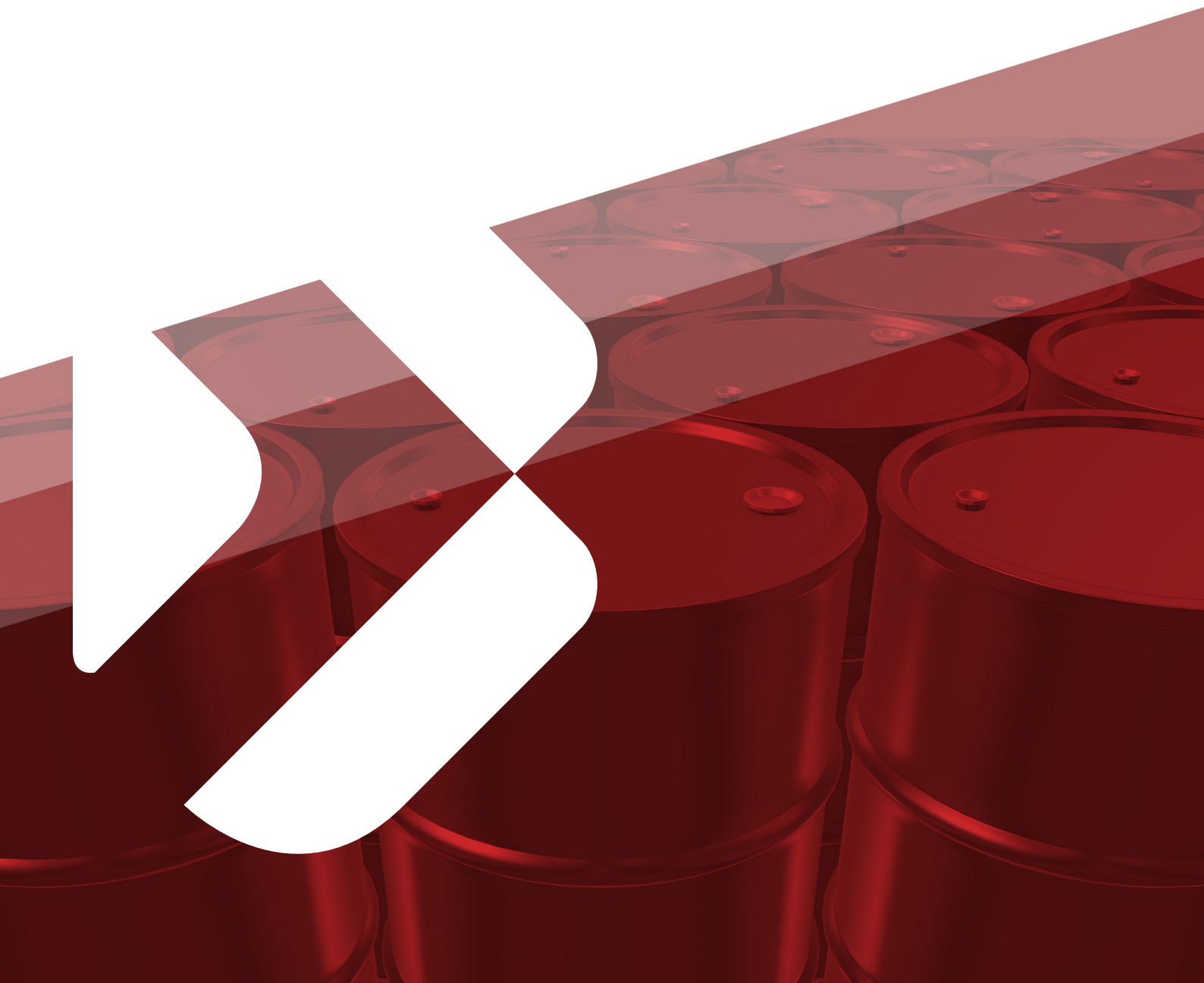
Entalpia
Europe

FIRE EXTINGUISHING CLEAN AGENT



HFC-227ea

STORAGE

All packaging will be stored in a dry, well ventilated, easily accessible place, sheltered from sunlight and bad weather, away from any ignition source.

PERFORMANCE

As a clean, environmental-friendly, high effective, and low toxic fire extinguishing agent, HFC-227ea is an ideal substitute for halon 1301, and has been listd on NFPA2011 standard fireextinguishing agent catalogue by US NFPA. It provides superior fire protection in a wide range of applications from sensitive electrical equipment to industrial applications using flammable liquids.

DESCRIPTION

- Colorless, odorless, liquefied compressed gas.
- Zero ozone depleting potential.
- It is suitable for use in a wide range of fire extinguishing applications, including total flooding, streaming and iner ting applications.

CLASSIFICATIONS

- UN Number: 3296
- Class: 2.2

CONDITIONS OF USE

HFC-227ea does not displace oxygen and therefore is safe for use in occupied spaces without fear of oxygen deprivation. Please be sure to read the Material Safety Data Sheet (MSDS) before use. Workers handling the product should be trained about risks and preventive measures.

PACKAGING

Ton cylinder of 1000kgs

CHEMICAL NAME	1,1,1,2,3,3,3-HEPTAFLUOROPROPANE	NOAEL(V/V,%)	9.0
CHEMICAL FORMULA	C3HF7	LOAEL	>10.5
CAS NUMBER	431-89-0	LC50 OR ALC	>80%
BOILING POINT (°C)	-16.4	PURITY(% BY WEIGHT), ≥	99.9
FREEZING POINT (°C)	-131	ACIDITY(PPM BY WEIGHT), ≤	1
CRITICAL TEMPERATURE (°C)	101.7	ACID CONTENT[HF](MG/KG) ≤	1
CRITICAL PRESSURE	2914.9KPA\424PSI	WATER CONTENT(PPM BY WEIGHT), ≤	10
VAPOR PRESSURE 25 °C	453.3KPA\65.7PSI	NON-VOLATILE RESIDUE(%) ≤	0.01
SUSPENDED AND PRECIPITATED SUBSTANCE	INVISIBLE	MOLECULAR WEIGHT	170
MINIMUM EXTINGUISHING CONCENTRATION(NFPA® 2001) CLASS A(%, VOL) CLASS B(%, VOL)	 5.2-5.8 6.7	MINIMUM DESIGN CONCENTRATION(NFPA® 2001) CLASS A(%, VOL) CLASS B(%, VOL)	 6.25-7.0 8.7
CRITICAL DENSITY,KG/M3	621	SUSPENDED SUBSTANCES	INVISIBLE

FK-5-1-12

PERFLUORO(2-METHYL-3-PENTANONE)

STORAGE

All packaging will be stored in a dry, well ventilated, easily accessible place, sheltered from sunlight and bad weather, away from any ignition source.

PERFORMANCE

PERFLUORO (2-METHYL-3-PENTANONE) hasmetth requirements of registration under SNAP and is approved for use as an alternative to Halon 1301 for flooding applications in occupied spaces. It is an effective fire extinguishing agent in standard fire scenarios where halons historically have been used and where halon alternatives are now being used.

DESCRIPTION

- A clear, colorless, low odor fluid at room temperature with zero ozone depletion potential.
- Long-term, sustainable alternative to Halons, HFCs and PFCs
- A clean agent, leaves no residue behind and will not affec sensitive high-value electronics.
- The Fire extinguishing concentration of ICOOL-5112 is far below the harmful level.

POTENTIAL ENVIRONMENTAL IMPACTS

- ODP 0
- GWP 1
- Atmospheric Lifetime 0.014

CONDITIONS OF USE

Please be sure to read the Safety Data Sheet (MSDS) before using. Workers handling the product should be trained about risks andpreventive measures.

PACKAGING

Iron drum of 250kgs

CHEMICAL NAME	PERFLUORO(2-METHYL-3-PENTANONE)	RELATIVE DIELECTRIC STRENGTH,1ATM(N2=1.0)	2.3
CHEMICAL FORMULA	C6F12O	SATURATED LIQUID DENSITY,G/ML	1.60
CAS NUMBER	756-13-8	GAS DENSITY,G/ML	0.0136
BOILING POINT AT 760MM HG(°C)	49	VAPOR PRESSURE(AT 25°C)	40.4 KPA\5.85 PSI
FREEZING POINT (°C)	-108.0	PURITY(% BY WEIGHT, ≥)	99.6
CRITICAL TEMPERATURE (°C)	168.66	WATER CONTENT(PPM BY WEIGHT, ≤)	10
LIQUID VISCOSITY@25°C,CENTISTOKES	0.524	ACIDITY(PPM BY WEIGHT, ≤)	3.0
SOLUBILITY OF WATER@25°C, WT%	<0.001	SUSPENDED MATTER	NONE
SPECIFIC HEAT, LIQUID@25°C,KJ/KG°C	1.013	NOAEL(V/V,%)	10
CRITICAL PRESSURE	1858.9 KPA	LOAEL (V/V,%)	> 10.0
CRITICAL DENSITY,KG/M3	639.1	HEAT OF VAPORIZATION,KJ/KG	88.0
LC50 OR ALC(%)	> 10.0	SUSPENDED SUBSTANCES	INVISIBLE
NON-VOLATILE RESIDUE(%), ≤	\	MOLECULAR WEIGHT	316.04

CLEAN AGENT COMPARISON

1. PROTENTIAL ENVIRONMENTAL IMPACTS

AGENT	ODP	GWP	ATMOSPHERIC LIFETIME/ YEARS
FK-5-1-12	0	1	0.014
HFC-227EA	0	3220	34.2
HFC-125	0	3500	38.9
HALON 1301	10	7140	65

2. CONCENTRATION AND SAFETY MARGIN

AGENT	EXTINGUISHING CONCENTRATION(%)	NOAEL(V/V,%)	LOAEL(V/V,%)	SAFTY MARGINS(%)
FK-5-1-12	4.5-6.0	10.0	> 10.0	67-122
HFC-227EA	6.7-8.7	9.0	10.5	3-34
HFC-125	8.7-12.1	7.5	10.0	NIL
IG-541	38-40	43.0	52.0	7-13
CO2	30-75	< 5.0	N/A	LETHAL

3. CLASS A AND CLASS B FLAME EXTINGUSHING AND MINIMUM DESIGN CONCENTRATION

AGENT	CLASS A MEC	CLASS A MDC	CLASS B MEC	CLASS B MDC	CLASS C MDC
FK-5-1-12	3.5	4.2	4.5	5.9	4.7
HFC-227EA	5.2-5.8	6.25-7.0	6.7	8.7	7.0
HFC-125	6.7	8.0	8.7	11.3	9.0
IG-541	28.5	34.2	31.25	40.6	38.5
CO_2	\	\	\	\	\

Note: Concentrations reported are at 70 °F (21°C). Class B values are for heptane, Class A design values are at a safety factor of 1.2, and Class B design values are at a safety factor of 1.3

HFC-125

CONDITIONS OF USE

HFC-125 does not displace oxygen and therefore is safe for use in occupied spaces without fear of oxygen eprivation. Please be sure to read the Material Safety Data Sheet (MSDS) before use. Workers handling the product should be trained about risks and preventive measures.

PACKAGING

Ton cylinder of 700kgs

STORAGE

All packaging will be stored in a dry, well ventilated, easily accessible place, sheltered from sunlight and bad weather, away from any ignition source.

PERFORMANCE

HFC-125 is an environmentally acceptable replacement for Halon 1301 that can be used on many types of fires. It is effective for many surface fires and most solid combustible materials. HFC-125 also can be used to protect a wide range of applications from sensitive electrical equipment to industrial applications.

DESCRIPTION

- An odorless, colorless, liquefied compressed gas with a zero ozone depleting potential and a low global warming potential.
- A safe, clean, and electrically nonconductive agent that is intended to protect people, high value assets and the continuity of business.

CLASSIFICATIONS

- UN Number: 3220
- Class: 2.2

CHEMICAL NAME	PENTAFLUOROETHANE	CRITICAL PRESSURE	3609.2 KPA\525 PSI
CHEMICAL FORMULA	C2HF5	CRITICAL DENSITY, KG/M³	574
MOLECULAR WEIGHT	120	VAPOR PRESSURE(AT 25°C)	1414.05 KPA\205.09 PSI
CAS NUMBER	354-33-6	LC50 OR ALC(%)	> 70
PURITY(% BY WEIGHT), ≥	99.9	LOAEL(V/V,%)	10.0
ACIDITY(PPM BY WEIGHT), ≤	1.0	NOAEL(V/V,%)	7.5
WATER CONTENT(PPM BY WEIGHT), ≤	10	NON-VOLATILE RESIDUE(%), ≤	0.01
BOILING POINT AT 760MM HG(°C)	-48.1	SUSPENDED SUBSTANCES	INVISIBLE
FREEZING POINT(°C)	-102.8	CRITICAL TEMPERATURE(°C)	66.3

HFC-23

CONDITIONS OF USE

HFC-23 is an extremely high pressure gas with its critical point at around ordinary temperature. Read the Material Safety Data Sheet (MSDS) before use. Workers handling the product should be trained about risks and preventive measures.

PACKAGING

High-pressure gas cylinder of 9kgs, 11kgs

STORAGE

All packaging will be stored in a dry, well ventilated, easily accessible place, sheltered from sunlight and bad weather, away from any ignition source.

PERFORMANCE

HFC-23 is intended to replace Halon 1301 in total flooding and inerting applications. It is suited for very low temperatures (-60 to -100°C) applications with reciprocating or rotary compressors.

DESCRIPTION

- A colourless and non-flammable gas at normal temperature and pressure.
- A safe, clean, and electrically nonconductive agent that is intended to protect people, high value assets and the contnuity of business.

CLASSIFICATIONS

- UN Number: 1984
- Class: 2.2

CHEMICAL NAME	TRIFLUOROMETHANE	CRITICAL PRESSURE	4812.3 KPA\700 PSI
CHEMICAL FORMULA	CHF3	CRITICAL DENSITY, KG/M³	527
MOLECULAR WEIGHT	70.01	VAPOR PRESSURE(AT 25°C)	4732 KPA\686.3 PSI
CAS NUMBER	75-46-7	LC50 OR ALC(%)	> 65
PURITY(% BY WEIGHT), ≥	99.9	LOAEL(V/V,%)	> 30.0
ACIDITY(PPM BY WEIGHT), ≤	1.0	NOAEL(V/V,%)	30.0
WATER CONTENT(PPM BY WEIGHT), ≤	10	NON-VOLATILE RESIDUE(%), ≤	0.01
BOILING POINT AT 760MM HG(°C)	-82.1	SUSPENDED SUBSTANCES	INVISIBLE
FREEZING POINT(°C)	-155.2	CRITICAL TEMPERATURE(°C)	26.1

HFC-236fa

CONDITIONS OF USE

Use personal protective equipment, such as side shield glasses, gloves, and safety shoes, when handling containers. Avoid skin contact with liquid HFC-236fa because it can cause frostbite. Please be sure to read the Material Safety Data Sheet (MSDS) before use. Workers handling the product should be trained about risks and preventive measures.

PACKAGING

Ton cylinder of 1000kgs

STORAGE

All packaging will be stored in a dry, well ventilated, easily accessible place, sheltered from sunlight and bad weather, away from any ignition source.

PERFORMANCE

HFC236fa is listed as an acceptable Halon replacement in the EPA SNAP Program for Halon 1211 in portable fire extinguishers and local application systems.It is ideally suited for protecting high value equipment such as in computer rooms, telecommunication facilities, and aircraft. It also can be used as a pure refrigerant for low-pressure.

DESCRIPTION

- A colorless, nonflammable, liquefied gas.
- Noncorrosive, electrically nonconductive, free of residue and has an ODP of zero.
- Used as a fire extinguishant and explosion suppression agent.

CLASSIFICATIONS

- UN Number: 3163
- Class: 2.2

CHEMICAL NAME	1, 1, 1, 3, 3, 3-HEXAFLOROPROPANE	CRITICAL PRESSURE	3190.6 KPA\464.1 PSI
CHEMICAL FORMULA	C3H2F6	CRITICAL DENSITY, KG/M³	551.3
MOLECULAR WEIGHT	152	VAPOR PRESSURE(AT 25°C)	272 KPA\39.45 PSI
CAS NUMBER	690-39-1	LC50 OR ALC(%)	> 45.7
PURITY(% BY WEIGHT), ≥	99.9	LOAEL(V/V,%)	15.0
ACIDITY(PPM BY WEIGHT), ≤	1.0	NOAEL(V/V,%)	10.0
WATER CONTENT(PPM BY WEIGHT), ≤	10	NON-VOLATILE RESIDUE(%), ≤	0.01
BOILING POINT AT 760MM HG(°C)	-1.4	SUSPENDED SUBSTANCES	INVISIBLE
FREEZING POINT(°C)	-103	CRITICAL TEMPERATURE(°C)	124.9

Entalpia Europe sp. z o. o.
Al. Jerozolimskie 65/70
00-697 Warsaw