



LOW GWP HYDROFLUOROOLEFINS (HFO)

Isofoam (insulation materials manufacturing in Kuwait) initiates XPS trial using Solstice Gas Blowing Agent to address environmental challenges

Isofoam: construction and engineering products

Sourcing an environmentally-responsible replacement for HCFCs.

Around the world, the extruded polystyrene industry is facing significant challenges as a result of the phasing out of Hydro-chlorofluorocarbons (e.g. HCFC-142b, HCFC-22) in the manufacturing process for insulation foam. HCFC-142b/22 blend has been the preferred blowing agent for decades in the XPS foam industry because of its superior insulation performance and ease of operation, but the material is ozone depleting as well as contributing to global warming. The consequence of this is that it is being phased out globally under the Montreal Protocol.

Kuwait, one of the largest XPS manufacturing countries in the Middle East, has decided to implement the phase-out program of HCFC-142b/22 in the XPS industry starting 2015 requiring businesses to find a new, effective solution that does not negatively impact on the ozone layer and which possesses minimal Global Warming Potential (GWP).

The company found through their trials done with Honeywell's Solstice® Gas Blowing Agent (GBA) that it is one of the good options for the production of Extruded polystyrene.

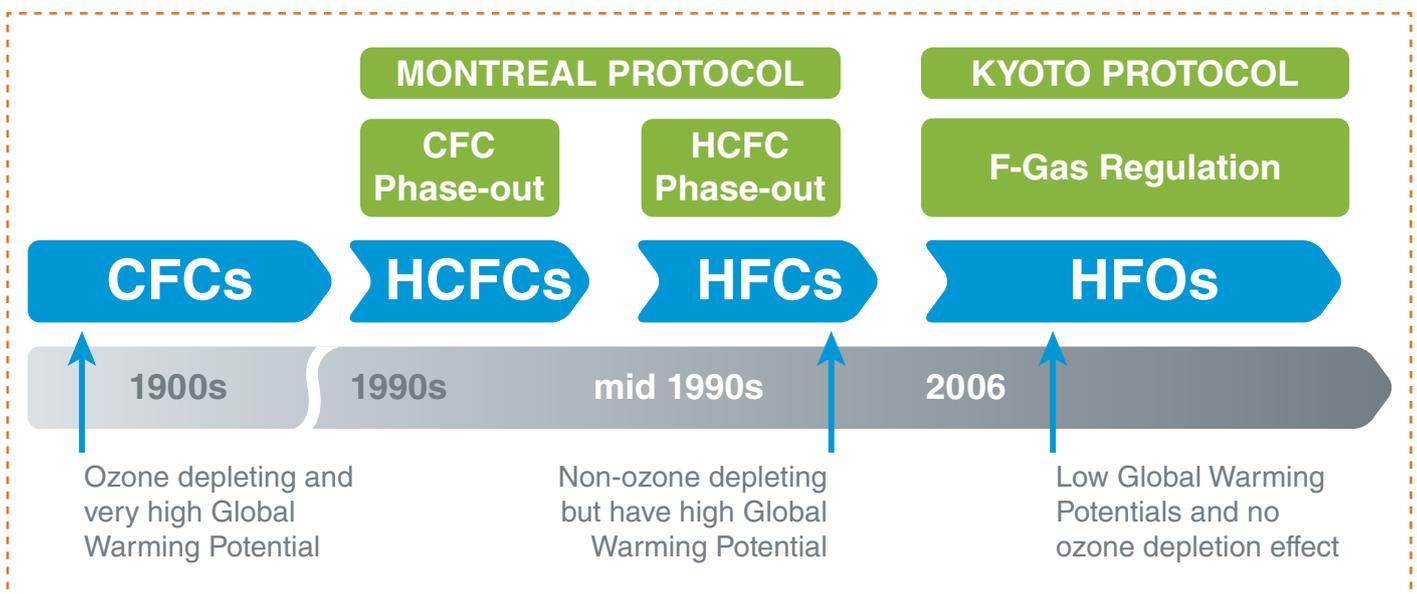
Background: Gaining competitive advantage through technology

Isofoam Insulating Materials Plants Co WLL is a Kuwait-based company engaged in the manufacture, wholesale and distribution of a range of heat insulation products for the construction industry.

The company's products include Isoboard, Styropor, Isopur and Isodek, which it provides to both the private and public sectors across the Kuwaiti market and other countries.

With the planned phasing out of Ozone Depleting Substances under the Montreal Protocol, including the established 142b/22 blend, Isofoam has been evaluating blowing agent capability in order to meet its customer requirements for insulation performance, compressive strength and low global warming potential.

In line with this strategy, Isofoam conducted trials using Honeywell's Solstice GBA on its existing HCFC-142b/22 lines.



Trial Setup: Testing Solstice® performance on existing production lines

Isofoam conducted trials on its existing HCFC-142b/22 extruder line, using a blend of Solstice GBA and dimethyl-ether (DME). Two GBA:DME blends were used in weight ratios of 60:40 and 70:30 (GBA:DME). Commonly produced boards of up to 65mm were then extruded with a density range of 26-47 kg/m³ using these blends.

Key observations from the trial:

- There were no safety issues.
- The overall product appearance was excellent as far as colour and surface appearance.
- The product was easily processed in the extruder once the operating limitations were determined.
- Isofoam is now refurbishing their production line to achieve optimum performance using Solstice GBA.

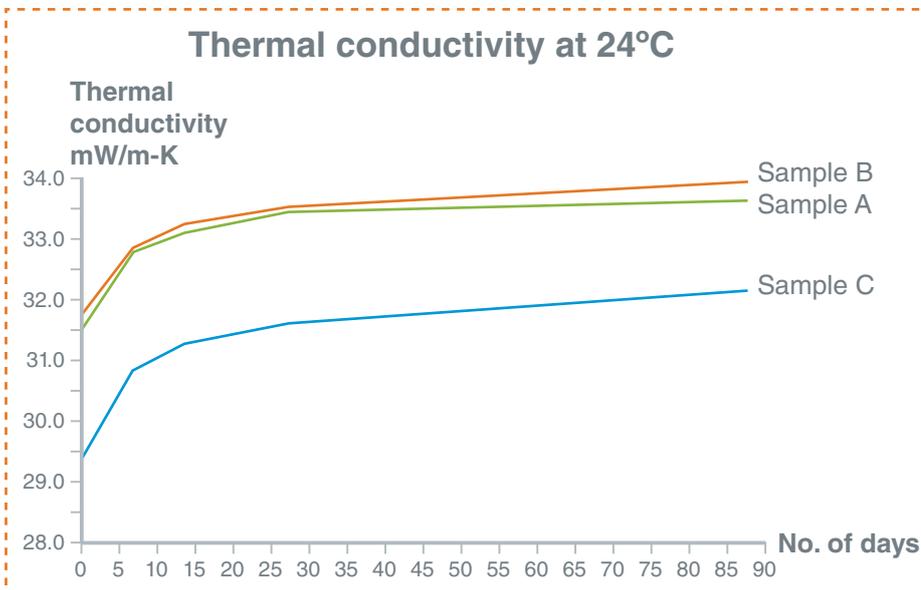
Headline results

- Solstice GBA provides improved energy performance over blowing agents currently in use
- Solstice GBA offers superior environmental properties over blowing agents currently in use, with a GWP of <1
- Solstice GBA blends deliver a product rated as excellent for compressive strength

“We’ve looked at various alternatives; Honeywell’s Solstice Gas Blowing Agent is found to be alternative for XPS production because of its low global warming impact, superior insulation properties and reliable foam characteristics compared to other alternatives. We strongly believe extruded polystyrene using Solstice GBA can be a good replacement where high performance insulation is required”

Mr. A. Chotani
General Manager, Isofoam, Kuwait

Product Core Density (ASTM D1622)		
Density	GBA:DME blend	kg/cu. metre
Sample A	70:30	22.8
Sample B	70:30	22.9
Sample C	60:40	30.3





Sector Perspective: Supporting a Sustainable XPS Industry

Solstice® Gas Blowing Agent (GBA) (HFO-1234ze) offers the XPS industry improved energy performance and superior environmental properties and is the replacement of choice for HCFC-142b/22 systems.

Solstice® GBA has no impact on the ozone layer, and possesses a low global warming potential (GWP) of <1, which has the effect of minimizing the climate change impact of the finished product. The HFO molecule retains all the positive attributes of HFCs: superior energy efficiency, good processability; and non-Volatile Organic Compound (VOC) properties, unlike hydrocarbon blowing agents.

Feedback: Gaining Competitive Advantage through Technology

Based on these performance results, Isofoam considers Solstice GBA to be a viable replacement to meet the increasing demand for high performance, non ODP, low GWP foams. To achieve optimum performance Isofoam is currently pursuing refurbishment of their existing manufacturing lines.

Physical properties

Molecular Weight	114
Boiling Point	-19°C
Vapour Thermal Conductivity	13.0 mW/m-K
Global Warming Potential (GWP)	<1
Non-Flammable	ASTM E-681 and EU A11
Lambda	27 mW/m-K



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RESPONSIBLE CARE

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