

SOLSTICE[®] LIQUID BLOWING AGENT (LBA) HELPS FESTIVO ACHIEVE ENERGY RATINGS AND ENVIRONMENTAL TARGETS

**LASSE KORPELA,
CEO, FESTIVO GROUP**

“What we have been able to achieve through Solstice LBA is to reach new levels of energy efficiency for our products without the need for major investment in new manufacturing equipment. At the same time, we are also improving our environmental performance, which is very important to the company’s SCR commitments and the concerns of our people and our customers”

Honeywell

Festivo Group, founded in 1994 in Finland, manufactures refrigeration equipment for domestic and commercial markets. With a strong reputation for quality and technological innovation, its 65 employees in Hollola operate modern manufacturing facilities that produce refrigeration units to satisfy growing demand in households, the food industry, hospitals, pharmacies and scientific institutions. Its primary markets are Scandinavian countries and Russia.

THE NEEDS

In 2014 all models with Energy Class 'A' were phased out, and the lower limit of the 'A+' class, the limit for Ecodesign, was increased from EEI 44 to EEI 42 meaning a 5% increase in energy efficiency. At the moment there are 3 labeling classes active, i.e. A+/A++/A+++ at lower class limits of EEI 42/33/22. With these strict directives on labeling, Festivo intends to achieve new level of energy efficiency without a need for a major investment in new equipment and therefore looked for a solution that would work with its existing high pressure foaming machines..

OPTIMISING REFRIGERATION INSULATION

Energy efficiency has become a major driver for Festivo as a result of the Ecodesign Directive (to meet A+ standards) and growing consumer demand for products that consume less energy but that also take account of environmental concerns.

The company embarked upon a trial of Honeywell's fourth generation blowing agent – Solstice® LBA – to improve the energy consumption of its products and to mitigate its impact on the environment. It was particularly focused on finding a solution that would work with its existing high- pressure Hennecke foaming machines, rather than having to commit to major investment in new equipment.

Their foam objects ranging from 300g to 8000g via single injection into horizontal presses for doors and into horizontal jigs for refrigerator bodies.

With Solstice LBA, they found a blowing agent that was not only a perfect near drop-in replacement for the previous HFC-245fa system, but which also improved the insulation properties and energy performance of the final product.

Solstice LBA is a hydro-fluoro-olefin (HFO-1233zd (E)), with a global warming potential of 1, which is 99.9% lower than the products it replaces, and equal to carbon dioxide. It is non-ozone-depleting and non-flammable.



THE BENEFITS

The introduction of strict rules governing the production and application of polyurethane foams blown using CFC or HCFC agents, means that manufacturers of refrigeration equipment are focused on the production of foams with zero Ozone Depletion Potential (ODP) and ultra-low Global Warming Potential (GWP).

As a result, there are a number of considerations for manufacturers to take into account when it comes to the production of insulation foam:

- Water-based systems require a higher density on application; the molds have to be heated, otherwise the adhesion to supports becomes critical. Since the polyol has a high viscosity, the mixing is more difficult; and the values of thermal conductivity deteriorate with age (see graph opposite)

- A transition to hydrocarbons needs to take into account the high capital investment of switching to pentanes, its highly flammable nature (requiring special detection equipment), and the need for comprehensive ventilation systems

In contrast, Honeywell's innovative HFO-based Solstice[®] LBA provided Festivo with a near drop-in replacement to help deliver A+ energy ratings in the end product without the need for major infrastructure investment.

A production trial was arranged to test the viability of Solstice LBA as a long-term solution.

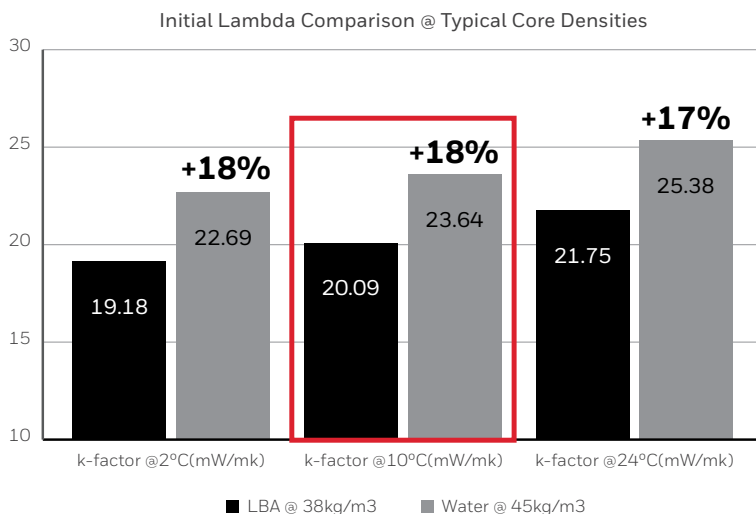
FIELD TRIAL: PROVING THE BUSINESS CASE

The trial compared the relative performances of manufacturing a polyurethane panel using a water-based system, an HFC 245fa blown system, and Solstice LBA.

The trial exhibited the following results:

- Insulation foams produced using Solstice LBA delivered an improvement in performance that contributed to the achievement of A+ energy rating for the company's refrigeration products.
- The trials demonstrated an 8% gain in energy efficiency in the Solstice LBA system in comparison to the low HFC 245fa content system previously used by the company. The improvements were verified over 24 hour continuous running.
- Impressive consistency in delivering optimal temperature stability and differential control – essential for the company's growing success in the high value laboratory and medical market.

Lambda Value Comparison – Solstice vs. Water



The panel made with Solstice LBA showed better Lambda performance over a 180 day period.

COMPANY-WIDE ADOPTION

Following the trials, Festivo adopted Solstice[®] LBA across all its operations and is now focused on extending its markets geographically into Sweden, Norway, and Russia.

The company is the only designer and manufacturer of household refrigeration units in northern Europe and is particularly successful in meeting demand in Scandinavian countries for larger-sized units. Festivo's products are well regarded by consumers for their sturdy structure, large interior spaces and zonal cooling technology that creates layered and controlled humidity to help foods retain their freshness.

At the same time, Festivo has recently opened a new market in laboratory and medical sectors as a result of its ability to combine A+ energy performance with units offering the highly sensitive temperature control so critical in hospital and laboratory environments. In addition, Festivo's ability to demonstrate the environmental benefits of using Solstice LBA enhances the overall proposition to these sectors.



SOLSTICE LBA – A DROP-IN REPLACEMENT WITH ENVIRONMENTAL BENEFITS

Honeywell Solstice LBA is the latest advance in blowing agent technology.

It is an ultra-low GWP, nonflammable, energy-efficient blowing agent for refrigerator and freezer insulation applications and, as proven by Festivo, does not require platform design changes or significant process configuration modification.

It offers up to 10-12% better performance than cyclopentane; 8% better than HFC-245fa (unoptimised), while delivering better energy efficiency at low temperatures. With a GWP equal to 1, its widespread adoption could save about 60 million metric tonnes per year of CO2 equivalent, comparable to eliminating carbon dioxide emissions from more than 11.8 million cars every year.*

Solstice LBA is a nonflammable liquid by 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>)



Honeywell's innovative HFO-based Solstice® Liquid Blowing Agent (LBA) provided Festivo with a near drop-in replacement agent to help deliver A+ energy ratings in end product without the need for major infrastructure investment. Festivo adopted Solstice LBA across all its operations and is now focused on extending its markets geographically into Sweden and Norway and also into Russia.

For more information

hwl.co/solstice-lba-appliance

