SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Trade name  Lead titanium oxide, polymeric precursor

Stock number: 39756

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

Identified use: SU24  Scientific research and development

1.3 Details of the supplier of the safety data sheet

Manufacturer/Supplier:

Thermo Fisher (Kandel) GmbH
Zeppelinstr. 7b
76185 Karlsruhe / Germany
Tel: +49 (0) 721 84007 280
Fax: +49 (0) 721 84007 300
Email: tech@alfa.com
www.alfa.com

Informing department: Product safety Tel + +049 (0) 7275 988687-0

1.4 Emergency telephone number:

Carechem 24: +44 (o) 1235 239 670 (Multi-language emergency number)
Poison Information Center Mainz
www.giftinfo.uni-mainz.de  Telephone: +49(0)6131/19240

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008

GHS02 flame
Flam. Liq. 2 H225 Highly flammable liquid and vapour.

GHS08 health hazard
Repr. 1A H360Df May damage the unborn child. Suspected of damaging fertility.
STOT RE 2 H373 May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.

GHS09 environment
Aquatic Acute 1 H400 Very toxic to aquatic life.
Aquatic Chronic 1 H410 Very toxic to aquatic life with long lasting effects.

Classification according to Directive 67/548/EEC or Directive 1999/45/EC

T; Toxic
R61:  May cause harm to the unborn child.

Xn; Harmful
R62-20/22:  Possible risk of impaired fertility. Harmful by inhalation and if swallowed.

F; Highly flammable
R11:  Highly flammable.
R33:  Danger of cumulative effects.

Information concerning particular hazards for human and environment:

The product has to be labelled due to the calculation procedure of the "General Classification guideline for preparations of the EU" in the latest valid version.

Other hazards that do not result in classification No information known.

2.2 Label elements

Labelling according to Regulation (EC) No 1272/2008 The product is classified and labelled according to the CLP regulation.

Hazard pictograms

GHS02 GHS07 GHS08 GHS09

Signal word Danger

Hazard-determining components of labelling:
Lead titanate polymer

Hazard statements
H225 Highly flammable liquid and vapour.
H302 Harmful if swallowed.
H332 Harmful if inhaled.
H319 Causes serious eye irritation.
H360D May damage the unborn child. Suspected of damaging fertility.
H373 May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.
H410 Very toxic to aquatic life with long lasting effects.

Precautionary statements
P210 Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
P230 Do not breathe dust/lime/gas/mist/vapours/spray.
P303+P361+P338 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P405 Store locked up.
P501 Dispose of contents/container in accordance with local/regional/national/international regulations.

(Contd. on page 2)
Trade name: **Lead titanium oxide, polymeric precursor**

### SECTION 3: Composition/information on ingredients

#### 3.2 Mixtures

**Dangerous components:**

- **Index number:** 082-001-00-6  
  **Lead titanate polymer**  
  R33  
  Rep. Cat. 1, 3 R61; Tr R62-20/22  
  !R38  
  !Xn R62-20/22  
  H360F; STOT RE 2, H373; Aquatic Acute 1, H400; Aquatic Chronic 1, H410; Acute Tox. 4, H302; Acute Tox. 4, H332

- **CAS:** 67-63-0  
  **EINECS:** 200-661-7  
  **Index number:** 603-117-00-0  
  **2-Propanol**  
  !Xi R36; F R11  
  !R67  
  Flam. Liq. 2, H225; Eye Irrit. 2, H319; STOT SE 3, H336

**Additional information:** None known.

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

- **After inhalation:** Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist. Seek immediate medical advice.

- **After skin contact:** Instantly wash with water and soap and rinse thoroughly. Seek immediate medical advice.

- **After eye contact:** Rinse opened eye for several minutes under running water. Then consult doctor.

- **After swallowing:** Seek medical treatment.

#### 4.2 Most important symptoms and effects, both acute and delayed

No further relevant information available.

#### 4.3 Indication of any immediate medical attention and special treatment needed

No further relevant information available.

### SECTION 5: Firefighting measures

#### 5.1 Extinguishing media

Suitable extinguishing agents: CO2, extinguishing powder or water jet. Fight larger fires with water jet or alcohol-resistant foam.

#### 5.2 Special hazards arising from the substance or mixture

If this product is involved in a fire, the following can be released:

- Carbon monoxide and carbon dioxide
- Leadoxide vapour
- Titanium oxides

#### 5.3 Advice for firefighters

**Protective equipment:**

- Wear self-contained breathing apparatus.
- Wear full protective suit.

### SECTION 6: Accidental release measures

#### 6.1 Personal precautions, protective equipment and emergency procedures

- **Wear protective equipment.** Keep unprotected persons away. Ensure adequate ventilation. Keep away from ignition sources.

#### 6.2 Environmental precautions: Do not allow material to be released to the environment without proper governmental permits.

#### 6.3 Methods and material for containment and cleaning up:

- Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
- Dispose of contaminated material as waste according to section 13.
- Ensure adequate ventilation.

#### 6.4 Reference to other sections

- See Section 7 for information on safe handling.
- See Section 8 for information on personal protection equipment.
- See Section 13 for information on disposal.

### SECTION 7: Handling and storage

#### 7.1 Precautions for safe handling

- Handle under dry protective gas.
- Keep containers tightly sealed. Store in cool, dry place in tightly closed containers. Ensure good ventilation/exhaustion at the workplace. Open and handle container with care.

**Information about protection against explosions and fires:**

- Protect against electrostatic charges.
- Fumes can combine with air to form an explosive mixture.
- Keep ignition sources away - Do not smoke.

#### 7.2 Conditions for safe storage, including any incompatibilities

**Storage:**

- Requirements to be met by storerooms and containers: Store in cool location.
- Information about storage in one common storage facility: Store away from water.
- Further information about storage conditions:
  - Store under dry inert gas. This product is moisture sensitive.
  - Keep container tightly sealed.
  - Store in cool, dry conditions in well sealed containers. Protect from humidity and keep away from water.
  - Store in a locked cabinet or with access restricted to technical experts or their assistants.

#### 7.3 Specific end use(s)

- No further relevant information available.

### SECTION 8: Exposure controls/personal protection

**Additional information about design of technical systems:**

- Properly operating chemical fume hood designed for hazardous chemicals and having an average face velocity of at least 100 feet per minute.
8.1 Control parameters

Components with critical values that require monitoring at the workplace:

Lead titanate polymer (85,0%)
- PEL (USA): Long-term value: 0,05 mg/m³ as Pb; See 29CFR 1910,1025
- TLV (USA): Long-term value: 0,05 mg/m³ as Pb; BEI

67-63-0 2-Propanol (15,0%)
- AGW (Germany): Long-term value: 500 mg/m³, 200 ppm
- PEL (USA): Long-term value: 980 mg/m³, 400 ppm
- REL (USA): Short-term value: 1225 mg/m³, 500 ppm
- TLV (USA): Short-term value: 984 mg/m³, 400 ppm

Ingredients with biological limit values:

Lead titanate polymer (85,0%)
- BEI (USA): 30 μg/100 ml Medium: blood Time: not critical Parameter: Lead

67-63-0 2-Propanol (15,0%)
- BGW (Germany): 25 mg/l Untersuchungsmaterial: Vollblut Probennahmezeitpunkt: Expositionsende bzw. Schichtende Parameter: Aceton
- BEI (USA): 40 mg/L Medium: urine Time: end of shift at end of workweek Parameter: Acetone (background, nonspecific)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

General Information
- Appearance: Viscous liquid
- Colour: Brown
- Smell: Not determined
- Odour threshold: Not determined.
- pH-value: Not determined.

Change in condition
- Melting point/Melting range: Not determined
- Boiling point/Boiling range: Not determined
- Sublimation temperature / start: Not determined

Flash point: 12 °C
- Inflammability (solid, gaseous) Not applicable.
- Ignition temperature: 455 °C
- Decomposition temperature: Not determined
- Self-inflammability: Product is not selfigniting.

Danger of explosion: Product is not explosive. However, formation of explosive air/steam mixtures is possible.
- Critical values for explosion:
  - Lower: 2,0 Vol %
  - Upper: 12,0 Vol %
- Steam pressure at 20 °C: 48 hPa
- Density: Not determined
- Relative density: Not determined
- Vapour density: Not determined.
- Evaporation rate: Not determined.
- Solubility in / Miscibility with Water: Hydrolyzes.
- Partition coefficient (n-octanol/water): Not determined.
- Viscosity: dynamic: Not determined.
- kinematic: Not determined.
Trade name: Lead titanium oxide, polymeric precursor

Solvent content:
- Organic solvents: 15.0 %
- Solids content: 85.0 %

SECTION 10: Stability and reactivity

10.1 Reactivity: No information known.

10.2 Chemical stability: Stable under recommended storage conditions.

10.3 Possibility of hazardous reactions: Reacts with strong oxidizing agents.

10.4 Conditions to avoid: No further relevant information available.

10.5 Incompatible materials:
- Oxidising agents
- Water/moisture

10.6 Hazardous decomposition products:
- Carbon monoxide and carbon dioxide
- Leadoxide vapour
- Titanium oxides

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity:
- Harmful if inhaled.
- Harmful if swallowed.

The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

LD/LC50 values that are relevant for classification:

67-83-0 2-Propanol
- Oral LD50 5045 mg/kg (rat)
- Dermal LD50 12800 mg/kg (rabbit)
- Inhalative LC50/8H 12560 ppm/8H (rat)

Skin irritation or corrosion: May cause irritation.

Eye irritation or corrosion: May cause irritation.

Germ cell mutagenicity: The Registry of Toxic Effects of Chemical Substances (RTECS) contains mutation data for components in this product.

Carcinogenicity:
- EPA-B2: Probable human carcinogen, sufficient evidence from animal studies; inadequate evidence or no data from epidemiologic studies.
- IARC-2B: Possibly carcinogenic to humans: limited evidence in humans in the absence of sufficient evidence in experimental animals.
- NTP-R: Reasonably anticipated to be a carcinogen: limited evidence from studies in humans or sufficient evidence from studies in experimental animals.
- ACGIH A3: Animal carcinogen: Agent is carcinogenic in experimental animals at a relatively high dose, by route(s) of administration, at site(s), of histologic type(s), or by mechanism(s) not considered relevant to worker exposure. Available epidemiologic studies do not confirm an increased risk of cancer in exposed humans. Available evidence suggests that the agent is not likely to cause cancer in humans except under uncommon or unlikely routes or levels of exposure.
- IARC-3: Not classifiable as to carcinogenicity to humans.
- ACGIH A4: Not classifiable as a human carcinogen: Inadequate data on which to classify the agent in terms of its carcinogenicity in humans and/or animals.

Reproductive toxicity:
- May damage fertility or the unborn child.
- No sensitizing effect known.
- No information known.

Specific target organ system toxicity - single exposure:
- No effects known.

Aspiration hazard:
- No effects known.

Specific target organ system toxicity - repeated exposure:
- May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.

Additional toxicological information:
- The product shows the following dangers according to the calculation method of the General EC Classification Guidelines for Preparations as issued in the latest version.
- Harmful
- May cause harm to the unborn child.

SECTION 12: Ecological information

12.1 Mobility in soil: No further relevant information available.

12.2 Persistence and degradability: No further relevant information available.

12.3 Bioaccumulative potential: No further relevant information available.

12.4 Toxicity:
- Aquatic toxicity: No further relevant information available.

12.5 Results of PBT and vPvB assessment:
- PBT: Not applicable.
- vPvB: Not applicable.

SECTION 13: Disposal considerations

13.1 Waste treatment methods:

Recommendation:
- Hand over to disposers of hazardous waste.
- Must be specially treated under adherence to official regulations.
- Consult state, local or national regulations for proper disposal.

Uncleaned packagings:
- Recommendation: Disposal must be made according to official regulations.

SECTION 14: Transport information

UN-Number: UN1993

ADR, IMDG, IATA
Trade name **Lead titanium oxide, polymeric precursor**

(Contd. of page 4)

14.2 UN proper shipping name

ADR 1993 FLAMMABLE LIQUID, N.O.S. (ISOPROPANOL (ISOPROPYL ALCOHOL))

IMDG FLAMMABLE LIQUID, N.O.S. (ISOPROPANOL (ISOPROPYL ALCOHOL)), MARINE POLLUTANT

IATA FLAMMABLE LIQUID, N.O.S. (ISOPROPANOL (ISOPROPYL ALCOHOL))

14.3 Transport hazard class(es)

ADR

Class 3 (F1) Flammable liquids.

Label 3

IMDG

Class 3 Flammable liquids.

Label 3

IATA

Class 3 Flammable liquids.

Label 3

Packing group

ADR, IMDG, IATA

III

14.5 Environmental hazards:

Marine pollutant:

Symbol (fish and tree)

14.6 Special precautions for user

Warning: Flammable liquids.

Kemler Number:

30

EMS Number:

F-E,S-E

14.7 Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code

Not applicable.

Transport/Additional information:

ADR

Excepted quantities (EQ): E1

Limited quantities (LQ): 5L

Transport category: 3

Tunnel restriction code: D/E

UN “Model Regulation”: UN1993, FLAMMABLE LIQUID, N.O.S. (ISOPROPANOL (ISOPROPYL ALCOHOL)), 3, III

SECTION 15: Regulatory information

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

Australian Inventory of Chemical Substances

67-63-0 2-Propanol

Standard for the Uniform Scheduling of Drugs and Poisons

None of the ingredients is listed.

National regulations

Information about limitation of use:

For use only by technically qualified individuals.

Employment restrictions concerning young persons must be observed.

Employment restrictions concerning women of child-bearing age must be observed.

Classification according to VbF: A I

Technical instructions (air):

<table>
<thead>
<tr>
<th>Class</th>
<th>Share in %</th>
</tr>
</thead>
<tbody>
<tr>
<td>NK</td>
<td>15.0</td>
</tr>
</tbody>
</table>

Water hazard class: Water danger class 3 (Self-assessment): extremely hazardous for water.

Other regulations, limitations and prohibitive regulations

ELINS (European List of Notified Chemical Substances)

None of the ingredients is listed.

Substance of Very High Concern (SVHC) according to the REACH Regulations (EC) No. 1907/2006.

Lead titanate polymer

85.0%

The conditions of restrictions according to Article 67 and Annex XVII of the Regulation (EC) No 1907/2006 (REACH) for the manufacturing, placing on the market and use must be observed.

None of the ingredients is listed.

Annex XIV of the REACH Regulations (requiring Authorisation for use)

None of the ingredients is listed.

15.2 Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

SECTION 16: Other information

Employers should use this information only as a supplement to other information gathered by them, and should make independent judgement of suitability of this information to ensure proper use and protect the health and safety of employees. This information is furnished without warranty, and any use of the product not in conformance with this Material Safety Data Sheet, or in combination with any other product or process, is the responsibility of the user.

Relevant phrases

H225 Highly flammable liquid and vapour.

H302 Harmful if swallowed.

H319 Causes serious eye irritation.

H322 Harmful if inhaled.

H330 May cause drowsiness or dizziness.

H360Df May damage the unborn child. Suspected of damaging fertility.

H373 May cause damage to the reproductive system, the blood, the brain and the endocrine system through prolonged or repeated exposure. Route of exposure: Oral, Inhalative.

H400 Very toxic to aquatic life.

(Contd. on page 6)
Trade name **Lead titanium oxide, polymeric precursor**

(Contd. of page 5)

H410 Very toxic to aquatic life with long lasting effects.
R11 Highly flammable.
R20/22 Harmful by inhalation and if swallowed.
R33 Danger of cumulative effects.
R36 Irritating to eyes.
R61 May cause harm to the unborn child.
R62 Possible risk of impaired fertility.
R67 Vapours may cause drowsiness and dizziness.

Department issuing SDS: Global Marketing Department

**Abbreviations and acronyms:**
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organization
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
IATA: International Air Transport Association
GHS: Globally Harmonized System of Classification and Labelling of Chemicals
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
VbF: Verordnung über brennbare Flüssigkeiten, Österreich (Ordinance on the storage of combustible liquids, Austria)
LC50: Lethal concentration, 50 percent
vPvB: very Persistent and very Bioaccumulative
ACGIH: American Conference of Governmental Industrial Hygienists (USA)
OSHA: Occupational Safety and Health Administration (USA)
NTP: National Toxicology Program (USA)
IARC: International Agency for Research on Cancer
EPA: Environmental Protection Agency (USA)