

\*\*\*SILICA GEL\*\*

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MATERIAL SAFETY DATA SHEET  
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SUBSTANCE IDENTIFICATION  
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CAS-NUMBER 63231-67-4

SUBSTANCE: \*\*\*SILICA GEL\*\*

TRADE NAMES/SYNONYMS:

HYDROXYLATED SILICON DIOXIDE; HI-SIL; GASIL; BIOSIL; KIESELGEL;  
HYDRATED AMORPHOUS SILICA; MERCKOSORB M.SI.; PARTISIL; POLYPOR; SYLOID;  
SORBSIL; SYNTHETIC PRECIPITATED SILICAS; STABIFIX;  
S-156; S-157; S-160; S-679; S-684; S-689; S-692; S-698; S-699; S-701;  
S-704; S-706; S-707; S-733; S-734; S-735; S-736; S-743; O2SI;

CHEMICAL FAMILY:  
SILICON

NON-METALLIC OXIDE

MOLECULAR FORMULA: SI-O2

MOLECULAR WEIGHT: 60.09

CERCLA RATINGS (SCALE 0-3): HEALTH=U FIRE=0 REACTIVITY=0 PERSISTENCE=3  
NFPA RATINGS (SCALE 0-4): HEALTH=U FIRE=0 REACTIVITY=0

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COMPONENTS AND CONTAMINANTS  
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COMPONENT: SILICA GEL

PERCENT: 100.0

OTHER CONTAMINANTS: NONE

EXPOSURE LIMITS:

SILICON DIOXIDE, AMORPHOUS (SILICA, AMORPHOUS):  
6 MG/M3 OSHA TWA (<1% CRYSTALLINE SILICA)  
10 MG/M3 ACGIH TWA (TOTAL DUST, CONTAINING <1% QUARTZ)

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PHYSICAL DATA  
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DESCRIPTION: OCCRLESS, COLORLESS TO WHITE, AMORPHOUS HYGROSCOPIC POWDER OR GRANULES. BOILING POINT: 4046 F (2230 C) MELTING POINT: 3110 F (1710 C)  
SPECIFIC GRAVITY: 2.1 VAPOR PRESSURE: NIL PH: 2.3-7.4 (AQU. SUSP)  
SOLUBILITY IN WATER: INSOLUBLE  
SOLVENT SOLUBILITY: SOLUBLE IN HYDROFLUORIC ACID, HOT FIXED ALKALI HYDROXIDE SOLUTIONS.

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FIRE AND EXPLOSION DATA  
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FIRE AND EXPLOSION HAZARD:  
NEGLECTIBLE FIRE HAZARD WHEN EXPOSED TO HEAT OR FLAME.

FIREFIGHTING MEDIA:  
EXTINGUISH USING AGENT SUITABLE FOR TYPE OF SURROUNDING FIRE.

FIREFIGHTING:  
NO ACUTE HAZARD. MOVE CONTAINER FROM FIRE AREA IF POSSIBLE. AVOID BREATHING VAPORS OR DUSTS; KEEP UPWIND.

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TOXICITY  
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SILICA GEL:  
CARCINOGEN STATUS: HUMAN INADEQUATE EVIDENCE, ANIMAL INADEQUATE EVIDENCE (IARC CLASS-3).  
ACUTE TOXICITY LEVEL: NO DATA AVAILABLE.  
TARGET EFFECTS: NO DATA AVAILABLE.  
AT INCREASED RISK FROM EXPOSURE: PERSONS WITH IMPAIRED PULMONARY FUNCTION.

HEALTH EFFECTS AND FIRST AID

INHALATION:

SILICA GEL:

ACUTE EXPOSURE- EXPOSURE TO HIGH CONCENTRATIONS MAY CAUSE, DRYING OF MUCOUS MEMBRANES, COUGHING AND POSSIBLY NOSEBLEEDS.

CHRONIC EXPOSURE- PULMONARY EFFECTS OF LONGTERM EXPOSURE MAY VARY WITH THE FORM OF THE NATURAL OR SYNTHETIC AMORPHOUS SILICA AND, MORE IMPORTANTLY, THE DEGREE OF CONTAMINATION WITH A CRYSTALLINE FORM OF SILICA. STUDIES DONE ON A GROUP OF WORKERS EXPOSED TO A PRECIPITATED SILICA DUST FOR AN AVERAGE OF 8.6 YEARS, REVEALED NO ADVERSE EFFECTS ON THEIR PULMONARY FUNCTION TESTS OR CHEST X-RAYS. IT IS POSSIBLE HOWEVER, THAT X-RAY CHANGES IN THE LUNGS, WITH ONLY EXERTIONAL DYSPNEA OR WITHOUT ANY DISABILITY, MAY OCCUR IN SOME WORKERS, IF THE QUANTITY OF DUST TO WHICH THEY ARE EXPOSED IS GREAT ENOUGH. THE PRESENCE OF CRYSTALLINE SILICA MAY GREATLY INCREASE THE POTENTIAL FOR A MORE DISABLING SILICOSIS TO OCCUR WITH THE POSSIBILITY OF ADVANCED FIBROSIS AND DIFFUSE OBSTRUCTIVE EMPHYSEMA LEADING TO SEVERE RESPIRATORY CRIPPLING AND ULTIMATELY, A FATAL CARDIORESPIRATORY FAILURE. IN ADDITION, EPIDEMIOLOGICAL STUDIES INDICATE LUNG CANCER OCCURS MORE FREQUENTLY AMONG PERSONS WITH SILICOSIS THAN IN THE GENERAL POPULATION. STUDIES IN WHICH RATS, GUINEA PIGS AND MONKEYS WERE EXPOSED TO FUMED, GEL AND PRECIPITATED FORMS OF AMORPHOUS SILICA AT CONCENTRATIONS OF 7-10 MG/M3 (RESPIRABLE DUST) FOR 5.5-6 HOURS A DAY FOR UP TO 18 MONTHS, RESULTED IN SOME FIBROGENIC LUNG CHANGES IN MONKEYS ONLY. PARTICULARLY WITH THE FUMED FORM, ALL THREE FORMS CAUSED MACROPHAGE AND MONONUCLEAR CELL AGGREGATES WITH RETICULIN FIBERS AND A RESULTANT REDUCTION IN THE SIZE OF THE BRONCHIOLE LUMINA IN THE LUNGS OF THE MONKEYS.

FIRST AID- REMOVE FROM EXPOSURE AREA TO FRESH AIR IMMEDIATELY. IF BREATHING HAS STOPPED, PERFORM ARTIFICIAL RESPIRATION. KEEP PERSON WARM AND AT REST. TREAT SYMPTOMATICALLY AND SUPPORTIVELY. GET MEDICAL ATTENTION IMMEDIATELY.

SKIN CONTACT:

SILICA GEL:

ACUTE EXPOSURE- NO HUMAN DATA AVAILABLE. ONE FUMED SILICA, PARTICLE SIZE 0.5-10 MICRONS WAS CONSIDERED INERT TO MILDLY IRRITATING WHEN TESTED ON RABBIT SKIN.

CHRONIC EXPOSURE- REPEATED OR PROLONGED CONTACT MAY HAVE A DRYING AND ABRASIVE EFFECT ON THE SKIN.

FIRST AID- REMOVE CONTAMINATED CLOTHING AND SHOES IMMEDIATELY. WASH AFFECTED AREA WITH SOAP OR MILD DETERGENT AND LARGE AMOUNTS OF WATER UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

EYE CONTACT:

SILICA GEL:

ACUTE EXPOSURE- PARTICLES MAY CAUSE IMMEDIATE IRRITATION. ONE FUMED SILICA, PARTICLE SIZE 0.5-10 MICRONS, WAS CONSIDERED INERT TO MILDLY IRRITATING WHEN TESTED IN RABBIT EYES.

CHRONIC EXPOSURE- NO DATA AVAILABLE.

FIRST AID- WASH EYES IMMEDIATELY WITH LARGE AMOUNTS OF WATER OR NORMAL SALINE. OCCASIONALLY LIFTING UPPER AND LOWER LIDS, UNTIL NO EVIDENCE OF CHEMICAL REMAINS (APPROXIMATELY 15-20 MINUTES). GET MEDICAL ATTENTION IMMEDIATELY.

INGESTION:

SILICA GEL:

ACUTE EXPOSURE- THE EFFECTS OF INGESTION ARE PURELY MECHANICAL AS THE SUBSTANCE IS INERT CHEMICALLY AND BIOLOGICALLY BY THIS ROUTE.

CHRONIC EXPOSURE- AMORPHOUS SILICA IS PERMITTED IN SOME FORMS AS A FOOD ADDITIVE IN AMOUNTS OF LESS THAN 2% BY WEIGHT.

FIRST AID- GIVE WATER OR FLUIDS. EMESIS IS NOT NECESSARY. TREAT SUPPORTIVELY AND SYMPTOMATICALLY. IF IRRITATION OR DIGESTIVE UPSET OCCURS, GET MEDICAL ATTENTION.

ANTIDOTE:

NO SPECIFIC ANTIDOTE. TREAT SYMPTOMATICALLY AND SUPPORTIVELY.

REACTIVITY

REACTIVITY:

STABLE UNDER NORMAL TEMPERATURES AND PRESSURES.

INCOMPATIBILITIES:

SILICA GEL:

FLUORINE: FIRE AND EXPLOSION HAZARD.

HYDROCHLORIC ACID: MAY REACT VIOLENTLY DUE TO HEAT OF ADSORPTION.

MAGNESIUM: MAY EXPLODE VIOLENTLY.

MANGANESE TRIFLUORIDE: MAY CAUSE VIOLENT REACTION IF HEATED WITH RELEASE OF SILICON TRIFLUORIDE.

MANGANESE TRIOXIDE: FIRE AND EXPLOSION HAZARD.

OXIDIZERS (STRONG): FIRE HAZARD.

OXYGEN DIFLUORIDE: EXOTHERMIC REACTION WITH POSSIBLE EXPLOSION.

OZONE: POSSIBLE EXPLOSION AT TEMPERATURES BELOW -100 C.

VINYL ACETATE: MAY REACT VIGOROUSLY.

XENON HEXAFLUORIDE: MAY DETONATE WITH THE FORMATION OF XENON TRIOXIDE.

DECOMPOSITION:

AT TEMPERATURES ABOVE 800 C, CALCINING MAY OCCUR AND AMORPHOUS SILICA MAY BE CONVERTED TO FIBROGENIC CRYSTALLINE SILICA.

POLYMERIZATION:

HAZARDOUS POLYMERIZATION HAS NOT BEEN REPORTED TO OCCUR UNDER NORMAL

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STORAGE AND DISPOSAL

OBSERVE ALL FEDERAL, STATE AND LOCAL REGULATIONS WHEN STORING OR DISPOSING OF THIS SUBSTANCE. FOR ASSISTANCE, CONTACT THE DISTRICT DIRECTOR OF THE ENVIRONMENTAL PROTECTION AGENCY.

**\*\*STORAGE\*\***

STORE AWAY FROM INCOMPATIBLE SUBSTANCES.

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CONDITIONS TO AVOID

PREVENT DISPERSION OF DUST IN AIR.

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SPILL AND LEAK PROCEDURES

OCCUPATIONAL SPILL:  
RESIDUE SHOULD BE CLEANED UP USING A HIGH-EFFICIENCY PARTICULATE FILTER VACUUM.

FOR LARGE SPILLS, SWEEP UP WITH A MINIMUM OF DUSTING AND PLACE INTO SUITABLE CLEAN, DRY CONTAINERS FOR RECLAMATION OR LATER DISPOSAL.

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PROTECTIVE EQUIPMENT

VENTILATION:  
PROVIDE LOCAL EXHAUST OR PROCESS ENCLOSURE VENTILATION TO MEET PUBLISHED EXPOSURE LIMITS.

RESPIRATOR:  
THE FOLLOWING RESPIRATORS AND MAXIMUM USE CONCENTRATIONS ARE RECOMMENDATIONS BY THE U. S. DEPARTMENT OF HEALTH AND HUMAN SERVICES, NIOSH POCKET GUIDE TO CHEMICAL HAZARDS OR NIOSH CRITERIA DOCUMENTS; OR DEPARTMENT OF LABOR, 29CFR1910 SUBPART Z. THE SPECIFIC RESPIRATOR SELECTED MUST BE BASED ON CONTAMINATION LEVELS FOUND IN THE WORK PLACE AND BE JOINTLY APPROVED BY THE NATIONAL INSTITUTE OF OCCUPATIONAL SAFETY AND HEALTH AND THE MINE SAFETY AND HEALTH ADMINISTRATION.

SILICON DIOXIDE, AMORPHOUS (SILICA, AMORPHOUS):

- 100 MPPCF- ANY DUST AND MIST RESPIRATOR.
- 200 MPPCF- ANY DUST AND MIST RESPIRATOR EXCEPT SINGLE-USE AND QUARTER-MASK RESPIRATORS.  
ANY SUPPLIED-AIR RESPIRATOR.  
ANY SELF-CONTAINED BREATHING APPARATUS.
- 500 MPPCF- ANY POWERED AIR-PURIFYING RESPIRATOR WITH A DUST AND MIST FILTER.  
ANY SUPPLIED-AIR RESPIRATOR OPERATED IN A CONTINUOUS FLOW MODE.
- 1000 MPPCF- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER  
ANY POWERED AIR-PURIFYING RESPIRATOR WITH A TIGHT-FITTING FACEPIECE AND A HIGH-EFFICIENCY PARTICULATE FILTER.  
ANY SELF-CONTAINED BREATHING APPARATUS WITH A FULL FACEPIECE.  
ANY SUPPLIED-AIR RESPIRATOR WITH A FULL FACEPIECE.  
ANY SUPPLIED-AIR RESPIRATOR WITH A TIGHT-FITTING FACEPIECE OPERATED IN A CONTINUOUS FLOW MODE.
- 10,000 MPPCF- ANY SUPPLIED-AIR RESPIRATOR WITH A HALF-MASK AND OPERATED IN A PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.
- ESCAPE- ANY AIR-PURIFYING FULL FACEPIECE RESPIRATOR WITH A HIGH-EFFICIENCY PARTICULATE FILTER.  
ANY APPROPRIATE ESCAPE-TYPE SELF-CONTAINED BREATHING APPARATUS.

FOR FIREFIGHTING AND OTHER IMMEDIATELY DANGEROUS TO LIFE OR HEALTH CONDITIONS:

SELF-CONTAINED BREATHING APPARATUS WITH FULL FACEPIECE OPERATED IN PRESSURE DEMAND OR OTHER POSITIVE PRESSURE MODE.

SUPPLIED-AIR RESPIRATOR WITH FULL FACEPIECE AND OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE IN COMBINATION WITH AN AUXILIARY SELF-CONTAINED BREATHING APPARATUS OPERATED IN PRESSURE-DEMAND OR OTHER POSITIVE PRESSURE MODE.

CLOTHING:  
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE (IMPERVIOUS) CLOTHING AND EQUIPMENT TO PREVENT REPEATED OR PROLONGED SKIN CONTACT WITH THIS SUBSTANCE.

GLOVES:  
EMPLOYEE MUST WEAR APPROPRIATE PROTECTIVE GLOVES TO PREVENT CONTACT WITH THIS SUBSTANCE.

EYE PROTECTION:  
EMPLOYEE MUST WEAR SPLASH-PROOF OR DUST-RESISTANT SAFETY GOGGLES TO PREVENT EYE CONTACT WITH THIS SUBSTANCE. CONTACT LENSES SHOULD NOT BE WORN.

\*\*\*SILICA GEL\*\*

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