SAFETY DATA SHEET

Compliant with OSHA's Hazard Communication Standard, 29 CFR 1910.1200(g)

SECTION 1 – CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name: UCF/DSI CM Asteroid Simulant
Product Use: Regolith/planetary simulant

Manufactured by: University of Central Florida
Office of Research and Commercialization
12201 Research Parkway, 5th Floor
Orlando, FL 23826-3246

Emergency Contact: 1-800-535-5053
Or contact your regional Poison Control

MSDS Issue Date: 10/04/18

SECTION 2 – HAZARDS IDENTIFICATION

Hazard Classification:

Physical	Health
Not hazardous	Carcinogen Category 1A Specific Target Organ Toxicity – Repeated exposure

Signal Word: Danger

Hazard Statements: May cause cancer by inhalation. Causes damage to lungs through prolonged or repeated exposure by inhalation.

Pictograms:

Precautionary Statements - Prevention
Obtain special instructions before use
Do not handle until all safety precautions have been read and understood
Use personal protective equipment as required
Do not breathe dust/fume/gas/mist/vapors/spray
Wash face, hands and any exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product

Precautionary Statements - Storage

Store locked up

Precautionary Statements - Response
If exposed or concerned: Get medical advice/attention

Precautionary Statements - Disposal
Dispose of contents/container to an approved waste disposal plant

Carcinogenicity: Natural terrestrial minerals are commonly contaminated with crystalline silica (quartz). Independent laboratory analyses indicate that crystalline silica is present in one or more of the simulant components. The International Agency on Research for Cancer (IARC) has classified silica dust, crystalline as a Group 1, known human carcinogen. The serpentine used in this product is non-asbestiform antigorite/lizardite, however independent analyses indicate that asbestos fibers are present at up to 0.5 wt.% of the total serpentine component. The IARC has classified asbestos as a Group 1, known human carcinogen. Sub-bituminous coal contains significantly less (<15 mg/kg) polycyclic aromatic hydrocarbons (PAH) than higher grade bituminous coal (>1000 mg/kg). Many PAHs are considered probable or possible human carcinogens by the IARC.

SECTION 3 – COMPOSITION/INFORMATION ON INGREDIENTS

Component	CAS Number	Wt. %
Serpentine (antigorite/lizardite, non-asbestiform)	12135-86-3	72.5
Magnetite	1317-61-9	10.4
Olivine	10034-94-3	7.8
Coal, Sub-bituminous	Not Listed	3.6
Pyrite	1309-36-0	2.6
Pyroxene	14483-19-3	2.1
Siderite	14476-16-5	1.0
Sodium metasilicate pentahydrate	10213-79-3	0-5.0

SECTION 4 – FIRST AID MEASURES

Inhalation: If irritation or discomfort exists, remove the exposed individual to fresh air.
Eyes: If irritation or discomfort exists, flush eyes lightly with water to remove dust.
Skin: Wash exposed skin if irritation exists.
Ingestion: Adverse effects not expected from this product.

SECTION 5 – FIREFIGHTING MEASURES

Flashpoint: Not applicable (solid)
Flammable Limits: N/A
Autoignition Temperature: N/A
Extinguishing Media: Water Spray (Fog), Foam, CO_2
Unusual Fire and Explosion Hazards: N/D
Special Protective Equipment or Precautions for Firefighters: N/A

SECTION 6 – ACCIDENTAL RELEASE MEASURES

Use of Personal Precautions: Wear protective equipment including gloves and safety glasses.
Emergency Procedures: N/A
Methods and Materials Used for Containment: N/A
Cleanup Procedures: Spray lightly with water to avoid creating dust and sweep/shovel into suitable container.

SECTION 7 – HANDLING AND STORAGE

Precautions for Safe Handling: Avoid creating dust. Wash exposed skin and clothes daily.
Recommendations on the Conditions for Safe Storage: Do not store near heat or open flame. Keep container closed when not in use. Special containers or storage locations are not required. Incompatible with strong oxidizers.

SECTION 8 – EXPOSURE CONTROL/PERSONAL PROTECTION

Respiratory Protection: Not required if dust levels are maintained below occupational exposure limits (TLV-TWA of 10 mg/m^3). For levels above the occupational exposure limits wear an appropriate NIOSH approved respirator.
Gloves: None required. For hygiene purposes, chemically compatible gloves are appropriate.
Protective Clothing: None required. Confine work clothing to workplace and wash daily.
Eye Protection: Safety glasses should be worn.

SECTION 9 – PHYSICAL AND CHEMICAL PROPERTIES

Appearance: Dark gray powder.
Upper/lower flammability or explosive limits: N/D
Odor: None.
Vapor pressure: N/D
Odor threshold: N/D
Vapor density: N/D
pH: N/D
Relative density: N/D
Melting point/freezing point: N/D
Solubility: Insoluble in water.
Initial boiling point and boiling range: N/D
Flash point: N/D
Evaporation rate: N/D
Flammability: N/D
Partition coefficient (n-octanol/water): N/D
Auto-ignition temperature: N/D
Decomposition temperature: N/D
Viscosity: N/D

SECTION 10 – STABILITY AND REACTIVITY

Stability: Stable.
Incompatibility (Materials to Avoid): Strong oxidizers.
Hazardous Decomposition Productions: Releases carbon monoxide, carbon dioxide, sulfur monoxide, sulfur dioxide and methane upon combustion.
Hazardous Polymerization: Will not occur.
Conditions to Avoid: Heat, open flames, sparks.

SECTION 11 – TOXICOLOGICAL INFORMATION

Likely routes of exposure: Inhalation, eye contact.
Symptoms related to the physical, chemical and toxicological characteristics: None known.
Effects of Chronic Exposure: Adverse health effects including silicosis, lung cancer, autoimmune and chronic kidney diseases, tuberculosis, and non-malignant respiratory diseases are attributed to respirable crystalline silica.
Numerical Measures of Toxicity: No data available.
Carcinogen Listings: The International Agency on Research for Cancer (IARC) has classified silica dust, crystalline as a Group 1, known human carcinogen. The IARC has classified asbestos as a Group 1, known human carcinogen.

SECTION 12 – ECOLOGICAL INFORMATION

Ecotoxicity: No data available.
Persistence and Degradability: No data available.
Bioaccumulative Potential: No data available.
Mobility in Soil: No data available.
Other Adverse Effects: No data available.

SECTION 13 – DISPOSAL CONSIDERATIONS

Waste Disposal Method: Disposed of in accordance with all applicable local, state, and federal regulations.

SECTION 14 – TRANSPORTATION INFORMATION

UN Number: N/A
UN Proper Shipping Name: N/A
Transport Hazard Class: N/A
Packing Group: N/A
Environmental Hazards: N/A
Transport in Bulk: N/A
Special Precautions in Connection with Transport: N/A

SECTION 15 – REGULATORY INFORMATION

Safety, Health and Environmental Regulations for the Product in Question: None known.

SECTION 16 – OTHER INFORMATION

SDS Prepared on: 10/04/2018
Last Known Revision: 10/04/2018

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