

SAFETY DATA SHEET

Product No. 16052 Conductive Silver Grease

Issue Date (04/28/14)

Review Date (05/03/2023) Rev. 04

Section 1: Product and Company Identification

Product Name: Conductive Silver Grease

Synonym: None

Company Name

Ted Pella, Inc., P.O. Box 492477, Redding, CA 96049-2477

Ted Pella, Inc., P.O. Box 492477, Redding, CA 96049-2477

Inside USA and Canada 1-800-237-3526 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)

Outside USA and Canada 1-530-243-2200 (Mon-Thu. 6:00AM to 4:30PM PST; Fri 6:00AM to 4:00PM PST)

CHEMTREC USA and Canada Emergency Contact Number 1-800-424-9300 24 hours a day

CHEMTREC Outside USA and Canada Emergency Contact Number +1-703-741-5970 24 hours a day

Section 2: Hazard Identification

Classification of the substance or mixture

Signal Word: WARNING

Hazard-determining component of labeling: Silver

GHS Categories:

GHS09 – Environment

Chronic Aquatic Toxicity:

Category 1

Label elements

GHS Pictograms:



GHS09

Hazard statements:

H410

Very toxic to aquatic life with long lasting effects.

Precautionary statements:

P273

Avoid release to the environment.

P302 + P352

IF ON SKIN: Wash with plenty of water.

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.

P301 + P330 + P331, P314

IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

Get medical advice /attention if feeling unwell

P391

Collect spillage.

P501

Dispose of contents/container in accordance to local/regional/national/international regulations.

HMIS® RATING

HEALTH:	* 1
FLAMMABILITY:	1
PHYSICAL HAZARD:	0
PERSONAL PROTECTION:	

NFPA® 704 CODES

Approximate HMIS and NFPA Risk Ratings Legend:

0 (Low or none); 1 (Slight); 2 (Moderate); 3 (Serious); 4 (Severe)

Other hazards

Argyria: Long term exposure to silver powder or compounds can lead to an irreversible blue-grey skin discoloration.

Classification complies with OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS)

Section 3: Composition / Information on Ingredients

<u>Hazardous Component(s)</u>	<u>CAS No.</u>	<u>EC No.</u>	<u>w/w%</u>
Aluminum powder	7429-90-5	231-072-3	30-60%
Silver	7440-22-4	231-131-3	10-30%

Section 4: First Aid Measures

Inhalation:	Remove person to fresh air and keep comfortable for breathing.
Skin Contact:	Wash with plenty of water and soap.
Eye(s) Contact:	Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Ingestion:	Rinse mouth. Do NOT induce vomiting. Get medical advice /attention if feeling unwell

Section 5: Fire Fighting Measures

Suitable extinguishing media:	In case of fire: Use extinguish media suitable for surrounding. Fight larger fires with water spray or alcohol resistant foam.
Specific hazards during firefighting:	At temperatures above 150 °C (302 °F), formaldehyde can be generated in presence of oxygen. Formaldehyde is classified as a human carcinogen, a skin and respiratory sensitizer; and an irritant to the eyes and throat.
Combustion Products:	Produces carbon oxides (CO, CO ₂), silicone oxides, aluminum oxides, and other metal toxic fumes.
Special protective equipment for fire fighters:	Wear self-contained breathing apparatus and full fire-fighting turn-out gear.

Section 6: Accidental Release MeasuresPersonal Protection:

- Use personal protection recommended in section 8

Precautions for Response:

- This product makes surfaces slippery and must be cleaned thoroughly.

Environmental Precautions:

- Avoid releasing to the environment.
- Do not allow to enter sewers/surface or ground water.

Containment Methods:

- Not applicable – not readily flowable.

Cleaning Methods:

- Collect waste in a waste container.
- Wipe off residues with paper towels and place towels in the waste container.
- Use soap and water to remove the last traces of residue.

Disposal Methods:

- Dispose contaminated material as waste according to Section 13

Section 7: Handling and Storage

Prevention:	Avoid release to the environment. Do not get in eyes, on skin, or on clothing.
Handling:	Wear protective gloves, eye protection. Collect spillage.
Storage:	Recommended that product be kept in a dry and clean area, away from incompatible substances.

Section 8: Exposure Controls / Personal Protection

Substances with Occupational Limit Values			
Chemical Name CAS #	Country or Regulator	Long-Term Exposure Limits (PEL)	Short-Term Exposure Limits (STEL)
Aluminum metal and insoluble compounds* 7429-90-5	ACGIH	1 mg/m ³	Not established
	USA OSGA PEL	15 mg/m ³	Not established
	Canada AB	10 mg/m ³	Not established
	Canada BC	1 mg/m ³	Not established
	Canada ON	1 mg/m ³	Not established
	Canada QC	10 mg/m ³	Not established
Silver (metal dust, mist) (metal) Silver and its compounds) (metal, dust, fumes) 7440-22-4	ACGIH	0.1 mg/m ³	Not established
	USA OSGA PEL	0.01 mg/m ³	Not established
	Canada AB	0.1 mg/m ³	Not established
	Canada BC	0.01 mg/m ³	0.03 mg/m ³
	Canada ON	0.1 mg/m ³	Not established
	Canada QC	0.1 mg/m ³	Not established

Note: Ingredients are listed in descending weight contribution order (from greatest to least).

The ACGIH1, OSHA (Table Z-1), and Canadian provinces exposure limits were consulted.

Limits from the RTECS2 database and from suppliers' SDS were also consulted.

Short term exposure limits (STEL) are for 15 min and long term permissible exposure limits (PEL) for 8 h.

*Respirable airborne particles

Engineering Controls:

Ventilation: Keep airborne concentrations below occupational exposure limits (OEL). Because the aluminum powder is bound to the grease matrix, it does not present an airborne hazard under normal use. Ensure adequate ventilation if the product is mechanically misted or aerosolized.

Personal Protection Equipment:

Eye Protection: Wear appropriate protective eyeglasses or chemical safety goggles. Recommended that all eye glasses have side shields for lateral protection.

Skin Protection: For likely contacts, use of protective butyl rubber or other chemically resistant gloves.
For incidental contacts, use nitrile or other chemically resistant gloves.

<u>Respiratory Protection:</u>	For over-exposures up to 10 x OEL of mist, vapors, or spray, wear respirator such as a half-mask respirator with organic vapor cartridge. Recommend consultation with local safety supply vendor to ensure that the respirator has a NIOSH (U.S.) approved filter cartridge appropriate for the components listed in Section 3. The respirator should be fitted to the employee by a professional. Ensure vapor cartridges are stored in sealed plastic bags when not being used.
<u>General Hygiene:</u>	Wash hand thoroughly with water and soap after handling.

Section 9 Physical and Chemical Properties

Physical state	Solid, paste
Color	Light brown, silver
Odor	Mild
Odor threshold	Not available
pH at 20°C (68°F)	Not available
Melting point/range	Not available
Freezing point/range	Not available
Flash point	Not available
Evaporation rate	<1 (ButAc =1)
Flammability (solid, gas)	Non-flammable
Upper explosion/flammability limit	Not available
Lower explosion/flammability limit	Not available
Vapor pressure at 20°C (68°F)	Not available
Vapor density	Not available
Relative Density at 25°C (77°F)	1.84
Solubility in H ₂ O	Insoluble
Partition coefficient (n-octanol/water)	Not available
Auto-ignition temperature	Not available
Decomposition temperature	Not available
Viscosity at 40°C (104°F)	Not available

Section 10: Stability and Reactivity

Reactivity:

- Reacts with acids to form flammable hydrogen gas.
- Reacts violently with hydrogen peroxide to form oxygen gas.
- Reaction with ammonia may form explosive compounds when dry.
- Reacts with acetylene for form shock-sensitive compounds

Chemical Stability:

- Chemically stable at normal temperatures and pressures.

Conditions to Avoid:

- Avoid flames, excessive temperatures, and incompatible substances.

Incompatible materials:

- Strong oxidizing agents, strong acids, strong bases, ammonia, fluorine, chlorine.

Polymerization:

- Will not occur.

Decomposition products:

- Will not decompose under normal conditions.
- For thermal decomposition, see combustion products in Section 5.

Section 11: Toxicological Information

Eyes:	Low toxicity – may cause mild eye irritation and redness.
Skin:	Low toxicity – no symptoms known or expected.
Inhalation:	Low toxicity – no symptoms known or expected.
Ingestion:	Low toxicity – no symptoms known or expected.
Chronic:	Prolonged or repeated exposure to silver or silver compounds by ingestion or inhalation can cause an irreversible blue-grey skin discoloration (Argyria).

Acute Toxicity (Lethal Exposure Concentrations)

Chemical Name	LD 50 (oral)	LD50 (dermal)	LC50 (inhalation)
Aluminum powder	Not available	Not available	Not available
Silver	>5g/kg Guinea pig	≥2,000 mg/kg Rabbit	5.16 mg/L Rat 4h (dust)

Note: Toxicity data from the RTEC² and ECHA databases were consulted.
The data from supplier SDS's were also consulted.

Other Toxicological Effects

<u>Skin corrosion/irritation:</u>	Based on available data, the classification criteria are not met.
<u>Serious eye damage/irritation:</u>	May cause mild eye irritation. Contains mechanically abrasive particles.
<u>Sensitization (allergic reactions):</u>	Based on available data, the classification criteria are not met.
<u>Carcinogenicity (risk of cancer):</u>	None of the components are classified or listed as a carcinogen by IARC, ACHIGH, California Proposition 65, or NTP.
<u>Mutagenicity:</u>	Based on available data, the classification criteria are not met.
<u>Reproductive Toxicity (risk to sex functions):</u>	Based on available data, the classification criteria are not met.
<u>Teratogenicity (risk of fetus malformation):</u>	Based on available data, the classification criteria are not met.
<u>STOT-single exposure:</u>	Based on available data, the classification criteria are not met.
<u>STOT-repeated exposure:</u>	Based on available data, the classification criteria are not met.
<u>Aspiration hazard:</u>	Based on available data, the classification criteria are not met. There is no category 1 components, and the kinematic viscosity is >20.5 mm ² /s at 40 °C.

Section 12: Ecological Information

Ecological classifications are based on the IMDG/GHS criteria in conjunction with ecotoxicological data from our suppliers, the European Chemical Agency database (<http://echa.europa.eu>), and other reliable sources.

Contains silver particles less than a 1 mm in size but >100 nm (larger than nanoparticles), which are very toxic to the environment in their ionic form. While both are insoluble in water, classification is being harmonized to EU classification.

Aluminum powder is not classifiable as ecotoxic hazards under GHS criteria.

Acute Ecotoxicity:

Category 1: Very toxic to aquatic life Chronic

Ecotoxicity:

Category 1: Very Toxic to aquatic life with long lasting effects
Avoid release to the environment. Collect spillage.

Biodegradability:

Not readily biodegradable

Other Effects:

Not applicable

Section 13: Disposal Considerations

Dispose in a safe manner in accordance with local, state and federal regulations.

Section 14: Transportation Information

U.S. Department of Transportation Ground (49 CFR): Not regulated for quantities of 5 kg or less
(per 49 CFR exception 171.4 (c) (2))

Section 171.4 (c) (2):

Single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other requirements of this subchapter provided the packagings meet the general requirements in §§ 173.24 and 173.24a. This exception does not apply to marine pollutants that are a hazardous waste or a hazardous substance. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class, all provisions of this subchapter relevant to any additional hazards continue to apply.

Canadian Transportation of Dangerous goods (TD): Not regulated for quantities of 450 kg or less
(per Special Provision 99)

Special Provision 99 (2):

These Regulations, except for Part 1 (Coming into Force, Repeal, Interpretation, General Provisions and Special Cases) and Part 2 (Classification), do not apply to the handling, offering for transport or transporting of less than 450 kg of UN3077, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S., or less than 450 L of UN3082, ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S., on a road vehicle or a railway vehicle. The dangerous goods must be contained in one or more small means of containment designed, constructed, filled, closed, secured and maintained so that under normal conditions of transport, including handling, there will be no accidental release of the dangerous goods that could endanger public safety.

ICAO-IATA regulations: Not regulated for quantities of 5 kg or less
(Not Restricted, as per Special Provisions A197)

Special Provision A197:

These substances when transported in single or combination packagings containing net quantity per single or inner packaging of less than 5 L or less for liquids or having a net mass of 5 kg or less for solids, are not subject to any other provisions of these Regulations provided the packagings meet the general provisions 5.0.2.4.1, 5.0.2.6.1.1 and 5.0.2.8. S

IMDG: Not regulated for quantities of 5 kg or less
(per 2.10.2.7)

Special Provision 2.10.2.7

Marine pollutants packaged in single or combination packagings containing a net quantity per single or inner packaging of 5 L or less for liquids or having a net mass per single or inner packaging of 5 kg or less for solids are not subject to any other provision of this Code relevant to marine pollutants provided the packagings meet the general provisions of 4.1.1.1, 4.1.1.2 and 4.1.1.4 to 4.1.1.8. In the case of marine pollutants also meeting the criteria for inclusion in another hazard class, all provisions of this Code relevant to any additional hazards continue to apply.

The transport classification(s) provided herein are for information purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet (SDS). Transportation classifications may vary by mode of transportation, package size, and variations in regional or country regulations.

Section 15: Regulatory Information

EPCRA (Emergency Planning and Right to Know Act, USA, 40 CFR 372.45)

This product does not contain ingredients that are subject to the reporting requirements of section 313 Title III of the SARA of 1986 and 40 CFR part 372.

TSCA (Toxic Substances Control Act of 1976, USA)

All substances are TSCA listed.

CAA (Clean Air Act, USA)

This product does not contain any class 1 ozone depleting substances. This product does not contain any class 2 ozone depleting substances. This product does not contain substances that are listed as hazardous air pollutants.

California Proposition 65 (Chemicals known to cause cancer or reproductive toxicity).

This product does not contain any substances on the California proposition 65 list.

Domestic Substance List (DSL) / Non-Domestic Substance Lists (NDSL Canada)

All hazardous ingredients are listed on the DSL/NDSL.

Hazardous Products Act (R.S.C., 1985, c. H-3 Canada)

The safety data sheet and label comply with the Hazardous Product Act and WHMIS 2015.

RoHS (Restriction of Hazardous Substances Directive) This product does not contain any lead, cadmium, mercury, hexavalent chromium, PBB's, PBDE's, DEHP, BBP, DBP, or DIBP and complies with European RoHS regulations.

WEEE (Waste Electrical and Electronic Equipment Directive) This product is not a piece of electrical or electronics equipment, and is therefore not governed by this regulation.

Section 16: Other Information

This Safety Data Sheet (SDS) is intended to comply with the OSHA Hazard Communication Standard (29 CFR 1910.1200) and is consistent with the provisions of the United Nations Globally Harmonized System of Classification and Labeling of Chemicals (GHS).

Full text of other abbreviations

ACGIH:	USA. ACGIH Threshold Limit Values (TLV)
ACGIH BEI:	ACGIH - Biological Exposure Indices (BEI)
NIOSH REL:	USA. NIOSH Recommended Exposure Limits
OSHA Z-1:	USA. Occupational Exposure Limits (OSHA) - Table Z-1 Limits for Air Contaminants
OSHA Z-2:	USA. Occupational Exposure Limits (OSHA) - Table Z-2
US WEEL:	USA. Workplace Environmental Exposure Levels (WEEL)
ACGIH / TWA:	8-hour, time-weighted average
ACGIH / STEL:	Short-term exposure limit
NIOSH REL/TWA:	Time-weighted average concentration for up to a 10-hour workday during a 40-hour workweek
NIOSH REL/ST:	STEL - 15-minute TWA exposure that should not be exceeded at any time during a workday
OSHA Z-1 / TWA:	8-hour time weighted average
OSHA Z-2/TWA:	8-hour time weighted average
OSHA Z-2/CEIL:	Acceptable ceiling concentration
OSHA Z-2/Peak:	Acceptable maximum peak above the acceptable ceiling concentration for an 8-hr shift
US WEEL/TWA:	8-hr TWA

AICS - Australian Inventory of Chemical Substances;

AIIC - Australian Inventory of Industrial Chemicals;

ASTM - American Society for the Testing of Materials;

bw - Body weight;

CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act;

CMR - Carcinogen, Mutagen or Reproductive Toxicant;

DIN - Standard of the German Institute for Standardization;

DOT - Department of Transportation;

DSL - Domestic Substances List (Canada);

ECx - Concentration associated with x% response;

EHS - Extremely Hazardous Substance;

ELx - Loading rate associated with x% response;

EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan);

ErCx - Concentration associated with x% growth rate response;

ERG - Emergency Response Guide;

GHS - Globally Harmonized System;

GLP - Good Laboratory Practice;

HMIS - Hazardous Materials Identification System;

IARC - International Agency for Research on Cancer;

IATA - International Air Transport Association;

IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk;

IC50 - Half maximal inhibitory concentration;

ICAO - International Civil Aviation Organization;
IECSC - Inventory of Existing Chemical Substances in China;
IMDG - International Maritime Dangerous Goods;
IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan);
ISO - International Organization for Standardization;
KECI - Korea Existing Chemicals Inventory;
LC50 - Lethal Concentration to 50 % of a test population;
LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose);
MARPOL - International Convention for the Prevention of Pollution from Ships;
MSHA - Mine Safety and Health Administration;
n.o.s. - Not Otherwise Specified;
NFPA - National Fire Protection Association;
NO(A)EC - No Observed (Adverse) Effect Concentration;
NO(A)EL - No Observed (Adverse) Effect Level;
NOELR - No Observable Effect Loading Rate;
NTP - National Toxicology Program;
NZIoC - New Zealand Inventory of Chemicals;
OECD - Organization for Economic Co-operation and Development;
OPPTS - Office of Chemical Safety and Pollution Prevention;
PBT - Persistent, Bioaccumulative and Toxic substance;
PICCS - Philippines Inventory of Chemicals and Chemical Substances;
(Q)SAR - (Quantitative) Structure Activity Relationship;
RCRA - Resource Conservation and Recovery Act;
REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorization and Restriction of Chemicals;
RQ - Reportable Quantity;
SADT - Self-Accelerating Decomposition Temperature;
SARA - Superfund Amendments and Reauthorization Act;
SDS - Safety Data Sheet;
TCSI - Taiwan Chemical Substance Inventory;
TSCA - Toxic Substances Control Act (United States);
UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods;
vPvB - Very Persistent and Very Bioaccumulative

Disclaimer

Ted Pella, Inc. makes no warranty of any kind regarding the information furnished herein. Users should independently determine the suitability and completeness of information from all sources. While this data is presented in good faith and believed to be accurate, it should be considered only as a supplement to other information gathered by the user. It is the User's responsibility to assure the proper use and disposal of these materials as well as the safety and health of all personnel who may work with or otherwise come in contact with these materials.