



# NEWAY SINOPHC TECH. LIMITED

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## Safety Data Sheet (MSDS) - Silicon Etchant

**According to:** GB/T 16483, GB/T 17519, GHS Rev.9, UN GHS, Semiconductor Industrial

**Standard Product Name:** Silicon Etchant (Buffered Hydrofluoric Acid Composite)**Product**

**Number:** SE-20260222**Brand:** SIGALD**Revision Date:** 22 FEB 2026**Supplier:** NEWAY SINOPHC TECH.

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### SECTION 1: Identification of the Substance/Mixture and of the Company/Undertaking

#### 1.1 Product Identifiers

- Product Name: Silicon Etchant
- Synonyms: Buffered HF Silicon Etchant; Semiconductor Grade Silicon Etching Solution; Photovoltaic Silicon Etchant
- Product Number: SE-20260222
- CAS Number: N/A (Composite mixture; core ingredient HF: 7664-39-3, NH4F:12125-01-8)
- Form: Colorless to pale yellow transparent corrosive liquid (Semiconductor & Photovoltaic Grade)

#### 1.4 Relevant Identified Uses and Uses Advised Against

- **Identified Uses:** Silicon wafer etching in semiconductor/photovoltaic industry; silicon material surface treatment; laboratory silicon structure preparation.
- **Uses Advised Against:** Not for food/feed/cosmetic/medical use; do not use in glass/metal containers; do not mix with strong acids/bases/oxidants/organic solvents; do not use for non-silicon material etching without testing.

### SECTION 2: Hazards Identification

#### 2.1 GHS Classification

- Skin corrosion, Category 1B - H314
- Serious eye damage, Category 1 - H318
- Acute aquatic toxicity, Category 1 - H400
- Chronic aquatic toxicity, Category 1 - H410
- Specific target organ toxicity (single exposure), respiratory tract - Category 3 - H335

#### 2.2 GHS Label Elements

- Hazard Pictogram: (Corrosive) (Aquatic Toxic)
- Signal Word: **Danger**
- **Hazard Statements:**
  - H314: Causes severe skin burns and eye damage
  - H318: Causes serious eye damage
  - H335: May cause respiratory tract irritation
  - H400: Very toxic to aquatic life
  - H410: Very toxic to aquatic life with long-lasting effects
- **Precautionary Statements:**
  - P260: Do not breathe mist/vapors/spray
  - P264: Wash hands thoroughly after handling
  - P270: Do not eat, drink or smoke when using this product
  - P273: Avoid release to the environment
  - P280: Wear protective gloves/eye protection/face protection/protective clothing
  - P301+P330+P331: If swallowed: Rinse mouth. Do NOT induce vomiting
  - P303+P361+P353: If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower
  - P304+P340: If inhaled: Remove victim to fresh air and keep at rest in a position comfortable for breathing
  - P305+P351+P338: If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do. Continue rinsing
  - P310: Immediately call a POISON CENTER/doctor
  - P321: Specific treatment (see supplemental first aid notes)



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- P363: Wash contaminated clothing before reuse
- P391: Collect spillage
- P501: Dispose of contents/container in accordance with local/regional/national/international regulations

## 2.3-2.6 Hazards Summary

- **Physical/Chemical Hazards:** Strongly corrosive to glass, metal, concrete and silicon; HF volatilizes at high temperature (>35°C) to produce toxic corrosive gas; reacts with strong acids to accelerate HF volatilization, reacts with strong bases to produce fluoride salts, reacts with active metals to release hydrogen gas (H<sub>2</sub>); non-flammable and non-explosive.
- **Health Hazards:** Severe chemical burns to skin/eyes (may cause permanent tissue damage); inhalation of HF vapor causes respiratory tract irritation/corrosion (cough, chest tightness); accidental ingestion causes severe gastrointestinal burns and fluoride ion poisoning (hypocalcemia, muscle spasm); long-term low-dose exposure causes fluorosis (teeth/bone damage).
- **Environmental Hazards:** Very toxic to aquatic life (acute/chronic); fluoride ions are non-biodegradable in water, accumulate in aquatic organisms and biomagnify in the food chain; fluoride pollution causes soil salinization and groundwater contamination, inhibits plant/soil microorganism growth.
- **Other Hazards:** No explosion/flammability hazards under normal conditions.

## SECTION 3: Composition/Information on Ingredients

- **Substance/Mixture:** Composite corrosive liquid (Buffered Hydrofluoric Acid System)
- **Core Active Ingredients (Hazardous):**

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Component	CAS No.	Concentration (w/w)	GHS Classification
Hydrofluoric Acid (HF)	7664-39-3	8.0-12.0%	H314, H318, H335, H400, H410
Ammonium Fluoride (NH <sub>4</sub> F)	12125-01-8	4.0-6.0%	H314, H318, H400, H410

- **Non-Hazardous Ingredients:** Special complexing agent (2.0-3.0%), Deionized Water (77.0-86.0%)
- **Total Hazardous Components:** 12.0-18.0% (w/w)

## SECTION 4: First Aid Measures

### 4.1 Description of First-Aid Measures

- **If Inhaled:** Remove victim to fresh air immediately, keep warm and at rest. Ensure unobstructed breathing; if breathing is difficult, give oxygen (no mouth-to-mouth resuscitation). Call a poison center/doctor immediately.
- **In Case of Skin Contact:** Take off all contaminated clothing, gloves and shoes immediately. Rinse the affected area with **plenty of running water** for 15-20 minutes (even for mild contact); apply calcium gluconate gel (2.5%) to the burn area for first aid. Call a poison center/doctor immediately.
- **In Case of Eye Contact:** Do not rub eyes; pry open upper/lower eyelids and rinse with plenty of deionized water/neutral saline for 20-30 minutes (rinse from inner to outer corner). Remove contact lenses if present. Apply calcium gluconate eye drops for first aid and call an ophthalmologist immediately (risk of permanent eye damage).
- **If Swallowed:** Rinse mouth with water immediately, **do not induce vomiting** (may cause esophageal/gastric re-burn). Drink a small amount of milk/egg white (binds fluoride ions). Call a poison center/doctor immediately; calcium gluconate is the specific antidote for systemic fluoride poisoning (intravenous injection under medical guidance).

### 4.2 Most Important Symptoms and Effects

- **Acute Effects:** Severe skin redness, blistering, chemical burns and tissue necrosis; severe eye pain, corneal damage, permanent vision loss; cough, chest tightness, respiratory tract burning/edema from inhalation; nausea, vomiting, severe abdominal pain, gastrointestinal

burns from ingestion; hypocalcemia (muscle spasm, convulsion, cardiac arrhythmia) caused by fluoride ion poisoning.

- **Delayed Effects:** Scarring of skin burns; permanent eye damage/vision loss; chronic bronchitis/pulmonary fibrosis from respiratory tract corrosion; fluorosis (teeth mottling, bone sclerosis) from long-term low-dose exposure.
- **Specific Antidote:** Calcium gluconate (2.5% gel for skin/eye burns; intravenous injection for systemic fluoride poisoning).

### 4.3 Immediate Medical Attention

Get medical attention immediately in all cases of contact, inhalation or ingestion. Inform the physician of the product composition (HF/NH<sub>4</sub>F composite) and hazards (corrosive, fluoride poisoning) for targeted treatment (calcium gluconate administration, burn debridement, hypocalcemia correction).

## SECTION 5: Firefighting Measures

### 5.1 Extinguishing Media

- **Suitable:** Water spray, carbon dioxide (CO<sub>2</sub>), dry powder, foam.
- **Unsuitable:** No limitations; do not use high-pressure water jet directly (may splash corrosive liquid and spread HF vapor).

### 5.2 Special Hazards Arising from the Substance or Mixture

- Non-flammable and non-explosive; decomposes at high temperature/fire to produce **toxic corrosive HF vapor** and ammonium fluoride fumes; the vapor forms hydrofluoric acid mist with water vapor, causing secondary corrosion/health hazards; corrosive to fire-fighting equipment (metal, glass).
- Fluoride ions in fire water cause severe environmental pollution (aquatic toxicity).

### 5.3 Advice for Firefighters

- Wear **full set of positive pressure self-contained breathing apparatus (SCBA)** and chemical anti-corrosion fire-fighting suit (HDPE/PTFE); avoid contact with fire debris and fire water.
- Cool the burning/surrounding containers with water spray to prevent HF volatilization and further decomposition; fight the fire from the upwind direction.
- Collect all fire water in a sealed HDPE container for centralized treatment (avoid environmental discharge); ventilate the fire scene thoroughly after the fire to remove residual HF vapor.

## SECTION 6: Accidental Release Measures

### 6.1 Personal Precautions

- Wear **Level C anti-corrosion PPE** (SCBA, chemical protective clothing, nitrile rubber gloves, face shield); no unprotected personnel enter the spill area.
- Ensure good ventilation (local exhaust fan for indoor spill); eliminate static electricity; set up a warning zone with "Corrosive Hazard" and "Aquatic Toxic" signs.

### 6.2 Environmental Precautions

- **Strictly prevent spilled liquid or washing water from flowing into sewers, rivers, lakes, soil or groundwater** (very toxic to aquatic life). Use sand/bags to block the overflow immediately if necessary.
- Do not flush the spill with a large amount of water directly; collect all contaminated water/soil for centralized treatment.

### 6.3 Containment and Cleaning Up

- **Small Spill:** Absorb the liquid with inert HDPE absorbent (or sand) using a dry HDPE shovel (no metal/glass tools); collect the waste into a sealed HDPE plastic container. Wipe the spill area with a small amount of lime water (neutralize fluoride ions), and collect the wiping waste into the same container.
- **Large Spill:** Contain the liquid with sand bags/dikes (HDPE material); transfer it to a sealed HDPE plastic drum with an anti-corrosion pump/shovel; label the drum with "Silicon Etchant - Corrosive, Aquatic Toxic, Contains HF". Collect contaminated soil/sand into a sealed container for hazardous waste disposal.

- Decontaminate the spill area with lime water (adjust pH to 7-8) to form insoluble calcium fluoride; collect the precipitate for hazardous waste disposal and rinse the area with a small amount of water (collect rinsing water for treatment).

## SECTION 7: Handling and Storage

### 7.1 Precautions for Safe Handling

- Operate in a **corrosion-resistant, well-ventilated fume hood** (HDPE/PTFE lining); install local exhaust ventilation at the operation point to collect HF vapor (airflow rate  $\geq 2$  m/s).
- Use only dry, anti-corrosion HDPE/PTFE tools and containers (no metal/glass/wood); avoid generating mist/spray during handling (slow pouring, sealed transfer).
- Prepare emergency equipment at the operation site: emergency eye wash (deionized water), safety shower, 2.5% calcium gluconate gel/eye drops, sealed HDPE containers, and lime water (neutralizer).
- **Hygiene Measures:** Wash hands/face with plenty of water after handling; do not eat/drink/smoke in the operation area; provide dedicated hand washing/shower facilities; do not take contaminated clothing home.
- Do not mix with strong acids, strong bases, oxidants, active metals, glass products and food/feed during any operation.

### 7.2 Safe Storage Conditions

- **Temperature & Humidity:** Store in a cool, dry corrosion-resistant warehouse at **0-30°C**; relative humidity  $\leq 60\%$ ; install dehumidifier and exhaust fan to keep the warehouse dry and ventilated.
- **Packaging:** Keep in the original sealed HDPE container (double-sealed for bulk); ensure no air contact to prevent HF volatilization; store in a dark place to avoid direct sunlight.
- **Incompatibilities:** Strong acids (HCl, H<sub>2</sub>SO<sub>4</sub>), strong bases (NaOH, KOH), oxidants (H<sub>2</sub>O<sub>2</sub>, KMnO<sub>4</sub>), active metals (Fe, Al, Zn), glass, concrete, marble, food/feed.
- **Storage Class:** Class 8 corrosive chemical; store in a dedicated corrosive chemical warehouse in accordance with GB 15603; separate from other chemicals with isolation distance  $\geq 2$ m; use HDPE/FRP shelves (no metal/glass).
- **Shelf Life:** 12 months (unopened, under specified storage conditions); use within 1 month after opening and reseal tightly immediately (fill with nitrogen if possible).
- **Other:** The storage area is equipped with emergency eye wash, safety shower and lime water (neutralizer); set up obvious "Corrosive", "Aquatic Toxic", "No Smoking" and "Protect from Sunlight" warning signs.

## SECTION 8: Exposure Controls/Personal Protection

### 8.1 Control Parameters

- **Occupational Exposure Limit (OEL):** Based on hydrofluoric acid (HF)
  - China (MAC): 2 mg/m<sup>3</sup> (as F<sup>-</sup>, 8h TWA)
  - US OSHA (PEL): 2.5 mg/m<sup>3</sup> (as F<sup>-</sup>, 8h TWA)
  - EU (ELV): 2 mg/m<sup>3</sup> (as F<sup>-</sup>, 8h TWA); 5 mg/m<sup>3</sup> (STEL)
- **Biological Exposure Limit:** Urine fluoride: 15 mg/L (post-shift, 8h exposure)

### 8.2 Exposure Controls

- **Engineering Controls:** Install local exhaust ventilation (LEV) with HDPE ducting at the operation point; use sealed transfer/pouring equipment for bulk handling; the operation area is equipped with dehumidification and gas detection equipment (HF vapor detector).
- **Personal Protective Equipment (PPE):**
  - Eye/Face: Chemical splash goggles + full face shield (mandatory for all operations).
  - Skin: Acid-alkali resistant nitrile rubber gloves (thickness  $\geq 0.2$ mm), anti-corrosion chemical protective clothing (HDPE/PTFE), acid-alkali resistant boots, protective apron (for large-scale handling).
  - Respiratory: HF-specific gas mask (organic vapor/acid gas cartridge) for normal handling; positive pressure SCBA for spill, mist generation or poor ventilation.
  - Other: Protective cap, chemical-resistant hand covers (for long-term operation).
- **Biological Monitoring:** Conduct urine fluoride testing for long-term operators every 6 months; conduct occupational health check (skin, eyes, respiratory tract, bones) every year.

## SECTION 9: Physical and Chemical Properties

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Property	Value
Physical State	Colorless to pale yellow transparent liquid
Odor	Mild pungent odor (HF vapor)
Taste	Not applicable (toxic/corrosive, no tasting)
Density (25°C)	1.05-1.15 g/cm <sup>3</sup>
Viscosity (25°C)	10-30 mPa·s
pH Value (25°C)	1.0-2.0
Boiling Point (25°C)	100-105°C (water evaporation, HF volatilizes above 35°C)
Freezing Point	≤ 0°C (aqueous mixture)
Flammability	Non-flammable
Flash Point	Not applicable
Autoignition Temperature	Not applicable
Vapor Pressure (25°C)	<1 hPa (HF vapor: 1.3 kPa at 25°C)
Solubility	Fully miscible with deionized water; insoluble in organic solvents (ethanol, acetone)
Corrosivity	Strongly corrosive to Si, glass, metal, concrete; slightly corrosive to HDPE/PTFE
HF Volatility	Low at 20-28°C; increased significantly above 35°C
Explosive Properties	Non-explosive
Oxidizing Properties	None

## SECTION 10: Stability and Reactivity

### 10.1 Chemical Stability

Stable under **recommended storage/use conditions (0-30°C, sealed, HDPE container)**; no phase separation, ingredient precipitation or chemical reaction. HF volatilizes slowly at room temperature, and the etching rate remains stable for a long time.

### 10.2-10.5 Reactivity Summary

- No hazardous reactions under normal sealed handling/storage conditions.
- **Conditions to Avoid:** High temperature (>35°C), direct sunlight, humid air, contact with strong acids/bases/oxidants/active metals/glass.
- **Incompatible Materials:** Concentrated HCl/H<sub>2</sub>SO<sub>4</sub>, NaOH/KOH, H<sub>2</sub>O<sub>2</sub>/KMnO<sub>4</sub>, Fe/Al/Zn metal, glass, concrete, marble, food/feed.
- **Hazardous Decomposition Products:** Toxic corrosive HF vapor (at high temperature); no other hazardous decomposition products.
- **Hazardous Reactions:** Reacts with strong acids to accelerate HF volatilization; reacts with strong bases to form fluoride salts (NH<sub>4</sub>F·NaF); reacts with active metals to release flammable hydrogen gas (H<sub>2</sub>); corrosive reaction with glass/metal to generate fluoride salts (e.g., SiF<sub>4</sub>, FeF<sub>3</sub>).

## SECTION 11: Toxicological Information

### 11.1 Key Toxicological Data (Based on core ingredient HF)

- **Acute Toxicity:**
  - Oral (Rat, LD<sub>50</sub>): 250 mg/kg bw (fluoride poisoning, corrosive)
  - Dermal (Rabbit, LD<sub>50</sub>): 500 mg/kg bw (severe skin burns)
  - Inhalation (Rat, LC<sub>50</sub>): 1800 mg/m<sup>3</sup> (4h exposure, respiratory tract corrosion)
- **Skin Corrosion/Irritation:** Category 1B (severe chemical burns, blistering, necrosis)
- **Serious Eye Damage/Irritation:** Category 1 (severe corneal damage, permanent vision loss)
- **Respiratory Irritation:** Severe irritation/corrosion of nasal cavity, trachea and lungs; high concentration causes pulmonary edema.
- **Sensitization:** No skin/respiratory sensitization (Guinea pig test)

- **Carcinogenicity/Mutagenicity:** IARC Class 3 (not classifiable as carcinogenic to humans); Ames test negative (no mutagenicity)
- **Reproductive/Developmental Toxicity:** High-dose fluoride ions cause fetal skeletal malformation in animal studies; long-term exposure causes fluorosis (teeth/bone damage) in adults.
- **Target Organ Toxicity:** Skin, eyes, respiratory tract, gastrointestinal tract, bones and teeth (fluoride ion accumulation); no toxic effects on liver/kidney at normal exposure levels.
- **Aspiration Hazard:** Low (liquid), but inhalation of HF vapor causes severe respiratory tract damage.

## 11.2 Additional Information

Toxicity is mainly caused by the **corrosive effect of HF** and **fluoride ion poisoning** (binds calcium ions in the body, leading to hypocalcemia and fluorosis). The buffered formula (NH<sub>4</sub>F) reduces HF volatilization and acute toxicity, but the overall hazard remains high (corrosive/aquatic toxic). Timely first aid (calcium gluconate) and medical treatment can significantly reduce damage from acute exposure.

## SECTION 12: Ecological Information

### 12.1 Ecotoxicity (Based on fluoride ions)

- **Aquatic Organisms:**
  - Zebrafish (LC<sub>50</sub>, 96h): 0.8 mg/L (as F<sup>-</sup>, very toxic)
  - Daphnia (EC<sub>50</sub>, 48h): 0.5 mg/L (as F<sup>-</sup>, very toxic)
  - Green algae (EC<sub>50</sub>, 72h): 1.2 mg/L (as F<sup>-</sup>, very toxic)
- **Terrestrial Organisms:** Inhibits seed germination and plant growth (10 mg/kg soil as F<sup>-</sup>); toxic to soil microorganisms (bacteria/fungi) at high concentration; causes fluorosis (bone damage) in grazing animals.
- **Other Organisms:** Toxic to aquatic invertebrates/amphibians; causes population decline at low fluoride concentration.

### 12.2-12.7 Ecological Properties

- **Persistence/Degradability:** Fluoride ions are **non-biodegradable** in aquatic/soil environment; exist stably for a long time and accumulate in the environment.
- **Bioaccumulative Potential:** Moderate bioaccumulation (log K<sub>ow</sub>=-0.8); fluoride ions accumulate in aquatic organisms (fish bones/shells) and terrestrial plants, and biomagnify in the food chain.
- **Mobility in Soil:** High mobility; easily leaches into groundwater with rainwater, causing groundwater fluoride pollution (exceeds drinking water standard 1.0 mg/L as F<sup>-</sup>).
- **PBT/vPvB Assessment:** Classified as **PBT** (persistent, bioaccumulative, toxic) in the environment.
- **Endocrine Disrupting Properties:** No endocrine disrupting effect (in vitro/in vivo animal tests negative).
- **Other Adverse Effects:** Long-term fluoride pollution causes soil salinization and reduced fertility; high fluoride groundwater causes human fluorosis (drinking water); severe damage to aquatic ecosystem and reduction of biodiversity.

## SECTION 13: Disposal Considerations

### 13.1 Waste Treatment Methods

- **Product Waste:** Spoiled/expired silicon etchant is classified as **hazardous waste (Class 8 corrosive, aquatic toxic)**; send to licensed hazardous waste treatment facilities for **stabilization/solidification treatment** (mix with lime to form insoluble calcium fluoride CaF<sub>2</sub>), then incineration/landfill in accordance with hazardous waste disposal standards. Do not dump directly into the environment.
- **Spill Waste:** Contaminated absorbent, soil, sand and tools are collected into sealed HDPE containers and disposed of as hazardous waste (same as product waste).
- **Washing Water/Waste Liquid:** Collect all contaminated water (spill cleaning, equipment washing, post-etching rinse water) into a sealed HDPE tank; add lime water to neutralize (adjust pH to 7-8) to form calcium fluoride precipitate; filter the precipitate (disposed as

hazardous waste), and discharge the supernatant **only after fluoride ion concentration  $\leq 1.0$  mg/L** (meets national wastewater discharge standards).

- **Packaging Waste:** Rinse HDPE packaging with a small amount of lime water (neutralize residual fluoride ions), then rinse with deionized water; the clean packaging can be recycled (HDPE) or disposed of as non-hazardous waste. Do not reuse contaminated packaging.

## 13.2 Disposal Regulations

Comply with China's **Hazardous Waste Pollution Control Law, Water Pollution Prevention and Control Law** and **Solid Waste Pollution Control Law**; comply with EU REACH (EC 1907/2006) and US RCRA hazardous waste disposal regulations; follow local Class 8 corrosive and aquatic toxic hazardous waste disposal standards. Strictly implement the "zero discharge" of fluoride-containing waste to the aquatic environment.

## SECTION 14: Transport Information

### 14.1-14.6 Transport Details

- **UN Number:** 2924
- **UN Proper Shipping Name:** Corrosive liquid, acidic, inorganic, n.o.s. (Silicon Etchant, contains HF/NH<sub>4</sub>F)
- **Transport Hazard Class:** 8 (Corrosive substances)
- **Packaging Group:** II (Medium hazard)
- **Marine Pollutant:** Yes (IMDG/IATA)
- **Transport Label:** Corrosive (Class 8), Marine Pollutant, Danger
- **Special Transport Requirements:**
  1. Transport by **closed anti-corrosion chemical cargo vehicles (HDPE lining)**; no open transport, no mixed transport with food, feed, aquatic products, metals, strong acids/bases and glass products.
  2. Use shockproof, sealed and leak-proof HDPE packaging; avoid package collision, leakage, rain and direct sunlight during transport; transport temperature **0-35°C**, relative humidity  $\leq 60\%$ .
  3. The transport vehicle is equipped with spill emergency treatment equipment (dry HDPE shovel, sealed HDPE containers, lime water) and fire extinguishers; no open fire or smoking during loading/unloading.
  4. Avoid transport through water source protection areas, aquaculture areas, nature reserves and residential areas; take detour measures if necessary.
  5. **IATA/IMDG Classification:** Class 8, Packaging Group II, Marine Pollutant; comply with IATA DGR and IMDG Code for corrosive and marine pollutant transport.
  6. Loading/unloading with anti-corrosion mechanical equipment (no manual direct contact); the operation site is dry, well-ventilated and free of water/humid air.

## SECTION 15: Regulatory Information

### 15.1 National/International Regulations

- **China (MEE/SAMR/SAWS):** Hazardous Chemical Safety Management Regulation (Class 8 corrosive chemical); National Drinking Water Standard ( $F^- \leq 1.0$  mg/L); Occupational Exposure Limit for Chemical Hazards in the Workplace; Semiconductor Industry Clean Production Standard.
- **International (UN/EU/US):** UN GHS Rev.9 (hazard classification); EU REACH (listed in SVHC Candidate List for aquatic toxicity); US OSHA (occupational exposure limit for HF); US RCRA (hazardous waste classification); IMDG/IATA (transport regulations for marine pollutants).
- **Other Standards:** ISO 9001 (quality management); ISO 14001 (environmental management); SEMI (Semiconductor Equipment and Materials International) industrial standards.

### 15.2 Other Requirements

- Production/handling must comply with the national **Hazardous Chemical Safety Production Regulations**; operators must hold a special operation certificate for hazardous chemicals.
- The product must be labeled in accordance with GHS and transport regulations (hazard class, marine pollutant, emergency contact); the safety data sheet (MSDS) and Certificate of Analysis (COA) must be provided to the receiver.

- All batch production records, test reports and COA must be retained for  $\geq 5$  years in accordance with hazardous chemical and semiconductor industry regulatory requirements.
- Environmental protection measures must be taken in production/use to ensure fluoride ion discharge meets national standards; no environmental pollution is allowed.

### SECTION 16: Other Information

- **MSDS Validity:** This MSDS is valid for 3 years from the revision date (22 FEB 2026) unless the product quality or hazard information changes.
- **Disclaimer:** This MSDS is based on current scientific, semiconductor and chemical industry knowledge, complying with GB/T 16483, GHS Rev.9 and international hazardous chemical safety standards. The supplier is not liable for any damage caused by improper handling, non-compliance with storage/transport/disposal requirements, unauthorized use or failure to follow safety precautions, especially environmental damage caused by fluoride pollution.
- **Additional Technical Support:** For silicon etching process optimization, on-site operation guidance, waste water treatment and etching failure analysis, contact the technical department at +86-021-50350029 ext. 844 (for licensed semiconductor/photovoltaic manufacturers and research institutions only).
- **Key Reminder:** This product is a Class 8 corrosive chemical and marine pollutant, contains hydrofluoric acid, and is very toxic to aquatic life with long-lasting effects. Strictly follow PPE, storage, transport and waste disposal requirements during all operations; prepare emergency first aid equipment and neutralizers; strictly prevent fluoride-containing waste from entering the environment to avoid ecological damage and legal liabilities.