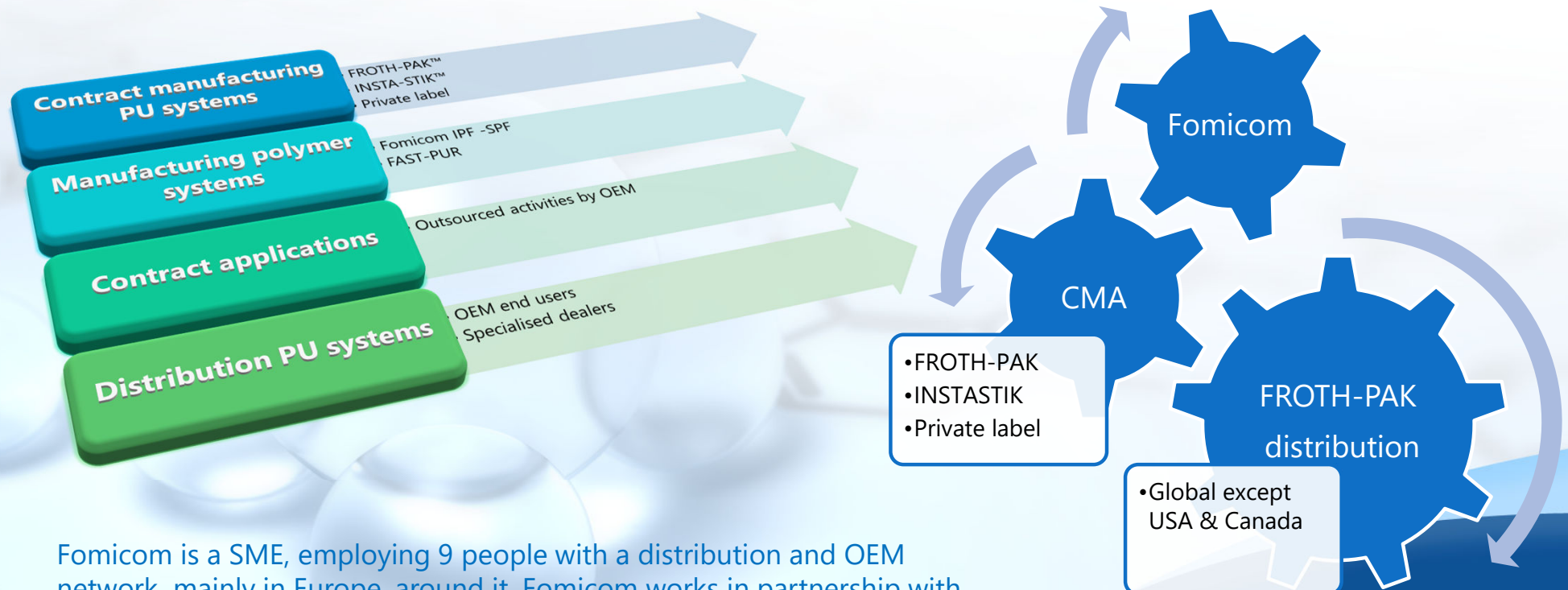


Fomicom

Company overview

We supply and manufacture low-pressure spray polyurethane (PU) foam and insulation pouring foam for a wide range of industrial niche markets and major construction projects: fast and simple insulation of objects, anti-condensation, combatting corrosion problems, injection into moulds, making items airtight, etc



Fomicom is a SME, employing 9 people with a distribution and OEM network, mainly in Europe, around it. Fomicom works in partnership with the Performance Building Solutions business of DuPont to develop the unique products with high efficiency requirements in niche end uses.

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PFAS definition

The current definition of PFAS includes hydrofluoroolefins (HFOs), HFO-1234ze(E) and HCFO-1233zd(E) in particular, that should not be in the scope of this restriction proposal. As noted in the REACH Registration dossiers, the REACH registration assessments concluded HFO-1234ze(E) and HCFO-1233zd(E) are not PBT/vPvB, and additional data shows the compounds do not break down into PBT/vPvB compounds.

Chemical name: Trans-1-chloro-3,3,3-trifluoroprop-1-ene [HFO-1233zd(E)] EC 700-486-0 / CAS 102687-65-0	
PBT assessment: overall result	Chemical name: Trans-1,3,3,3-tetrafluoroprop-1-ene [HFO-1234ze(E)] EC 471-480-0 / CAS 29118-24-9
PBT status the substance is not PBT / vPvB	PBT assessment: overall result
Justification The substance is a gas at room temperature and partition to the water rather than the sediment partition coefficient ($\log K_{ow} = 2.2$) and adsorption coefficient ($K_{oc} = 1065 \text{ L/kg}$) and Henry's law constant ($H = 1.06 \times 10^5 \text{ Pa}\cdot\text{m}^3/\text{mol}$) suggest that the substance will volatilize rapidly from water and partition to the air compartment. However, QSAR estimates of half-life in the air are 1.57 days for the cis-isomer and 1.571 days for the trans-isomer. The half-life of the substance in the air is supported by a publication showing a lifetime of 26 days by its reaction with OH in the atmosphere. Thus, the substance is not P/vP. Based on the $\log K_{ow}$ value of 2.2, the substance does not meet the criteria for classification as carcinogenic in Category 1A, 1B or 2, or STOT RE in Category 1 or 2. Thus, the substance is not B/vB according to screening criteria. The test substance does not meet the criteria for classification as carcinogenic in Category 1A or 1B, mutagenic in Category 1A or 1B, reproduction in category 1A, 1B or 2, or STOT RE in Category 1 or 2. The substance is not toxic to aquatic organisms. Thus, the substance is considered not T. Based on all information, the substance is concluded to be not PBT/vPvB.	PBT status the substance is not PBT / vPvB
	Justification The substance is a gas at room temperature and is not readily biodegradable. In addition, it is likely to partition to the water rather than to the sediment and soil compartments as it has a relatively low partition coefficient ($\log K_{ow} = 1.6$) and adsorption coefficient ($K_{oc} = 71.1 \text{ L/kg}$). Furthermore, the high vapour pressure (427.1 kPa) and Henry's law constant ($8.7 \times 10^4 \text{ Pa}\cdot\text{m}^3/\text{mol}$) suggest that the substance will volatilize rapidly from water and partition to the air. Currently, there are no established persistence criteria for the air compartment. However, publications from Javadi et al. (2008) and S�ndergaard et al. (2007) show that the substance is removed by its reaction with OH in the air in 2 weeks. Based on all the evidence, it is concluded that the substance is not P/vP. Based on the $\log K_{ow}$ value of 1.6 at 25 °C and the estimated BCF value in aquatic organisms of 4.57 L/kg ww, the substance is considered not B/vB according to screening criteria. The test substance does not meet the criteria for classification as carcinogenic in Category 1A or 1B, mutagenic in Category 1A or 1B, reproduction in category 1A, 1B or 2, or STOT RE in Category 1 or 2. The substance is not toxic to aquatic organisms. Thus, the substance is considered not T. Based on all information, the substance is concluded to be not PBT/vPvB.

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Alternative blowing agents for low-pressure spray PU foam

Blowing agent considerations	Usable?	Technical issues	Outcome of technical issues
Hydrocarbons	✗	Flammable, volatile organic compound (VOC)	- VOCs have strict regulations due to smog creation-1991 Geneva Protocol & 1999 Gothenburg Protocol - Flammables cannot be used in spray foam applications - safety hazard UN FTOC
CFCs	✗	Ozone depleting	Outlawed per Montreal Protocol
HCFCs	✗	Ozone depleting	Outlawed per Montreal Protocol
HFCs	✗	High global warming potential	Being phased-down per Montreal Protocol's Kigali Amendment
Exxsol Blowing Agents (hydrocarbons)	✗	Flammable, volatile organic compound (VOC)	- VOCs have strict regulations due to smog creation-1991 Geneva Protocol & 1999 Gothenburg Protocol - Flammables cannot be used in spray foam applications - safety hazard
Formic Acid	✗	Toxic. Above 69°C explosive vapour/air mixtures may be formed.	Toxic Liquid
Electroset Technology	✗	Not applicable to spray applications	Additive only - not a blowing agent
Methyl Formate	✗	Extremely flammable. Toxic. Vapour/air mixtures are explosive.	Toxic & Flammables cannot be used in spray foam applications - safety hazard
Methylal	✗	Highly flammable, VOC, Vapour/air mixtures are explosive	- VOCs have strict regulations due to smog creation-1991 Geneva Protocol & 1999 Gothenburg Protocol - Flammables cannot be used in spray foam applications - safety hazard
Transcend ^(TM) Technologies	✗	Additive, not a stand alone BA	Not a standalone blowing agent, additive for HFCs and HFOs to improve compatibility
Water	✗	Creates an open-cell, low thermal value foam	Impossible to meet product requirements; loss of compressive strength reduces ability of foam to provide structural support. Cannot meet thermal (R-value) requirements. Co-agent only.
CO2	✗	Limited solubility, Small molecule escapes closed-cell quickly	Impossible to meet product requirements as a stand alone BA; cannot meet thermal (R-value) requirements per building codes. Co-agent only.
Noble gas (argon, etc.)	✗	Diffusivity, poor R-value, Small molecule escapes closed-cell quickly, limited solubility	Impossible to meet product requirements as a stand alone BA; cannot meet thermal (R-value) requirements per building codes. Co-agent only.
H2O2	✗	produces oxygen, poor R-value, flammable	Flammables cannot be used in spray foam applications - safety hazard
HFO-1234ze & HCFO-1233zd	✓	Numerous function issues have taken 7-10yrs to find solutions to make this technology workable.	Per global regulations, safety restrictions and building code requirements, this class has been deemed the only alternative.

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derogation

As PU foam manufacturers, we do not develop new blowing agent molecules; we rely on the blowing agent industry and they do not have alternatives to the insulating, non-flammable HFO compounds at this time. Developing and registering new molecules, followed by testing and certifying a new low-pressure spray PU foam product for the industrial and construction market, requires at least 12 years.

Eliminating the use of HFO blowing agent without valid alternatives would jeopardise heavily the activities of Fomicom and the network around it. This is a very small market with only 2 manufacturers in the EU and a very limited number of brand name products; there will be a small number of commentators (perhaps 3), and this should be seen as strong evidence.

The use of HFO-1234ze(E) and HCFO-1233zd(E) as foam blowing agent in low-pressure spray PU foams for use in all industrial and construction applications should be given a full derogation.