

Boxcold adopts Solstice[®] LBA for Long-Term Value in Cold Storage

“Solstice LBA provided a drop-in replacement for our previous HFC 365mfc/227ea and offered good performance from the outset. Almost no trials were needed to incorporate it effectively into our production facility and it exhibits excellent properties comparable to HFC 365mfc/227ea. Critically for us, Solstice LBA possesses an optimal environmental profile, which is a perfect fit for our business strategy. Overall, we are very happy with the new product.”

*Marco Moscagiuri,
Boxcold, Production Manager*

Case Study



Boxcold, based in Veglie, Italy, is a national and international leader in the production of commercial and industrial cold rooms for the manufacture, processing, and storage of both food and non-food products.

Operating out of a 70,000 m² state-of-the-art plant, Boxcold has invested in an advanced rigid polyurethane foam system used in the company's growing range of cold rooms and modular cabinets. However, F-Gas Regulation (EU) No 517/2014 mean that the foams that contain hydrofluorocarbons (HFCs) with GWP of 150 or more for foaming polyurethane (PU) sandwich panels cannot be used beyond 2023, so the company set about finding an alternative solution that would not only meet its performance criteria but also satisfy its commitment to sustainable manufacturing – a position underpinned by its use of 100 % renewable energy to power its facility.

The Needs

- Boxcold required a drop-in replacement for HFC 365mfc/227ea that would meet its rigorous thermal performance standards
- The blowing agent would need to comply with F-Gas Regulation (EU) No 517/2014 through an ultra-low global warming potential (GWP) and meet the company's strict environmental policy
- The blowing agent would need to satisfy Boxcold's strict quality requirements across a range of key metrics, including process flow, demoulding times, consistency, and excellent substrate adhesion



Solstice® Liquid Blowing Agent (LBA)

The Solution

Boxcold worked closely with its PU system provider, Tagos, to find a suitable alternative to its original HFC-based blowing agent HFC 365mfc/227ea. Tagos is a consolidate system house in Italy and Honeywell has had a long history with Tagos in former HFC technology and now in transitioning to HFO.

Honeywell's fourth generation HFO-based blowing agent, Solstice LBA, was identified as a near drop-in replacement which exhibited ultra-low GWP and is non-ozone-depleting, while delivering the performance required. This positioned Solstice LBA as a long-term solution that did not require any additional capital investment in equipment.

The Benefits

- Solstice LBA has enabled Boxcold to achieve the best thermal performance for its sandwich panels while reducing its environmental impact
- By having panels with optimum insulation, cold store owners and operators can save energy and money
- The new blowing agent positions the company ahead of competitors through the application of a sustainable, innovative solution
- Solstice LBA provides a balance between cost and thermal conductivity, offering perfect flatness and PU panel finish
- Solstice LBA provides a long-term solution through its ultra-low GWP while delivering excellent process capabilities, narrow density variation and good adhesion
- Solstice LBA is a near drop-in replacement for the predecessor agent HFC 365mfc/227ea
- Solstice LBA contributes to the company's eco-friendly credentials, adding to its growing reputation for sustainable manufacturing, as evidenced by its 100 % renewable energy usage
- Total cost of ownership for the Solstice LBA system is comparable to the previous system



Negative cold room



Stainless steel cold room

Boxcold – Delivering its long-term vision of ecofriendly PU manufacturing

The PU sector faces particular challenges with the introduction of strict rules governing the production and application of polyurethane foams blown using HFC blowing agents. The focus for regulatory authorities – and increasingly for customers – is on reducing the impact of these high GWP materials on the environment and for this reason, the use of HFC blowing agents will not be allowed in Europe as of 2023 per the F-Gas Regulation.

Among the options available to PU manufacturers and cold storage panel producers are:

	Insulation Performance (lambda)	Density	De-moulding time	Adhesion to steel facing
Water	-	-	-	-
Pentane	+	++	++	++
HFO	+++	++	+++	++

Additionally, any transition to pentane needs to take into account the high costs associated with safety equipment needed to mitigate the flammability risk, the operational requirements of constantly monitoring working areas, training of skilled personnel and the use of specialized detection equipment and powerful ventilation systems. Solstice LBA is nonflammable according to ASTM E-681, exhibits no flashpoint or vapour flame limits, and has no limitation on hazards classification.

Boxcold’s PU system supplier Tagos conducted an assessment of each type of blowing agent, including Solstice LBA, considering the relative performance of each option and the cost of implementation. This also involved comparisons with the predecessor system HFC 365mfc/227ea to ensure that quality standards would be maintained.

The assessment showed that Solstice LBA gave the company the most advantageous future pathway taking account of cost, process integration, energy efficiency, safety, product quality, and environmental impact.

“Tagos adopted an ISO 14001 certified Environment Management System in 2004 and since then we have been committed to continuously reducing the environmental impact of our products and activities. When we decided to replace the traditional, high GWP blowing agents, we considered Solstice LBA, which is now regularly used in our production of rigid PU foam systems.”

“It is a very effective, ultra-low GWP blowing agent with very good permanency in the PU foam’s closed cells, which guarantees long-term low thermal conductivity. With Honeywell’s Solstice LBA we succeeded twice: by quitting the use of high-GWP products and by allowing our customers to achieve lower thermal conductivity which translates into higher energy efficiency of freezers, refrigerators, cold rooms and buildings.”

Marco Monzeglio,
Managing Director of Tagos



Modular cabinet

The Solstice LBA Advantage

- Honeywell Solstice Liquid Blowing Agent is the latest advance in blowing agent technology. It is a non-ODP, ultra-low GWP, nonflammable, energy-efficient blowing agent ideally suited to PU foaming for cold storage insulation applications, and does not require platform design changes or process configuration modifications.
- It offers up to 20% better insulation performance than pentane-based blowing agents, while delivering better energy efficiency especially at low temperatures. With a GWP of 1, its widespread adoption could save about 60 million metric tons per year of CO₂ equivalent, comparable to eliminating carbon dioxide emissions from more than 11.8 million cars every year.*
- Solstice LBA is nonflammable according to ASTM E-681, exhibits no flashpoint or vapour flame limits, and has no limitation on hazards classification. Solstice LBA has a very low Maximum Incremental Reactivity (MIR) when compared to hydrocarbon blowing agents. It is also a near drop-in replacement for liquid HCFC, HFC, hydrocarbons and other non-fluorocarbon blowing agents – it does not require expensive hydrocarbon storage and handling or risk mitigation equipment.

* Source: GHG Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energyresources/calculator.html>

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