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S A F E T Y D A T A S H E E T

SECTION 1. CHEMICAL IDENTIFICATION

CATALOG #:	47107
NAME:	Monocrystalline silicon flakes (<1 micron)
24 HOUR EMERGENCY TELEPHONE:	(800) 535-5053(USA) 352-323-3500 (INTERNATIONAL)
TO REQUEST AN MSDS:	(800) 869-9290
CUSTOMER SERVICE:	(630) 766-2112

SECTION 2. HAZARDS IDENTIFICATION

CLASSIFICATION OF THE SUBSTANCE OR MIXTURE

GHS CLASSIFICATION IN ACCORDANCE WITH 29 CFR 1910 (OSHA HCS)
FLAMMABLE SOLIDS (CATEGORY 2), H228

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE
SECTION 16.

GHS LABEL ELEMENTS, INCLUDING PRECAUTIONARY STATEMENTS
PICTOGRAM



SIGNAL WORD

WARNING

HAZARD STATEMENT(S)
H228 FLAMMABLE SOLID.

PRECAUTIONARY STATEMENT(S)
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.
P280 WEAR PROTECTIVE GLOVES/ EYE PROTECTION/ FACE PROTECTION.
P370 + P378 IN CASE OF FIRE: USE DRY SAND, DRY CHEMICAL OR ALCOHOL-RESISTANT FOAM TO EXTINGUISH.

**HAZARDS NOT
OTHERWISE
CLASSIFIED
(HNOC) OR NOT
COVERED BY GHS** NONE

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

MF: Si
MW: 28.09
CAS-NO. 7440-21-3
PURITY: $\geq 97\%$ (Trace metals basis)

HAZARDOUS COMPONENTS

COMPONENT	CLASSIFICATION	CONCENTRATION
MONOCRYSTALLINE SILICON FLAKES (<1 MICRON)		

FOR THE FULL TEXT OF THE H-STATEMENTS MENTIONED IN THIS SECTION, SEE SECTION 16.

SECTION 4. FIRST-AID MEASURES

DESCRIPTION OF FIRST AID MEASURES

GENERAL ADVICE SHOW THIS MATERIAL SAFETY DATA SHEET TO THE DOCTOR IN ATTENDANCE.

IF INHALED AFTER INHALATION: FRESH AIR.

IN CASE OF SKIN CONTACT	IN CASE OF SKIN CONTACT: TAKE OFF IMMEDIATELY ALL CONTAMINATED CLOTHING. RINSE SKIN WITH WATER/ SHOWER.
IN CASE OF EYE CONTACT	AFTER EYE CONTACT: RINSE OUT WITH PLENTY OF WATER. CALL IN OPHTHALMOLOGIST. REMOVE CONTACT LENSES.
IF SWALLOWED	AFTER SWALLOWING: MAKE VICTIM DRINK WATER (TWO GLASSES AT MOST). CONSULT DOCTOR IF FEELING UNWELL.
MOST IMPORTANT SYMPTOMS AND EFFECTS, BOTH ACUTE AND DELAYED	THE MOST IMPORTANT KNOWN SYMPTOMS AND EFFECTS ARE DESCRIBED IN THE LABELLING (SEE SECTION 2.2) AND/OR IN SECTION 11.
INDICATION OF ANY IMMEDIATE MEDICAL ATTENTION AND SPECIAL TREATMENT NEEDED	NO DATA AVAILABLE

SECTION 5. FIRE AND EXPLOSION DATA

EXTINGUISHING MEDIA

SUITABLE EXTINGUISHING MEDIA	SUITABLE EXTINGUISHING MEDIA WATER FOAM CARBON DIOXIDE (CO ₂) DRY POWDER
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UNSUITABLE EXTINGUISHING MEDIA
FOR THIS SUBSTANCE/MIXTURE NO LIMITATIONS OF EXTINGUISHING AGENTS ARE GIVEN.

SPECIAL HAZARDS ARISING FROM THE SUBSTANCE OR MIXTURE	SILICON OXIDES COMBUSTIBLE. DEVELOPMENT OF HAZARDOUS COMBUSTION GASES OR VAPORS POSSIBLE IN THE EVENT OF FIRE.
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ADVICE FOR FIREFIGHTERS	IN THE EVENT OF FIRE, WEAR SELF-CONTAINED BREATHING APPARATUS.
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FURTHER INFORMATION	SUPPRESS (KNOCK DOWN) GASES/VAPORS/MISTS WITH A WATER SPRAY JET. PREVENT FIRE EXTINGUISHING WATER FROM CONTAMINATING SURFACE WATER OR THE GROUND WATER SYSTEM.
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SECTION 6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS, PROTECTIVE EQUIPMENT AND EMERGENCY PROCEDURES	ADVICE FOR NON-EMERGENCY PERSONNEL: AVOID INHALATION OF DUSTS. AVOID SUBSTANCE CONTACT. ENSURE ADEQUATE VENTILATION. KEEP AWAY FROM HEAT AND SOURCES OF IGNITION. EVACUATE THE DANGER AREA, OBSERVE EMERGENCY PROCEDURES, CONSULT AN EXPERT. FOR PERSONAL PROTECTION SEE SECTION 8.
ENVIRONMENTAL PRECAUTIONS	DO NOT LET PRODUCT ENTER DRAINS. RISK OF EXPLOSION.
METHODS AND MATERIALS FOR CONTAINMENT AND CLEANING UP	COVER DRAINS. COLLECT, BIND, AND PUMP OFF SPILLS. OBSERVE POSSIBLE MATERIAL RESTRICTIONS (SEE SECTIONS 7 AND 10). TAKE UP DRY. DISPOSE OF PROPERLY. CLEAN UP AFFECTED AREA. AVOID GENERATION OF DUSTS.
REFERENCE TO OTHER SECTIONS	FOR DISPOSAL SEE SECTION 13.

SECTION 7. HANDLING AND STORAGE

PRECAUTIONS FOR SAFE HANDLING	KEEP AWAY FROM OPEN FLAMES, HOT SURFACES AND SOURCES OF IGNITION. TAKE PRECAUTIONARY MEASURES AGAINST STATIC DISCHARGE. CHANGE CONTAMINATED CLOTHING. WASH HANDS AFTER WORKING WITH SUBSTANCE. FOR PRECAUTIONS SEE SECTION 2.2.
CONDITIONS FOR SAFE STORAGE, INCLUDING ANY INCOMPATIBILITIES	TIGHTLY CLOSED. KEEP AWAY FROM HEAT AND SOURCES OF IGNITION. AIR SENSITIVE. STORAGE CLASS (TRGS 510): 4.1B: FLAMMABLE SOLID HAZARDOUS MATERIALS STORE AT RT
SPECIFIC END USE(S)	APART FROM THE USES MENTIONED IN SECTION 1.2 NO OTHER SPECIFIC USES ARE STIPULATED.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

CONTROL PARAMETERS

COMPONENTS WITH WORKPLACE CONTROL PARAMETERS

CONTAINS NO SUBSTANCES WITH OCCUPATIONAL EXPOSURE LIMIT VALUES.

EXPOSURE CONTROLS

APPROPRIATE ENGINEERING CONTROLS	IMMEDIATELY CHANGE CONTAMINATED CLOTHING. APPLY PREVENTIVE SKIN PROTECTION. WASH HANDS AND FACE AFTER WORKING WITH SUBSTANCE.
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COMPONENTS WITH LIMIT VALUES THAT REQUIRE MONITORING AT THE WORKPLACE:

SILICON	MG/M3
ACGIH TLV	10
BELGIUM TWA	10
DENMARK TWA	10
FRANCE TWA	10
IRELAND TWA	5 (RESPIRABLE); 10 (INHALABLE)
NETHERLANDS TWA	10
SWITZERLAND TWA	4
UNITED KINGDOM TWA	4 (RESPIRABLE DUST); 10 (TOTAL INHALABLE DUST)
USA PEL	5 (RESPIRABLE FRACTION); 15 (TOTAL DUST)

PERSONAL PROTECTIVE EQUIPMENT

EYE/FACE PROTECTION	USE EQUIPMENT FOR EYE PROTECTION TESTED AND APPROVED UNDER APPROPRIATE GOVERNMENT STANDARDS SUCH AS NIOSH (US) OR EN 166(EU). SAFETY GLASSES
SKIN PROTECTION	HANDLE WITH GLOVES. GLOVES MUST BE INSPECTED PRIOR TO USE. USE PROPER GLOVE REMOVAL TECHNIQUE (WITHOUT TOUCHING GLOVE'S OUTER SURFACE) TO AVOID SKIN CONTACT WITH THIS PRODUCT. DISPOSE OF CONTAMINATED GLOVES AFTER USE IN ACCORDANCE WITH APPLICABLE LAWS AND GOOD LABORATORY PRACTICES. WASH AND DRY HANDS.
BODY PROTECTION	FLAME RETARDANT ANTISTATIC PROTECTIVE CLOTHING.

RESPIRATORY PROTECTION	REQUIRED WHEN DUSTS ARE GENERATED. OUR RECOMMENDATIONS ON FILTERING RESPIRATORY PROTECTION ARE BASED ON THE FOLLOWING STANDARDS: DIN EN 143, DIN 14387 AND OTHER ACCOMPANYING STANDARDS RELATING TO THE USED RESPIRATORY PROTECTION SYSTEM. RECOMMENDED FILTER TYPE: : FILTER TYPE P1 THE ENTREPRENEUR HAS TO ENSURE THAT MAINTENANCE, CLEANING AND TESTING OF RESPIRATORY PROTECTIVE DEVICES ARE CARRIED OUT ACCORDING TO THE INSTRUCTIONS OF THE PRODUCER. THESE MEASURES HAVE TO BE PROPERLY DOCUMENTED.
GENERAL PROTECTIVE AND HYGIENIC MEASURES	THE USUAL PRECAUTIONARY MEASURES FOR HANDLING CHEMICALS SHOULD BE FOLLOWED. KEEP AWAY FROM FOODSTUFFS, BEVERAGES AND FEED. REMOVE ALL SOILED AND CONTAMINATED CLOTHING IMMEDIATELY. WASH HANDS BEFORE BREAKS AND AT THE END OF WORK. AVOID CONTACT WITH THE EYES AND SKIN.
CONTROL OF ENVIRONMENTAL EXPOSURE	DO NOT LET PRODUCT ENTER DRAINS. RISK OF EXPLOSION.
ADDITIONAL INFORMATION ABOUT DESIGN OF TECHNICAL SYSTEMS	PROPERLY OPERATING CHEMICAL FUME HOOD DESIGNED FOR HAZARDOUS CHEMICALS AND HAVING AN AVERAGE FACE VELOCITY OF AT LEAST 100 FEET PER MINUTE.

SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES

INFORMATION ON BASIC PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Yellow brown powder
ODOUR	NO DATA AVAILABLE
ODOUR THRESHOLD	NO DATA AVAILABLE
PH	NO DATA AVAILABLE
MELTING	NO DATA AVAILABLE
POINT/FREEZING POINT	
INITIAL BOILING POINT AND BOILING RANGE	NO DATA AVAILABLE
FLASH POINT	NO DATA AVAILABLE
EVAPOURATION RATE	NO DATA AVAILABLE
FLAMMABILITY (SOLID, GAS)	HIGHLY FLAMMABLE
UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMITS	NO DATA AVAILABLE
VAPOUR PRESSURE	NO DATA AVAILABLE
VAPOUR DENSITY	NO DATA AVAILABLE
RELATIVE DENSITY	NO DATA AVAILABLE
WATER SOLUBILITY	INSOLUBLE

PARTITION COEFFICIENT: N- OCTANOL/WATER	NO DATA AVAILABLE
AUTO-IGNITION TEMPERATURE	NO DATA AVAILABLE
DECOMPOSITION TEMPERATURE	NO DATA AVAILABLE
VISCOSITY	NO DATA AVAILABLE
EXPLOSIVE PROPERTIES	NO DATA AVAILABLE
OXIDIZING PROPERTIES	NO DATA AVAILABLE

OTHER SAFETY INFORMATION

NO DATA AVAILABLE

SECTION 10. STABILITY AND REACTIVITY

REACTIVITY	REACTS VIOLENTLY WITH OXIDIZING AGENTS
CHEMICAL STABILITY	NO DATA AVAILABLE
POSSIBILITY OF HAZARDOUS REACTIONS	NO DATA AVAILABLE
CONDITIONS TO AVOID	DECOMPOSITION WILL NOT OCCUR IF USED AND STORED ACCORDING TO SPECIFICATIONS.
INCOMPATIBLE MATERIALS	OXIDIZING AGENTS ACIDS BASES INTERHALOGENS HALOGENS WATER/MOISTURE ALKALI METALS
HAZARDOUS DECOMPOSITION PRODUCTS	METAL OXIDE FUME IN THE EVENT OF FIRE: SEE SECTION 5

SECTION 11. TOXICOLOGICAL INFORMATION

INFORMATION ON TOXICOLOGICAL EFFECTS

ACUTE TOXICITY	ORAL: LD50: 3160 MG/KG (RAT) IRRITATION OF EYES: MILD: 3 MG (RBT) INHALATION: NO DATA AVAILABLE DERMAL: NO DATA AVAILABLE NO DATA AVAILABLE
SKIN CORROSION/IRRITATION	IRRITANT TO SKIN AND MUCOUS MEMBRANES.
SERIOUS EYE DAMAGE/EYE IRRITATION	IRRITATING EFFECT.
RESPIRATORY OR SKIN SENSITISATION	NO SENSITIZING EFFECTS KNOWN.
GERM CELL MUTAGENICITY	NO DATA AVAILABLE
CARCINOGENICITY	
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 ON OSHA'S LIST OF REGULATED CARCINOGENS.
REPRODUCTIVE TOXICITY	ELEMENTARY SILICON IS AN INERT MATERIAL THAT SEEMS TO HAVE LITTLE ADVERSE EFFECT ON LUNGS AND DOES NOT APPEAR TO PRODUCE SIGNIFICANT ORGANIC DISEASE OR TOXIC EFFECTS WHEN EXPOSURES ARE KEPT UNDER REASONABLE CONTROL.
SPECIFIC TARGET ORGAN TOXICITY - SINGLE EXPOSURE	NO DATA AVAILABLE
SPECIFIC TARGET ORGAN TOXICITY - REPEATED EXPOSURE	NO DATA AVAILABLE
ASPIRATION HAZARD	NO DATA AVAILABLE

**ADDITIONAL
INFORMATION**

RTECS: NOT AVAILABLE

TO THE BEST OF OUR KNOWLEDGE, THE CHEMICAL,
PHYSICAL, AND TOXICOLOGICAL PROPERTIES HAVE
NOT BEEN THOROUGHLY INVESTIGATED.

SECTION 12. ECOLOGICAL INFORMATION

TOXICITY NO DATA AVAILABLE

**PERSISTENCE AND
DEGRADABILITY** NO DATA AVAILABLE

**BIOACCUMULATIVE
POTENTIAL** NO DATA AVAILABLE

MOBILITY IN SOIL NO DATA AVAILABLE

**RESULTS OF PBT AND
VPVB ASSESSMENT** NO DATA AVAILABLE

**OTHER ADVERSE
EFFECTS** NO DATA AVAILABLE

SECTION 13. DISPOSAL CONSIDERATIONS

WASTE TREATMENT METHODS

PRODUCT WASTE MATERIAL MUST BE DISPOSED OF IN
ACCORDANCE WITH THE NATIONAL AND LOCAL
REGULATIONS. LEAVE CHEMICALS IN ORIGINAL
CONTAINERS. NO MIXING WITH OTHER WASTE. HANDLE
UNCLEANED CONTAINERS LIKE THE PRODUCT ITSELF.

**CONTAMINATED
PACKAGING** DISPOSE OF AS UNUSED PRODUCT.

SECTION 14. TRANSPORT INFORMATION

DOT (US)
PROPER SHIPPING NAME: METAL POWDERS, FLAMMABLE, N.O.S. (Monocrystalline
silicon flakes (<1 micron))

UN NUMBER: 3089
CLASS: 4.1
PACKING GROUP: III

IMDG

PROPER SHIPPING NAME: METAL POWDERS, FLAMMABLE, N.O.S. (Monocrystalline silicon flakes (<1 micron))
UN NUMBER: 3089
CLASS: 4.1
PACKING GROUP: III

IATA

PROPER SHIPPING NAME: METAL POWDERS, FLAMMABLE, N.O.S. (Monocrystalline silicon flakes (<1 micron))
UN NUMBER: 3089
CLASS: 4.1
PACKING GROUP: III

SECTION 15. REGULATORY INFORMATION

CERCLA REPORTABLE QUANTITY

THIS MATERIAL DOES NOT CONTAIN ANY COMPONENTS WITH A CERCLA RQ.

SARA 304 EXTREMELY HAZARDOUS SUBSTANCES REPORTABLE QUANTITY

THIS MATERIAL DOES NOT CONTAIN ANY COMPONENTS WITH A SECTION 304 EHS RQ.

SARA 302 EXTREMELY HAZARDOUS SUBSTANCES THRESHOLD PLANNING QUANTITY

THIS MATERIAL DOES NOT CONTAIN ANY COMPONENTS WITH A SECTION 302 EHS TPQ.

SARA 311/312 HAZARDS REACTIVITY HAZARD

SARA 313 THIS MATERIAL DOES NOT CONTAIN ANY CHEMICAL COMPONENTS WITH KNOWN CAS NUMBERS THAT EXCEED THE THRESHOLD (DE MINIMIS) REPORTING LEVELS ESTABLISHED BY SARA TITLE III, SECTION 313.

PRODUCT RELATED HAZARD INFORMATION

HAZARD SYMBOLS XI IRRITANT F HIGHLY FLAMMABLE

RISK PHRASES 11 HIGHLY FLAMMABLE.
36/37/38 IRRITATING TO EYES, RESPIRATORY SYSTEM AND SKIN.

SAFETY PHRASES 26 IN CASE OF CONTACT WITH EYES, RINSE IMMEDIATELY WITH PLENTY OF WATER AND SEEK MEDICAL ADVICE.
36/37/39 WEAR SUITABLE PROTECTIVE CLOTHING, GLOVES AND EYE/FACE PROTECTION.

NATIONAL
REGULATIONS

ALL COMPONENTS OF THIS PRODUCT ARE LISTED IN THE
U.S. ENVIRONMENTAL PROTECTION AGENCY TOXIC
SUBSTANCES CONTROL ACT CHEMICAL SUBSTANCE
INVENTORY.

INFORMATION ABOUT
LIMITATION OF USE

FOR USE ONLY BY TECHNICALLY QUALIFIED
INDIVIDUALS.

US STATE REGULATIONS

MASSACHUSETTS RIGHT TO KNOW

NO COMPONENTS ARE SUBJECT TO THE MASSACHUSETTS RIGHT TO KNOW ACT.

MAINE CHEMICALS OF HIGH CONCERN

PRODUCT DOES NOT CONTAIN ANY LISTED CHEMICALS

VERMONT CHEMICALS OF HIGH CONCERN

PRODUCT DOES NOT CONTAIN ANY LISTED CHEMICALS

WASHINGTON CHEMICALS OF HIGH CONCERN

PRODUCT DOES NOT CONTAIN ANY LISTED CHEMICALS

**THE INGREDIENTS OF THIS PRODUCT ARE REPORTED IN THE FOLLOWING
INVENTORIES:**

TSCA

ALL SUBSTANCES LISTED AS ACTIVE ON THE TSCA
INVENTORY

TSCA LIST

NO SUBSTANCES ARE SUBJECT TO A SIGNIFICANT NEW USE RULE.

NO SUBSTANCES ARE SUBJECT TO TSCA 12(B) EXPORT NOTIFICATION
REQUIREMENTS.

SECTION 16. OTHER INFORMATION

FULL TEXT OF H-STATEMENTS REFERRED TO UNDER SECTIONS 2 AND 3.
H228 FLAMMABLE SOLID.

MSDS LEGEND

MW:

MOLECULAR WEIGHT

MF:

MOLECULAR FORMULA

VOC:

VOLATILE ORGANIC COMPOUNDS

ACGIH:

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL
HYGINISTS

CAS:

CHEMICAL ABSTRACTS SERVICE REGISTRY NUMBER

OSHA:

OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION

PEL:

PERMISSIBLE EXPOSURE LIMIT (OSHA)

TLV:

THRESHOLD LIMIT VALUE (ACGIH)

IMPORTANT:

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