

# Material Safety Data Sheet

Page 1 of 5

Material Name: Powder, DuraForm TiAl6V4 (titanium alloy)

## I. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product/Trade Name: Powder, DuraForm® TiAl6V4 (titanium alloy)

Chemical Family: Metal Powder

Product Use:

### Hazardous Materials Identification System (HMIS):

(Degree of hazard: 0 = low, 4 = extreme):

Health 0

Flammability 4

Physical Hazards 2

### Personal Protection:

Skin, eye protection

Manufacturer:



Manufacturer Contact	3D Systems, Inc. 333 Three D Systems Circle Rock Hill, SC 29730 U.S.A.
For Information	Phone: 803.326.3900
Emergency	800.424.9300 - Chemtrec

## II. COMPOSITION INFORMATION

CAS #	Component	Percent
7429-90-5	Aluminum powder (pyrophoric)	5 – 10

OSHA Classification: Reactive

## III. HAZARDS IDENTIFICATION

### Emergency Overview

Unusually reactive with water.

### Potential Health Effects:

Eyes: Can cause irritation consisting of redness, swelling and pain.

Skin: Can cause irritation.

Inhalation: Can cause respiratory irritation.

Ingestion: Not an expected route of entry.

## IV. FIRST AID MEASURES

Skin contact: Immediately flush skin with plenty of soap and water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse.

Eye contact: Immediately flush eyes with plenty of water for at least 15 minutes. Get medical attention if irritation persists.

Inhalation: Move affected person to fresh air. In case of asphyxia, initiate artificial respiration immediately. If breathing is difficult, give oxygen. Get medical attention immediately.

Ingestion: Ingestion is unlikely. However, if large swallowed, do not induce vomiting; immediately get medical help.



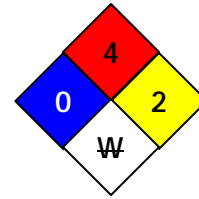
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## V. FIRE FIGHTING MEASURES

Flash Point: NA  
Upper Flammable Limit (UFL): NA  
Auto Ignition: Not self-igniting.  
Ignition Temp: 300-450 °C (572-842 °F)

Method Used: NA  
Lower Flammable Limit (LFL): NA  
Rate of Burning: NA



NFPA Ratings  
0 = Minimal  
1 = Slight  
2 = Moderate  
3 = Serious  
4 = Severe

General Fire Hazards: Metal powder; do not use water.  
Hazardous Combustion Products: Thermal decomposition products can include organometallic compounds.  
Extinguishing Media: Dry sand or an extinguisher approved for metal powder fires. Without disturbing the burning mass, smother the fire and allow the fire to burn itself out. DO NOT USE foam, CO<sub>2</sub>, extinguishing powder, or water.  
Fire Fighting Equipment/Instructions: Wear full protective clothing, including helmet, self-contained positive-pressure or pressure-demand breathing apparatus, protective clothing and facemask. Move container from area if it can be done without risk. Do not use high-volume water jet or high-pressure inert gas since pressure may cause dusting. Avoid inhalation of material or combustion by-products. Dust accumulation from this product can present an explosion hazard in the presence of an ignition source.

## VI. ACCIDENTAL RELEASE MEASURES

Containment Procedures: Ensure adequate ventilation. Avoid formation of dust.  
Clean-Up Procedures: Wear appropriate protective equipment and clothing. Avoid the generation of dusts during clean up. Clean mechanically with non-sparking tools. Place material in an appropriate container for disposal.  
Evacuation Procedures: Keep unnecessary personnel away.  
Special Procedures: A slipping hazard exists when small particles are spilled.

## VII. HANDLING AND STORAGE

Handling Procedures: Avoid spilling powders to prevent slip hazards. Avoid dust accumulation of this material.  
Storage Procedures: Keep this material in a cool, dry place. Eliminate all sources of ignition. Avoid contact with water or moisture. Keep separate from alcohols, amines, oxidizing materials, aqueous acids and bases, and halogenated compounds.

## VIII. EXPOSURE CONTROLS/PERSONAL PROTECTION

### Exposure Guidelines

General Product Information:

CAS #	Chemical Name	ACGIH TLV	OSHA PEL	NIOSH REL
7429-90-5	Aluminum powder	(10) NIC-1R mg/m <sup>3</sup> Metal dust; NIC-A3	15 mg/m <sup>3</sup> total dust 5 mg/m <sup>3</sup> respirable fraction	15 mg/m <sup>3</sup> total dust 5 mg/m <sup>3</sup> respirable fraction

### Engineering Controls

Ventilation must effectively control dusts.

### PERSONAL PROTECTIVE EQUIPMENT

Eyes/Face: Wear tightly sealed goggles.  
Skin: Use impervious gloves, an apron, and closed shoes.  
Respiratory: If ventilation cannot effectively keep dust concentrations below established limits, appropriate certified respiratory protection must be provided.  
General: An eye wash fountain and safety shower are recommended.

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Material Name: Powder, DuraForm TiAl6V4 (titanium alloy)

Page 3 of 5

## IX. PHYSICAL AND CHEMICAL PROPERTIES

Appearance .....	Grey	Odor .....	Oderless
Physical State.....	Powder	PH .....	NA
Vapour Pressure .....	NA	Flash Point .....	NA
Melting Point.....	1670 °C (3038 °F)	Viscosity .....	NA
Solubility (H <sub>2</sub> O) .....	Insoluble	Density .....	4.5 g/cm <sup>3</sup>
Percent Volatile .....	NA	Molecular Weight.....	NA

## X. CHEMICAL STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of handling, use and transportation.
Incompatibility:	Alcohols, amines, oxidizing materials, aqueous acids and bases, halogenated compounds.
Hazardous Decomposition:	Thermal decomposition products can include organometalic compounds.
Hazardous Polymerization:	Will not occur.
Thermal Decomposition:	Undetermined

## XI. TOXICOLOGICAL INFORMATION

### Acute and Chronic Toxicity

- A: General Product Information: No data available.  
B: Component Analysis: No data available.

### Carcinogenicity

- A: General Product Information: None.  
B: Component Carcinogenicity: Neither this product, nor any of its components are known to be listed by ACGIH, IARC, OSHA, NIOSH, or NTP.

## XII. ECOLOGICAL INFORMATION

### Ecotoxicity

- A: General Product Information: The aquatic toxicity of the product is unknown; however based on components, it is not predicted that this material is harmful to aquatic organisms or that it causes long-term adverse effects in the aquatic environment. Prevent contamination of soil drains and surface waters.  
B: Component Analysis - Ecotoxicity - Aquatic Toxicity:  
Environmental Fate: No information available for product.

## XIII. DISPOSAL CONSIDERATIONS

### Waste Disposal Instructions

Do not contaminate drains, soil or surface waters with the material or its container. Avoid disposal. Attempt to utilize product completely. Dispose of in compliance with all local, state, and federal regulations. Prior to disposal of unused material, 3D Systems Inc., recommends consulting and using an approved waste disposal operative to ensure regulatory compliance.

## XIV. TRANSPORT INFORMATION

	US DOT	RID/ADR	IMDG	IATA	IMO	Canada TDG
Shipping Name	Not Regulated					

## XV. REGULATORY INFORMATION

### US FEDERAL

- TSCA:.....All materials are listed on the TSCA Inventory or are not subject to TSCA requirements  
SARA 302 EHS List (40 CFR 355 Appendix A): .....None listed



# Material Safety Data Sheet

Page 4 of 5

**Material Name: Powder, DuraForm TiAl6V4 (titanium alloy)**

SARA 313 (40 CFR 372.65): ..... 7429-90-5 aluminum powder (pyrophoric) (5 – 10%), 7440-62-2 Vanadium (trace)

CERCLA (40 CFR 302.4): .....None listed

## STATE RIGHT-TO-KNOW STATUS

Component	CA Prop. 65	MI	NJ	PA	MA
	None listed				

## Component Analysis - Inventory

Component/CAS	EC #	EEC	CAN	TSCA	NLP
Aluminum powder (pyrophoric) (CAS#7429-90-5)	231-072-3	EINECS	DSL	Yes	No

## **XVI. ADDITIONAL INFORMATION**

MSDS Creation Date: .... July 2, 2008

MSDS Revision #: ..... A

MSDS Revision Date:.....

Reason for Revision: ..... Creation

For more information: .... [www.3dsystems.com](http://www.3dsystems.com)

800.793.3669 (Toll-free in the US GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.)

803.326.3900 (Outside the U.S. GMT-07:00; N. America, Mon – Fri, 6:00 a.m. to 6 p.m.)

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## Key/Legend

ACGIH = American Conference of Governmental Industrial Hygienists

CAS = Chemical Abstracts Service

CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act

CFR = Code of Federal Regulations

CPR = Controlled Products Regulations

DOT = Department of Transportation

DSL = Domestic Substances List

EINECS = European Inventory of Existing Commercial Chemical Substances

EPA = Environmental Protection Agency

IARC = International Agency for Research on Cancer

IATA = International Air Transport Association

IDL = Ingredients Disclosure List

mg/Kg = milligrams per Kilogram

mg/L = milligrams per Liter

mg/m<sup>3</sup> = milligrams per Cubic Meter

MSHA = Mine Safety and Health Administration

NA = Not Applicable or Not Available

NIOSH = National Institute for Occupational Safety and Health

NJTSR = New Jersey Trade Secret Registry

NTP = National Toxicology Program

OSHA = Occupational Safety and Health Administration

SARA = Superfund Amendments and Reauthorization Act

STEL = Short Term Exposure Limit

TDG = Transport Dangerous Goods

TSCA = Toxic Substances Control Act

WHMIS = Workplace Hazardous Materials Information System.