



Safety Data Sheet

Material Name: Aluminum Powder

MSDS ID: TA-104_NA

This SDS is prepared according to Regulation 2012 OSHA Hazard Communication Standard; 29 CFR Part 1910.1200

*** Section 1 - IDENTIFICATION***

PRODUCT IDENTIFICATION

Material Name: Aluminum Powder (Low Micron)

Grade Names: TCP-1; TCP-2; TCP-2B, TCP-2D, SWJ2, A16-1417, A19-1436, A19-1438, A21-1457

Product Use

Thermal management products; electronics

Restrictions on Use

None known.

Manufacturer Information

Toyal America, Inc.
17401 South Broadway
Lockport, IL 60441
Facility Phone: 815-740-3000

24 Hour Emergency Telephone:

1-800-424-9300 Chemtrec (USA & Canada)
+1-703-527-3887 Chemtrec (International Call Collect)

*** Section 2 - HAZARDS IDENTIFICATION***

GHS Classification

Flammable Solid, Category 2
Combustible Dust

GHS LABEL ELEMENTS

Symbol(s)



Signal Word

WARNING

Hazard Statement(s)

Flammable Solid
May form combustible dust concentrations in air.

Precautionary Statement(s)

Prevention

Keep away from heat/sparks/flames/hot surfaces-No smoking. Ground/bond container and receiving container.
Use explosion-proof electrical/ventilating/lighting/equipment. Wear protective eye protection.

Response

IN case of fire, use Class D extinguisher or dry sand to extinguish.



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Storage

None indicated

Disposal

None indicated

Other Hazards which do not Result in Classification

None known

*** Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS***

CAS	Component	Percent
7429-90-5	Aluminum	99-100%

*** Section 4 - FIRST AID MEASURES***

Inhalation

If adverse effects occur, remove to uncontaminated area. Give artificial respiration if not breathing. If breathing is difficult, oxygen should be administered by qualified personnel. Get immediate medical attention.

Skin

Wash skin with soap and water for at least 15 minutes while removing contaminated clothing and shoes. Get medical attention, if needed. Thoroughly clean and dry contaminated clothing and shoes before reuse.

Eyes

Flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Then get immediate medical attention.

Ingestion

Do NOT induce vomiting. If vomiting occurs, keep head lower than hips to help prevent aspiration. Get immediate medical attention. Give artificial respiration if not breathing.

Notes to Physician

For inhalation, consider oxygen

Symptoms: Immediate

None known.

Symptoms: Delayed

None known

*** Section 5 - FIRE FIGHTING MEASURES***

Suitable Extinguishing Media

Dry sand; Class D Extinguishing Agent (for metal powder fires).

Unsuitable Extinguishing Media

Do not use halogenated extinguishing agents, water, carbon dioxide, ABC powder, or foam.



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Special Hazards Arising from the Substance or Mixture

This material is potentially explosive when loosened and dispersed in air. DO NOT ALLOW A DUST CLOUD TO BE FORMED. Avoid heat, sparks, and open flames. Eliminate the generation of static electricity. Aluminum powder will react with acids, bases, or water to form flammable hydrogen gas. Finely divided **burning** aluminum powder will react violently with water to form hydrogen gas.

Combustion Products:

Oxides of aluminum

Fire Fighting Measures

Use Class "D" extinguisher or dry sand. Gently cover the burning powder with the sand or Class "D" agent and allow to burn itself out under the crust. Once covered do not disturb until totally cooled. Do not use Class A, B, or C extinguishers, halogenated agents, or water.

Protective Equipment and Precautions for Firefighters

Wear full protective fire fighting gear including self contained breathing apparatus (SCBA) for protection against possible exposure.

*** Section 6 - ACCIDENTAL RELEASE MEASURES***

Personal Precautions, Protective Equipment and Emergency Procedures

Wear personal protective clothing and equipment, see Section 8.

Environmental Precautions

Avoid release to the environment. Collect spillage.

Methods and Material for Containment and Cleaning up

Eliminate all sources of ignition. Do not touch or walk through spilled material. Stop leak if possible without personal risk. Do not get water directly on material. Eliminate the generation of static electricity. Use natural bristle broom or brush to collect material into suitable container for disposal. Move containers away from spill to a safe area. Do not form dust cloud.

Precautionary Measures to Prevent Secondary Hazards

No additional information is available.

*** Section 7 - HANDLING AND STORAGE***

Precautions for Safe Handling

Keep away from heat, sparks and flame. Eliminate the generation of static electricity. Do not breathe dust. Do not get in eyes, on skin, or on clothing. Wash thoroughly after handling. Wear protective gloves/clothing and eye/face protection. Do not eat, drink, or smoke when using this product. Use only with adequate ventilation. Dust can form an explosive mixture with air. Take precautionary measures against static charges. Use explosion-proof equipment and non-sparking tools.

Empty containers may contain residues and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition; they may explode and cause injury or death.

Conditions for Safe Storage, Including any Incompatibilities

Store and handle in accordance with all current regulations and standards. Store in a well-ventilated place. Store in a cool, dry place. Store in a tightly closed container. Store locked up. Keep separated from oxidizing agents, acids, alkalis, nitrates, alcohols, halogenated hydrocarbons, halogens, and water. Keep material dry.



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Humidity penetration into closed containers may lead to pressure increase and possible bursting of the container.

*** Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION***

Component Exposure Limits

Aluminum (7429-90-5)

ACGIH: 1 mg/m³ TWA (respirable fraction)

OSHA: 15 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable fraction)

NIOSH: 10 mg/m³ TWA (total dust); 5 mg/m³ TWA (respirable dust)

Mexico: 10 mg/m³ TWA LMPE (dust)

Engineering Controls

Ventilation equipment should be explosion-resistant if explosive concentrations of material are present. Provide local exhaust or process enclosure ventilation system. Ensure compliance with applicable exposure limits.

Eye / Face Protection

The appropriate eye/face protection must be determined by the user of the material, based upon the conditions of use. Safety glasses with side shields should be worn at a minimum. Chemical safety goggles provide a greater level of protection, and should be considered based upon the material's anticipated exposure levels. A face shield (in addition to safety goggles) should be considered when significant exposures are expected.

Skin Protection

Wear appropriate chemical resistant clothing.

Glove Recommendations

Wear appropriate chemical resistant gloves.

Respiratory Protection

Use an air purifying respirator for concentrations exceeding the occupational limits.

Protection provided by air-purifying respirators is limited.

Use a positive-pressure, air-supplied respirator if there is any potential for uncontrolled release, exposure levels are not known, or any other circumstance where air-purifying respirators may not provide adequate protection.

*** Section 9 - PHYSICAL AND CHEMICAL PROPERTIES***

Appearance:	Silver/Gray Powder
Physical State:	Finely Divided Powder
Color:	Silver/Gray
Odor:	Not available



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Odor Threshold:	Not available
pH:	Not available
Melting Point:	660C (1220F)
Boiling Point:	Not available
Flash Point:	Not available
Evaporation Rate:	Not available
Flammability (solid, gas):	Flammable solid. Metal powder burning time >5 min. and ≤10 min. in accordance with UN test method.
Upper/lower explosive limits:	Not available
Vapor Pressure:	Not available
Vapor Density:	Not available
Relative Density:	2.7
Solubility:	Not available
Partition coefficient: n-octanol/water	Not available
Auto-ignition temperature:	Not available
Decomposition temperature:	Not available
Viscosity:	Not available

*** Section 10 - STABILITY AND REACTIVITY***

Reactivity

See sub-sections below.

Chemical Stability

Stable at normal temperatures and pressure.

Possibility of Hazardous Reactions

Reacts violently with halogenated hydrocarbons and oxidizers to produce heat. Reacts with water and slowly generates heat and hydrogen gas. Aluminum reacts with acids or alkalis to form flammable hydrogen gas. Will not polymerize.

Conditions to Avoid

Avoid heat, flames, sparks and other sources of ignition. Containers may rupture or explode if exposed to heat. Take precautionary measures against static discharge.

Incompatible Materials

Water, acids, bases, combustible materials, oxidizing materials, halogenated hydrocarbons, strong oxidizers.

Hazardous Decomposition Products

Combustion: oxides of aluminum



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*** Section 11 - TOXICOLOGICAL INFORMATION***

Likely Routes of Exposure

Eye Contact: May cause irritation by mechanical means Symptoms may include pain or irritation, watering, and/or redness.

Inhalation: May cause respiratory tract irritation.

Skin Contact: May cause irritation on repeated contact. Symptoms may include dryness of skin.

Ingestion: None known.

Acute toxicity - LD50/LC50

No data available

Immediate Effects

Possible skin, eye or respiratory irritation.

Delayed Effects

None known,

Irritation / Corrosivity

No data available.

Respiratory Sensitization

No data available.

Skin Sensitization

No data available.

Germ Cell Mutagenicity

No information available for the product.

Carcinogenicity

Aluminum (7429-90-5)

ACGIH: A4 - Not Classifiable as a Human Carcinogen

Reproductive Toxicity

No information available for the product.

Specific Target Organ Toxicity - Single Exposure

No information on significant adverse effects.

Specific Target Organ Toxicity - Repeated Exposure

No information on significant adverse effects.

Aspiration Hazard

Not expected to be an aspiration hazard

Medical Conditions Aggravated by Exposure

None known.

*** Section 12 - ECOLOGICAL INFORMATION***

No information available for the product.



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*** Section 13 - DISPOSAL CONSIDERATIONS***

Disposal Methods

Dispose in accordance with all applicable regulations. Reprocess whenever possible. Co-process or incinerate in authorized facilities. Incineration should be done in accordance with prevailing municipal, state, and federal laws and standards from local environmental agencies.

Disposal of Contaminated Packaging

Empty containers may contain residues and can be dangerous. Do not pressurize, cut, weld, braze, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition; they may explode and cause injury or death. Dispose in accordance with all applicable regulations

*** Section 14 - TRANSPORT INFORMATION***

LAND TRANSPORTATION (DOT)

UN3089, Metal Powder Flammable, N.O.S., 4.1, PGIII

TDG Information

UN3089, Metal Powder Flammable, N.O.S., 4.1, PGIII

SEA (IMDG)

UN3089, Metal Powder Flammable, N.O.S., 4.1, PGIII

Marine Pollutant: No

AIR (IATA)

UN3089, Metal Powder Flammable, N.O.S., 4.1, PGIII

*** Section 15 - REGULATORY INFORMATION***

U.S. Federal Regulations

SARA 313

Aluminum (7429-90-5) –dust or fume only

Max. % in Product

100%

Canada

This product has been classified in accordance with the criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

WHMIS CLASSIFICATION: B-4

Canadian WHMIS Ingredient Disclosure List (IDL)



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Components of this material have been checked against the Canadian WHMIS Ingredients Disclosure List. The List is composed of chemicals which must be identified on MSDSs if they are included in products which fall under WHMIS criteria specified in the Controlled Products Regulations and present above the threshold limits listed on the IDL.

Aluminum (7429-90-5) 1 %

Inventory List Status

- US TSCA:** All components are listed or exempt.
- Canada DSL:** All components are listed or exempt.
- EINECS:** All components are listed or exempt.
- Australia (AICS):** All components are listed or exempt.
- Philippines (PICCS):** All components are listed or exempt.
- Japanese Inventory:** All components are listed or exempt.
- Korea Inventory:** All components are listed or exempt.
- China Inventory:** All components are listed or exempt.
- New Zealand (NZIoC):** All components are listed or exempt.
- Mexico (INSQ):** All components are listed or exempt.
- Taiwan (EC SI):** All components are listed or exempt.

*** Section 16 - OTHER INFORMATION***

Summary of Changes

- Revision 1.0000, 06 March, 2013: New MSDS.
- Revision 2.0000, 15 May, 2015: Revised to meet GHS format
- Revision 3.0000, 07 July, 2017: Review & Update

Key / Legend

ACGIH - American Conference of Governmental Industrial Hygienists; CAS - Chemical Abstracts Service; DOT - Department of Transportation; EC50 - Effective Concentration, 50%; IARC - International Agency for Research on Cancer; IATA - International Air Transport Association; ICAO - International Civil Aviation Organization; IMDG - International Maritime Dangerous Goods; Kow - Octanol/water partition coefficient; LD50 - Lethal Dose, 50%; LEL - Lower Explosive Limit; MAK - Maximum Concentration Value in the Workplace; MEL - Maximum Exposure Limits; NIOSH - National Institute for Occupational Safety and Health; NTP = National Toxicology Program; STEL - Short-term Exposure Limit; TWA - Time Weighted Average; UEL - Upper Explosive Limit; UEL - Upper Explosive Limit; WHMIS - Workplace Hazardous Materials Information System

Other Information



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The information set forth in this Safety Data Sheet does not purport to be all-inclusive and should be used only as a guide. While the information and recommendations set forth herein are believed to be accurate, the company makes no warranty regarding such information and recommendations and disclaims all liability from reliance thereon.

End of Sheet TA-104