

# Heegermaterials

## 1. Identification

<u>Product Name:</u>	Aluminum-2024	Aluminum-6061	Aluminum-5056
	Aluminum-7050	Aluminum-7075	Aluminum CP-AI
<u>Synonyms:</u>	Aluminum alloy, 2024, 5056, 6061, 7050, 7075, CP-AI		

### 1.2 Product Use

<u>Product Use:</u>	Cold spray, additive manufacturing, repair
<u>Restrictions:</u>	Industrial use or research purposes only

### 1.3 Manufacturer/Supplier

Heeger Materials Inc.  
230 Steele St Denver  
CO 80206  
United States  
Tel: 925-385-8104

### Emergency Telephone Numbers

1 – 800 – 255 – 3924

## 2. Hazard(s) identification

If suspended in air (dust cloud) fine grades can be ignited in the presence of an ignition source and could pose an explosion risk in a confined environment.

Prolonged contact with water may result in a reaction releasing hydrogen – ignition risk.

Will react with oxidizing agents or acids and alkalis, causing heating and hydrogen release – explosion risk.

Can violently react with halogenated hydrocarbons.

May cause sensitization by inhalation and skin contact.

May cause allergy or asthma symptoms or breathing difficulties if inhaled.

May cause damage to organs through prolonged or repeated exposure.



### 2.2 Statements

#### Hazard Statements

H260: In contact with water releases flammable gases which may ignite  
H317: May cause an allergic skin reaction.  
H334: May cause allergy or asthma symptoms or breathing difficulties if inhaled  
H373: May cause damage to organs through prolonged or repeated exposure

#### Precautionary Statements

P201: Obtain special instructions before use.  
P202: Do not handle until all safety precautions have been read and understood.  
P210: Keep away from heat/sparks/open flames/hot surfaces. No smoking.  
P240: Ground/bond container and receiving equipment.  
P241: Use explosion-proof electrical/ventilating/lighting equipment

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P261: Avoid breathing dust/ fume/ gas/ mist/ vapors/ spray.

P272: Contaminated work clothing should not be allowed out of the workplace.

P280: Wear protective gloves/protective clothing/eye protection/face protection

P302+P352: IF ON SKIN: Wash with plenty of soap and water.

P308+P313: IF exposed or concerned: Get medical advice/ attention.

P321: Specific treatment (see supplemental first aid instructions on this label)

P333+P313: If skin irritation or rash occurs: Get medical advice/ attention.

P363: Wash contaminated clothing before reuse.

P370: Use for extinction: Special powder for metal fires.

P378: Use for extinction: Dry sand.

P405: Store locked up.

P501: Dispose of contents/ container to an approved waste disposal plant.

## 3. Composition/Information on Ingredients

Ingredient	CAS Number	Weight (%)	Synonym	CLP Hazard	H Statement
Al	7429-90-5	Bal	Aluminum	Water-react. 2, Flam. Sol. 1	H261, H228
Cr	7440-47-3	0 – 0.5	Chromium	Eye Irrit. 2, Resp. Sens. 1	H319, H334
Cu	7440-50-8	0 – 5	Copper	Aquatic Chron 1, Aquatic Acute 1	H410, H400
Mg	7439-95-4	0 – 6	Magnesium	Aquatic Chron 3, Flam. Sol. 1	H412, H228
Zn	7440-66-6	0 – 6.1	Zinc	Aquatic Chron 1, Aquatic Acute 1	H410, H400
Si	7440-21-3	0 – 13	Silicon	Flam. Sol. 2, Skin Irrit. 2, Eye Irrit. 2	H228, H315, H319

## 4. First-aid measures

### 4.1 Eyes

Flush eyes with plenty of water, lifting the upper and lower eyelids occasionally. Get medical attention if irritation develops.

### 4.2 Skin

Wash skin using soap or a mild detergent and warm water.

### 4.3 Inhalation

Move exposed individuals to fresh air at once. If breathing has stopped, perform artificial respiration. Call a physician.

### 4.4 Ingestion

If swallowed, call a physician immediately. Rinse mouth with water. Do not induce vomiting unless directed by medical personnel.

## 5. Fire-fighting measures

### 5.1 Extinguishing Media

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Dry powder, do not use water. Gently smother burning material with dry sand or other inert substance. Special Powder (Class D – dry powder) extinguishers with spin applicators for smoother effect application may be used carefully.

Not to be used: water, carbon dioxide, foam, ABC powder

## 5.2 Unusual Fire and Explosion Hazards

Dust can combine with air to form an explosive mixture.

Contact with water releases flammable gases (hydrogen)

Decomposition of this product may yield metallic oxides

## 5.3 Fire Fighting Equipment

Wear self-contained breathing apparatus for firefighting if necessary and protective clothing.

Avoid creation of dusts.

Prevent firefighting water entering watercourses or groundwater.

## 5.4 Precautions

Keep away from ignition sources.

## 6. Accidental release measures

1. Restrict area to those wearing appropriate respiratory and personal protective equipment
2. Ventilate area
3. Collect powder to minimize spread to environment and dust generation
4. Keep out of waterways and sewers
5. Dispose of as appropriate per regional, local, state, and federal regulations (see section 13)
6. Avoid using a vacuum unless certified to handle Class 4.1 PG II metal powders such as aluminum and titanium. May use water to wash spill area. Collect wash water for approved disposal. Avoid allowing water to enter drain.

## 7. Handling and storage

### 7.1 Handling

Provide appropriate exhaust ventilation where dust may form

Keep away from sources of ignition

Avoid breathing dust

Use non-sparking tools when opening or closing containers. Avoid sources of spark and employ electrostatic discharge clothing and equipment when possible.

### 7.2 Storage

Storage: Store at ambient temperatures in tightly sealed container. The area should be suitably marked to indicate the presence of ignitable dust. No-smoking warning should be present. Do not store with reactive materials. Ground storage.

Shelf Life: Unlimited shelf life if kept dry and inert packaged

## 8. Exposure controls / personal protection

### 8.1 Ventilation Requirements

Keep dust and fume levels below occupational exposure limits. Provide adequate local exhaust ventilation at the work area where spraying and fusing are being done.

### 8.2 Personal Protective Equipment

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Eyes: Wear dust-proof safety goggles. Contact lenses are not recommended.

SKIN: Protective gloves and clothing are recommended.

INHALATION: Do not breathe dust or fume. Use with adequate ventilation. Where appropriate, use of a respirator type N100 (US) or type P3 (EN 143) is recommended. Dust masks alone are insufficient as particles smaller than typical safety standards may be present in small quantities in the powder. Generally, proper engineering controls should be implemented to reduce the chances of dust inhalation as the greater danger is dust combustion under source of ignition.

## 8.3 Occupational Exposure Limits

Component	CAS-No	Limited Value - 8 hours	Basis	Category
Aluminum	7429-90-5	15 mg/m <sup>3</sup>	USA - OSHA	Total Dust
	7429-90-5	5 mg/m <sup>3</sup>	USA - OSHA	Respirable Dust
	7429-90-5	1.0 mg/m <sup>3</sup>	ACGIH (TLV)	Respirable Dust
Copper	7440-50-8	0.2 mg/m <sup>3</sup>	United Kingdom	-
	7440-50-8	0.01 mg/m <sup>3</sup>	Germany	Respirable Fraction
	7440-50-8	1.0 mg/m <sup>3</sup>	ACGIH (TLV)	Dust
	7440-50-8	0.2 mg/m <sup>3</sup>	ACGIH (TLV)	Fume
Zinc	7440-66-6	0.1 mg/m <sup>3</sup>	Germany	Respirable aerosol
	7440-66-6	0.1 mg/m <sup>3</sup>	Switzerland	Respirable aerosol
	7440-66-6	5.0 mg/m <sup>3</sup>	ACGIH (TLV)	Fume
Chromium	7440-47-3	0.05 mg/m <sup>3</sup>	Finland	-
	7440-47-3	0.5 mg/m <sup>3</sup>	Japan - JSOH	-
	7440-47-3	0.5 mg/m <sup>3</sup>	ACGIH (TLV)	-
Magnesium	7440-47-3	15 mg/m <sup>3</sup>	USA - OSHA	Total Dust
	7440-47-3	4 mg/m <sup>3</sup>	Germany	Inhalable Aerosol
	7440-47-3	10 mg/m <sup>3</sup>	ACGIH (TLV)	Fume
Manganese	7439-96-5	4 mg/m <sup>3</sup>	United Kingdom - HSE	Respirable Dust
	7439-96-5	0.02 mg/m <sup>3</sup>	ACGIH (TLV)	Respirable Dust
Silicon	7440-21-3	10 mg/m <sup>3</sup>	ACGIH (TLV)	Total Dust
	7440-21-3	5 mg/m <sup>3</sup>	ACGIH (TLV)	Respirable Dust

## 9. Physical and chemical properties

### 9.1 Material Properties

Property	Descriptor
Appearance and Odor	Grey or silver, odorless
Flammability	Non-flammable solid
Autoignition Temperature	Product is not self-igniting
pH	Not applicable
Vapor Pressure	1mm Hg @ 1628°C
Vapor Density	Not determined
Melting Point	660°C
Boiling Point	2460°C
Solubility in Water	Not soluble
Relative Density	2.7 g/cm <sup>3</sup>

## 9.2 Flammability Properties

Property	Descriptor
P <sub>Max</sub> [bar]	6.7 – 8.1
dP/dt max [bar/s]	267 - 353
K <sub>st</sub> [bar*m/s]	72 - 96
MEC [g/m <sup>3</sup> ]	46 – 70
MIE Range [mJ]	82 - 400
MAT [°C]	600 - 610
UN 4.1	NOT readily combustible solid
UN 4.2	NON-self-heating material
UN 4.3	7050 will produce flammable gas in contact with water

## 10. Stability and reactivity

### 10.1 Stability

Stable under normal conditions.

### 10.2 Incompatible Materials

Acids, alkalines, oxidizers, bases, halogens.

Some sensitivity to moisture and oxygen, particularly at elevated temperatures

Strong oxidizing agents

### 10.3 Hazardous Decomposition

Will react exothermically if mixed with a strong oxidizing substance and ignited. Contact with water releases flammable gases.

### 10.4 Hazardous Polymerization

Will not occur.

### 10.5 Reactivity

Stable under recommended storage and handling conditions. Will react exothermically if mixed with a strong oxidizing substance and ignited.

### 10.6 Conditions to Avoid

Formation of dust cloud, high temperatures, contact with water.

## 11. Toxicological information

### 11.1 Potential Health Effects

Inhalation of metal fumes may cause metal fume fever, a flu-like illness generally lasting 24 hours or less.

### 11.2 Substance Analysis

Aluminum (7429-90-3)

Oral LD50 Rat: 15900 mg/kg

Copper (7440-50-8)

Oral LD50 Rat: 300-500 mg/kg

Inhalation (D50 < 10 microns)

LD50 Rat 1-4 g/m<sup>3</sup> air

Chromium (7440-47-3)

Oral LD50 Rat: >3400 mg/kg

Zinc (7440-66-6)

Oral LD50 Rat: >2000 mg/kg

Magnesium (7439-95-4)

Oral LD50 Rat: >2000 mg/kg

Silicon (7440-21-3)

Oral LD50 Rat: >3160 mg/Kg

Manganese (7439-95-5)

Oral LD50 Rat: >3478 mg/Kg

Iron (7439-89-6)

Oral LD50 Rat: > 30000 mg/Kg

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## 11.3 Information On Toxicological Effects

Routes of Exposure: Eye Contact, Ingestion, Inhalation, Skin Contact, Injection

Carcinogenicity: None known

IARC: No component of this product present at levels greater than or equal to 0.1% is identified as probable, possible or confirmed human carcinogen by IARC.

NTP: No component of this product present at levels greater than or equal to 0.1% is identified as a known or anticipated carcinogen by NTP.

OSHA: No component of this product present at levels greater than or equal to 0.1% is identified as a carcinogen or potential carcinogen by OSHA.

## 12. Ecological information

### 12.1 Ecological Toxicity

No Data Available

### 12.2 Persistence and Degradability

No Data Available

### 12.3 Bioaccumulate Potential

No further relevant information

### 12.4 Mobility in Soil

No Data Available

### 12.5 Results of PBT and Vpvh Assessment

Water Reactive

### 12.6 Other Adverse Effects

No Data Available

## 13. Disposal considerations

Disposal must be in accordance with applicable local, state, and federal regulations. Do not dump into sewers, on the ground, or into any body of water.

## 14. Transport information

	14.1 DOT	14.2 ADR/RID	14.3 IMO/IMDG	14.4 ICAO/IATA
UN Number	-	-	-	-
Shipping Name	-	-	-	-
Class	-	-	-	-
Packing Group	-	-	-	-

## 15. Regulatory information

Electrical equipment must be suitable for use in hazardous atmospheres involving Group E combustible dusts in accordance with 29CFR1910.307. Refer to the National Electrical Code (NFPA 70) for guidance with determining the type and design of equipment and installation which meets this requirement.

### SARA Title III

Section 311/312: Reactive (Sudden Release of Pressure)

Section 313 Toxic Chemicals: Aluminum (Fume or Dust)  
Chromium (1.0% de minimus if present)  
Copper (1.0% de minimus if present)  
Silver (1.0% de minimus if present)  
Zinc (Fume or Dust) (1.0% de minimus if present)

## 16. Other information

### Disclaimer

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and

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*Heeger Materials Inc.*