



HFO1233zd is a non-flammable Blowing Agent for polymeric foams with an extremely low GWP. Its complete chemical name is trans-1-Chloro-3,3,3-trifluoropropene. This molecule is used to replace various HFC, HCFC and other liquid Blowing Agents in more of applications, among which polyurethane foaming and of other thermosetting polymers.

DATI TECNICI	
Molecular Weight	130
Chemical Formula	CF ₃ -CH=CClH
Boiling Point	+19°C
Vapour Pressure	20°C = 1,06 Bar
Liquid Density	20°C = 1.296 g/ml
GWP	4,5 (100 Yeras)
ODP	0
OEL	800 ppm
UN:	3163

USAGE

HFO1233zd is mainly used as a Blowing Agent for polymers **with high insulation performances and a very low environmental impact.**

By thermosetting foams we mean for example Polyurethane, Integral skin and other polymers in general.

HFO1233zd is already being used in various applications, such as:
Foaming the framework of refrigerator cabinets, refrigerated glass showcases, metal sandwich panels, paper sandwich panels, spray foams for insulation purposes, pre-insulated pipes, blocks PU in general, integral skin foam, etc.

In Europe, Regulation EU 517/2014 "Fgas" is bringing to an end the use of HFC with a greenhouse effect that, at the moment, are still used to obtain foams with higher thermal insulation generally in systems premixed with Polyol and Blowing Agent.

In the last decades, Sinteco S.r.l. has been involved in designing blends of Blowing Agents meant for polyurethane expansion and of other expanded plastics, and in plant engineering for the management of foaming processes based on **n-Pentane, Cyclopentane, Cyclo/Isopentane, HFO...**

Since a few years, Sinteco S.r.l. is developing solutions for the application of the new and enviro-friendly Blowing Agent HFO1233zd, which not only can replace HFC still in use, but also complies with the provisions of the Ecodesign directive, thereby optimising polyurethane foam insulation.

Sinteco S.r.l. has conducted tests in the various sectors of rigid foam PU production using HFO1233zd pure and/or pre-mixed with other functional co-blowing agents fed directly to the foaming head or blended with Polyol immediately before and the test results proved very interesting (Sinteco's know-how).

Our tests confirmed an average increase of the foam thermal insulation Lambda by 22.5 to 23% in comparison with previous productions of expanded products taken as references, for example using Pentane and/or CO2 released from H2O/isocyanate reaction.



If you do not price polyurethane foam on foam volume or size, but you think in **terms of insulation factor K and Lambda**, on the basis of the results obtained, you can state that: **"compared to other solutions presently in use, it is financially more convenient to manufacture thermal insulation elements using a blend of HFO1233zd and other functional co-blowing agents as the blowing agent"**. In effect, considering the results obtained, you can decrease the foam thickness and save on the raw materials in general, reduce the isocyanate percentage involved in the process and obtain an insulation factor K and Lambda similar or exceeding that of a thicker foam with higher production costs.

OUR ENGINEERS WILL BE GLAD TO PROVIDE ALL DETAILS TO SUPPORT WHAT SPECIFIED ABOVE AND TO EVALUATE TOGETHER WITH YOU THE BEST BLOWING SOLUTIONS WITH USE OF HFO1233zd AND MODIFICATIONS, IF ANY, TO BE MADE TO YOUR FOAMING PROCESS.



PACKAGING ELEMENTS

HFO1233zd is handled in different types of packaging, as follows:

- In bulk using Isotanks
- 930 lt horizontal bottles
- 1100 lt vertical Mini-tanks
- Or in little cylinders 60-40-12 lt

PRODUCT TYPE

HFO1233zd, based on customer's needs and type of process involved, can be made available in different solutions:

- Pure
- Blended with other products to improve the performance and reduce the costs

INDUSTRIAL USE AND PERFORMANCE

ECODESIGN

A Directive 2009/125/EC, referred to as "Ecodesign", and a series of EU implementation regulations, among which Regulation 2019/2024/EC specific to refrigerating appliances, will lead to the need of producing polyurethane foams with higher thermal insulation to increase energy efficiency of refrigerated equipment, refrigerators, insulating panels for refrigerated rooms and the building sector. Also, as of March 2021, Regulation 2017/1369/EC will bring substantial improvements to refrigerated equipment through 3 energy efficiency improvement steps. In 2021 the energy classification of equipment will also change and the old classes A++ will be replaced with new classes where the best energy class is class A. **Therefore, in a few years even the most widespread foams produced using flammable hydrocarbons can be replaced with more performing foams providing better thermal insulation.**

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