toxicological effects
Toxicological effects Not regarded as a health hazard under current legislation.
Acute toxicity - oral Notes (oral LD₅₀) Based on available data the classification criteria are not met.
Acute toxicity - dermal Notes (dermal LD₅₀) Based on available data the classification criteria are not met.
Acute toxicity - inhalation Notes (inhalation LC₅₀) Based on available data the classification criteria are not met.
Skin corrosion/irritation Animal data Based on available data the classification criteria are not met.
Serious eye damage/irritation
Lanthanum Titanium Oxide (pieces)

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Serious eye damage/irritation</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Respiratory sensitization</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Skin sensitization</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Germ cell mutagenicity</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Carcinogenicity</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>IARC carcinogenicity</td>
<td>None of the ingredients are listed or exempt.</td>
</tr>
<tr>
<td>Reproductive toxicity</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Reproductive toxicity - fertility</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Reproductive toxicity - development</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Specific target organ toxicity - single exposure</td>
<td>Not classified as a specific target organ toxicant after a single exposure.</td>
</tr>
<tr>
<td>Specific target organ toxicity - repeated exposure</td>
<td>Not classified as a specific target organ toxicant after repeated exposure.</td>
</tr>
<tr>
<td>Aspiration hazard</td>
<td>Not relevant. Solid.</td>
</tr>
</tbody>
</table>

General information: No specific health hazards known. The severity of the symptoms described will vary dependent on the concentration and the length of exposure.

12. Ecological information

<table>
<thead>
<tr>
<th>Category</th>
<th>Classification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ecotoxicity</td>
<td>Not regarded as dangerous for the environment. However, large or frequent spills may have hazardous effects on the environment.</td>
</tr>
<tr>
<td>Toxicity</td>
<td>Based on available data the classification criteria are not met.</td>
</tr>
<tr>
<td>Persistence and degradability</td>
<td>The degradability of the product is not known.</td>
</tr>
<tr>
<td>Bioaccumulative potential</td>
<td>The degradability of the product is not known.</td>
</tr>
<tr>
<td>Bio-Accumulative Potential</td>
<td>No data available on bioaccumulation.</td>
</tr>
<tr>
<td>Partition coefficient</td>
<td>Not applicable.</td>
</tr>
</tbody>
</table>
### Lanthanum Titanium Oxide (pieces)

#### Mobility in soil

**Mobility**
No data available.

**Other adverse effects**
None known.

#### 13. Disposal considerations

**Waste treatment methods**

**General information**
The generation of waste should be minimized or avoided wherever possible. Reuse or recycle products wherever possible. This material and its container must be disposed of in a safe way.

**Disposal methods**
Dispose of surplus products and those that cannot be recycled via a licensed waste disposal contractor. Waste packaging should be collected for reuse or recycling. Incineration or landfill should only be considered when recycling is not feasible. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of the local water authority.

#### 14. Transport information

**General**
The product is not covered by international regulations on the transport of dangerous goods (IMDG, IATA, DOT).

**UN Number**

**UN No. (International)**
Not applicable.

**UN proper shipping name**

**Proper shipping name (International)**
Not applicable.

**Transport hazard class(es)**

**Transport Labels**

**(International)**
No transport warning sign required.

**Packing group**

**Packing group (International)**
Not applicable.

**Environmental hazards**

**Environmentally Hazardous Substance No.**

**Special precautions for user**
Not applicable.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**
Not applicable.

#### 15. Regulatory information

**US Federal Regulations**

**SARA Section 302 Extremely Hazardous Substances Tier II Threshold Planning Quantities**
None of the ingredients are listed or exempt.
Lanthanum Titanium Oxide (pieces)

CERCLA/Superfund, Hazardous Substances/Reportable Quantities (EPA)
None of the ingredients are listed or exempt.

SARA Extremely Hazardous Substances EPCRA Reportable Quantities
None of the ingredients are listed or exempt.

SARA 313 Emission Reporting
Yes

CAA Accidental Release Prevention
None of the ingredients are listed or exempt.

FDA - Essential Chemical
None of the ingredients are listed or exempt.

FDA - Precursor Chemical
None of the ingredients are listed or exempt.

SARA (311/312) Hazard Categories
None of the ingredients are listed or exempt.

OSHA Highly Hazardous Chemicals
None of the ingredients are listed or exempt.

US State Regulations
California Proposition 65 Carcinogens and Reproductive Toxins
WARNING
Cancer and Reproductive harm - www.p65warnings.ca.gov

California Air Toxics "Hot Spots" (A-I)
None of the ingredients are listed or exempt.

California Air Toxics "Hot Spots" (A-II)
None of the ingredients are listed or exempt.

California Directors List of Hazardous Substances
Some of the ingredients are listed or exempt.

Massachusetts "Right To Know" List
None of the ingredients are listed or exempt.

Rhode Island "Right To Know" List
Some of the ingredients are listed or exempt.

Minnesota "Right To Know" List
Some of the ingredients are listed or exempt.

New Jersey "Right To Know" List
Some of the ingredients are listed or exempt.

Pennsylvania "Right To Know" List
Some of the ingredients are listed or exempt.

Inventories
Lanthanum Titanium Oxide (pieces)

**US - TSCA**
All the ingredients are listed or exempt.

**US - TSCA 12(b) Export Notification**
None of the ingredients are listed or exempt.

**Philippines - PICCS**
All the ingredients are listed or exempt.

**New Zealand - NZIOC**
All the ingredients are listed or exempt.

### 16. Other Information

<table>
<thead>
<tr>
<th>Training advice</th>
<th>Only trained personnel should use this material.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Revision date</td>
<td>8/31/2018</td>
</tr>
<tr>
<td>Revision</td>
<td>1</td>
</tr>
<tr>
<td>SDS No.</td>
<td>4909</td>
</tr>
<tr>
<td>End of SDS</td>
<td></td>
</tr>
</tbody>
</table>

This information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is, to the best of the company's knowledge and belief, accurate and reliable as of the date indicated. However, no warranty, guarantee or representation is made to its accuracy, reliability or completeness. It is the user's responsibility to satisfy himself as to the suitability of such information for his own particular use.