

# MATERIAL SAFETY DATA SHEET

MSDS DATE:07/31/07

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## SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

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PRODUCT NAME: ALUMINUM OXIDE  
SYNONYMS: ALUMINIA; ALPHA-ALUMINA; ALUMINUM OXIDE, POWDER  
PRODUCT CODES: 10400

MANUFACTURER: ELECTRON MICROSCOPY SCIENCES  
DIVISION: 1560 INDUSTRY ROAD/P.O. BOX 550  
ADDRESS: HATFIELD, PA 19440

EMERGENCY PHONE: 215-412-8400  
CHEMTREC PHONE: 800-424 -4300

FAX PHONE: 215-412-8450

CHEMICAL NAME: ALUMINUM OXIDE  
CHEMICAL FAMILY: METAL OXIDE. (SALT)

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## SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

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**INGREDIENT:**  
ALUMINUM OXIDE

<u>CAS NO.</u>	<u>% WT</u>	<u>% VOL</u>	<u>SARA 313 REPORTABLE</u>
1344-28-1	100	N/A	
	<u>ppm</u>	<u>mg/m3</u>	
OSHA PEL-TWA:	N/A	5	
OSHA PEL STEL :	N/A	N/A	
OSHA PEL CEILING:	N/A	N/A	
ACGIH TLV-TWA:	N/A	N/A	
ACGIH TLV STEL:	N/A	N/A	
ACGIH TLV CEILING:	N/A	N/A	

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## SECTION 3: HAZARDS IDENTIFICATION

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EMERGENCY OVERVIEW:

ROUTES OF ENTRY: SKIN, EYES, INGESTION, INHALATION

POTENTIAL HEALTH EFFECTS

EYES: NUISANCE DUST. DUST MAY CAUSE MECHANICAL EYE IRRITATION.

SKIN: IRRITATION TO SKIN

INGESTION: MAY BE HARMFUL IF SWALLOWED. INGESTION OF LARGE AMOUNTS MAY CAUSE GASTROINTESTINAL TRACT IRRITATION. IT IS EXPECTED TO BE A LOW HAZARD FOR NORMAL INDUSTRIAL HANDLING.

INHALATION: NUISANCE DUST. MATERIAL IS IRRITATING TO MUCOUS MEMBRANES AND UPPER RESPIRATORY TRACT. MAY CAUSE LUNG INJURY

ACUTE HEALTH HAZARDS: SLIGHTLY HAZARDOUS IN CASE OF SKIN CONTACT (IRRITANT), OF EYE CONTACT (IRRITANT), OF INGESTION, OF INHALATION

CHRONIC HEALTH HAZARDS: THE SUBSTANCE MAY BE TOXIC TO LUNGS. REPEATED OR PROLONGED EXPOSURE TO THE SUBSTANCE CAN PRODUCE TARGET ORGAN DAMAGE. MAY CAUSE EMPHYSEMA, AND MAY PRODUCE SMALL PULMONARY RADIOGRAPHIC OPACITIES, BUT ARE USUALLY NOT FIBROGENIC. SOME EPIDEMIOLOGIC STUDIES HAVE SHOWN EXCESS NONMALIGNANT PULMONARY FIBROSIS OR FIBROTIC CHANGES IN THE LUNGS WHILE OTHERS HAVE NOT. MAY RESULT IN HIGH LEVELS OF ALUMINUM FIBERS IN LUNGS. ALSO, SOME REPORTS ATTRIBUTE ALUMINUM OXIDE EXPOSURE AS CAUSING PNEUMOCONIOSIS. HOWEVER, WORKERS EXPOSED TO POWDERED ALUMINA IN THE CHINA INDUSTRY FOR MORE THAN 15 YEARS HAD NO RADIOLOGICAL SIGNS OF PNEUMOCONIOSIS.

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MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE: N/A

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## CARCINOGENICITY

OSHA: N/A

ACGIH: A4

NTP: N/A

IARC: N/A

OTHER: N/A

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## SECTION 4: FIRST AID MEASURES

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**EYES:** CHECK FOR AND REMOVE ANY CONTACT LENSES. FLUSH WITH WATER FOR 15 MINUTES. SEEK MEDICAL ATTENTION

**SKIN:** WASH WITH SOAP AND WATER. COVER THE IRRITATED SKIN WITH AN EMOLIENT. REMOVE CONTAMINATED CLOTHING AND SHOES. WASH CLOTHING BEFORE REUSE. THOROUGHLY CLEAN SHOES BEFORE REUSE. SEEK MEDICAL ATTENTION.

**INGESTION:** DO NOT INDUCE VOMITING UNLESS DIRECTED TO DO SO BY MEDICAL PERSONNEL. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON. IF LARGE QUANTITIES OF THIS MATERIAL ARE SWALLOWED, CALL A PHYSICIAN IMMEDIATELY. LOOSEN TIGHT CLOTHING SUCH AS A COLLAR, TIE, BELT OR WAISTBAND

**INHALATION:** IF INHALED, REMOVE TO FRESH AIR, IF NOT BREATHING GIVE ARTIFICIAL RESPIRATION. IF BREATHING IS DIFFICULT, GIVE OXYGEN. GET MEDICAL ATTENTION

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS: N/A

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## SECTION 5: FIRE-FIGHTING MEASURES

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FLAMMABLE LIMITS IN AIR, UPPER: NON FLAMMABLE  
(% BY VOLUME) LOWER: NON FLAMMABLE

FLASH POINT: N/A

F: N/A

C: N/A

METHOD USED:N/A

AUTOIGNITION TEMPERATURE: N/A

F: N/A

C: N/A

### NFPA HAZARD CLASSIFICATION

HEALTH: N/A

FLAMMABILITY: N/A

REACTIVITY: N/A

OTHER: N/A

### HMIS HAZARD CLASSIFICATION

HEALTH: N/A

FLAMMABILITY: N/A

REACTIVITY: N/A

PROTECTION: N/A

EXTINGUISHING MEDIA: N/A

SPECIAL FIRE FIGHTING PROCEDURES: N/A

UNUSUAL FIRE AND EXPLOSION HAZARDS: CHLORINE TRIFLUORIDE REACTS VIOLENTLY WITH ALUMINUM OXIDE PRODUCING A FLAME

HAZARDOUS DECOMPOSITION PRODUCTS: N/A

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## SECTION 6: ACCIDENTAL RELEASE MEASURES

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ACCIDENTAL RELEASE MEASURES:

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SMALL SPILL: USE APPROPRIATE TOOLS TO PUT THE SPILLED SOLID IN A CONVENIENT WASTE DISPOSAL CONTAINER. FINISH CLEANING BY SPREADING WATER ON THE CONTAMINATED SURFACE AND DISPOSE OF ACCORDING TO LOCAL AND REGIONAL AUTHORITY REQUIREMENTS

LARGE SPILL: USE A SHOVEL TO PUT THE MATERIAL INTO A CONVENIENT WASTE DISPOSAL CONTAINER. FINISH CLEANING BY SPREADING WATER ON THE CONTAMINATED SURFACE AND ALLOW TO EVACUATE THROUGH THE SANITARY SYSTEM. BE CAREFUL THAT THE PRODUCT IS NOT PRESENT AT A CONCENTRATION LEVEL ABOVE TLV. CHECK TLV ON THE MSDS AND WITH LOCAL AUTHORITIES.

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## SECTION 7: HANDLING AND STORAGE

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HANDLING AND STORAGE: DO NOT BREATHE DUST. WEAR SUITABLE PROTECTIVE CLOTHING. IN CASE OF INSUFFICIENT VENTILATION. WEAR SUITABLE RESPIRATORY EQUIPMENT. IF YOU FEEL UNWELL, SEEK MEDICAL ATTENTION AND SHOW THE LABEL WHEN POSSIBLE. AVOID CONTACT WITH SKIN AND EYES. KEEP AWAY FROM INCOMPATIBLES SUCH AS OXIDIZING AGENTS, ACIDS.

KEEP CONTAINER TIGHTLY CLOSED. KEEP CONTAINER IN A COOL, WELL VENTILATED AREA

OTHER PRECAUTIONS: N/A

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## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

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ENGINEERING CONTROLS:

VENTILATION: USE PROCESS ENCLOSURES, LOCAL EXHAUST VENTILATION, OR OTHER ENGINEERING CONTROLS TO KEEP AIRBORNE LEVELS BELOW RECOMMENDED EXPOSURE LIMITS. IF USER OPERATIONS GENERATE DUST, FUME, OR MIST, USE VENTILATION TO KEEP EXPOSURE TO AIRBORNE CONTAMINANTS BELOW THE EXPOSURE LIMIT

RESPIRATORY PROTECTION: BE SURE TO USE AN APPROVED/CERTIFIED RESPIRATOR OR EQUIVALENT.

EYE PROTECTION: SPLASH GOGGLES

SKIN PROTECTION: LAB COAT. GLOVES

OTHER PROTECTIVE CLOTHING OR EQUIPMENT: IN CASE OF LARGE SPILL: SPLASH GOGGLES, FULL SUIT, DUST RESPIRATOR, BOOTS, GLOVES, A SELF CONTAINED BREATHING APPARATUS SHOULD BE USED TO AVOID INHALATION OF THE PRODUCT. SUGGESTED PROTECTIVE CLOTHING MIGHT NOT BE SUFFICIENT; CONSULT A SPECIALIST BEFORE HANDLING THIS PRODUCT.

WORK HYGIENIC PRACTICES: WASH THOROUGHLY AFTER HANDLING. WASH CLOTHING BEFORE REUSE.

EXPOSURE GUIDELINES:

TWA: 10 (MG/M<sup>3</sup>) FROM ACGIH (TLV) [ UNITED STATES] INHALATION TOTAL

TWA: 10 (MG/M<sup>3</sup>) [CANADA] INHALATION TOTAL.

TWA: 5 (MG/M<sup>3</sup>) FROM OSHA (PEL) [UNITED STATES] INHALATION RESPIRABLE

TWA: 15 FROM OSHA (PEL) [UNITED STATES] INHALATION TOTAL.

TWA: 10 [UNITED KINGDOM (UK)] INHALATION TOTAL.

TWA: 4 [UNITED KINGDOM (UK)] INHALATION RESPIRABLE.

CONSULT LOCAL AUTHORITIES FOR ACCEPTABLE EXPOSURE LIMITS.

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## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

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APPEARANCE: WHITE

ODOR: ODORLESS

PHYSICAL STATE: SOLID (SOLID CRYSTALLINE POWDER)

pH AS SUPPLIED: N/A

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pH (Other): N/A

BOILING POINT:

F: 5396 DEG

C: 2980 DEG

MELTING POINT:

F: 3761.6 DEG

C: 2072 DEG

FREEZING POINT: N/A

F: N/A

C: N/A

VAPOR PRESSURE (mmHg): N/A

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F: N/A

C: N/A

VAPOR DENSITY (AIR = 1): N/A

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F: N/A

C: N/A

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F: N/A

C: N/A

EVAPORATION RATE: N/A

BASIS (=1): N/A

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## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (con't)

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SOLUBILITY IN WATER:VERY SOLUBLE IN COLD WATER. INSOLUBLE IN HOT WATER

PERCENT SOLIDS BY WEIGHT: N/A

PERCENT VOLATILE: N/A

BY WT/ BY VOL @

F: N/A

C: N/A

VOLATILE ORGANIC COMPOUNDS (VOC): N/A

WITH WATER: N/A LBS/GAL  
WITHOUT WATER: N/A LBS/GAL

MOLECULAR WEIGHT: N/A

VISCOSITY: N/A

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F: N/A

C: N/A

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## SECTION 10: STABILITY AND REACTIVITY

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STABILITY: PRODUCT IS STABLE

CONDITIONS TO AVOID (STABILITY): INCOMPATIBLE MATERIALS

INCOMPATIBILITY (MATERIAL TO AVOID): REACTIVE WITH OXIDIZING AGENTS, ACIDS.

HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: N/A

HAZARDOUS POLYMERIZATION: N/A

CONDITIONS TO AVOID (POLYMERIZATION): N/A

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## SECTION 11: TOXICOLOGICAL INFORMATION

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## TOXICOLOGICAL INFORMATION:

MAY CAUSE DAMAGE TO THE FOLLOWING ORGANS: LUNGS.  
SLIGHTLY HAZARDOUS IN CASE OF SKIN CONTACT (IRRITANT), OR INGESTION, OF INHALATION.  
MAY CAUSE CANCER (TUMORIGENIC) ACCORDING TO ANIMAL DATA. NO HUMAN DATA FOUND.

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## SECTION 12: ECOLOGICAL INFORMATION

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### ECOLOGICAL INFORMATION:

PRODUCTS OF BIODEGRADATION: POSSIBLY HAZARDOUS SHORT TERM DEGRADATION PRODUCTS ARE NOT LIKELY;  
HOWEVER, LONG TERM DEGRADATION PRODUCTS MAY ARISE.  
TOXICITY OF THE PRODUCTS OF BIODEGRADATION: THE PRODUCT ITSELF AND ITS PRODUCTS OF DEGRADATION ARE NOT TOXIC.

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## SECTION 13: DISPOSAL CONSIDERATIONS

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WASTE DISPOSAL METHOD: COMPLY WITH FEDERAL, STATE, LOCAL REGULATIONS.

RCRA HAZARD CLASS: N/A

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## SECTION 13: DISPOSAL CONSIDERATIONS (con't)

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## SECTION 14: TRANSPORT INFORMATION

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### U.S. DEPARTMENT OF TRANSPORTATION

PROPER SHIPPING NAME: NOT A DOT CONTROLLED MATERIAL (UNITED STATES)  
HAZARD CLASS:  
ID NUMBER:  
PACKING GROUP:  
LABEL STATEMENT:

### WATER TRANSPORTATION

PROPER SHIPPING NAME: N/A  
HAZARD CLASS:  
ID NUMBER:  
PACKING GROUP:  
LABEL STATEMENTS:

### AIR TRANSPORTATION

PROPER SHIPPING NAME: N/A  
HAZARD CLASS:  
ID NUMBER:  
PACKING GROUP:  
LABEL STATEMENTS:

OTHER AGENCIES: N/A

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## SECTION 15: REGULATORY INFORMATION

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### U.S. FEDERAL REGULATIONS

TSCA (TOXIC SUBSTANCE CONTROL ACT): INVENTORY: ALUMINUM OXIDE

CERCLA (COMPREHENSIVE RESPONSE COMPENSATION, AND LIABILITY ACT): N/A

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT): N/A

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311/312 HAZARD CATEGORIES: N/A

313 REPORTABLE INGREDIENTS: TOXIC CHEMICAL NOTIFICATION AND RELEASE REPORTING: LISTED AS ALUMINUM OXIDE (FIBROUS FORMS)

## STATE REGULATIONS:

ILLINOIS TOXIC SUBSTANCES DISCLOSURE TO EMPLOYEE ACT: ALUMINUM OXIDE

RHODE ISLAND RTK HAZARDOUS SUBSTANCES: ALUMINUM OXIDE

MINNESOTA: ALUMINUM OXIDE

MASSACHUSETTS RTK: ALUMINUM OXIDE

NEW JERSEY: ALUMINUM OXIDE

NEW JERSEY SPILL LIST: ALUMINUM OXIDE

CALIFORNIA DIRECTOR'S LIST OF HAZARDOUS SUBSTANCES: ALUMINUM OXIDE

## INTERNATIONAL REGULATIONS:

EINECS: THIS PRODUCT IS ON THE EUROPEAN INVENTORY OF EXISTING COMMERCIAL CHEMICAL SUBSTANCES (EINECS NO. 215-691-6

CANADA: LISTED ON CANADIAN DOMESTIC SUBSTANCE LIST (DSL).

CHINA: LISTED ON NATIONAL INVENTORY.

JAPAN: LISTED ON NATIONAL INVENTORY (ENCS)

KOREA: LISTED ON NATIONAL INVENTORY (KECI).

PHILIPPINES: LISTED ON NATIONAL INVENTORY (PICCS).

AUSTRALIA: LISTED ON AICS.

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## SECTION 16: OTHER INFORMATION

OTHER INFORMATION: NOTICE TO READER: ALL CHEMICALS MAY POSE UNKNOWN HAZARDS AND SHOULD BE USED WITH CAUTION. THIS MATERIAL SAFETY DATA SHEET APPLIES ONLY TO THE MATERIAL AS PACKAGED. IF THIS PRODUCT IS COMBINED WITH OTHER MATERIALS, DETERIORATES, OR BECOMES CONTAMINATED, IT MAY POSE HAZARDS NOT MENTIONED IN THIS MSDS. IT SHALL BE THE USER'S RESPONSIBILITY TO DEVELOP PROPER METHODS OF HANDLING AND PERSONAL PROTECTION BASED ON THE ACTUAL CONDITIONS OF USE.

PREPARATION INFORMATION: N/A

DISCLAIMER: IN COMPLIANCE WITH THE OSHA HAZARD COMMUNICATION STANDARD, 29 C.F.R. 1910.1200, WE ARE PROVIDING YOU WITH A MSDS FOR THE HAZARDOUS MATERIAL YOU ARE PURCHASING.

IT IS YOUR RESPONSIBILITY TO EDUCATE YOUR EMPLOYEES ON THE SAFE USE OF THE HAZARDOUS MATERIAL.

ELECTRON MICROSCOPY SCIENCES MAKES NO REPRESENTATION AS TO THE ACCURACY OF THE INFORMATION IN THE MSDS. THE INFORMATION IS BELIEVED TO BE CORRECT; HOWEVER, YOU (THE CUSTOMER), SHOULD PERFORM YOUR OWN INVESTIGATION AND INDEPENDENT VERIFICATION. IF YOU RESELL THE PRODUCT, YOU ARE RESPONSIBLE TO FORWARD THE INFORMATION IN THE MSDS TO YOUR CUSTOMER.