

# Fike ECARO-25™ Frequently Asked Questions (FAQ)

This document is aimed at those giving sales presentations to enable them to answer queries raised by the audience.

## 1) What is ECARO-25™?

A) ECARO-25™ stands for **E**xtinguishing **C**lean **A**gent **R**etrofit **O**ption, a Fike product containing DuPont™ FE-25™, a clean agent fire extinguishant also known as HFC-125.

## 2) What is HFC-125?

A) HFC-125 is a hydrofluorocarbon. HFC-125 is Pentafluoroethane as listed in NFPA 2001 and ISO 14520. The chemical formula for HFC-125 is  $\text{CF}_3\text{CH}_2$ .

## 3) What is FE-25™?

A) As a fire-extinguishing agent, HFC-125 is referred to as FE-25™, a trademark of DuPont™. FE-25™ is a clean agent fire extinguishant that is electrically nonconductive, non-corrosive, free of residue, has zero ozone-depletion potential (ODP) and is an environmentally preferred alternative to Halon.

## 4) Why is FE-25™ considered to be the preferred alternative for Halon 1301 in existing systems?

A) FE-25™ is most similar to Halon 1301 as determined in comparative, third party testing for agent storage, delivery, and distribution. FE-25™ closely matches Halon 1301 in terms of physical properties such as flow characteristics and vapor pressure. The pressure traces, vaporization, and spray patterns for FE-25™ nearly duplicate that of Halon 1301.

## 5) Why ECARO-25?

A) The ECARO-25 System is THE Halon 1301 “drop-in” replacement system. ECARO-25 has the advantage of being able to reuse the existing Halon 1301 piping structure. ECARO-25 reduces the cost of conversion and minimizes business interruption when replacing Halon 1301 in total flooding systems. Only the agent storage container and system nozzles must be replaced, to deliver the same level of protection. ECARO-25 requires minimal system modifications, minimizes downtime, reduces costs of conversion and protects what matters most.

## **Fike ECARO-25™ Frequently Asked Questions (FAQ)**

**6) Why does Fike come out with ANOTHER gas/agent?**

- A) FE-25™ is the best fit for Halon replacement for minimum disruption to the system user at a competitive price. The FE-25™ is complementary to the FE-227™ product. FE-25™ satisfies the immediate need in the EU community to decommission existing Halon systems without requiring a complete new installation. The pipe work can be reused with minimal disruption to the protected facility.

**7) Where was ECARO-25 when we introduced HFC-227ea?**

- A) ECARO-25, by Fike Corporation, was introduced and released for use in Europe to meet the required needs to replace existing Halon 1301 systems in 2002. European environmental regulation changes since the introduction of HFC-227ea influenced the development of ECARO-25.

**8) Why didn't we start with ECARO-25 agent in 1994?**

- A) Current science, through the use of PBPK modeling, identified that ECARO-25 is safe for human exposure for short periods (5 minutes or less). The PBPK modeling approach is endorsed by the US EPA, NFPA and is included as part of the new ISO 14520 standard.

**9) Are there toxicity problems with ECARO-25?**

- A) ECARO-25 can be used safely in Normally Occupied Spaces for the protection of Class-A assets (Computer Rooms, Data Centers, Clean Rooms, etc). The National Fire Protection Association 2001 Standard for Clean Agent Fire Extinguishing Systems lists HFC-125 as an acceptable halocarbon agent for spaces that are normally occupied and designed to concentrations up to 11.5% by volume with a maximum 5-minute exposure time.

HFC-125 is also listed on the EPA Significant New Alternatives Policy "SNAP" Program as an approved Halon 1301 replacement.

**10) Why did the toxic test fail in the early 90's when this was being researched?**

- A) In the early 90's the industry utilized heptane cup-burner values to establish Minimum Extinguishing Concentrations. For FE-25™, it was measured at 8.7% and the LOAEL or maximum concentration for occupied spaces was 10.0%. Adding the safety factor to the extinguishing

## **Fike ECARO-25™ Frequently Asked Questions (FAQ)**

concentration, as required by NFPA, did not permit FE-25™ systems acceptable for use in occupied spaces without lockout devices.

Two primary events have occurred allowing FE-25™ as a viable alternative for occupied spaces:

First, the industry determined that using heptane as the basis for the extinguishing concentration for Class A fires, such as those found in computer rooms, was causing excessive amounts of agent to extinguish fires. As a result, the industry created new realistic Class “A” fire tests. Under these tests, the FE-25™ Class “A” extinguishing concentration is 6.7% which safely permits FE-25™ to be used in normally occupied spaces.

Secondly, the industry has accepted a new toxicity modeling methodology that incorporates the time of exposure element. This was driven by the use of Halon for many years at concentrations above its NOAEL. Essentially, this model has determined that FE-25™ can be used at concentrations up to 11.5% for occupied spaces where egress can be expected in 5 minutes or less.

### **11) Is ECARO-25 in the Clean Agent Standard NFPA 2001?**

A) Yes. ECARO-25 is designated as HFC-125 (Pentafluoroethane).

### **12) Why is ECARO-25 only being used as a Halon replacement?**

A) Several countries signatory to the Montreal Protocol have introduced a systematic mandate for Halon 1301 systems to be replaced with an environmentally acceptable product.

### **13) When I expand my HFC-227ea system can I use ECARO-25?**

A) No. Fike Corporation is only introducing ECARO-25 as a Halon 1301 replacement. Fike Corporation also offers HFC-227ea for new installations.

### **14) When and if I have to recharge my HFC-227ea can I use ECARO-25?**

A) No. We do not recommend refilling HFC-227ea containers with ECARO-25.

## **Fike ECARO-25™ Frequently Asked Questions (FAQ)**

**15) How available is ECARO-25?**

- A) ECARO-25 is available through the approved distributor network. Fike Corporation has selected domestic as well as international distributors to provide this service.

**16) How long will my system be down if I need a refill?**

- A) This will vary depending on location. Fike Corporation has a well-established distribution network in major markets offering quality and timely service for Fike installed systems. Most ECARO-25 systems can be returned to full service within a few days.

**17) Is ECARO-25 a proprietary product?**

- A) Yes. ECARO-25 is a Fike Corporation product.

**18) Is FE-25™ targeted for phase-out?**

- A) No. As a hydrofluorocarbon, or HFC, FE-25™ is part of a group of chemicals that are not currently targeted for phase-out and are not expected to be phased-out in the future.

**19) Is FE-25™ available long-term?**

- A) Yes. FE-25™ is available worldwide and will be available long-term. FE-25™ has the lowest environmental impact of any of the HFC products, which have been commercialized in the fire protection industry. FE-25™ provides the best combination of benefits to the end-user from an environmental and commercial perspective for the replacement of Halon in existing systems. HFC-125 is also a significant component of many of the refrigeration blends being used today to replace CFCs. In total, the benefits of FE-25™ and its utility in many applications make it likely to have long-term viability in the fire protection industry.

**20) Will HFC's be banned in the future (rumors spread by the inert gas people)?**

- A) There are no plans to ban the use of HFC's for fire protection. The European Commission sponsored a study that showed that fire protection use of HFC's was essentially non-emissive and minuscule compared to other uses. The Kyoto Protocol, which manages the control of Global

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Warming Gases, does NOT in any way require the phase-out of HFC's for fire protection.

**21) Is it dangerous to use a gas over its NOAEL (no observable adverse effect level)?**

A) FE-25 is one of the most extensively tested gases. The PBPK model shows that the take-up of gas in the blood is very slow and that with an appropriate egress time from a protected space the gas is perfectly safe. In simple terms, the PBPK model incorporates the "time" factor when evaluating acceptable human exposures. Most of the Halon systems installed in the past were designed at concentrations above Halon 1301's NOAEL.

**22) Can someone stay in the protected space after a discharge?**

A) As with all fire situations people should move away from a fire rather than towards it. The products of combustion from burning material in the hazard are extremely noxious and we recommend all personnel evacuate a space prior to discharge. The standards recommend that all personnel leave a protected space within 5 minutes of the discharge of extinguishant.

**23) What is the right concentration to use?**

A) Fike and DuPont™ have undertaken extensive testing, much of it in front of independent authorities to determine the correct concentrations. The majority of installations are Class "A" fuels which require a Minimum Extinguishing Concentration (MEC) of 6.7%. Adding the factor of safety gives design concentrations of 8% in the USA Specified markets and 8.7% in European Specified markets. Class B type fuels will generally require higher concentrations.

**24) How does HFC-125 extinguish the fire? How does the chemical reaction take place?**

A) The unique mechanism HFC-125 relies upon, is its ability to absorb, at a molecular level, the heat energy from the combustion reaction. The ability of HFC-125 to absorb heat faster than the amount of heat generated by the combustion reaction essentially ceases the combustion reaction since it cannot sustain itself. The ability of HFC-125 to form free radicals, which chemically interfere with the chain reaction of the combustion process, also aids in the extinction of the fire.

# Fike ECARO-25™ Frequently Asked Questions (FAQ)

Extinguishing mechanism comparison:

	<b>Halon</b>	<b>HFC-125</b>	<b>Inert</b>	<b>Foam</b>
<b>Oxygen depletion</b>			100%	
<b>Heat absorption</b>	15%	67%		
<b>Reaction interruption</b>	85%	33%		
<b>Reaction barrier</b>				30%
<b>Cooling</b>				70%

**25) What are the end products after the fire has been extinguished?**

- A) HFC-125 systems are aimed at the market that requires early detection and early extinguishing to minimize fire and smoke damage. Keeping the fire small avoids noxious products of combustion of an unchecked fire. HFC-125 is a very stable chemical, which only decomposes in the presence of fire to extinguish it (as did Halon). Very low concentrations of HF can be formed, however they are usually at lower concentration levels than the toxic combustion products of the fire itself. Refer to separate paper on the subject.

**26) Is HFC-125 safe for the environment? Who says so?**

- A) HFC-125 has zero ozone depletion potential and a short atmospheric lifetime. Over the other HFC alternatives it offers the smallest impact and best combination of performance and environmental impact for existing Halon 1301 systems.

**27) What is the PBPK model for HFC125?**

- A) The PBPK model is intended to incorporate the time of exposure factor with the toxicity of a specific chemical to determine a safe use level for fire protection. This model is considered to be the “best available toxicity” modeling. For HFC-125, this model would suggest that HFC-125 could be used up to 11.5% providing a person could reasonably egress a room in 5 minutes or less. However, to be conservative, the NFPA 2001 Standard and the preliminary ISO 14520 Standard limits the allowable concentration for areas where people are normally present at 10% providing egress can be reasonably be expected in 5 minutes or less.

**28) What is the difference between HFC-125 and HFC-227ea?**

- A) In summary, HFC-125 has system flow properties and characteristics very similar to those for Halon 1301. When HFC-125 is used as a replacement for Halon 1301 in existing systems, in many instances, the existing hardware requires minimal modification.