Armour Etch Glass Etchant

Armour Products
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MATERIAL SAFETY DATA SHEET

SECTION I - PRODUCT IDENTIFICATION

TRADE NAME : Armour Etch
CHEMICAL NAME: Chemical Mixture
CHEMICAL FAMILY: Chemical Mixture

- H M I S -		
HEALTH	**FIRE**	**REACTIVITY**
3	0	1

SECTION II - INGREDIENTS

COMPOSITION	CONCENTRATION	CAS #
BARIUM SULFATE	0.0 - 6.0%	7727-43-7
SULFURIC ACID	0.0 - 9.0%	7664-93-9
SODIUM BIFLUORIDE	7.0 - 12.0%	1333-83-1
AMMONIUM BIFLUORIDE	21.0 - 27.0%	1341-49-7

NO OTHER INGREDIENTS IN THIS MIXTURE ARE CONSIDERED TO BE HAZARDOUS ACCORDING TO ANY STATE OR FEDERAL REGULATIONS.

SECTION III - PHYSICAL DATA

BOILING POINT: Not applicable
MELTING POINT: Not determined
VAPOR DENSITY (AIR=1): Not applicable
% SOLUBILITY IN WATER: Soluble
SPECIFIC GRAVITY (H2O=1): Not determined
VAPOR PRESSURE (mm Hg): Not applicable
EVAPORATION RATE (BUTYL ACETATE =1): Not applicable
pH: Acidic
APPEARANCE AND ODOR: White gritty paste, tan paste, blue gel, or blue liquid suspension. Acrid odor.

SECTION IV - FIRE AND EXPLOSION DATA

FLASH POINT: Not Applicable
AUTO-IGNITION: Not Applicable
LEL: Not Applicable **UEL:** Not Applicable
EXTINGUISHING MEDIA: Water Spray, Carbon Dioxide, Foam, Dry Chemical, Halon or "ABC" Class.
SPECIAL FIRE FIGHTING PROCEDURES: Move containers from fire area if it can be done without risk to firefighters. Incipient fire responders should wear eye protection. Structural firefighters must wear Self-Contained Breathing Apparatus and full protective equipment. Chemical resistant clothing may be necessary, as specified in 29 CFR 1910.156. If this product is involved in a fire, fire run-off water should be contained to prevent possible environmental damage. All contaminated equipment must be thoroughly cleaned with a neutralizer suitable for acidic solutions and fluoride compounds and rinsed with water before such equipment is returned to service.
UNUSUAL FIRE AND EXPLOSION HAZARDS: This product is corrosive and presents a severe contact hazard to firefighters. When involved in a fire, this material may decompose and produce irritating vapors, and toxic gases (e.g., fluorine and other fluoride compounds). This solution can give off a small amount of heat when mixed with water. Contact with some metals may produce flammable hydrogen gas.

SECTION V - HEALTH HAZARD DATA

EFFECTS OF OVEREXPOSURE:
CHRONIC HEALTH HAZARDS:
Exposure to Fluorides over years may produce mottling of tooth enamel, embrittlement and decalcification of bones and increased calcification of ligaments and vertebrae resulting in spinal stiffness (fluorosis). Repeated exposure may cause dental erosion, jaw necrosis, nasal ulceration, asthma, bronchitis and other respiratory ailments.
TARGET ORGANS

ACUTE: Skin, eyes, respiratory system. **CHRONIC:** Skin, respiratory system, bones.

EYE CONTACT: may cause severe irritation with possible corneal burns.

SKIN CONTACT: causes severe burns and fluoride-like burns which may not be immediately evident. Skin contact may cause hypocalcemia by skin absorption. The fluoride components of this product can penetrate the skin and destroy the deep tissue layers, including bone tissue. This damage to the body's tissues may continue for days, as the fluoride ion reacts with the calcium in the skin and bone. Severe skin-contact exposures (especially when the skin contamination exceeds 160 cm2) can cause hypocalcemia, a life-threatening lowering of serum calcium in the body.

INHALATION: may cause irritation to the respiratory tract and lung damage if exposure is excessive.

Inhalation may lead to hypercalcemia, due to absorption of the fluoride components. Chronic, low-level inhalation exposure may cause bronchitis, dental erosion and perforation of the nasal septum. Chronic, lowlevel inhalation may also cause baritosis, which is benign form of pneumoconiosis, due to the Barium Sulfate component. There are several reports of death due to acute hypersensitivity reaction and acute inflammation of the bronchi and peripheral airways after accidental inhalation of barium sulfate.

INGESTION: can cause very serious damage to the mouth, esophagus, stomach, and other tissues with which contact is made. Reported symptoms of ingestion of fluoride salts, such as in this product include salivation, nausea. Repeated small doses may produce no other symptoms, but polyuria and polydipsia have also been reported. Large doses lead promptly to burning or crampy abdominal pain, intense vomiting and diarrhea, often with hematemesis and melena, dehydration and thirst, muscle weakness, tremors, and rarely transient epileptiform convulsions, preceded or followed by progressive central nervous depression (lethargy, coma and respiratory arrest, even in the absence of circulatory failure), shock characterized by pallor, weak and thready pulse (sometimes irregular), shallow unlabored respiration, weak heart sounds, wet cold skin, cyanosis, anuria, dilated pupils, followed almost invariably by death in 2 to 4 hours. Even in the absence of shock, arrhythmias may occur, especially multiple episodes of ventricular fibrillation leading eventually to cardiac arrest. If the victim survives a few hours, paralysis of the muscles of deglutition, carpopedal spasm, and painful spasms of the extremities, occasionally localized or generalized urticaria. The above signs and symptoms are related to a variety of metabolic disorders that may occur in acute fluoride poisoning, including hypocalcemia, hypomagnesaemia, metabolic and/or respiratory acidosis and sometimes hyperkalemia. Ingestion may be fatal.

ROUTES OF ENTRY AND EMERGENCY FIRST AID PROCEDURES:

RESCUERS SHOULD NOT ATTEMPT TO RETRIEVE VICTIMS OF EXPOSURE TO TiIIS PRODUCT WITHOUT ADEQUATE PERSONAL PROTECTIVE EQUIPMENT, OR BY THEMSELVES. If necessary, Self-Contained Breathing Apparatus and chemical-protective clothing should be worn. Victims of chemical exposure must be taken for medical attention. Rescuers should be taken for medical attention if necessary. Take a copy of label and MSDS to health professional with victim.

INHALATION: If inhaled, remove victim to fresh air. If necessary, use artificial respiration to support vital functions. Seek immediate medical attention,

SKIN CONTACT: If the product contaminates the skin, immediately begin decontamination with running water. Minimum flushing is for 15 minutes. Do not interrupt flushing. Remove exposed or contaminated clothing, taking care not to contaminate eyes. Do not reuse clothing or shoes until cleaned. Do not apply oils or ointments unless ordered to by a physician. Victim must seek immediate medical attention.

EYE CONTACT: If product enters the eyes, open victim's eyes while under gently running water. Use sufficient force to open eyelids. Have victim "roll" eyes. Minimal flushing is for 15 minutes. Do not interrupt flushing. Seek immediate medical attention.

INGESTION: If this product is swallowed, CALL PHYSICIAN OR POISON CONTROL CENTER FOR MOST CURRENT INFORMATION. If professional advice is not available, do not induce vomiting. Rinse mouth with water immediately. Victim should drink large quantities of water. If milk is available, victim should drink it after drinking water. Never induce vomiting or give diluents (milk or water) to someone who is unconscious, having convulsions, or unable to swallow.

NOTE: In the event the symptoms of fluoride poisoning develop, refer to "Recommendations to Physicians" below.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE

May aggravate existing medical conditions such as allergies, dermatitis, asthma, bronchitis or any other respiratory ailment.

RECOMMENDATIONS TO PHYSICIANS

Treat symptoms and eliminate overexposure. All personnel providing treatment must be gloved. If symptoms of fluoride poisoning develop, treatment recommendations for contamination are as follows:

SKIN CONTACT: After 15 minute water flush (if flush has not yet been done), apply calcium gluconate gel (2.16.33% concentration) until pain has subsided, but not longer than 30 minutes. If pain lasts longer than 15 minutes, proceed with calcium gluconate injections.

EYE CONTACT: After 15 minutes water flush (if flush has not been done), flush eyes with 1 % calcium gluconate gel in normal, sterile saline.
INHALATION: Provide 100% oxygen, followed by inhalation of a mist containing 2% calcium gluconate in saline solution. Watch for pulmonary edema.
INGESTION: Gastric lavage with lime water or milk.

SECTION VI – REACTIVITY DATA

STABILITY: Stable at standard temperature and pressure.
INCOMPATIBILITIES (Materials to Avoid): Carbides, chlorates, cyanides, metal powders, nitrates, acids, bases, aluminum, phosphorous, glass and most metals.
HAZARDOUS DECOMPOSITION OR BY-PRODUCTS: If heated to decomposition, this product may produce sulfur oxides, nitric oxides, ammonia, barium oxides and hydrogen fluoride. This product may react with acids to liberate hydrogen fluoride and may react with basic materials to release ammonia. Solutions of the product can corrode glass, cement and most metals.
POLYMERIZATION: Hazardous polymerization is not expected to occur.
CONDITIONS TO AVOID: Avoid contact with incompatible chemicals and excessive heat.

SECTION VII - SPILL OR LEAK PROCEDURES

SPILL, LEAK OR RELEASE: All persons responding to spills of this product must be adequately trained to respond to chemical spills and must wear appropriate personal protective equipment. Contain spillage, absorb spilled product on material appropriate for acidic materials and scoop into a container for disposal, avoiding generation of dusts. Decontaminate the area thoroughly. Neutralize residue with sodium bicarbonate or other neutralizing agent for acids. Test area with litmus paper to ensure neutralization is complete. Place all spill residue in a suitable container and seal. DO NOT STORE WASTE IN GLASS CONTAINERS. Notification of the National Response Center (800-424-8002) may be required. Refer to U.S. EPA, DOT and applicable U.S. state and local regulations.
It is recommended that each user establish a spill prevention, control and countermeasure plan (SPCC). Such a plan should include procedures applicable procedures to proper storage, clean-up of spills, including reuse or disposal as appropriate (See Waste Disposal).
NOTE In the event of accidental release of this material, the above procedures should be followed. Additionally, proper exposure controls and personal protective equipment should be utilized (See Section VIII -Special Protection Information) and disposal of the material should be in accordance with Section VII: Waste Disposal.
WASTE DISPOSAL: US EPA Waste Number: D002
U.S. Federal, state and local disposal laws and regulations will determine proper waste disposal/recycling/reclamation procedure. All waste materials should be reviewed to determine applicable hazards (testing may be necessary). Any material classified as a DOT Corrosive or any waste solution with a pH of <=2 or >=12.5 are hazardous wastes under US EPA hazardous waste regulations. Disposal requirements are dependent on the hazard classification and will vary by location and type of disposal selected.
NOTE Chemical additions, processing or otherwise altering this material may make the waste management information presented above incomplete, inaccurate or otherwise inappropriate.
As local regulations vary; all wastes must be disposed/recycled/reclaimed in accordance with applicable U.S. Federal, state and local environmental control regulations.

SECTION VIII - SPECIAL PROTECTION INFORMATION

VENTILATION: Use with adequate ventilation. Follow standard medical product handling procedures. During decontamination of work surfaces, workers should wear the same equipment recommended in Section VII (Spill or Leak Procedures) of this MSDS.

EXPOSURE LIMITS:

CHEMICAL NAME	CAS #	EXPOSURE LIMITS IN AIR									
		ACGIH-TLV		OSHA-PEL		NIOSH-RELs		AIHA WEELs		NIOSH IDLH	DFG MAKs
		TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	TWA mg/m³	STEL mg/m³	mg/m³	mg/m³
Ammonium Bi fluoride, Sodium Bi fluoride Exposure limits are for Fluorides as F		2.5	NE	2.5	NE	2.5	NE	NE	NE	NE	TWA – 2.5 (inhalable fraction) PEAK = 2. MAK 15 min. average value, 1-hr interval.
Barium Sulfate	7727-43-7	10	NE	5 (resp fract.); 15 (total dust)	NE	5 (resp.fract.); 10 (total dust)	NE	NE	NE	NE	TWA = 4 (inhalable fraction); 1.5 (resp.fraction)
Sulfuric Acid	7664-93-9	0.2(T)	NE	1	NE	1	NE	NE	NE	15	TWA = 0.1 (inhalable fraction) PEAK = 1.MAK 15 min.average value, 1-hr interval ; 0.2 (ceiling DFG MAK Pregnancy Risk Classification: C

RESPIRATORY PROTECTION: Maintain airborne contaminant concentrations below exposure limits listed m Section Xli (Exposure Controls/Personal Protection-Exposure Limits), if applicable. If respiratory protection is needed, use only protection authorized in the U.S. Federal OSHA Standard (29 CFR 1910.134), equivalent U.S. State standards, Canadian CSA Standard Z94.4-93, the European Standard EN149, and EC member states. Oxygen levels below 19.5% are considered IDLH by OSHA. In such atmospheres, use of a full-face piece pressure/demand SCBA or a full face piece, supplied air respirator with -auxiliary self-contained air supply is required under OSHAs Respiratory Protection Standard (1910.134-1998).

OTHER: Use body protection appropriate for task. An apron or other impermeable body protection is suggested. Full-body chemical protective clothing is recommended for emergency response procedures. If a hazard of injury to the feet exists due to falling objects, rolling objects, where objects may pierce the soles of the feet or where employee's feet may be exposed to electrical hazards, use foot protection, as described in U.S. OSHA 29 CFR 1910.136.

PROTECTIVE GLOVES: Use butyl rubber, Teflon, Viton, Saranex, or Responder gloves for routine industrial use. Check gloves for leaks. Wash hands before putting on gloves and after removing gloves. Gloves should cover the gown cuff. If necessary, refer to U.S. OSHA 29 CFR 1910.138,

EYE PROTECTION: Splash goggles or safety glasses, with a side shield. If necessary, refer to U.S. OSHA 29 CFR 1910.133.

SECTION IX - SPECIAL PRECAUTIONS

HANDLING AND STORAGE:

All employees who handle this material should be trained to handle it safely. Avoid breathing mists or sprays generated by this product. Use in a well-ventilated location. Open containers slowly on a stable surface. Containers of this product must be properly labeled. Empty containers may contain residual product; therefore, empty containers should be handled with care. Store containers in a cool, dry location, away from direct sunlight, sources of intense heat, or where freezing is possible. DO NOT STORE IN GLASS CONTAINERS. Store away from incompatible materials (see Section X, Stability and Reactivity). Material should be stored in secondary containers or in a diked area, as appropriate. Keep container tightly closed when not in use. Storage areas should be made of fire and corrosion resistant materials. If appropriate, post warning signs in storage and use areas. Inspect all incoming containers before storage to ensure containers are properly labeled and not damaged.

OTHER PRECAUTIONS:

PROTECTIVE PRACTICES DURING MAINTENANCE OF CONTAMINATED EQUIPMENT:

Follow practices indicated in Section VII (Spill or Leak Procedures). Make certain that application equipment is locked and tagged-out safely. Always use this product in areas where adequate ventilation is provided. Decontaminate equipment using neutralizing agent suitable for acids and follow with a triple-rinse with water before maintenance begins. Collect all rinsates and dispose of according to applicable U.S. Federal, State, or local procedures.

WORK PRACTICES AND HYGIENE PRACTICES:
Avoid all contact with this material. All employees who handle this material should be trained to handle it safely. Avoid breathing mists or sprays generated by this material. Wash thoroughly after handling this material. All personal protective equipment, tools, etc. should be neutralized thoroughly with sodium carbonate or dilute ammonia after each use. Check gloves DAILY for pinhole leaks. Discard defective gloves. Never touch outer surfaces of gloves after use. Wash contaminated clothing before reuse. Destroy contaminated shoes. Do not eat or drink while handling this material. All work practices should minimize the release of this material. Eyewash stations and safety showers should be in areas of use of this material. Calcium gluconate gel should be readily accessible in areas where potential exposure to this product exists.

SECTION X - TRANSPORTATION REQUIREMENTS

PROPER SHIPPING NAME: CORROSIVE SOLID, ACIDIC, INORGANIC N.O.S. (AMMONIUM BIFLUORIDE, SODIUM BIFLUORIDE)
HAZARD CLASS: 8, CORROSIVE
ID NUMBER: UN3260
DOT GUIDE: 154
PKG. GROUP: II

NOTICE

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