Safety Data Sheet

Version 6.0 SDS Number 300000007333
Revision Date 11/22/2016 Print Date 11/28/2016

1. PRODUCT AND COMPANY IDENTIFICATION

Product name	:	ACT ® NE-14 Remover/Resist Stripper
Product Use Description	:	Semiconductor Processing
Manufacturer/Importer/Distributor	:	Versum Materials US, LLC 7201 Hamilton Blvd. Allentown, PA 18195-1501 Exporter EIN No.475632014 www.versummaterials.com
Telephone	:	(610)481-4911
Emergency telephone number (24h)	:	800-523-9374 USA +1 610 481 7711 International

2. HAZARDS IDENTIFICATION

GHS classification

Flammable liquids - Category 4
Acute toxicity - Oral Category 4
Acute toxicity - Inhalation Category 4
Skin corrosion - Category 1C
Serious Eye Damage - Category 1
Reproductive toxicity - Category 1B

GHS label elements

Hazard pictograms/symbols

Signal Word: Danger

Hazard Statements:

H227:Combustible liquid

H302+H332:Harmful if swallowed or if inhaled.
H314:Causes severe skin burns and eye damage.
H360:May damage fertility or the unborn child

Precautionary Statements:

Prevention : P201:Obtain special instructions before use.
P202:Do not handle until all safety precautions have been read and understood.
P210:Keep away from heat, hot surfaces, sparks, open flames, and other ignition sources. No smoking.
P261:Avoid breathing dust/fume/gas/mist/vapours/spray.
P264:Wash hands thoroughly after handling.
P270:Do not eat, drink or smoke when using this product.
P271:Use only outdoors or in a well-ventilated area
P280:Wear protective gloves/protective clothing/eye protection/face protection.
P281:Use personal protective equipment as required.

Response : P301+P330+P331 :IF SWALLOWED: rinse mouth. Do NOT induce vomiting.
P303+P361+P353 :IF ON SKIN (or hair): Remove/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 CENTRE/doctor.
P363 :Wash contaminated clothing before reuse.
P370+P378 :In case of fire, use recommended extinguishing media for extinction.

Storage : P403+P235:Store in a well-ventilated place. Keep cool.
P405:Store locked up.

Disposal : P501:Disposal of contents/container to be specified in accordance with regulations.

Hazards not otherwise classified

The potential for hydrogen fluoride formation exists with every exposure, therefore its toxicity must also be considered.
Symptoms may be delayed.

3. COMPOSITION/INFORMATION ON INGREDIENTS

Components	CAS Number	Concentration (Weight)
Proprietary amide solvent	Not Available	50% - 60 %
Acetic acid	64-19-7	10% - 20 %

Ammonium Fluoride	12125-01-8	0.5% - 5 %

The composition is trade secret. Please treat the information contained within the SDS(s) as confidential information. In this regard, the information contained within the SDS(s) may be the subject of, for example, a confidentiality agreement or non-disclosure agreement (NDA) with your company and/or a patent application or patent.

4. FIRST AID MEASURES

General advice : Obtain medical attention. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. If additional information is needed consult the Safetygram – "Medical treatment Protocol for Hydrofluoric Acid Burns" available on the company website. Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.

Eye contact : Rinse immediately with plenty of water also under the eyelids for at least 20 minutes. Remove contact lenses. Hold eyelids apart, initiate and maintain gentle and continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour.

Skin contact : Wash off immediately with plenty of water for at least 20 minutes. Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Take off contaminated clothing and shoes immediately. Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Initiate and maintain continuous irrigation until the patient receives medical care. If medical care is not promptly available, continue to irrigate for one hour.

Ingestion : Never give anything by mouth to an unconscious person. If a person vomits when lying on his back, place him in the recovery position. Do not induce vomiting. Drink 1 to 3 glasses of water or milk. Call a physician immediately. Gastric lavage with calcium chloride or calcium g luconate may be performed by a physician. Administer several vials of 10% aqueous calcium g luconate orally. (Calcium carbonate or an antacid containing calcium carbonate or magnesium carbonate or hydroxide may also be used.) Prevent aspiration of vomit. Turn victim's head to the side.

Inhalation : If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Move to fresh air. Move to fresh air.

Most important symptoms/effects - acute and delayed : Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat.

Immediate Medical Attention and Special Treatment

Treatment : NOTE TO PHYSICIANS: Application of corticosteroid cream has been

effective in treating skin irritation. This product contains ammonium fluoride. The effects of exposure to ammonium fluoride will depend on the strength of the solution and the route of exposure. It may be possible to absorb excessive amounts of fluoride ion from high exposures to ammonium fluoride. Acute systemic toxicity depends primarily on the total amount of fluoride ions adsorbed. Blood samples should be taken to monitor the levels of fluoride, potassium and calcium. The use of calcium gluconate injections or infusions should also be considered. When aqueous ammonium fluoride is acidified, it may form hydrofluoric acid. If this occurs treatment for hydrofluoric acid exposure must be started.

5. FIRE-FIGHTING MEASURES

Suitable extinguishing media	:	Alcohol-resistant foam. Carbon dioxide (CO2). Dry chemical. Dry sand. Limestone powder.
Specific hazards	:	Ammonia gas may be liberated at high temperatures. In case of incomplete combustion an increased formation of oxides of nitrogen (NOx) is to be expected. Incomplete combustion may form carbon monoxide. Burning produces noxious and toxic fumes. In the event of fire, cool tanks with water spray . Fire or intense heat may cause violent rupture of packages. May form explosive mixtures in air. Downwind personnel must be evacuated.
Special protective equipment for fire-fighters	:	Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

6. ACCIDENTAL RELEASE MEASURES

Personal Precautions, Protective Equipment, and Emergency Procedures	:	Use self-contained breathing apparatus and chemically protective clothing. Remove all sources of ignition. Evacuate personnel to safe areas.
Environmental precautions	:	Shut off or remove all ignition sources. Construct a dike to prevent spreading.
Methods for cleaning up	:	Call Emergency Response number for advice. Approach suspected leak areas with caution. Absorb with inert absorbent materials such as: Dry sand. Vermiculite. Activated charcoal. Place in appropriate chemical waste container.
Additional advice	:	Evacuate area and do not approach spilled product . If possible, stop flow of product.

7. HANDLING AND STORAGE

Handling

See "Flammable and Combustible Liquid Code" NFPA No. 30, National Fire Protection Association, Boston, MA. Use only in well-ventilated areas. Avoid contact with eyes. Avoid breathing vapors and/or aerosols. Use

personal protective equipment. When using, do not eat, drink or smoke.

Storage

Keep away from alkalis. Keep containers tightly closed in a dry, cool and well-ventilated place. To avoid ignition of vapors by static electricity discharge, all metal parts of the equipment must be grounded. Keep away from heat and sources of ignition. Keep in a dry, cool place. Keep away from oxidizers.

Technical measures/Precautions

Keep away from open flames, hot surfaces and sources of ignition.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering measures

Apply process controls to ensure safe operating conditions. Assess potential flammability hazards based on flashpoint and potential ignition sources.
Ensure adequate ventilation.
Provide readily accessible eye wash stations and safety showers.
Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

Personal protective equipment

Respiratory protection	:	Wear appropriate respirator when ventilation is inadequate.
Hand protection	:	Butyl-rubber Neoprene gloves. Nitrile rubber. Impervious gloves. 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.
Eye protection	:	Chemical resistant goggles must be worn.
Skin and body protection	:	Long sleeve shirts and trousers without cuffs. Impervious Clothing (rubber apron) should be worn when there is a potential for significant skin exposure such as a spillor splash.
Environmental exposure controls	:	Shut off or remove all ignition sources.
Special instructions for protection and hygiene	:	Provide readily accessible eye wash stations and safety showers.

Exposure limit(s)

Proprietary amide solvent	Time Weighted Average (TWA): ACGIH	10 ppm	-
Proprietary amide solvent	Recommended exposure limit (REL): NIOSH	10 ppm	35 mg/m3
Proprietary amide solvent	Permissible exposure limit: OSHA Z1	10 ppm	35 mg/m3
Proprietary amide solvent	Time Weighted Average (TWA): OSHA Z1A	10 ppm	35 mg/m3
Proprietary amide solvent	Time Weighted Average (TWA) Permissible Exposure Limit (PEL): US CA OEL	10 ppm	35 mg/m3
Proprietary amide solvent	Time Weighted Average (TWA): TN OEL	10 ppm	35 mg/m3
Acetic acid	Time Weighted Average (TWA): ACGIH	10 ppm	-
Acetic acid	Short Term Exposure Limit (STEL): ACGIH	15 ppm	-
Acetic acid	Recommended exposure limit (REL): NIOSH	10 ppm	25 mg/m3
Acetic acid	Short Term Exposure Limit (STEL): NIOSH	15 ppm	37 mg/m3
Acetic acid	Permissible exposure limit: OSHA Z1	10 ppm	25 mg/m3
Acetic acid	Time Weighted Average (TWA): OSHA Z1A	10 ppm	25 mg/m3
Acetic acid	Time Weighted Average (TWA) Permissible Exposure Limit (PEL): US CA OEL	10 ppm	25 mg/m3
Acetic acid	Ceiling Limit Value: US CA OEL	40 ppm	-
Acetic acid	Short Term Exposure Limit (STEL): US CA OEL	15 ppm	37 mg/m3
Acetic acid	Time Weighted Average (TWA): TN OEL	10 ppm	25 mg/m3
Ammonium Fluoride	Time Weighted Average (TWA): ACGIH	-	2.5 mg/m3
Ammonium Fluoride	Time Weighted Average (TWA): OSHA Z2	-	2.5 mg/m3
Ammonium Fluoride	Permissible exposure limit: OSHA Z1	-	2.5 mg/m3
Ammonium Fluoride	Time Weighted Average (TWA): OSHA Z1A	-	2.5 mg/m3
Ammonium Fluoride	Recommended exposure limit (REL): NIOSH	-	2.5 mg/m3
Ammonium Fluoride	Time Weighted Average (TWA): TN OEL	-	2.5 mg/m3

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance : Liquid. Clear.

Odor : Acidic.

Odor threshold : No data available.

pH : 4.7

Melting point/range : < -4 °F (< -20 °C)

Boiling point/range : 212 °F (100 °C)

Flash point : 183 °F (84 °C) closed cup

Evaporation rate : No data available.

Flammability (solid, gas) : Not applicable.

Upper/lower explosion/flammability limit : Not applicable.

Vapor pressure	:	No data available.
Water solubility	:	Completely soluble.
Relative vapor density	:	Not applicable.
Relative density	:	1.015 (water = 1)
Partition coefficient (n-octanol/water)	:	No data available.
Auto-ignition temperature	:	No data available.
Decomposition temperature	:	No data available.
Viscosity	:	No data available.
Molecular Weight	:	No data available.
Density	:	63.302 lb/ft3 (1.014 g/cm3) at 77 °F (25 °C)

10. STABILITY AND REACTIVITY

Chemical Stability	:	Stable under normal conditions.
Conditions to avoid	:	Heat, flames and sparks.
Materials to avoid	:	Amines. Incompatible with bases. Reducing agents. Oxidizing agents. Chlorinated solvents. Aluminium. Strong bases. Alkali metals. Alkaline earth metals. Brass. Acids.
Hazardous decomposition products	:	Nitric acid. Ammonia Nitrogen oxides (NOx). Nitrogen oxide can react with water vapors to form corrosive nitric acid. Carbon monoxide. Carbon dioxide (CO2). Organic acid vapors. Toxic fluorides. Hydrogen fluoride.

Possibility of hazardous Reactions/Reactivity : No data available.

11. TOXICOLOGICAL INFORMATION

11.1. Information on toxicological effects

Likely routes of exposure

Effects on Eye : Causes eye burns. May cause blindness.

Effects on Skin : If absorbed through the skin, may cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Potential for hydrogen fluoride formation exists, which may cause additional tissue destruction and possibly a systemic reaction that can be fatal.

Inhalation Effects : May cause central nervous system effects, such as headache, nausea, dizziness, confusion, breathing difficulties. Severe cases of overexposure can result in respiratory failure. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system. Toxic by inhalation.

Ingestion Effects : Causes severe digestive tract burns.Harmful if swallowed.

Symptoms : Repeated and/or prolonged exposure to low concentrations of vapors and/or aerosols may cause: Sore throat.

Acute toxicity

Acute Oral Toxicity : No data is available on the product itself.

Acute Oral Toxicity - Components

Proprietary amide solvent	LD50 : 4,300 mg/kg	Species : Rat.
Acetic acid	LD50 : 3,310 mg/kg	Species : Rat.
Ammonium Fluoride	LD50 : 50 mg/kg	Species : Rat.

Inhalation : No data is available on the product itself.

Inhalation - Components

Proprietary amide solvent	LC50 (1 h) : 8.81 mg/l	Species : Rat. Female
Acetic acid	LC50 (1 h) : 39 mg/l	Species : Rat.

Acute Dermal Toxicity : No data is available on the product itself.

Acute Dermal Toxicity - Components

Proprietary amide solvent	LD50 : 2,240 mg/kg	Species : Rabbit.
Acetic acid	LD50 : 1,060 mg/kg	Species : Rabbit.

Skin corrosion/irritation : Causes skin burns.

Serious eye damage/eye irritation : Causes serious eye damage.

Sensitization. : No data available.

Chronic toxicity or effects from long term exposures

Carcinogenicity : No data available.

Reproductive toxicity : May damage fertility or the unborn child

Germ cell mutagenicity : No data is available on the product itself.

Specific target organ systemic toxicity (single exposure) : May cause drowsiness or dizziness.

Specific target organ systemic toxicity (repeated exposure) : No data available.

Aspiration hazard : No data available.

Delayed and Immediate Effects and Chronic Effects from Short and Long Term Exposure

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater.

Repeated exposure to levels above the occupationa l exposure limit produces adverse effects on the liver, kidneys, bone marrow, and the cardiovascular system. Similar effects may be seen followingrepeated skin exposure.

12. ECOLOGICAL INFORMATION

Ecotoxicity effects

Aquatic toxicity : No data is available on the product itself.

Toxicity to fish - Components

Proprietary amide solvent	LC50 (96 h) : > 500 mg/l	Species : Fish.
Acetic acid	LC50 (96 h) : 75 mg/l	Species : Bluegill sunfish (Lepomis macrochirus).
Acetic acid	LC50 (96 h) : 79 mg/l	Species : Fathead minnow (Pimephales promelas).
Acetic acid	LC50 : 251 mg/l	Species : Fish.
Ammonium Fluoride	LC50 (96 h) : 364 mg/l	Species : Fathead minnow (Pimephales promelas).

Toxicity to daphnia - Components

Proprietary amide solvent	EC50 (48 h) : > 500 mg/l	Species : Daphnia
Acetic acid	EC50 (48 h) : 65 mg/l	Species : Daphnia

Ammonium Fluoride	EC50 (48 h) :	Species : Grass shrimp (Palaemonetes).

Toxicity to algae - Components

Proprietary amide solvent	EC50 (72 h) : > 500 mg/l	Species : Scenedesmus subspicatus

Toxicity to other organisms : No data available.

Persistence and degradability

Biodegradability : No data is available on the product itself.

Mobility : No data available.

Bioaccumulation : No data is available on the product itself.

Bioaccumulation - Components

Proprietary amide solvent	Negligible bioaccumulation potential.
Acetic acid	Negligible bioaccumulation potential.
Ammonium Fluoride	Negligible bioaccumulation potential.

13. DISPOSAL CONSIDERATIONS

Waste from residues / unused products : Contact supplier if guidance is required.

Contaminated packaging : Dispose of container and unused contents in accordance with federal, state, and local requirements.

14. TRANSPORT INFORMATION

DOT

UN/ID No.	: UN3265
Proper shipping name	: Corrosive liquid, acidic, organic, n.o.s., (Acetic acid)
Class or Division	: 8
Packing group	: III
Label(s)	: 8
RQ Substance	: Yes
Marine Pollutant	: No

* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

IATA

UN/ID No.	:	UN3265
Proper shipping name	:	Corrosive liquid, acidic, organic, n.o.s., (Acetic acid)
Class or Division	:	8
Packing group	:	III
Label(s)	:	8
RQ Substance	:	Yes
Marine Pollutant	:	No

* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

IMDG

UN/ID No.	:	UN3265
Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (Acetic acid)
Class or Division	:	8
Packing group	:	III
Label(s)	:	8
RQ Substance	:	Yes
Marine Pollutant	:	No

* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

TDG

UN/ID No.	:	UN3265
Proper shipping name	:	CORROSIVE LIQUID, ACIDIC, ORGANIC, N.O.S., (Acetic acid)
Class or Division	:	8
Packing group	:	III
Label(s)	:	8
RQ Substance	:	Yes
Marine Pollutant	:	No

* NOTE: This product contains a USDOT Hazardous Substance and will meet the Reportable Quantity definition when shipped to, from, or within the United States, in the amount specified in 49CFR 172.101 Appendix A.

Further Information

The transportation information is not intended to convey all specific regulatory data relating to this material. For complete transportation information, contact customer service.

15. REGULATORY INFORMATION

Toxic Substance Control Act (TSCA) 12(b) Component(s):

None.

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.
Philippines	PICCS	Included on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification
Acute Health Hazard Chronic Health Hazard Fire Hazard.

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level
Ammonium Fluoride
Acetic acid, ammonium salt

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)
WARNING! This product contains a chemical known in the State of California to cause birth defects or other reproductive harm.
DIMETHYLACETAMIDE

16. OTHER INFORMATION

HMIS Rating

Health : 3*
Flammability : 2
Physical hazard : 0

Prepared by : Versum Materials, Product Regulatory Department

Telephone : (610)481-4911

Preparation Date : 11/28/2016

For additional information, please visit Versum Materials' Product Stewardship web site.
http://www.versummaterials.com/productstewardship/