ARMOUR ETCH

Section 1. Identification

Product trade name : ARMOUR ETCH

Product code : 15-0150, 15-0151, 15-0200, 15-0250, 15-0260, 10-0100, 10-0101

Material uses : Etching and frosting of glass.

Supplier : ARMOUR PRODUCTS
176-180 FIFTH AVENUE
HAWTHORNE, NJ 07506 USA
PHONE: 973-427-8787

e-mail address of person responsible for this SDS : SDS@ARMOURPRODUCTS.COM

Emergency telephone number (with hours of operation) : 1-800-424-9300; INTNL: 1-703-527-3887

Section 2. Hazards identification

OSHA/HCS status : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).

Classification of the substance or mixture : ACUTE TOXICITY (oral) - Category 4
SKIN CORROSION - Category 1B
SERIOUS EYE DAMAGE - Category 1

Classification code : : Acute Tox. 4, H302
Skin Corr. 1B, H314
Eye Dam. 1, H318

Hazards not otherwise classified : None known.

GHS label elements

Hazard pictograms :

Signal word : Danger

Hazard statements : Harmful if swallowed. Causes severe skin burns and eye damage.

Contains : ammonium bifluoride; sodium bifluoride

Precautionary statements

Prevention : Wear suitable gloves. Wear eye or face protection. Wear protective clothing. Do not eat, drink or smoke when using this product. Wash hands thoroughly after handling.

Response : IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician. IF SWALLOWED: Immediately call a POISON CENTER or physician. Rinse mouth. Do NOT induce vomiting. IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower. Wash contaminated clothing before reuse. Immediately call a POISON CENTER or physician. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or physician.

Supplemental label elements :

Section 3. Composition/information on ingredients

Substance/mixture : Mixture

Ingredient name	Identifiers	%
ammonium bifluoride	215-676-4	20 - 40
sodium bifluoride	215-608-3	10 - 20
citric acid	201-069-1	10 - 20
sulphuric acid	231-639-5	5 - 10

Any concentration shown as a range is to protect confidentiality or is due to batch variation.

There are no additional ingredients present which, within the current knowledge of the supplier and in the concentrations applicable, are classified as hazardous to health or the environment and hence require reporting in this section.

Occupational exposure limits, if available, are listed in Section 8.

Section 4. First aid measures

Description of necessary first aid measures

Eye contact : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.

Inhalation : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Skin contact : Get medical attention immediately. Call a poison center or physician. Flush contaminated skin with plenty of water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. Wash clothing before reuse. Clean shoes thoroughly before reuse.

Ingestion : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.

Most important symptoms/effects, acute and delayed

Potential acute health effects

Eye contact : Causes serious eye damage.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes severe burns.

Ingestion : Harmful if swallowed. May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain
watering
redness

Inhalation : No specific data.

Section 4. First aid measures

Skin contact : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur

Ingestion : Adverse symptoms may include the following:
stomach pains

Indication of immediate medical attention and special treatment needed, if necessary

Notes to physician : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.

Specific treatments : No specific treatment.

Protection of first-aiders : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

See toxicological information (Section 11)

Section 5. Fire-fighting measures

Extinguishing media

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

Specific hazards arising from the chemical : In a fire or if heated, a pressure increase will occur and the container may burst.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides
sulfur oxides
halogenated compounds
metal oxide/oxides

Special protective actions for fire-fighters : Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters : Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

Section 6. Accidental release measures

Personal precautions, protective equipment and emergency procedures

For non-emergency personnel : No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Do not breathe vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialized clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

Environmental precautions : Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods and materials for containment and cleaning up

Section 6. Accidental release measures

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see Section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see Section 1 for emergency contact information and Section 13 for waste disposal.

Section 7. Handling and storage

Precautions for safe handling

Protective measures : Put on appropriate personal protective equipment (see Section 8). Do not get in eyes or on skin or clothing. Do not breathe vapor or mist. Do not ingest. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Empty containers retain product residue and can be hazardous. Do not reuse container.

Advice on general occupational hygiene : Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. See also Section 8 for additional information on hygiene measures.

Conditions for safe storage, including any incompatibilities

Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see Section 10) and food and drink. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

Section 8. Exposure controls/personal protection

Control parameters

Occupational exposure limits

Ingredient name	Exposure limits
ammonium bifluoride	**ACGIH TLV (United States, 3/2016).** TWA: 2,5 mg/m³, (as F) 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 2,5 mg/m³, (as F) 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 2,5 mg/m³, (as F) 8 hours. **OSHA PEL Z2 (United States, 2/2013).** TWA: 2,5 mg/m³ 8 hours. Form: Dust
sodium bifluoride	**ACGIH TLV (United States, 3/2016).** TWA: 2,5 mg/m³, (as F) 8 hours. **OSHA PEL 1989 (United States, 3/1989).** TWA: 2,5 mg/m³, (as F) 8 hours. **OSHA PEL (United States, 6/2016).** TWA: 2,5 mg/m³, (as F) 8 hours. **OSHA PEL Z2 (United States, 2/2013).** TWA: 2,5 mg/m³ 8 hours. Form: Dust
citric acid	None.
sulphuric acid	**OSHA PEL 1989 (United States, 3/1989).** TWA: 1 mg/m³ 8 hours. **NIOSH REL (United States, 10/2013).**

Section 8. Exposure controls/personal protection

	TWA: 1 mg/m³ 10 hours. **ACGIH TLV (United States, 3/2016).** TWA: 0,2 mg/m³ 8 hours. Form: Thoracic fraction **OSHA PEL (United States, 6/2016).** TWA: 1 mg/m³ 8 hours.

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Environmental exposure controls : Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

Individual protection measures

Hygiene measures : Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Eye/face protection : Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists, gases or dusts. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.

Hand protection : Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary.

Recommended : butyl rubber, Teflon, Viton®.

Body protection : Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Other skin protection : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Respiratory protection : Based on the hazard and potential for exposure, select a respirator that meets the appropriate standard or certification. Respirators must be used according to a respiratory protection program to ensure proper fitting, training, and other important aspects of use.

Section 9. Physical and chemical properties

Appearance

Physical state : Solid. [Gel]

Color : White., Light brown.

Odor : Pungent.

Flash point : Closed cup: Not applicable.

Flammability of the product : None available.

The information presented in this section does not serve as specifications.

Section 10. Stability and reactivity

Reactivity : No specific test data related to reactivity available for this product or its ingredients.

Chemical stability : The product is stable.

Conditions of instability : Avoid increased storage temperature.

Section 10. Stability and reactivity

Possibility of hazardous reactions : Under normal conditions of storage and use, hazardous reactions will not occur.

Conditions to avoid : No specific data.

Incompatible materials : No specific data.

Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Test	Dose	Exposure
ammonium bifluoride	LD50 Oral	OCDE 401	130 mg/kg	-
sodium bifluoride	LD50 Oral	-	160 mg/kg	-
citric acid	LD50 Oral	-	3 g/kg	-
sulphuric acid	LD50 Oral	-	2140 mg/kg	-

Conclusion/Summary : Harmful if ingested.

Irritation/Corrosion

Product/ingredient name	Result	Test	Score	Exposure	Observation
citric acid	Eyes - Severe irritant	-	-	24 hours 750 Micrograms	-

Conclusion/Summary :

Skin : Causes burns.

Eyes : Causes serious eye damage.

Sensitization

Conclusion/Summary : Not available.

Mutagenicity

Conclusion/Summary : Not available.

Carcinogenicity

Conclusion/Summary : Not available.

Reproductive toxicity

Conclusion/Summary : Not available.

Teratogenicity

Conclusion/Summary : Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Long term exposure

Section 11. Toxicological information

Potential immediate effects : Not available.

Potential delayed effects : Not available.

Potential chronic health effects

Conclusion/Summary : Not available.

General : No known significant effects or critical hazards.

Carcinogenicity : No known significant effects or critical hazards.

Mutagenicity : No known significant effects or critical hazards.

Teratogenicity : No known significant effects or critical hazards.

Developmental effects : No known significant effects or critical hazards.

Fertility effects : No known significant effects or critical hazards.

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Test	Species	Exposure
ammonium bifluoride	Acute LC0 237 mg/l Fresh water	-	Fish - Brachydanio rerio	96 hours
	Acute LC100 562 mg/l Fresh water	-	Fish - Brachydanio rerio	96 hours
sodium bifluoride	Acute EC50 43 mg/l Fresh water	-	Algae	96 hours
	Acute EC50 26 mg/l Fresh water	-	Crustaceans - Daphnia magna	48 hours
	Acute LC50 51 mg/l Fresh water	-	Fish - Salmo gairdneri	96 hours
	Chronic NOEC 50 mg/l Fresh water	-	Algae	7 days
	Chronic NOEC 8,9 mg/l Fresh water	-	Crustaceans - Daphnia magna	21 days
	Chronic NOEC 4 mg/l Fresh water	-	Fish - Oncorhynchus mykiss	21 days
citric acid	Acute LC50 160000 µg/l Marine water	-	Crustaceans - Carcinus maenas - Adult	48 hours
sulphuric acid	Acute LC50 42500 µg/l Marine water	-	Crustaceans - Pandalus montagui - Adult	48 hours
	Acute LC50 42 ppm Fresh water	-	Fish - Gambusia affinis - Adult	96 hours

Persistence and degradability

Conclusion/Summary : Not available.

Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
acide citrique	-1,64	-	low

Mobility in soil

Soil/water partition coefficient (K_{OC}) : Not available.

Section 11: Toxicological information

Other adverse effects No known significant effects or critical hazards.

Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	TDG Classification	Mexico Classification	IMDG	IATA
UN number	UN3260	UN3260	UN3260	UN3260	UN3260
UN proper shipping name	Corrosive solid, acidic, inorganic, n.o.s. (ammonium bifluoride, sulphuric acid, mixture) RQ (ammonium bifluoride, sodium bifluoride)	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (ammonium bifluoride, sulphuric acid, mixture)	SOLIDO CORROSIVO, ACIDO, INORGANICO, N.E.P. (ammonium bifluoride, sulphuric acid, mixture)	CORROSIVE SOLID, ACIDIC, INORGANIC, N.O.S. (ammonium bifluoride, sulphuric acid, mixture)	Corrosive soliid, acidic, inorganic, n.o.s. (ammonium bifluoride, sulphuric acid, mixture)
Transport hazard class(es)	8 	8 	8 	8 	8 
Packing group	II	II	II	II	II
Environmental hazards	No.	No.	No.	No.	No.
Additional information	**Reportable quantity** 454,55 lbs / 206, 36 kg Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements. **Limited quantity** Yes. **Packaging instruction** **Passenger aircraft** Quantity limitation: 15 K **Cargo aircraft**	Product classified as per the following sections of the Transportation of Dangerous Goods Regulations: 2. 40-2.42 (Class 8). **Explosive Limit and Limited Quantity Index** 1 **Passenger Carrying Road or Rail Index** 1 **Special provisions** 16	**Special provisions** 274	**Emergency schedules (EmS)** F-A, S-B **Special provisions** 274 **IMDG Code Segregation group** 1 - Acids 2 - Ammonium compounds	**Passenger and Cargo Aircraft** Quantity limitation: 15K Packaging instructions: 851 **Cargo Aircraft Only** Quantity limitation: 50 K Packaging instructions: 863 **Limited Quantities - Passenger Aircraft** Quantity limitation: 5 k Packaging instructions: Y844 **Special provisions** A803

Section 14. Transport information

	Quantity limitation: 50 K **Special provisions** 386, B2, IB2, T11, TP2, TP27				

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL and the IBC Code : Not available.

Section 15. Regulatory information

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Not listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

DEA List I Chemicals (Precursor Chemicals) : Not listed

DEA List II Chemicals (Essential Chemicals) : Listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ (lbs)	SARA 302 TPQ (gallons)	SARA 304 RQ (lbs)	SARA 304 RQ (gallons)
sulphuric acid	5 - 10	Yes.	1000	65,2	1000	65,2

SARA 304 RQ : 16666,7 lbs / 7566,7 kg

SARA 311/312

Classification : Immediate (acute) health hazard

Composition/information on ingredients

Name	%	Fire hazard	Sudden release of pressure	Reactive	Immediate (acute) health hazard	Delayed (chronic) health hazard
ammonium bifluoride	20 - 40	No.	No.	No.	Yes.	No.
sodium bifluoride	10 - 20	No.	No.	No.	Yes.	No.
citric acid	10 - 20	No.	No.	No.	Yes.	No.
sulphuric acid	5 - 10	No.	No.	No.	Yes.	No.

SARA 313

	Product name	%
Form R - Reporting requirements	ammonium bifluoride sulphuric acid	20 - 40 5 - 10
Supplier notification	ammonium bifluoride sulphuric acid	20 - 40 5 - 10

SARA 313 notifications must not be detached from the SDS and any copying and redistribution of the SDS shall

include copying and redistribution of the notice attached to copies of the SDS subsequently redistributed.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	*	3
Flammability		0
Physical hazards		1

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)

Procedure used to derive the classification

Classification	Justification
Acute Tox. 4, H302	Calculation method
Skin Corr. 1B, H314	Calculation method
Eye Dam. 1, H318	Calculation method

History

Date of printing : 14/01/2020

Date of issue/Date of revision : 14/01/2020

Date of previous issue : 18/04/2016

Version : 2.02

Key to abbreviations : ATE = Acute Toxicity Estimate
BCF = Bioconcentration Factor
GHS = Globally Harmonized System of Classification and Labelling of Chemicals
IATA = International Air Transport Association
IBC = Intermediate Bulk Container
IMDG = International Maritime Dangerous Goods
LogPow = logarithm of the octanol/water partition coefficient
MARPOL = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution)
UN = United Nations

References : Not available.

Indicates information that has changed from previously issued version.

Notice to reader

The information contained in this document is provided as a guideline; it is based on the extent of ARMOUR's knowledge regarding the product on the date indicated above. It applies to the product as is, in conformity with the specifications provided by ARMOUR*.
Should the product undergo chemical transformation or be combined or mixed with other substances, it is the sole responsibility of the user to ensure that no new danger appear. Given that the use of this information is beyond the control of ARMOUR*, ARMOUR* provides no warranty, whether express or implied, and assumes no responsibility, regarding the use of this information and of the user's product.

Section 16. Other information

ARMOUR PRODUCTS
176-180 FIFTH AVENUE
HAWTHORNE, NJ 07506USA
PHONE: 973-427-8787