MATERIAL SAFETY DATA SHEET

CMC MATERIALS

1. Chemical product and company identification

A. Product name **Ammonium Fluoride 40%**

Synonyms Ammonium Fluoride 40% * Ammonium Fluoride 40% W/W

Product code -

B. Recommended use and Limitations on use

Recommended use Industrial use.

Limitations on use None known.

Manufacturer/Importer/Distributor information

Manufacturer/Supplier CMC Materials; 870 North Commons Drive; Aurora, IL 60504; United States

Telephone +1.630.375.6631

Manufacturer/Supplier CMC Materials; Amber Business Centre; Riddings Alfreton Derbyshire DE55 4DA; United Kingdom

Telephone +44 (0) 1773 844200

E-mail steve.grundy@cmcmaterials.com

Manufacturer/Supplier CMC Materials; 300 Throckmorton, Suite 1900; Fort Worth, Texas 76102; United States

Telephone +1.817.761.6100

Manufacturer/Supplier CMC Materials; Les Vieilles Hayes; 50620 Saint Fromond; France

Telephone +33 (0) 2 33 75 64 00

E-mail francesds@cmcmaterials.com

Manufacturer/Supplier CMC Materials; 9 Tuas View Lane; Singapore 638826

Telephone 65.3163.6666

Manufacturer/Supplier CMC Materials; Via Umbria 4; 20098 San Giuliano Milanese (MI); Italy

Telephone +39 02 988381 / +44 (0) 1773 844200

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Emergency phone number

3E Global Incident Response Hotline

Korea +82 070 4732 5813

Asia-Pacific +1.760.476.3960

International +1.760.476.3962

Access code 333035

CHEMTREC For Dangerous Goods Incidents ONLY (spill, leak, fire, exposure or accident), call CHEMTREC 24/7 at:

Korea +82 070 7686 0086

International +1.703.741.5970

2. Hazards identification

A. Hazard category/Classification

Physical hazards	Not classified.	
Health hazards	Acute toxicity, oral	Category 4
	Acute toxicity, dermal	Category 3
	Acute toxicity, inhalation	Category 3
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2
Environmental hazards	Not classified.	

B. Warning label items including precautionary statement

- **Pictogram**

- **Signal word** Danger
- **Hazard statement**

H302	Harmful if swallowed.
H311	Toxic in contact with skin.
H315	Causes skin irritation.
H319	Causes serious eye irritation.
H331	Toxic if inhaled.

- **Precautionary statement**

Prevention

P261	Avoid breathing mist.
P264	Wash thoroughly after handling.
P280	Wear protective gloves/protective clothing/eye protection/face protection.

Response

P302 + P352	IF ON SKIN: Wash with plenty of water.
P304 + P340	IF INHALED: Remove person to fresh air and keep comfortable for breathing.
P311	Call a poison center/doctor.

Storage

P403 + P233	Store in a well-ventilated place. Keep container tightly closed.

Disposal

P501	Dispose of contents/container in accordance with local/regional/national/international regulations.

C. Other hazards not included in the hazard category criteria (e.g. dust explosion hazard) None known.

Supplemental information None.

3. Composition/information on ingredients

Chemical identity	Common and alternative names	CAS number	ID number	Content in percent (%)
Ammonium fluoride		12125-01-8	KE-01665, 2011-1-617	40

Composition comments All concentrations are in percent by weight unless otherwise indicated.
Components not listed are either non-hazardous or are below reportable limits.

4. First aid measures

A. In case of eye contact Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.

B. In case of skin contact Take off immediately all contaminated clothing. Wash with plenty of soap and water. Get medical advice/attention if you feel unwell. If skin irritation occurs: Get medical advice/attention.

C. In case of inhalation Remove victim to fresh air and keep at rest in a position comfortable for breathing. Oxygen or artificial respiration if needed. Do not use mouth-to-mouth method if victim inhaled the substance. Induce artificial respiration with the aid of a pocket mask equipped with a one-way valve or other proper respiratory medical device. Call a poison center or doctor/physician.

D. In case of swallowing Rinse mouth. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs. Get medical advice/attention if you feel unwell.

E. Note to physician Provide general supportive measures and treat symptomatically. Keep victim warm. Keep victim under observation. Symptoms may be delayed.

Most important symptoms/effects, acute and delayed Severe eye irritation. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain. Absorbed fluoride can cause metabolic imbalances with irregular heartbeat, nausea, dizziness, vomiting and seizures.

General advice Take off immediately all contaminated clothing. Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Show this safety data sheet to the doctor in attendance.

5. Fire-fighting measures

A. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media Use extinguishing agent suitable for type of surrounding fire.

Unsuitable extinguishing media None known.

B. Specific hazards arising from the chemical (example: hazardous combustion products) During fire, gases hazardous to health may be formed. Combustion products may include: nitrogen oxides, ammonia, hydrogen fluoride.

C. Specific methods of fire-fighting

Special protective equipment for firefighters Self-contained breathing apparatus and full protective clothing must be worn in case of fire.

Special fire fighting procedures Use water spray to cool unopened containers. Dike and collect water used to fight fire. Avoid discharge into drains, water courses or onto the ground.

General fire hazards Material will not burn. In case of fire, toxic and irritating gases may be formed.

Specific methods Use standard firefighting procedures and consider the hazards of other involved materials.

6. Accidental release measures

A. Personal precautions, protective equipment and emergency measures Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing mist. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the MSDS.

B. Environmental precautions Avoid discharge into drains, water courses or onto the ground.

C. Methods and materials for containment and cleaning up This product is miscible in water.

Large Spills: Stop the flow of material, if this is without risk. Dike the spilled material, where this is possible. Absorb in vermiculite, dry sand or earth and place into containers. Following product recovery, flush area with water. Retain and dispose of contaminated wash water.

Small Spills: Wipe up with absorbent material (e.g. cloth, fleece). Clean surface thoroughly to remove residual contamination.

Never return spills to original containers for re-use. For waste disposal, see section 13 of the MSDS.

7. Handling and storage

A. Precautions for safe handling Use only with adequate ventilation. Avoid any exposure. Wash thoroughly after handling. Handle and open container with care. Use personal protection recommended in Section 8 of the SDS. Observe good industrial hygiene practices.

B. Conditions for safe storage (including any incompatibilities) Keep containers tightly closed in a dry, cool and well-ventilated place. Keep this material away from food, drink and animal feed. Use care in handling/storage. Store away from incompatible materials.

8. Exposure controls/personal protection

A. Exposure limit values, biological limit values, etc

US. ACGIH Threshold Limit Values

Components	Type	Value
Ammonium Fluoride (CAS 12125-01-8)	TWA	2.5 mg/m3

Biological limit values

ACGIH Biological Exposure Indices

Components	Value	Determinant	Specimen	Sampling Time
Ammonium Fluoride (CAS 12125-01-8)	3 mg/l	Fluoride	Urine	*
	2 mg/l	Fluoride	Urine	*

* - For sampling details, please see the source document.

Exposure guidelines Follow standard monitoring procedures.

B. Appropriate engineering controls Good general ventilation should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level. Provide easy access to water supply and eye wash facilities.

C. Personal protective equipment

• Respiratory protection	When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Appropriate respirator selection should be made by a qualified professional. Minimize inhalation of aerosols/mists: Use a properly fitted, particulate filter respirator complying with an approved standard if a risk assessment indicates this is necessary. To protect from mist or dust from dried product: Wear approved full face respirator with filter type FFP3 or equivalent protection. Wear NIOSH approved full face respirator with filter type N99 or equivalent protection. KOSHA Certified dust & vapor respirator.
• Eye protection	Wear one or more of the following depending on hazard of task: chemical splash goggles, face shield, indirectly vented tight fitting goggles, safety glasses with side shields, sealed eyewear. KOSHA Certified chemical goggles are recommended.
• Hand protection	Wear appropriate KOSHA Certified chemical resistant gloves. The following glove materials are recommended: nitrile, natural rubber latex. Suitable KOSHA Certified gloves can be recommended by the glove supplier. Recommended use: Glove material: nitrile. Use gloves with breakthrough time of >360 minutes. Minimum glove thickness 0.56 mm.
• Body protection	Wear appropriate chemical resistant clothing. Use of an impervious KOSHA Certified apron is recommended.
Hygiene measures	Keep away from food and drink. When using, do not eat, drink or smoke. Wash hands before breaks and immediately after handling the product. Handle in accordance with good industrial hygiene and safety practice. Remove and isolate contaminated clothing and shoes. Launder contaminated clothing before reuse.

9. Physical and chemical properties

A. Appearance

Physical state	Liquid.
Form	Liquid.
Color	Colorless.
B. Odor	Odorless.
C. Odor threshold	Not available.
D. pH	6.2 - 7 (68 °F (20 °C))
E. Melting point/freezing point	
Melting point	32 °F (0 °C)
Freezing point	32 °F (0 °C)
F. Boiling point, initial boiling point, and boiling range	212 °F (100 °C)
H. Evaporation rate	Not available.
I. Flammability (solid, gas)	Not applicable.
K. Vapor pressure	Not available.
L. Solubility	
Solubility (water)	Completely miscible with water.
M. Vapor density	Not available.
N. Specific gravity	1.11 (water=1)
O. n-octanol/water partition coefficient	No data available.
P. Auto-ignition temperature	Not applicable.
Q. Decomposition temperature	Not available.
R. Viscosity	Not available.
S. Molecular weight	Not available.
Other data	
Explosive properties	Not explosive.
Oxidizing properties	Not oxidizing.

10. Stability and reactivity

Reactivity May be corrosive to metals.

A. Stability and hazardous reaction potential

Stability	Material is stable under normal conditions.
Hazardous reaction potential	Both high and low pH may facilitate generation of toxic gases: ammonia, hydrogen fluoride.

B. Conditions to avoid (e.g. static discharge, shock or vibration, etc)	High temperatures. Contact with incompatible materials.
C. Incompatible materials	Oxidizing materials. Strong bases. Strong acids. Metals.
D. Hazardous decomposition products	Ammonia and hydrogen fluoride at elevated temperatures.

11. Toxicological information

A. Information on likely routes of exposure

• Respiratory organs	Mist: Toxic if inhaled.
• Skin	Toxic in contact with skin. Causes skin irritation.
• Eyes	Causes eye irritation.
• Mouth	Harmful if swallowed.

B. Information on health hazards

• Acute toxicity (list all possible routes of exposure)	Toxic in contact with skin. Toxic if inhaled. Harmful if swallowed.

Components	Species	Test Results
Ammonium fluoride (CAS 12125-01-8)		
Acute		
Oral		
LD50	Rat	200 - 2000 mg/kg

• Corrosivity or irritation to the skin	Causes skin irritation.
• Serious eye damage/eye irritation	Causes serious eye irritation.
• Respiratory sensitization	Not a respiratory sensitizer.
• Skin sensitization	This product is not expected to cause skin sensitization.
• Carcinogenic properties /Carcinogenicity	Not classifiable as to carcinogenicity to humans.

IARC Monographs. Overall Evaluation of Carcinogenicity

Ammonium fluoride (CAS 12125-01-8)	3 Not classifiable as to carcinogenicity to humans.

• Mutagenic properties /Mutagenicity	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.
• Reproductive toxicity	This product is not expected to cause reproductive or developmental effects.
• Specific target organ toxicity - single exposure	Not classified.
• Specific target organ toxicity - repeated exposure	Not classified.
• Aspiration hazard	Not an aspiration hazard.

12. Ecological information

A. Ecotoxicity	The product is not classified as environmentally hazardous. However, this does not exclude the possibility that large or frequent spills can have a harmful or damaging effect on the environment.
B. Persistence/degradability	The product solely consists of inorganic compounds which are not biodegradable.
C. Bioaccumulative potential	No data available on bioaccumulation.

Octanol/water partition coefficient log Kow

Ammonium fluoride (CAS 12125-01-8)	-4.37

D. Mobility in soil	The product is completely soluble in water. Expected to be mobile in soil.
E. Other adverse effects	None known.

13. Disposal considerations

A. Method of disposal	Collect and reclaim or dispose in sealed containers at licensed waste disposal site. Dispose of contents/container in accordance with local/regional/national/international regulations.
B. Disposal considerations (including disposal of contaminated containers or packaging)	Since emptied containers may retain product residue, follow label warnings even after container is emptied. Empty containers should be taken to an approved waste handling site for recycling or disposal.

Waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.

14. Transport information

KRDG

A. UN number	UN3287
B. UN proper shipping name	TOXIC LIQUID, INORGANIC, N.O.S. (Ammonium fluoride)
C. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
D. Packing group	3
E. Environmental hazards	No
F. Special precautions for user	
Special precautions	Read safety instructions, SDS and emergency procedures before handling.

IATA

A. UN number	UN3287
B. UN proper shipping name	Toxic liquid, inorganic, n.o.s. (Ammonium fluoride)
C. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
D. Packing group	III
E. Environmental hazards	No
ERG Code	6L
F. Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

IMDG

A. UN number	UN3287
B. UN proper shipping name	TOXIC LIQUID, INORGANIC, N.O.S. (Ammonium fluoride)
C. Transport hazard class(es)	
Class	6.1
Subsidiary risk	-
D. Packing group	III
E. Environmental hazards	
Marine pollutant	No
EmS	F-A, S-A
F. Special precautions for user	Read safety instructions, MSDS and emergency procedures before handling.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not established.

15. Regulatory information

A. Restrictions under the Industrial Safety and Health Law

Harmful Substances Prohibited from Manufacturing

Not regulated.

Harmful Substances Requiring Permission for Manufacture or Use

Not regulated.

Controlled Hazardous Substances

Not regulated.

Harmful Substances Requiring Special Medical Examination

Not regulated.

Workplace Environmental Monitoring Harmful Materials

Not regulated.

Occupational Exposure Limit

Not regulated.

B. Restrictions under the Chemicals Control Law (Previously Toxic Chemicals Control Law)

Accidental Release Prevention Substances

Not regulated.

Act on the Registration and Evaluation of Chemicals

Banned Toxic Chemicals

Not regulated.

Designated Existing Chemicals Subject to Registration (PEC) (MoE No. 2015-92)

Ammonium fluoride (CAS 12125-01-8)

Restricted Chemical Substances

Not regulated.

Toxic Chemicals

Ammonium fluoride (CAS 12125-01-8) 2011-1-617

C. Restrictions under the Dangerous Substance Safety Management Act

Not dangerous goods under the Dangerous Substance Safety Management Law

D. Restrictions under the Wastes Control Act

Halogenated Materials in Waste Organic Solvents

Not regulated.

Hazardous Substances

Not regulated

E. Restrictions under other foreign or domestic laws

Clean Air Conservation Act

Air Pollutants

Ammonium fluoride (CAS 12125-01-8)

Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides (Rules on PIC, MoE No. 2014-252, Dec. 31, 2014; Standards for Pesticides, RDA No. 2014-26), as amended

Not listed.

Specific Air Pollutants

Not regulated.

Further information This material safety data sheet was prepared in accordance with Article 41 of the Industrial Safety and Health Law.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Korea	Existing Chemicals List (ECL)	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)
A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

16. Other information

A. Source of information

Korea. Accidental Release Prevention Substances (Presidential Decree of Toxic Chemical Control Law, Executive Order No. 19203)
Korea. Dangerous Substances Threshold Quantity (Presidential Decree of Dangerous Substances Safety Management Act No. 18406, Schedule 1)
Korea. Harmful Substances Prohibited from Manufacturing (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 29)
Korea. Harmful Substances Requiring Permission for Manufacture or Use (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 30)
Korea. OELs. Regulation for Permitted Concentration of Hazardous Substances (Ministry of Labor (MOL) Public Notice No. 1986-45, as amended)
Korea. Prohibited Chemical Substances (TCCL Article 11)
Korea. Regulated volatile organic compounds (VOCs) (MOE Notice No. 2001-36, March 8, 2001, as amended)
Korea. Restricted Chemical Substances (TCCL Article 11)
Korea. Toxic Chemical Control Law (TCCL), Existing Chemicals Inventory (KECI)
Korea. Toxic Chemical Control Law (TCCL), pre-1997 List
Korea. Toxic Chemicals (TCCL Article 10)
Korea. Toxic Release Inventory (TRI) Chemicals (TCCL Article 14)
Korea. Accidental Release Prevention Substances (Pres. Decree of Toxic Chemical Control Law, Ex. Order No. 19203, Tables 2 & 3, Dec 28, 2005)
Korea. OELs (ISHL Article 42; MOL Public Notice No. 1986-45, as amended through MOEL Notice 2013-38, August 14, 2013)
Korea. Prohibited Chemical Substances (AREC "K-REACH" Article 27; Designation of Toxic, Restricted or Banned Chemicals Appendices 4 and 5)
Korea. Restricted Chemical Substances (AREC "K-REACH" Article 27; Designation of Toxic, Restricted or Banned Chemicals Appendices 2 and 3)
KECI, January 27, 2015, amended through MoE 2016-138, July 13, 2016
Korea. Toxic Chemicals (AREC "K-REACH" Article 20; Designation of Toxic, Restricted or Banned Chemicals Appendix 1)
Korea. Toxic Release Inventory (TRI) Chemicals (MOE Public Notice No. 2002-166, Nov. 8, 2002)

B. Issue date 21-December-2020

C. Number of revisions and date of most recent revision 07-March-2021 (03 revision)

D. Other

CAS: Chemical Abstract Service.
IATA: International Air Transport Association.
IMDG: International Maritime Dangerous Goods.
TWA: Time Weighted Average.

Disclaimer

CMC Materials cannot anticipate all conditions under which this information and its product, or the products of other manufacturers in combination with its product, may be used. It is the user's responsibility to ensure safe conditions for handling, storage and disposal of the product, and to assume liability for loss, injury, damage or expense due to improper use. The information in the sheet was written based on the best knowledge and experience currently available.