Safety Data Sheet

Document Group:	18-8773-6	**Version Number:**	6.01
Issue Date:	06/12/23	**Supercedes Date:**	05/08/18

SECTION 1: Identification

1.1. Product identifier
30% Hydrofluoric Acid, 98-0212-3200-8

Product Identification Numbers
98-0212-3200-8
7010321402

1.2. Recommended use and restrictions on use

Recommended use
Product

1.3. Supplier's details

MANUFACTURER:	3M
DIVISION:	Electronics Materials Solutions Division
ADDRESS:	3M Center, St. Paul, MN 55144-1000, USA
Telephone:	1-888-3M HELPS (1-888-364-3577)

1.4. Emergency telephone number
1-800-364-3577 or (651) 737-6501 (24 hours)

SECTION 2: Hazard identification

2.1. Hazard classification
Corrosive to metal: Category 1.
Acute Toxicity (dermal): Category 1.
Acute Toxicity (oral): Category 2.
Acute Toxicity (inhalation): Category 2.
Serious Eye Damage/Irritation: Category 1.
Skin Corrosion/Irritation: Category 1A.
Specific Target Organ Toxicity (single exposure): Category 1.
Specific Target Organ Toxicity (repeated exposure): Category 1.

2.2. Label elements
Signal word
Danger

Symbols

Corrosion | Skull and crossbones | Health Hazard |

Pictograms

Hazard Statements
May be corrosive to metals.

Fatal if swallowed.
Fatal in contact with skin.
Fatal if inhaled.
Causes severe skin burns and eye damage.

Causes damage to organs:
cardiovascular system |
respiratory system |

Causes damage to organs through prolonged or repeated exposure:
musculoskeletal system |
kidney/urinary tract |
respiratory system |

Precautionary Statements

Prevention:
Keep only in original container.
Do not breathe dust/fume/gas/mist/vapors/spray.
Do not get in eyes, on skin, or on clothing.
Use only outdoors or in a well-ventilated area.
Wear respiratory protection.
Wear protective gloves, protective clothing, and eye/face protection.
Do not eat, drink or smoke when using this product.
Wash thoroughly after handling.

Response:
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
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 doctor/physician.
Wash contaminated clothing before reuse.
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
Specific treatment is urgent (see Notes to Physician on this label).
Absorb spillage to prevent material damage.

Storage:
Store in a corrosive resistant container with a resistant inner liner.
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.

Disposal:

Dispose of contents/container in accordance with applicable local/regional/national/international regulations.

Notes to Physician:
This product contains or can produce hydrofluoric acid (HF). HF is highly corrosive and its exposure can lead to severe local damage, hypocalcemia, hypomagnesemia and the development of cardiac arrhythmias, which are the primary cause of death in HF exposures. To significantly reduce or prevent HF dermal absorption, immediate irrigation of the affected area with copious amounts of either water or saline followed by the application of a calcium gluconate-containing gel is recommended. Intravenous (IV) access, serum electrolyte concentrations, an electrocardiogram, and cardiac monitoring should be obtained in patients exposed to HF. Patients with inhalation injuries are treated with oxygen and nebulized calcium gluconate (4 mL of 2.5-5%). Succinylcholine is best avoided if rapid sequence intubation must be performed in the setting of HF exposure due to the possibility of hyperkalemia. If systemic toxicity is suspected (due to QTc prolongation, cardiac arrhythmia, or obvious systemic illness), calcium is administered intravenously as part of the medical management.

2.3. Hazards not otherwise classified
May cause chemical gastrointestinal burns. May cause chemical respiratory tract burns.

SECTION 3: Composition/information on ingredients

Ingredient	C.A.S. No.	% by Wt
Water	7732-18-5	68 - 77
Hydrofluoric Acid	7664-39-3	23 - 32 Trade Secret *

*The specific chemical identity and/or exact percentage (concentration) of this composition has been withheld as a trade secret.

SECTION 4: First aid measures

4.1. Description of first aid measures

Inhalation:
Remove person to fresh air. Get immediate medical attention.

Skin Contact:
Immediately flush with large amounts of water for at least 15 minutes. Remove contaminated clothing. Get immediate medical attention. Wash clothing before reuse.

Eye Contact:
Immediately flush with large amounts of water for at least 15 minutes. Remove contact lenses if easy to do. Continue rinsing. Immediately get medical attention.

If Swallowed:
Rinse mouth. Do not induce vomiting. Get immediate medical attention.

4.2. Most important symptoms and effects, both acute and delayed

Fatal if inhaled. Corrosive to respiratory tract (severe nose and throat pain, chest tightness and pain, wheezing, and breathlessness). Fatal in contact with skin. Skin burns (localized redness, swelling, itching, intense pain, blistering, and tissue destruction). Serious damage to the eyes (corneal cloudiness, severe pain, tearing, ulcerations, and significantly impaired or loss of vision). Fatal if swallowed. Target organ effects. See Section 11 for additional details. Target organ effects following prolonged or repeated exposure. See Section 11 for additional details.

4.3. Indication of any immediate medical attention and special treatment required
This product contains or can produce hydrofluoric acid (HF). HF is highly corrosive and its exposure can lead to severe local damage, hypocalcemia, hypomagnesemia and the development of cardiac arrhythmias, which are the primary cause of death in HF exposures. To significantly reduce or prevent HF dermal absorption, immediate irrigation of the affected area with copious amounts of either water or saline followed by the application of a calcium gluconate-containing gel is recommended. Intravenous (IV) access, serum electrolyte concentrations, an electrocardiogram, and cardiac monitoring should be obtained in patients exposed to HF. Patients with inhalation injuries

are treated with oxygen and nebulized calcium gluconate (4 mL of 2.5-5%). Succinylcholine is best avoided if rapid sequence intubation must be performed in the setting of HF exposure due to the possibility of hyperkalemia. If systemic toxicity is suspected (due to QTc prolongation, cardiac arrhythmia, or obvious systemic illness), calcium is administered intravenously as part of the medical management.

SECTION 5: Fire-fighting measures

5.1. Suitable extinguishing media
DO NOT USE WATER Use a fire fighting agent suitable for the surrounding fire.

5.2. Special hazards arising from the substance or mixture
Exposure to extreme heat can give rise to thermal decomposition.

5.3. Special protective actions for fire-fighters
Wear full protective clothing, including helmet, self-contained, positive pressure or pressure demand breathing apparatus, bunker coat and pants, bands around arms, waist and legs, face mask, and protective covering for exposed areas of the head.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Evacuate area. Ventilate the area with fresh air. For large spill, or spills in confined spaces, provide mechanical ventilation to disperse or exhaust vapors, in accordance with good industrial hygiene practice. Refer to other sections of this SDS for information regarding physical and health hazards, respiratory protection, ventilation, and personal protective equipment.

6.2. Environmental precautions
Avoid release to the environment. For larger spills, cover drains and build dikes to prevent entry into sewer systems or bodies of water.

6.3. Methods and material for containment and cleaning up
Contain spill. Working from around the edges of the spill inward, cover with bentonite, vermiculite, or commercially available inorganic absorbent material. Mix in sufficient absorbent until it appears dry. Remember, adding an absorbent material does not remove a physical, health, or environmental hazard. Collect as much of the spilled material as possible. Place in a metal container approved for use in transportation by appropriate authorities. The container must be lined with polyethylene plastic or contain a plastic drum liner made of polyethylene. Clean up residue with water. Cover, but do not seal for 48 hours. Dispose of collected material as soon as possible in accordance with applicable local/regional/national/international regulations.

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Do not breathe thermal decomposition products. Do not breathe dust/fume/gas/mist/vapors/spray. Do not get in eyes, on skin, or on clothing. Do not eat, drink or smoke when using this product. Wash thoroughly after handling. Avoid release to the environment. Wash contaminated clothing before reuse. Keep away from reactive metals (eg. Aluminum, zinc etc.) to avoid the formation of hydrogen gas that could create an explosion hazard.

7.2. Conditions for safe storage including any incompatibilities
Store in a well-ventilated place. Keep container tightly closed to prevent contamination with water or air. If contamination is suspected, do not reseal container. Keep only in original container. Store in a corrosive resistant container with a resistant inner liner. Store away from strong bases.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational exposure limits

If a component is disclosed in section 3 but does not appear in the table below, an occupational exposure limit is not available for the component.

Ingredient	C.A.S. No.	Agency	Limit type	Additional Comments
Hydrofluoric Acid	7664-39-3	ACGIH	TWA(as F):0.5 ppm;CEIL(as F):2 ppm	Danger of cutaneous absorption
Hydrofluoric Acid	7664-39-3	OSHA	TWA:3 ppm	

ACGIH : American Conference of Governmental Industrial Hygienists
AIHA : American Industrial Hygiene Association
CMRG : Chemical Manufacturer's Recommended Guidelines
OSHA : United States Department of Labor - Occupational Safety and Health Administration
TWA: Time-Weighted-Average
STEL: Short Term Exposure Limit
CEIL: Ceiling

8.2. Exposure controls

8.2.1. Engineering controls
For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use with appropriate local exhaust ventilation sufficient to maintain levels of thermal decomposition products below their exposure guidelines. Use general dilution ventilation and/or local exhaust ventilation to control airborne exposures to below relevant Exposure Limits and/or control dust/fume/gas/mist/vapors/spray. If ventilation is not adequate, use respiratory protection equipment.

8.2.2. Personal protective equipment (PPE)

Eye/face protection

Select and use eye/face protection to prevent contact based on the results of an exposure assessment. The following eye/face protection(s) are recommended:
Full Face Shield
Indirect Vented Goggles

Skin/hand protection
Select and use gloves and/or protective clothing approved to relevant local standards to prevent skin contact based on the results of an exposure assessment. Selection should be based on use factors such as exposure levels, concentration of the substance or mixture, frequency and duration, physical challenges such as temperature extremes, and other use conditions. Consult with your glove and/or protective clothing manufacturer for selection of appropriate compatible gloves/protective clothing. Note: Nitrile gloves may be worn over polymer laminate gloves to improve dexterity.
Gloves made from the following material(s) are recommended: Fluoroelastomer
Neoprene
Polymer laminate

If this product is used in a manner that presents a higher potential for exposure (eg. spraying, high splash potential etc.), then use of protective coveralls may be necessary. Select and use body protection to prevent contact based on the results of an exposure assessment. The following protective clothing material(s) are recommended: Apron - Neoprene
Apron - polymer laminate

Respiratory protection

An exposure assessment may be needed to decide if a respirator is required. If a respirator is needed, use respirators as part of a full respiratory protection program. Based on the results of the exposure assessment, select from the following respirator type(s) to reduce inhalation exposure:
For those situations where the material might be exposed to extreme overheating due to misuse or equipment failure, use a positive pressure supplied-air respirator.
Half facepiece or full facepiece air-purifying respirator suitable for hydrogen fluoride

For questions about suitability for a specific application, consult with your respirator manufacturer.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance	
Physical state	Liquid
Color	Colorless
Odor	Strong Odor, Pungent Odor
Odor threshold	*No Data Available*
pH	3.8
Melting point	-94 ºF
Boiling Point	238 ºF
Flash Point	No flash point
Evaporation rate	*No Data Available*
Flammability (solid, gas)	Not Applicable
Flammable Limits(LEL)	*Not Applicable*
Flammable Limits(UEL)	*Not Applicable*
Vapor Pressure	19 mmHg [@ 20 ºC]
Vapor Density	2.4 [@ 20 ºC] [*Ref Std:*AIR=1]
Density	1.1 g/ml
Specific Gravity	1.1 [*Ref Std:*WATER=1]
Solubility in Water	Complete
Solubility- non-water	*No Data Available*
Partition coefficient: n-octanol/ water	*No Data Available*
Autoignition temperature	*Not Applicable*
Decomposition temperature	*No Data Available*
Viscosity	Approximately 0.9 centipoise

SECTION 10: Stability and reactivity

10.1. Reactivity
This material may be reactive with certain agents under certain conditions - see the remaining headings in this section.

10.2. Chemical stability
Stable.

10.3. Possibility of hazardous reactions
Hazardous polymerization will not occur.

10.4. Conditions to avoid
None known.

10.5. Incompatible materials
Strong bases
Reactive metals

glass, ceramics: dissolves

10.6. Hazardous decomposition products

Substance	Condition
Hydrogen Gas	At Elevated Temperatures
Hydrogen Fluoride	At Elevated Temperatures
Toxic Vapor, Gas, Particulate	At Elevated Temperatures

Extreme heat arising from situations such as misuse or equipment failure can generate hydrogen fluoride as a decomposition product.

SECTION 11: Toxicological information

The information below may not be consistent with the material classification in Section 2 if specific ingredient classifications are mandated by a competent authority. In addition, toxicological data on ingredients may not be reflected in the material classification and/or the signs and symptoms of exposure, because an ingredient may be present below the threshold for labeling, an ingredient may not be available for exposure, or the data may not be relevant to the material as a whole.

11.1. Information on Toxicological effects

Signs and Symptoms of Exposure

Based on test data and/or information on the components, this material may produce the following health effects:

Inhalation:
Fatal if inhaled.
Respiratory Tract Corrosion: Signs/symptoms may include nasal discharge, severe nose and throat pain, chest tightness and pain, coughing up blood, wheezing, and breathlessness, possibly progressing to respiratory failure.

May cause additional health effects (see below).

Skin Contact:
Fatal in contact with skin. Corrosive (Skin Burns): Signs/symptoms may include localized redness, swelling, itching, intense pain, blistering, ulceration, and tissue destruction.

May cause additional health effects (see below).

Eye Contact:
Corrosive (Eye Burns): Signs/symptoms may include cloudy appearance of the cornea, chemical burns, severe pain, tearing, ulcerations, significantly impaired vision or complete loss of vision.

Ingestion:
Fatal if swallowed. Gastrointestinal Corrosion: Signs/symptoms may include severe mouth, throat and abdominal pain; nausea; vomiting; and diarrhea; blood in the feces and/or vomitus may also be seen.

May cause additional health effects (see below).

Additional Health Effects:

Single exposure may cause target organ effects:
Cardiac Effects: Signs/symptoms may include irregular heartbeat (arrhythmia), changes in heart rate, damage to heart muscle, heart attack, and may be fatal.

Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

Prolonged or repeated exposure may cause target organ effects:
Hard Tissue Effects: Signs/symptoms may include color changes in the teeth and nails; changes in development of bone, teeth or nails; weakening of the bones; and/or hair loss.

Respiratory Effects: Signs/symptoms may include cough, shortness of breath, chest tightness, wheezing, increased heart rate, bluish colored skin (cyanosis), sputum production, changes in lung function tests, and/or respiratory failure.

Kidney/Bladder Effects: Signs/symptoms may include changes in urine production, abdominal or lower back pain, increased protein in urine, increased blood urea nitrogen (BUN), blood in urine, and painful urination.

Toxicological Data
If a component is disclosed in section 3 but does not appear in a table below, either no data are available for that endpoint or the data are not sufficient for classification.

Acute Toxicity

Name	Route	Species	Value
Overall product	Dermal		No data available; calculated ATE >0 - =50 mg/kg
Overall product	Inhalation-Vapor(4 hr)		No data available; calculated ATE >0.5 - =2 mg/l
Overall product	Ingestion		No data available; calculated ATE >5 - =50 mg/kg
Hydrofluoric Acid	Dermal		LD50 estimated to be 0 - 50 mg/kg
Hydrofluoric Acid	Inhalation-Vapor		LC50 estimated to be 0.5 - 2 mg/l
Hydrofluoric Acid	Ingestion		LD50 estimated to be 5 - 50 mg/kg
Hydrofluoric Acid	Inhalation-Gas (4 hours)	Rat	LC50 805 ppm

ATE = acute toxicity estimate

Skin Corrosion/Irritation

Name	Species	Value
Hydrofluoric Acid	Human	Corrosive

Serious Eye Damage/Irritation

Name	Species	Value
Hydrofluoric Acid	similar health hazards	Corrosive

Skin Sensitization
For the component/components, either no data are currently available or the data are not sufficient for classification.

Respiratory Sensitization
For the component/components, either no data are currently available or the data are not sufficient for classification.

Germ Cell Mutagenicity

Name	Route	Value
Hydrofluoric Acid	In vivo	Some positive data exist, but the data are not sufficient for classification

Carcinogenicity
For the component/components, either no data are currently available or the data are not sufficient for classification.

Reproductive Toxicity

Reproductive and/or Developmental Effects
For the component/components, either no data are currently available or the data are not sufficient for classification.

Target Organ(s)

Specific Target Organ Toxicity - single exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Hydrofluoric Acid	Dermal	heart	Causes damage to organs	Human	NOAEL Not available	poisoning and/or abuse
Hydrofluoric Acid	Dermal	respiratory system	Not classified	Human	NOAEL Not available	poisoning and/or abuse
Hydrofluoric Acid	Inhalation	heart	Causes damage to organs	Rabbit	NOAEL Not available	
Hydrofluoric Acid	Inhalation	respiratory system	Causes damage to organs	Human	NOAEL Not available	poisoning and/or abuse
Hydrofluoric Acid	Inhalation	respiratory irritation	May cause respiratory irritation		NOAEL Not available	

Specific Target Organ Toxicity - repeated exposure

Name	Route	Target Organ(s)	Value	Species	Test Result	Exposure Duration
Hydrofluoric Acid	Inhalation	kidney and/or bladder	Causes damage to organs through prolonged or repeated exposure	Rat	NOAEL 8.2 ppm	5 weeks
Hydrofluoric Acid	Inhalation	respiratory system	Causes damage to organs through prolonged or repeated exposure	Multiple animal species	LOAEL 31 ppm	5 weeks
Hydrofluoric Acid	Inhalation	bone, teeth, nails, and/or hair	Causes damage to organs through prolonged or repeated exposure	Human	NOAEL Not available	occupational exposure
Hydrofluoric Acid	Inhalation	liver	Not classified	Multiple animal species	NOAEL 18 ppm	50 days
Hydrofluoric Acid	Inhalation	blood	Not classified	Multiple animal species	NOAEL 18 ppm	5 weeks
Hydrofluoric Acid	Ingestion	bone, teeth, nails, and/or hair	Causes damage to organs through prolonged or repeated exposure	Professional judgement	NOAEL Not available	

Aspiration Hazard
For the component/components, either no data are currently available or the data are not sufficient for classification.

Please contact the address or phone number listed on the first page of the SDS for additional toxicological information on this material and/or its components.

SECTION 12: Ecological information

Ecotoxicological information

Please contact the address or phone number listed on the first page of the SDS for additional ecotoxicological information on this material and/or its components.

Chemical fate information

Please contact the address or phone number listed on the first page of the SDS for additional chemical fate information on this material and/or its components.

SECTION 13: Disposal considerations

13.1. Disposal methods
Dispose of contents/ container in accordance with the local/regional/national/international regulations.

Dispose of waste product in a permitted industrial waste facility. As a disposal alternative, incinerate in a permitted waste incineration facility. Proper destruction may require the use of additional fuel during incineration processes. Combustion products will include HF. Facility must be capable of handling halogenated materials. Empty drums/barrels/containers used for transporting and handling hazardous chemicals (chemical substances/mixtures/preparations classified as Hazardous as per

applicable regulations) shall be considered, stored, treated & disposed of as hazardous wastes unless otherwise defined by applicable waste regulations. Consult with the respective regulating authorities to determine the available treatment and disposal facilities.

EPA Hazardous Waste Number (RCRA): Not regulated

SECTION 14: Transport Information

For Transport Information, please visit http://3M.com/Transportinfo or call 1-800-364-3577 or 651-737-6501.

SECTION 15: Regulatory information

15.1. US Federal Regulations

Contact 3M for more information.

EPCRA 311/312 Hazard Classifications:

Physical Hazards
Corrosive to metal

Health Hazards
Acute toxicity
Hazard Not Otherwise Classified (HNOC)
Serious eye damage or eye irritation
Skin Corrosion or Irritation
Specific target organ toxicity (single or repeated exposure)

Section 313 Toxic Chemicals subject to the reporting requirements of that section and 40 CFR part 372 (EPCRA):

Ingredient	C.A.S. No	% by Wt
Hydrofluoric Acid	7664-39-3	Trade Secret 23 - 32

15.2. State Regulations

Contact 3M for more information.

15.3. Chemical Inventories

The components of this product are in compliance with the chemical notification requirements of TSCA. All required components of this product are listed on the active portion of the TSCA Inventory.

Contact 3M for more information.

15.4. International Regulations

Contact 3M for more information.

This SDS has been prepared to meet the U.S. OSHA Hazard Communication Standard, 29 CFR 1910.1200.

SECTION 16: Other information

NFPA Hazard Classification

Health: 4 **Flammability:** 1 **Instability:** 1 **Special Hazards:** Reacts with Water

National Fire Protection Association (NFPA) hazard ratings are designed for use by emergency response personnel to address the hazards that are presented by short-term, acute exposure to a material under conditions of fire, spill, or similar emergencies. Hazard ratings are primarily based on the inherent physical and toxic properties of the material but also include the toxic properties of combustion or decomposition products that are known to be generated in significant quantities.

HMIS Hazard Classification

Health: *4 **Flammability:** 1 **Physical Hazard:** 1 **Personal Protection:** X - See PPE section.

Hazardous Material Identification System (HMIS® IV) hazard ratings are designed to inform employees of chemical hazards in the workplace. These ratings are based on the inherent properties of the material under expected conditions of normal use and are not intended for use in emergency situations. HMIS® IV ratings are to be used with a fully implemented HMIS® IV program. HMIS® is a registered mark of the American Coatings Association (ACA).

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