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1 Identification of the substance/preparation and of the company/undertaking

- **Product details**
- **Trade name:** AMMONIUM FLUORIDE Aqueous solution
- **Article number:** 4
- **Application of the substance / the preparation** wet etchant for semiconductor applications
- **Manufacturer/Supplier:**
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2 Hazards identification

- **GHS label elements**

**Danger**

- 3.1/3 - Toxic if swallowed.
- 3.1/3 - Toxic in contact with skin.
- 3.1/3 - Toxic if inhaled.
- **Prevention:**
Avoid breathing dust/fume/gas/mist/vapours/spray.
Wash thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Wear protective gloves/protective clothing/eye protection/face protection.
- **Response:**
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN: Wash with plenty of soap and water.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER or doctor/physician.
Call a POISON CENTER or doctor/physician if you feel unwell.
Specific treatment (see on this label).
Specific measures (see on this label).
Rinse mouth.
Remove/Take off immediately all contaminated clothing.
Wash contaminated clothing before reuse.
- **Storage:**
Store in a well-ventilated place. Keep container tightly closed.
Store locked up.
- **Disposal:**
Dispose of contents/container in accordance with local/regional/national/international regulations.

3 Composition/information on ingredients

- **Chemical characterization:**

7732-18-5 water	60,0%
12125-01-8 ammonium fluoride	40,0%
Danger: skull and crossbones 3.1.O/3, 3.1.D/3, 3.1.I/3	

4 First-aid measures

- **General information:**
Immediately remove any clothing soiled by the product.

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*Remove breathing equipment only after contaminated clothing have been completely removed.**In case of irregular breathing or respiratory arrest provide artificial respiration.**Seek immediate medical advice.***· After inhalation:***Supply fresh air or oxygen; call for doctor.**In case of unconsciousness place patient stably in side position for transportation.***· After skin contact:***Rub in Ca-gluconate solution or Ca-gluconate gel immediately.**Immediately wash with water and soap and rinse thoroughly.***· After eye contact:** *Rinse opened eye for several minutes under running water. Then consult a doctor.***· After swallowing:** *Do not induce vomiting; call for medical help immediately.*

5 Fire-fighting measures

· Suitable extinguishing agents:*CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.***· Special hazards caused by the substance, its products of combustion or resulting gases:***Formation of toxic gases is possible during heating or in case of fire.***· Protective equipment:***Mouth respiratory protective device.**Wear fully protective suit.*

6 Accidental release measures

· Person-related safety precautions: *Wear protective clothing.***· Measures for environmental protection:***Dilute with plenty of water.**Do not allow to enter sewers/ surface or ground water.***· Measures for cleaning/collecting:***Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).**Dispose contaminated material as waste according to item 13.**Ensure adequate ventilation.*

7 Handling and storage

· Handling:**· Information for safe handling:***Ensure good ventilation/exhaustion at the workplace.**Open and handle receptacle with care.**Prevent formation of aerosols.***· Information about fire - and explosion protection:** *Keep respiratory protective device available.***· Storage:****· Requirements to be met by storerooms and receptacles:***Store only in the original receptacle.**Provide acid-resistant floor.***· Information about storage in one common storage facility:** *Do not store together with alkalis (caustic solutions).***· Further information about storage conditions:***Store under lock and key and with access restricted to technical experts or their assistants only.**Keep container tightly sealed.*

8 Exposure controls/personal protection

· Additional information about design of technical facilities: *No further data; see item 7.*

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· **Ingredients with limit values that require monitoring at the workplace:**

The product does not contain any relevant quantities of materials with critical values that have to be monitored at the workplace.

· **Additional information:** The lists valid during the making were used as basis.

· **Personal protective equipment:**

· **General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing

Wash hands before breaks and at the end of work.

Store protective clothing separately.

Avoid contact with the eyes and skin.

Keep away from tobacco products.

· **Respiratory protection:**

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

· **Protection of hands:**



Protective gloves

· **Material of gloves** Fluorocarbon rubber (Viton)

· **Eye protection:** Goggles recommended during refilling

· **Body protection:**

Acid resistant protective clothing

Boots

Apron

Full head, face and neck protection

Protective work clothing

9 Physical and chemical properties

· **General Information**

Form:	Liquid
Colour:	Colourless
Odour:	Pungent

· **Change in condition**

Melting point/Melting range: ca.12-13°C

Boiling point/Boiling range: Undetermined.

· **Flash point:** Not applicable.

· **Self-igniting:** Product is not selfigniting.

· **Danger of explosion:** Product does not present an explosion hazard.

· **Density at 20°C:** 1,11 g/cm³

· **Solubility in / Miscibility with**

water: Fully miscible.

· **Water:** 60,0 %

10 Stability and reactivity

· **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.

· **Materials to be avoided:** Glass, concrete and silicon

· **Dangerous reactions** Reacts with alkali (lyes).

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- **Dangerous decomposition products:** Hydrogen fluoride

11 Toxicological information

- **Acute toxicity:** no data

12 Ecological information

- **General notes:**
Do not allow undiluted product or large quantities of it to reach ground water, water course or sewage system.

13 Disposal considerations

- **Product:**
- **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.
- **Recommended cleansing agents:** Water, if necessary together with cleansing agents.

14 Transport information

- **UN "Model Regulation":** UN3287, TOXIC LIQUID, INORGANIC, N.O.S., 6.1, III

15 Regulatory information

- **Code letter and hazard designation of product:**
T Toxic
- **Hazard-determining components of labelling:**
ammonium fluoride
- **Risk phrases:**
23/24/25 Toxic by inhalation, in contact with skin and if swallowed.
- **Safety phrases:**
4 Keep away from living quarters.
36/37/39 Wear suitable protective clothing, gloves and eye/face protection.
45 In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).
60 This material and its container must be disposed of as hazardous waste.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Department issuing MSDS:** Toxicology and Product Regulatory
- **Contact:** <http://www.daikin.com/>
- **Abbreviations and acronyms:** GHS: Globally Harmonized System of Classification and Labelling of Chemicals