

ISO9001 ISO14001
IATF16949 OHSAS18001



Product Manual



Add : No.218, Qingnian Road, Wuyi County, Zhejiang Province, China.

Tel: 86-579-87641888 Http: www.sanmeichem.com
Fax: 86-579-87646868 E-mail: sales@sanmeichem.com

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Though it has been reviewed for several times for accuracy, it is only for reference. [2019.08]

ZHEJIANG SANMEI CHEMICAL IND. CO., LTD.

COMPANY PROFILE

SANMEI

- Company profile: Zhejiang Sanmei Chemical Ind, Co., Ltd.
- Founded: May 11, 2001
- CEO: Qixiang Hu
- Add: No.218, Qingnian Road, Wuyi County, Zhejiang Province, China
- Registered capital: RMB 376 million
- Enterprise nature: Private company
- Staff: 1800+

Branch

- Jiangsu Sanmei Chemical Ind, Co., Ltd.
- Fujian Qingliu Dongying Chemical Ind, Co., Ltd.
- Zhejiang Sanmei Chemical Products Co., Ltd.
- Chongqing Sanmei Chemical Ind, Co., Ltd.
- Fluo Shanghai International Trade Co., Ltd.
- Zhejiang Sanmei Refrigeration Fitting Co., Ltd.
- Guangdong Furun Chemical Ind, Co., Ltd.

Capacity

Up to now, our annual manufacturing capacity is as follows:

131,000MT AHF;

65,000MT R134a, 52,000MT R125, 40,000MT R32, 6,000MT R143a;

25,000MT mix-refrigerant.

Production Quota: 34,299MT HCFC-141b, 3,219MT HCFC-142b, 14,008MT R22.

Electronic Grade Hydrofluoric Acid

HF-H₂O

HS Code: 2811110000
UN NO: 1790
Danger Class: 8



Applications:

1. Mainly used as wafer cleaner and etching chemical in IC industries. It is an indispensable chemical in manufacturing microelectronics.
2. Used as an etching reagent for glass substrate, Si₃N₄ and SiO₂ in TFT-LCD industry.
3. Used as a cleaner and etching reagent in solar cell industry.
4. Reacts with metal salt, oxide, and hydroxide to form fluoride salt, and reacts with silicate to generate SiF₄ gas.

Applications: Avoid sunshine and keep in well-ventilated places.

Packaging: 1 gallon barrel; 20L barrel; 200L barrel; 1000L IBC.

Physical Properties

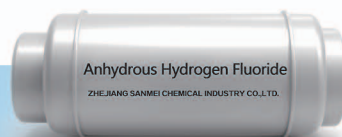
Molecular Weight	20.01	Equivalent Conductance (18°C)	17.32Ω-1CM-1
Boiling Point, °C	107	Appearance	Colorless, Clear
Density(sea level), g/ml	1.157	Odor	Pungent, Caustic
Freezing Point, °C	-46.3		

Quality Standards (Q/KAIHN01-2019)

ITEM	GRADE				ITEM	GRADE			
	EL grade	UP grade	UP-Sgrade	UP-SSgrade		EL grade	UP grade	UP-Sgrade	UP-SSgrade
ASSAY %	49±0.5	49±0.5	49±0.5	49±0.5	Fe w/(μg/kg)	≤100	≤10	≤1	≤0.1
Coloration HU	≤10	≤10	≤7	≤7	Pb w/(μg/kg)	≤50	≤10	≤1	≤0.1
H ₂ SiF ₆ w/(mg/kg)	≤50	≤50	≤30	≤30	Ti w/(μg/kg)	≤100	≤10	≤1	≤0.1
Cl w/(mg/kg)	≤5	≤5	≤0.2	≤0.05	Sb w/(μg/kg)	≤50	≤10	≤1	≤0.1
NO ₃ w/(mg/kg)	≤3	≤3	≤0.1	≤0.05	Li w/(μg/kg)	≤20	≤5	≤1	≤0.1
PO ₄ w/(mg/kg)	≤1	≤1	≤0.1	≤0.05	Mg w/(μg/kg)	≤100	≤10	≤1	≤0.1
SO ₄ w/(mg/kg)	≤5	≤5	≤0.2	≤0.05	Mn w/(μg/kg)	≤50	≤10	≤1	≤0.1
Al w/(μg/kg)	≤100	≤10	≤1	≤0.1	Mo w/(μg/kg)	≤100	≤10	≤1	≤0.1
As w/(μg/kg)	≤200	≤10	≤1	≤0.1	Ni w/(μg/kg)	≤50	≤10	≤1	≤0.1
B w/(μg/kg)	≤100	≤10	≤1	≤0.1	K w/(μg/kg)	≤100	≤10	≤1	≤0.1
Ba w/(μg/kg)	≤100	≤10	≤1	≤0.1	Ag w/(μg/kg)	≤20	≤5	≤1	≤0.1
Be w/(μg/kg)	≤20	≤5	≤1	≤0.1	Na w/(μg/kg)	≤100	≤10	≤1	≤0.1
Bi w/(μg/kg)	≤20	≤5	≤1	≤0.1	Pt w/(μg/kg)	≤100	≤10	≤1	≤0.1
Cd w/(μg/kg)	≤50	≤10	≤1	≤0.1	Sr w/(μg/kg)	/	≤10	≤1	≤0.1
Ca w/(μg/kg)	≤100	≤10	≤1	≤0.1	Tl w/(μg/kg)	/	≤10	≤1	≤0.1
Cr w/(μg/kg)	≤20	≤10	≤1	≤0.1	Sn w/(μg/kg)	≤20	≤10	≤1	≤0.1
Co w/(μg/kg)	≤20	≤10	≤1	≤0.1	V w/(μg/kg)	/	≤10	≤1	≤0.1
Cu w/(μg/kg)	≤20	≤10	≤1	≤0.1	Zn w/(μg/kg)	≤50	≤10	≤10	≤10
Ga w/(μg/kg)	≤20	≤10	≤1	≤0.1	Partical size ≥ 1.0 μm Ea/ml	≤25	/	/	/
Ge w/(μg/kg)	≤20	≤10	≤1	≤0.1	Partical size ≥ 0.5 μm Ea/ml	/	≤25	≤5	/
Au w/(μg/kg)	≤20	≤5	≤1	≤0.1	Partical size ≥ 0.2 μm Ea/ml	/	/	/	≤20

Anhydrous Hydrogen Fluoride

Molecular Formula: AHF
HS Code: 2811119000
UN NO: 1052 Danger Class: 8



Applications:

Used in the production of fluoride salts, fluoroplastics, fluoro-rubber, fluoro-medicine, and in the agricultural pesticides industry.

Packaging: 330kg or 660kg steel cylinder; 15-20MT ISO tank.

Note: Our company which can produce 131,000 MT of AHF per year.

Physical Properties

Molecular Weight	20.01	Appearance	Colorless, Clear
Boiling Point, °C	19.5	Odor	Pungent, Caustic

Quality Standards (GB 7746-2011)

Index Name	Special-Grade	Excellent-Grade	1st-Grade	Qualified Product
HF, %	≥99.98	≥99.96	≥99.92	≥99.80
H ₂ O, %	≤0.005	≤0.02	≤0.04	≤0.06
SO ₂ , %	≤0.005	≤0.008	≤0.015	≤0.050
H ₂ SO ₄ , %	≤0.003	≤0.005	≤0.010	≤0.030
H ₂ SiF ₆ , %	≤0.005	≤0.005	≤0.010	≤0.050

Industrial Hydrofluoric Acid

Molecular Formula: HF
HS Code: 2811119000
UN NO: 1790 Danger Class: 8



Applications: Used in the production of fluoride salts; to engrave and erode glass, to clean metal, and to treat surfaces.

Packaging: Polyethylene plastic 20L(25kg) drum, 30L(30kg) drum, 200L drum, ISO tank.

Note: The HF content of the product ranges 49-70% per customer requirements.

Physical Properties

Molecular Weight	N/A	Freezing Point, °C	N/A
Boiling Point, °C	N/A	Appearance	Colorless, Clear
Density(sea level), g/ml	N/A	Odor	Pungent, Caustic

Quality Standards (GB 7744-2008)

HF, %	30.0-70.0
H ₂ SiF ₆ , %≤	0.02
H ₂ SO ₄ , %≤	0.02
Fe, %≤	0.005

CEO Greeting:

Sanmei is a privately owned company proudly headquartered in Wuyi, Zhejiang Province, nicknamed "The Hometown of Fluorite." Over the past 15 years, Sanmei has grown exponentially, but we haven't forgotten our roots. Today Sanmei is proud to be Wuyi's largest employer, with over 1800 employees, all of whom grew up right here. Because Wuyi is our home, Sanmei has never allowed industrial growth to come at the expense of the local environment. We are proud that Wuyi has become a major tourist destination for the pristine natural environment that Sanmei has helped protect.

Thanks to our vast fluorite reserves, Sanmei is able to utilize only the safest and most efficient extraction techniques. We balance our growth aspirations with constant focus on our three core responsibilities: our customers, our families, and our surrounding environment. In China's rapidly evolving business environment, we have built Sanmei to be the company our children can be proud of.

Today Sanmei is the largest manufacturer and distributor of AHF, and a leading producer of fluoride refrigerants (R22.R134a.R125.R32), ODS substitutes, foaming and cleaning agent HCFC-141b, and fluoride salt. Sanmei exports to more than 1,000 customers in over 50 countries. We have established a reputation for consistency and reliability, with sound and transparent management. I promise continuous improvement, and look forward to showing you why Sanmei is the right supplier for your chemical needs.

Faithfully yours,

Hanson Hu

胡淇翔

President and CEO

Zhejiang Sanmei Chemical Ind. Co., Ltd.



R134a



HS Code: 29033990.90
UN NO: 3159
Danger Class: 2.2



Applications: Substitute of refrigerants R502 and R22, and extinguishing agents halon-1211 and halon-1301.

Packaging: Disposable cylinder 200g, 250g, 300g, 340g, 750g, 820-850g, 1000g, 7.5lb/3.4kg, 15lb/6.8kg, 30lb/13.6kg, 50lb/22.7kg; Recyclable steel cylinder 800L, 926L; ISO tank.

Physical Properties

Molecular Weight	102.03	Solubility in Water (25°C), %	0.15
Boiling Point, °C	-26.1	Vaporization Heat at Boiling Point, kJ/kg	216.0
Critical Temperature, °C	101.1	Ozonosphere Damage Potency (ODP)	0.000
Critical Pressure, MPa	4.07	Global Warming Potency (GWP)	1430
Critical Density, g/ml	0.512	Appearance	Colorless, Clear
Density of Saturated Liquid (25°C), g/ml	1.207	Odor	Odorless
Specific Heat of Liquid 25°C, kJ/(kg·°C)	1.51		

Quality Standards (GB/T 18826-2016)

Purity, %	≥99.90	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	Unsaturated Olefin, ppm	≤40
Chloride, %	Pass	High Boiling Residue, ppm by volume	≤100
Foul Gas in Air Phase, %	≤1.5		

Quality Standards for Aerosol Cans (GB/T36765-2018)

Purity, %	≥99.9	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤15	High Boiling Residue, ppm by volume	≤50

R125



HS Code: 29033990.90
UN NO: 3220
Danger Class: 2.2



Applications: Used as refrigerant.

Packaging: Disposable cylinder 22lb/10kg; Recyclable steel cylinder 926L; 18-20MT/ISO tank.

Physical Properties

Molecular Weight	120.02	Heat of Evaporation, kJ/kg	165.0
Boiling Point (760mmHg, °C)	-48.45	Heat Capacity 25°C, Liquid, kJ/kg	1.26
Density of Liquid at 25°C, g/cm³	1.245	Ozonosphere Damage Potency (ODP)	0
Critical Temperature, °C	66.05	Global Warming Potency (GWP)	3500
Critical Pressure, MPa	3.592	Appearance	Colorless, Clear
Critical Density, g/cm³	0.571	Odor	Odorless

Quality Standards (HG/T 4633-2014)

Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤100

R141b



HS Code: 2903791014



Applications:

Foaming agent as alternative to CFC11, and precision cleaning agent to substitute CFC-113.

Packaging:

Non-refillable cylinder 30lb/13.6kg; Steel drum in 30L/30kg, 200L; ISO tank.

Physical Properties

Molecular Weight	116.95	Solubility in Water at 25°C, W%	0.509
Boiling Point (1atm), °C	32.05	Vapour Pressure at 25°C, MPa	0.079
Critical Pressure, MPa	4.34	Specific Heat (25°C), kJ/kg	1.16
Critical Density, g/cm³	0.433	Percent Volatiles by Volume (20°C)	100.0
Freezing Point (1atm), °C	-103.5	Critical Temperature, °C	204.1
Latent Heat of Vaporization at Boiling Point, kJ/kg	223.0	Ozonosphere Damage Potency (ODP)	0.11
Density of Liquid at 25°C, g/cm³	1.227	Global Warming Potency (GWP)	0.09
Conductivity of Heat Vapor (1atm, 25°C) mw/mk	8.3	Appearance	Colorless, Clear
Vapour Density (Air=1)	4.1	Odor	Odorless

Quality Standards (GB/T 18827-2002)

Purity, %	≥99.5	High Boiling Residue, ppm by volume	≤100
Moisture, ppm	≤50	Vinylidene Chloride+Dichloroacetylene, ppm	≤200
Acidity (as HCl), ppm	≤1		

R142b



HS Code: 2903791015
UN NO: 2517
Danger Class: 2.1



Applications:

- Used as working fluid in high-temperature air-conditioners, heat pumps and temperature controllers.
- Used as component of blend refrigerants, including R22 and R142b (40:60 by mass).
- Used as a blowing agent applied in Polyurethane and Polyethylene foam.

Packaging: Recyclable steel cylinder 400kg/400L, 800kg/800L, 20MT bulk in ISO tank.

Physical Properties

Molecular Weight	100.5	Conductivity of Heat, Vapor(1atm, 25°C), mv/mk	9.4
Boiling Point (1atm), °C	-9.6	Solubility in Water at 25°C, %	0.14
Density of Liquid at 30°C, g/cm³	1.096	Specific Heat of Liquid 25°C, kJ/kg°C	1.34
Critical Temperature, °C	137.1	Ozonosphere Damage Potency (ODP)	0.06
Critical Pressure, Mpa	4.12	Global Warming Potency (GWP)	2000
Critical Density, g/cm³	0.435	Appearance	Colorless, Clear
Latent Heat of Vaporization at Boiling Point, kJ/kg	215	Odor	Odorless

Quality Standards (HG/T 4795-2014)

Liquid Gas Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤50

R22

CHClF₂

HS Code: 2903710000
UN NO: 1018
Danger Class: 2.2



Applications:

1. Used in reciprocating compressors.
2. Used as a refrigerant in industrial, commercial, and household air conditioning systems.
3. Used to produce insecticide and aerosol for spraying paint or extinguishing agent 1211.
4. R22 is the basic material used to produce a wide variety of fluorinated macromolecular compounds.

Packaging: Disposable cylinder 15lb/6.8kg, 22lb/10kg, 30lb/13.6kg, 50lb/22.7kg; Recyclable steel cylinder 400L, 800L, 926L; ISO tank.

Physical Properties

Molecular Weight	86.47	Critical Pressure, MPa	4.91
Boiling Point, °C	-40.8	Ozone Damage Potency (ODP)	0.055
Relative Density(30°C), Liquid, g/m ³	1.18	Global Warming Potency (GWP)	1700
Melting Point, °C	-146.00	Appearance	Colorless, Clear
Critical Temperature	96	Odor	Odorless

Quality Index (GB/T 7373-2006)

Grade	Excellent Grade	First Grade
Purity, %	≥99.9	≥99.6
Moisture, ppm	≤10	≤30
Acidity (as HCl), ppm	≤0.1	≤1
High Boiling Residue, ppm by volume	≤100	≤100
Foul gas in air phase, % (v/v)	≤1.5	≤1.5

R406A

Refrigerant Components: R22/R600a/R142b (55/4/41)

HS Code: 3824740000 / 3824740015
UN NO: 3163 Danger Class: 2.2

Applications: Substitute of dichlorodifluoromethane (R12).

Packaging: Disposable cylinder 13.6kg/30lb, 22.7kg/50lb; Recyclable steel cylinder 360kg/400L, 720kg/800L.

Physical Properties

Molecular Weight	89.86	Ozone Damage Potency (ODP)	0.036
Boiling Point, (1atm), °C	-32.7	Appearance	Colorless, Clear
Critical Temperature °C	116.5	Odor	Odorless
Critical Pressure, MPa	4.88		

Quality Standards (CRAA 100-2012)

Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤100



R32

CH₂F₂

HS Code: 29033990.90
UN NO: 3252
Danger Class: 2.1



Applications: Used as refrigerant, important component for the substitute of R22.

Packaging: Disposable cylinder 6.6lb/3kg; Recyclable steel cylinder, 926L/670kg; ISO tank.

Physical Properties

Molecular Weight	52.02	Latent Heat of Vaporization at BP kJ/kg	390.5
Boiling Point (1atm), °C	-51.7	Solubility in Water at 25°C, %by weight	0.440
Melting Point, °C	-136	Specific Heat of Liquid 25°C, kJ/kg°C	2.35
Density of Liquid at 25°C, g/cm ³	0.960	Ozone Damage Potency (ODP)	0
Vapour Pressure at 25°C, MPa	1.702	Global Warming Potency (GWP)	675
Critical Temperature, °C	78.52	Appearance	Colorless, Clear
Critical Pressure, Mpa	5.808	Odor	Odorless
Critical Density, g/cm ³	0.430		

Quality Standards (HG/T 4634-2014)

Purity, %	≥99.8	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤15	High Boiling Residue, ppm by volume	≤100
Foul Gas in Air Phase, % (v/v)	≤1.5		

R143a

CH₃CF₃

HS Code: 29033990.90
UN NO: 2035
Danger Class: 2.1



Applications: Used as refrigerant, as important component of the substitute for R502.

Packaging: Recyclable steel cylinder 260kg/200L, 400L, 926L; ISO tank.

Physical Properties

Molecular Weight	84.04	Ozone Damage Potency (ODP)	0
Boiling Point, °C	-47.5	Global Warming Potency (GWP)	4470
Density of Saturated Liquid (25°C), g/ml	0.932	Critical Density, g/cm ³	0.455
Specific Heat of Liquid 25°C, [kJ/kg.°C]	1.31	Vaporization Heat Under Boiling Point, kJ/kg	231.0
Critical Temperature, °C	73.15	Appearance	Colorless, Clear
Critical Pressure, MPa	3.761	Odor	Odorless
Solubility (water, 25°C)%	/		

Quality Standards (HG/T 4794-2014)

Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤100

R410A

Refrigerant Components: R32/ R125 (50/50)
 HS Code: 3824780000
 UN NO: 3163 Danger Class: 2.2



Applications: Used as refrigerant, replacement for R22.

Packaging: Disposable cylinder 11lb/5kg, 22lb/10kg, 25lb/11.3kg; Recyclable steel cylinder 926L; ISO tank.

Physical Properties

Molecular Weight	72.58	Ozonosphere Damage Potency (ODP)	0
Boiling Point, °C	-51.6	Global Warming Potency (GWP)	2088
Critical Temperature, °C	72.5	Appearance	Colorless, Clear
Critical Pressure, MPa	4.95	Odor	Odorless
Specific Heat of Liquid 30°C, [kJ/(kg°C)]	1.78		

Quality Standards (HG/T 5162-2017)

Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤100

R404A

Refrigerant Components: R125/R143a/R134a (44/52/4)
 HS Code: 3824780000
 UN NO: 3337 Danger Class: 2.2



Applications: Used as refrigerant, replacement of R502.

Packaging: Disposable cylinder 24lb/10.9kg; Recyclable steel cylinder 400L, 800L, 926L; ISO tank.

Physical Properties

Molecular Weight	97.6		
Boiling Point, °C	-46.1		
Critical Temperature °C	72.4		
Critical Pressure, MPa	3.69		
Specific Heat of Liquid 30°C, kJ/(kg°C)	0.38		
Ozonosphere Damage Potency (ODP)	0		
Global Warming Potency (GWP)	3922		
Appearance	Colorless, Clear		
Odor	Odorless		

Quality Standards (HG/T 5161-2017)

Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤100

R407C

Refrigerant Components: R32/R125/R134a (23/25/52)
 HS Code: 3824780000
 UN NO: 3340 Danger Class: 2.2



Applications: Used as refrigerant, replacement of R22.

Packaging: Disposable cylinder 22lb/10kg, 25lb/11.3kg; Recyclable steel cylinder 400L, 926L; ISO tank.

Physical Properties

Molecular Weight	86.2	Ozonosphere Damage Potency (ODP)	0
Boiling Point, °C	-42.4	Global Warming Potency (GWP)	1774
Critical Temperature, °C	86.74	Appearance	Colorless, Clear
Critical Pressure, MPa	4.619	Odor	Odorless
Specific Heat of Liquid (30°C), kJ/(kg°C)	1.51		

Quality Standards (CRAA 100-2012)

Purity, %	≥99.5	Acidity (as HCl), ppm	≤1
Moisture, ppm	≤10	High Boiling Residue, ppm by volume	≤100

R507

Refrigerant Components: R125/R143a (50/50)
 HS Code: 3824780000
 UN NO: 3163 Danger Class: 2.2



Applications: Used as refrigerant, replacement of R22 and R502.

Packaging: Disposable cylinder 22lb/10kg, 25lb/11.3kg; Recyclable steel cylinder 400L, 800L, 926L; ISO tank.

Physical Properties

Molecular Weight	98.86	Ozonosphere Damage Potency (ODP)	0
Boiling Point, °C	-47.1	Global Warming Potency (GWP)	3985
Critical Temperature, °C	70.9	Appearance	Colorless, Clear
Critical Pressure, MPa	3.79	Odor	Odorless
Solubility (water, 25°C), %	0.89		

Quality Standards (CRAA 100-2012)

Purity, %	≥99.5		
Moisture, ppm	≤10		
Acidity (as HCl), ppm	≤1		
High Boiling Residue, ppm by volume	≤100		