MATERIAL SAFETY DATA SHEET

SECTION 1: PRODUCT AND EMERGENCY CONTACT INFORMATION

MATERIAL NAME: CERIUM OXIDE – POLISHING POWDER

PRODUCT CODE: 1 LB. – C5412710

EMERGENCY CONTACTS: NORTH AMERICA (24 HRS) – CHEMTREC 1 (800) 424-9300
OUTSIDE NORTH AMERICA (COLLECT) – 1 (703) 527-3887

NON – EMERGENCY CONTACT: 1 (740) 548-4100 (8:00 AM – 5:00 PM EST)

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CHEMICAL NAME</th>
<th>COMMON NAME</th>
<th>SARA 313</th>
<th>Y/N</th>
<th>CAS #</th>
<th>OSHA PEL</th>
<th>TLV</th>
<th>CARCINOGEN</th>
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<tbody>
<tr>
<td>KAOLIN</td>
<td>***</td>
<td>N</td>
<td>1332-58-7</td>
<td>5 mg/m³ RESPIRABLE</td>
<td>2 mg/m³ RESPIRABLE</td>
<td>N/CLASS 4</td>
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<tr>
<td>RARE EARTH OXIDE</td>
<td>***</td>
<td>N</td>
<td>***</td>
<td>5 mg/m³ RESPIRABLE</td>
<td>10 mg/m³ RESPIRABLE</td>
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<tr>
<td>RARE EARTH FLUORIDE</td>
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<td>***</td>
<td>2.5 mg/m³ as F</td>
<td>2.5 mg/m³ as F</td>
<td>N/CLASS 4</td>
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COMPOSITION IS PROPRIETARY.
SECTION 3: HAZARDS IDENTIFICATION

ACUTE HEALTH EFFECTS: DUST MAY IRRITATE EYES, SKIN AND RESPIRATORY SYSTEM. INGESTION IS RARE, BUT SEEK MEDICAL ATTENTION IMMEDIATELY IF IT OCCURS. AVOID DUST FORMATION AND PROVIDE ADEQUATE VENTILATION.

CHRONIC HEALTH EFFECTS:

REPEATED OR PROLONGED EXPOSURE MAY CAUSE DERMATITIS. PRE-EXISTING HEALTH CONDITIONS MAY BE AGGRAVATED BY EXPOSURE TO COMPONENTS OF THESE PRODUCTS.

CARCINOGENIC EFFECTS – CLASSIFIED AS 4 (NOT CLASSIFIABLE FOR HUMAN OR ANIMAL)

MUTAGENIC EFFECTS – NOT AVAILABLE

TETRATOGIC EFFECTS – NOT AVAILABLE

DEVELOPMENTAL TOXICITY – NOT AVAILABLE

SECTION 4: FIRST AID MEASURES:

EYE CONTACT: IN CASE OF EYE CONTACT, CHECK FOR AND REMOVE CONTACT LENSES. FLUSH WITH TEPID WATER FOR AT LEAST 15 MINUTES WHILE HOLDING THE EYELIDS OPEN. SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS.

SKIN CONTACT: CAREFULLY REMOVE CONTAMINATED CLOTHING, WASH EXPOSED AREA WITH SOAP AND WATER AND SEEK MEDICAL ATTENTION IF IRRITATION PERSISTS OR WORSENS.

INHALATION CONTACT: IN CASE OF INHALATION, OBSERVE PERSONAL SAFETY FIRST, IF POSSIBLE MOVE INDIVIDUAL TO FRESH AIR. IF BREATHING IS DIFFICULT ADMINISTER OXYGEN. IF BREATHING HAS STOPPED, ADMINISTER ARTIFICIAL RESPIRATION AND CALL FOR EMERGENCY MEDICAL ASSISTANCE.
INHALATION CONTACT: (CONTINUED) NOTE TO MEDICAL PERSONNEL, LANTHANIDES, DUE TO THEIR HIGH DENSITY CAN PRODUCE ABNORMAL CHEST X-RAY. SEE MSDS FOR LANTHANIDES FOR FURTHER INFORMATION.

INGESTION CONTACT: SEEK IMMEDIATE MEDICAL ATTENTION. GIVE WATER TO DILUTE. DO NOT INDUCE VOMITING UNLESS DIRECTED BY QUALIFIED/LICENSED MEDICAL PERSONNEL. NEVER TRY TO GIVE ANYTHING BY MOUTH IF THE PERSON IS UNCONSCIOUS.

SECTION 5: FIRE, EXPLOSION DATA AND MEASURES

FLAMMABILITY: NOT FLAMMABLE
AUTO-IGNITION: NOT APPLICABLE
FLASH POINT: NOT APPLICABLE
FLAMMABLE LIMITS: LEL: NOT APPLICABLE UEL: NOT APPLICABLE
PRODUCTS OF COMBUSTION: NOT AVAILABLE

EXTINGUISHING MEDIA: IN PRESENCE OF FIRE USE WATER OR OTHER MEASURES FOR SURROUNDING FIRE

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:

ALWAYS WEAR SELF-CONTAINED BREATHING APPARATUS ON POSITIVE PRESSURE. USE WATER TO KEEP MATERIAL IN OR NEAR FIRE COOL. AVOID ANY BODILY CONTACT WITH SUBSTANCE OR WATER FROM FIRE FIGHTING. WATER FROM FIRE FIGHTING SHOULD BE CONTAINED AND DISPOSED PER INSTRUCTIONS IN SECTION 12.
SECTION 6: ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR RELEASE: ALWAYS WEAR RECOMMENDED PERSONAL PROTECTIVE EQUIPMENT PER SECTION 8. PROVIDE ADEQUATE VENTILATION TO THE AREA OF THE SPILL. AVOID RAISING DUST DURING THE CLEAN UP PROCESS. USE APPROPRIATE TOOLS TO CLEAN UP AS MUCH OF THE SPILL AS POSSIBLE AND PLACE SOLIDS IN A WASTE DISPOSAL CONTAINER. COMPLETE THE CLEAN UP BY MOPPING UP THE REMAINING DUST AND DEBRIS. COLLECT ALL MOP WATER AND DRY MATERIAL AND DISPOSE OF IN ACCORDANCE TO FEDERAL, STATE OR LOCAL GUIDELINES FOR THIS MATERIAL.

SECTION 7: HANDLING AND STORAGE

HANDLING: USE ONLY WITH ADEQUATE VENTILATION. ALWAYS WEAR THE CORRECT PERSONAL PROTECTIVE EQUIPMENT PER SECTION 8. AVOID ANY CONTACT WITH EYES OR SKIN. IF YOU HAVE ANY SYMPTOMS OF SICKNESS SEEK MEDICAL ATTENTION AND PROVIDE THE MEDICAL PERSONNEL WITH A COPY OF THIS MSDS. KEEP AWAY FROM INCOMPATIBLES LISTED IN SECTION 10.

STORAGE: STORE THIS CHEMICAL IN DRY LOCATION APART FROM ANY OF THE INCOMPATIBLE CHEMICALS LISTED IN SECTION 10.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: USE ADEQUATE VENTILATION TO PROVIDE FRESH AIR DURING POLISHING PROCESS. DO NOT GENERATE DUST, FUMES OR MIST.

PERSONAL PROTECTIVE EQUIPMENT (PPE) DURING POLISHING PROCESS

EYE PROTECTION: SAFETY GLASSES WITH SIDE SHIELDS ARE RECOMMENDED.

RESPIRATORY PROTECTION: DUST RESPIRATOR DURING THE MIXING PROCESS TO PREVENT INHALATION OF DUST.
SKIN PROTECTION: PROTECTIVE BOOTS, GLOVES AND APRON TO PREVENT CONTACT WITH SKIN.

PERSONAL PROTECTIVE EQUIPMENT IN CASE OF ACCIDENTAL SPILL

EYE PROTECTION: DUST AND MIST PROTECTIVE GOGGLES OR FACE SHIELD

RESPIRATORY PROTECTION: ½ MASK RESPIRATOR WITH CARTRIDGES MATCHED TO CHEMICAL RELEASE OR DUST.

SKIN PROTECTION: FULL PROTECTIVE SUIT WITH APPROVED BOOTS AND GLOVES.

IN CASE OF SPILL OBSERVE THE ACGIH TLV VALUES WHEN SELECTING THE APPROPRIATE PPE.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

<table>
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<tr>
<th>PROPERTY</th>
<th>VALUE</th>
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<tr>
<td>APPEARANCE</td>
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<td>POWDER</td>
</tr>
<tr>
<td>ODOR</td>
<td>ODORLESS</td>
</tr>
<tr>
<td>SOLUBILITY</td>
<td>INSOLUBLE IN WATER</td>
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<tr>
<td>PH</td>
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<tr>
<td>BOILING POINT</td>
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<tr>
<td>MELTING POINT</td>
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<tr>
<td>VISCOSITY</td>
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<tr>
<td>FLASH POINT</td>
<td>NOT APPLICABLE</td>
</tr>
<tr>
<td>AUTO IGNITION</td>
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</table>
SECTION 10: STABILITY AND REACTIVITY

STABILITY: STABLE UNDER NORMAL CONDITIONS
CONDITIONS TO AVOID: KEEP POWDERS DRY UNTIL READY FOR USE
MATERIALS TO AVOID: STRONG ACIDS
HAZARDOUS DECOMPOSITION PRODUCTS: NOT AVAILABLE
HAZARDOUS POLYMERIZATION: WILL NOT OCCUR

SECTION 11: TOXICOLOGICAL INFORMATION

ROUTES OF ENTRY: INHALATION, INGESTION
TOXICITY: RARE EARTH OXIDE – ORAL (LD50) – 5 gm/kg (RAT)

SPECIAL REMARKS ON ACUTE EFFECTS ON HUMANS AS POWDER:
SKIN IRRITATION, EYE IRRITATION, IRRITATION OF MUCOUS MEMBRANES
LUNG INJURY, GASTROINTESTINAL TRACT IRRITATION

GENERALLY LOW HAZARD FOR NORMAL INDUSTRIAL USE.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY: NOT AVAILABLE
BOD AND COD: NOT AVAILABLE
CHRONIC ECOTOXICITY: LONG TERM DEGRADATION PRODUCTS MAY BE HARMFUL.
SECTION 13: DISPOSAL CONSIDERATIONS

DISPOSE OF UNUSED POWDER ACCORDING TO FEDERAL, STATE OR LOCAL LAWS. EMPTY CONTAINERS MAY CONTAIN TRACE AMOUNTS OF POWDER AND SHOULD BE TREATED AS POSSIBLY HARMFUL.

SECTION 14: TRANSPORT INFORMATION

DOT CLASSIFICATION: SODIUM NITRATE – CLASS 5.1 – OXIDIZING MATERIAL

INDENTIFICATION: SODIUM NITRATE UN/NA 1498, PGIII (MARINE POLLUTANT)

SECTION 15: REGULATORY INFORMATION

29CFR 1910.1200 HAZ COM: IRRITANT, EYES, RESPIRATORY, SKIN

SARA 313: NOT REPORTABLE

HMIS (USA) NFPA (USA)

HEALTH HAZARD: 1 HEALTH HAZARD: 1

FIRE HAZARD: 0 FIRE HAZARD: 0

REACTIVITY: 0 REACTIVITY: 0

PPE: E PPE: GLOVES, LAB COAT, BOOTS, GLASSES, RESPIRATOR
SECTION 16: OTHER INFORMATION

CERIUM OXIDE – POLISHING POWDER IS SOLD FOR PROFESSIONAL USE ONLY.

THE INFORMATION CONTAINED HEREIN IS BASED ON DATA CONSIDERED TO BE ACCURATE. HOWEVER, NO WARRANTY IS EXPRESSED OR IMPLIED REGARDING THE ACCURACY OF THESE DATA OR THE RESULTS TO BE OBTAINED FROM THE USE THEREOF.

VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDEE OR THIRD PARTY PERSONS PROXIMATELY CAUSED BY THE MATERIAL IF REASONABLE SAFETY PRECEDURES ARE NOT ADHERED TO AS STIPULATED IN THE MATERIAL SAFETY DATA SHEET.

ADDITIONALLY, VENDOR ASSUMES NO RESPONSIBILITY FOR INJURY TO VENDEE OR THIRD PARTY PERSONS PROXIMATELY CAUSED BY ABNORMAL USE OF THIS MATERIAL EVEN IF REASONABLE SAFETY PROCEDURES ARE FOLLOWED.

FURTHERMORE, VENDEE ASSUMES THE RISK IN USE OF THIS MATERIAL.

<table>
<thead>
<tr>
<th>CREATION DATE</th>
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<th>REVISED BY</th>
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<tr>
<td>08/29/2011</td>
<td>D. ANDERSON</td>
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