



The MSDS format adheres to the standards and regulatory requirements of the United States and may not meet regulatory requirements in other countries.

DuPont
Material Safety Data Sheet

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 DACU 405X2
 EPM00111 Revised 11-OCT-2008

 CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Material Identification

Formula : SiO2
 Molecular Weight : 60.08
 CAS Name : Silica

Tradenames and Synonyms

Collodial Silica

Company Identification

MANUFACTURER/DISTRIBUTOR
 DuPont Air Products Nanomaterials
 Limited
 2441 West Erie Drive
 Tempe
 AZ
 USA
 85282

PHONE NUMBERS

Product Information : 1-800-441-7515(Outside the US
 302-774-1000)
 Transport Emergency : CHEMTREC1-800-424-9300(Outside the US
 703-527-3887
 Medical Emergency : 1-800-441-3637(Outside the US
 302-774-1000)

 COMPOSITION/INFORMATION ON INGREDIENTS

Components

| Material | CAS Number | % |
|------------------|------------|---------|
| Amorphous Silica | 7631-86-9 | 0-30 |
| Water | 7732-18-5 | |
| Component A | | 0.012-1 |
| Component B | | 0-5 |
| Component C | | 0-2 |
| Component D | | 0-2 |
| Component E | | 0-4 |
| Sulfuric Acid | 7664-93-9 | <1 |
| Component F | | <2 |
| Component G | | <5 |
| Component H | | <2 |
| Component I | | <2 |
| Component J | | <1.94 |
| Component K | | <1 |

(COMPOSITION/INFORMATION ON INGREDIENTS - Continued)

| | | |
|-------------|---------|-----------|
| Component L | | <2 |
| Isopropanol | 67-63-0 | <1 |
| Component M | | <2 |
| Component N | | <1 |
| Component O | | <1 |
| Component P | | <1 |
| Component Q | | <1 |
| Component R | | <2 |
| Component S | | <2 |
| Component T | | <1 |
| Component U | | <1.5-3.75 |
| Component V | | <1 |
| Component W | | <1 |
| Component X | | <1 |
| Component Y | | <1 |
| Component Z | | <1 |

Components (Remarks)

The specific identities of Components A-Z are being with held as trade secrets.

HAZARDS IDENTIFICATION

Potential Health Effects

This product has not been tested as a whole for health effects. general information reported here is based on the health effects of the individual components of this mixture.

Colloidal Silica

<<<Skin contact may cause skin irritation with discomfort or rash, and possibly skin burns. Eye contact may cause eye irritation with discomfort, tearing, or blurring of vision. Inhalation may cause drying of mucous membranes and irritation of nose, throat, and lungs with nosebleeds, cough, difficulty breathing or shortness of breath. Based on animal experiments, long term exposures to high doses could lead to pulmonary inflammation and subsequent development of chronic lung disease. Colloidal Silica does not induce the lung effects associated with crystalline silica.

Epidemiology studies have not shown any evidence of fibrosis in workers exposed to Amorphous Silica dust levels ranging from 2 to 7 mg/m3.

Component A

<<<Causes severe eye burns. Eye damage may be delayed. Prolonged or repeated eye contact may cause conjunctivitis. Causes redness and pain in the eye and skin. Causes severe skin burns with delayed tissue destruction. Prolonged or repeated skin contact may cause dermatitis. Harmful if swallowed. May cause circulatory system failure. Causes

(HAZARDS IDENTIFICATION - Continued)

severe digestive tract burns. Causes severe irritation of upper respiratory tract. Causes chemical burns to the respiratory.

Component B

<<<Causes eye burns. Causes skin burns. May be harmful if absorbed through the skin. Harmful if swallowed. Material is extremely destructive to the tissue of the mucous membranes and upper respiratory tract. May be harmful if inhaled.

Component C

<<<May cause mild irritation to the eyes and respiratory system. No adverse effects expected in case of skin contact or ingestion.

Component D

<<<Skin contact may initially include skin irritation with discomfort or rash. Eye contact may initially cause eye irritation with discomfort, tearing, or blurring of vision. Prolonged eye contact can cause corneal destruction and loss of vision. Inhalation of the mist or dust may initially include: irritation of the upper respiratory passages, with discomfort and coughing. Ingestion of strong concentrations may initially include: gastrointestinal tract irritation. This compound is listed as "generally recognized as safe" by the FDA.

Component E

<<<Causes burns to the skin and eye. Vapors are severely irritating. Swallowing can cause burns of the mouth, throat, and stomach.

Sulfuric Acid

<<<Exposure to mists by inhalation may cause irritation of the nose and throat with sneezing, sore throat or runny nose; non-specific effects such as headache, nausea and weakness. Gross overexposure may cause irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath. Pulmonary edema (body fluid in the lungs) with cough, wheezing, abnormal lung sounds, possibly progressing to severe shortness of breath and bluish discoloration of the skin; symptoms may be delayed. Repeated and/or prolonged exposure to mists may cause corrosion of teeth.

Skin contact with liquid may cause skin corrosion, burns or ulcers. Contact with a 1 % solution may cause slight irritation with itching, redness or swelling. Repeated and/or prolonged exposure to mists may cause irritation with itching, burning, redness, swelling or rash.

Eye contact with may cause eye corrosion or ulceration; blindness may result. Repeated and/or prolonged exposure to

(HAZARDS IDENTIFICATION - Continued)

mists may cause eye irritation with tearing, pain or blurred vision.

Immediate effects of ingestion may include burns of the mouth, throat, esophagus and stomach, with severe pain, bleeding, vomiting, diarrhea and collapse of blood pressure-damage may appear days after exposure.

Increased susceptibility to the effects of this material may be observed in persons with pre-existing disease of the lungs.

Component F

<<<Inhalation: Material is irritating to mucous membranes and upper respiratory tract. Multiple Routes: Causes eye and skin irritation. May be harmful by inhalation, ingestion, or skin absorption.

Component G

<<<May cause very mild irritation to skin, eyes, or respiratory tract in sensitive individuals. No skin sensitization was observed in tests using human volunteers.

Component H

<<<Toxic by inhalation, in contact with skin and if swallowed. Causes burns.

Component I

<<<Eye contact may cause severe irritation, redness, swelling, discharge or corneal clouding. Skin contact may cause severe damage on prolonged contact. Inhalation may result in respiratory irritation.

Component J

<<<Eye contact causes moderate to severe irritation. Skin contact causes irritation with discomfort, local redness and possible swelling. Prolonged skin contact may cause severe irritation. Prolonged or widespread skin contact may result in the absorption of potentially harmful amounts of material. Repeated skin contact may cause dermatitis. Moderately toxic if swallowed. May cause irritation of the mouth and throat.

Component K

<<<Irritating to eyes and skin. May be harmful if swallowed. Inhalation of vapors (generated at high temperatures only) or oil mist from this product may cause mild irritation of the upper respiratory tract.

<<<Isopropanol

Inhalation may cause irritation of the nose and throat with sneezing, sore throat or runny nose.^^ Repeated and/or prolonged skin contact may cause defatting of the skin with itching, redness or rash. There are inconclusive or

(HAZARDS IDENTIFICATION - Continued)

unverified reports of human sensitization. Eye contact may cause eye irritation or injury with tearing, pain or blurred vision. Contact with the vapor or aerosol may cause eye irritation with tearing, pain or blurred vision.^ ^ Ingestion may cause irritation of the digestive tract with stomach pain, heartburn, nausea, vomiting or diarrhea; however there may be no symptoms at all. A major ingestion hazard is aspiration (liquid entering the lungs during ingestion or vomiting) which may result in "chemical pneumonia". Symptoms include coughing, gasping, choking, shortness of breath, bluish discoloration of the skin, rapid breathing and heart rate, and fever. Pulmonary edema or bleeding, drowsiness, confusion, coma and seizures may occur in more serious cases. Symptoms may develop immediately or as late as 24 hours after exposure, depending on how much chemical entered the lungs. Inhalation, ingestion or skin contact may include non-specific effects such as headache, nausea and weakness; flushing of the face; and low blood pressure. Repeated and/or prolonged exposure may cause central nervous system depression with dizziness, confusion, incoordination, drowsiness or unconsciousness. Gross overexposure may cause fatality. Increased susceptibility to the effects may be observed in persons with pre-existing disease of the skin.

Component L

<<< Contact with the eyes may result in temporary irritation. Prolonged or repeated skin contact may result in slight, temporary irritation. Ingestion of large amounts will result in diarrhea and weakness. Inhalation of the vapors or mists may result in respiratory irritation.

Component M

<<< May cause skin irritation. May be harmful if absorbed through the skin. May cause eye irritation. May be harmful if inhaled. Material may be irritating to mucous membranes and upper respiratory tract. May be harmful if swallowed.

Component N

<<< No information available.

Component O

<<< Contact with the eyes may result in temporary irritation. Prolonged or repeated skin contact may result in slight, temporary irritation. Ingestion of large amounts will result in diarrhea and weakness. Inhalation of vapors or mists may result in respiratory irritation.

Component P

>>> Contact with the eyes and skin may result in irritation. Inhalation may result in respiratory irritation.. Ingestion may result in gastric disturbances.

Component Q

>>> Direct contact with this material may cause

(HAZARDS IDENTIFICATION - Continued)

moderate eye and skin irritation.

Component R

>>>May cause skin irritation. May be harmful if absorbed through the skin. Causes eye irritation. May be harmful if inhaled and if swallowed.

Component S

>>>May be harmful if inhaled, in contact with skin and if swallowed. Irritating to eyes, respiratory system, and skin.

Component T

>>>Contact with eyes may cause mild irritation and discomfort. Contact with skin causes mild irritation and discomfort. Product is absorbed through the skin and may cause nausea, headache, and general discomfort. Repeated and/or prolonged exposure may cause allergic reaction/sensitization.

Component U

>>>Prolonged contact may cause skin irritation to some individuals. Contact with eyes may cause reversible cornea opacity and mild conjunctivitis.

Component V

>>>May be harmful if inhaled, if swallowed, or absorbed through the skin. Corrosive, Causes burns.

Component W

>>>May be harmful by inhalation, ingestion, or skin absorption. May cause eye and skin irritation.

Component X

>>>Material is irritating to mucous membranes and upper respiratory tract. May be harmful by inhalation, ingestion, or skin absorption. May cause eye and skin irritation.

Component Y

>>>Harmful if swallowed. Irritating to eyes, respiratory system, and skin.

Component Z

>>>May be corrosive to the eyes and skin based on animal studies. May induce skin sensitization in humans. Vapors and/or aerosols may irritate mucous membranes, eyes, nose and respiratory passages. May cause chemical burns of the mouth, pharynx, esophagus, and stomach in humans if ingested. Classified a slightly toxic by ingestion.

(HAZARDS IDENTIFICATION - Continued)

Carcinogenicity Information

None of the components present in this material at concentrations equal to or greater than 0.1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

FIRST AID MEASURES

First Aid

INHALATION

If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Call a physician.

SKIN CONTACT

In case of contact, immediately wash skin with soap and water. Wash contaminated clothing before reuse.

EYE CONTACT

In case of contact, immediately flush eyes with plenty of water for at least 15 minutes. Call a physician.

INGESTION

If swallowed, do not induce vomiting. Immediately give 2 glasses of water. Never give anything by mouth to an unconscious person. Call a physician.

Notes to Physicians

Activated charcoal mixture may be beneficial. Suspend 50 g activated charcoal in 400 mL water and mix well. Administer 5 mL/kg, or 350 mL for an average adult.

FIRE FIGHTING MEASURES

Flammable Properties

Flash Point : Not Available

Extinguishing Media

Use media appropriate for surrounding material.

Fire Fighting Instructions

Wear self-contained breathing apparatus (SCBA) and full protective equipment.

ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel)

NOTE: Review FIRE FIGHTING MEASURES and HANDLING (PERSONNEL) sections before proceeding with clean-up. Use appropriate PERSONAL PROTECTIVE EQUIPMENT during clean-up.

Ventilate spill area.

Initial Containment

Dike spill.

Spill Clean Up

Soak up with sawdust, sand, oil dry or other absorbent material.

HANDLING AND STORAGE

Handling (Personnel)

Avoid inhalation. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling. Wash clothing after use.

Handling (Physical Aspects)

Keep container tightly closed.

Storage

Store in a well ventilated place.

EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls

Use only with adequate ventilation.

Personal Protective Equipment

Wear coverall chemical splash goggles.

RESPIRATOR

Where there is potential for airborne exposure, wear appropriate NIOSH approved respiratory protection.

PROTECTIVE CLOTHING

Where there is potential for skin contact have available, and wear as appropriate, impervious gloves, apron, pants, and jacket.

(EXPOSURE CONTROLS/PERSONAL PROTECTION - Continued)

Exposure Guidelines

Applicable Exposure Limits

Amorphous Silica

PEL (OSHA) : 80 mg/m³ / % SiO₂ - 8 Hr TWA
 AEL * (DuPont) : 3 mg/m³, 8 & 12 Hr. TWA, respirable dust

Component A

PEL (OSHA) : None Established
 TLV (ACGIH) : Ceiling 2 mg/m³

Sulfuric Acid

PEL (OSHA) : 1 mg/m³, 8 Hr. TWA
 TLV (ACGIH) : 0.2 mg/m³, 8 Hr. TWA
 A2 (Sulfuric acid contained in strong
 inorganic acid mists)
 AEL * (DuPont) : 0.5 mg/m³, 8 & 12 Hr. TWA
 1.5 mg/m³, 15 minute TWA

Component H

PEL (OSHA) : 2.5 mg/m³, as F, 8 Hr. TWA
 2.5 mg/m³ - 8 Hr. TWA, as Dust
 TLV (ACGIH) : 2.5 mg/m³, as F, 8 Hr. TWA, A4
 AEL * (DuPont) : None Established

Isopropanol

PEL (OSHA) : 400 ppm, 980 mg/m³, 8 Hr. TWA
 TLV (ACGIH) : 200 ppm, 8 Hr. TWA, A4
 STEL 400 ppm
 AEL * (DuPont) : 200 ppm, 8 & 12 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which are lower than the AEL are in effect, such limits shall take precedence.

PHYSICAL AND CHEMICAL PROPERTIES

Physical Data

Boiling Point : 100 C (212 F)
 Form : Liquid Dispersion.
 pH : 2-12
 Odor : (mild), Acid.
 Color : Opaque.
 Specific Gravity : 1.01-1.3
 Solubility in Water : Silica Dispersion in water
 Melting Point : Dispersion in Water

STABILITY AND REACTIVITY

Chemical Stability

Stable at normal temperatures and storage conditions.

Incompatibility with Other Materials

Material may be perishable if frozen (possible non-hazardous irreversible silica agglomeration). DO NOT ALLOW TO FREEZE. Store at temperatures >40 degF.

Decomposition

Decomposition will not occur.

Polymerization

Polymerization will not occur.

TOXICOLOGICAL INFORMATION

Animal Data

Colloidal Silica:

Oral LD50: >10,000 mg/kg in rats

Component A

Draize test, rabbit, skin: 50 mg/24H Severe

Oral, rat: LD50 = 273 mg/kg

Component B

LD50 Oral, rat: 890 ul/kg

LD50 Oral, bird (wild): 75 mg/kg

Skin, rabbit, irritation, 2 mg/24H Severe

Eyes, rabbit, irritation, 0.25 mg/24H Severe

Component C

No information available.

Component D

Inhalation LC50: no information found

Skin absorption LD50: no information found

Oral LD50: 1870 mg/kg in rats (Slightly toxic by ingestion)

Component E

Oral LD50: 200 mg/kg in rats

Skin LD50: >2000 mg/kg in guinea pig

Inhalation LC50: >300ppm/6h in rat.

Sulfuric Acid

Oral LD50: 2,140 mg/kg in rats

Inhalation 8 hour LC50: 30 mg/m3 in guinea pigs

(TOXICOLOGICAL INFORMATION - Continued)

Component G

Oral LD50: >2000 mg/kg in rats.
Skin LD50: >2000 mg/kg in rat.

Isopropanol

Oral LD50: 4700 mg/kg in rats
Dermal LD50: 12,900 mg/kg in rabbits
Inhalation 4 hour LC50: 16,000 ppm in rats

Component L

Rabbit-eye: 5.30 Draize: Max = 110 (minimally irritating)
-skin: 0.21 Draize: Max = 8 (minimally irritating)

Component M

LD50 Intraperitoneal: 51 mg/kg (mouse)

Component N

Oral: LD50 (rat) >2000 mg/kg
Eye: Minimally irritating (Rabbit)
Skin: Practically non-irritating (Rabbit)

Component Q

Oral (rat) LD50: >1500 mg/kg (estimated)
Dermal (rabbit) LD50: > 2000 mg/kg (estimated)
4-hr Inhalation (rat) LC50: > 20 mg/l (estimated)

Component R

Oral (rat) LD50: 10000 mg/kg
Dermal (rabbit) LD50: > 3000 mg/kg
Irritation data: skin (rabbit) 660 mg
(Open irritation test)

Component S

Oral (mouse) LD50: 350 mg/kg
Irritation data: eye (rabbit) 100 mg 24H
(moderate irritation effect)

Component T

Oral LD50: >500 mg/kg in rat (No deaths).
Skin LD50: >1000 mg/kg in rabbit. (No deaths).

Component Y

RTECS: IPR-MUS LD50 78 mg/kg

Component Z

Oral LD50: 500- 5000 mg/kg

No information available for the other components.

ECOLOGICAL INFORMATION

Ecotoxicological Information

Colloidal Silica:
96 hour LC50 -
Fathead minnow: LC50: 5600 ppm

Component F
96 hour LC50 - Bluegill sunfish: 10.5 ppm.
48 hour TLm - Flounder: 100-300 ppm

No information available for the other components.

DISPOSAL CONSIDERATIONS

Waste Disposal

Treatment, storage, transportation, and disposal must be in accordance with applicable Federal, State/Provincial, and Local regulations. Do not flush to surface water or sanitary sewer system.

REGULATORY INFORMATION

U.S. Federal Regulations

All Ingredients in This Product are TSCA Listed/Reported.

State Regulations (U.S.)

WARNING - SUBSTANCES KNOWN TO THE STATE OF CALIFORNIA TO CAUSE CANCER, BIRTH DEFECTS OR OTHER REPRODUCTIVE HARM-

-Ethylene oxide <0.00002%
-1,4-Dioxane <0.00001%
-Acetaldehyde <0.00001%
-Formaldehyde <0.00001%
-Propylene Oxide Trace

OTHER INFORMATION

The data in this Material Safety Data Sheet relates only to the specific material designated herein and does not relate to use in combination with any other material or in any process.

Responsibility for MSDS : MSDS COORDINATOR
Telephone : (757)686-8663 OR (919)248-5027

Indicates updated section.

(Continued)

This information is based upon technical information believed to be reliable. It is subject to revision as additional knowledge and experience is gained.

End of MSDS