EXCEPTIONAL PERFORMANCE.
WITH NO EXCEPTIONS.
HONEYWELL FOAM BLOWING AGENTS
Features and Benefits

**Solstice® LBA (HFO-1233zd(E))**
- GWP = 1; 99.9% lower than HFCs and equal to CO₂
- Non-flammable (ASTM E-681)
- Non-ozone-depleting
- Official WEEL value (PEL) is 800 ppm
- More energy efficient than HFCs and hydrocarbons
- VOC-exempt
- U.S. EPA SNAP listed
- TSCA Inventory listed

**Enovate® 245fa (HFC-245fa)**
- Non-flammable (ASTM E-681 and EU A11)
- Non-ozone-depleting
- VOC-exempt
- U.S. EPA SNAP listed
- TSCA Inventory listed

Over the past few years, Honeywell has successfully commercialized two new foam blowing agents. Solstice® Liquid Blowing Agent (HFO-1233zd(E)) and Solstice® Gas Blowing Agent (HFO-1234ze(E)) are now in use globally and being produced in two new world-class production facilities, which started up in 2014 in Louisiana. To date, nearly 40 customers globally have adopted Solstice® LBA and GBA.

**Solstice® Blowing Agents Examples**
Some other examples where Solstice® Blowing Agents are being used or in development include: appliance insulation, pipe, tank and vessel insulation for the LNG industry, foam seating, shoe soles and much more.

For more case studies and testimonials, visit honeywell-blowingagents.com/resources
**SOLSTICE® FOAM BLOWING AGENTS**

**U.S. EPA RULES ACCELERATE ADOPTION ACTIVITY**

The U.S. EPA has announced phaseout dates for high-global-warming-potential HFC blowing agents under its Significant New Alternatives Policy (SNAP) program through two new rules (20 and 21) published in 2015 and 2016. These rules will lead to increased adoption of materials with radically lower global warming potentials, like Honeywell’s Solstice® Liquid Blowing Agent (LBA) and Solstice® Gas Blowing Agent (GBA). For example, HFC blowing agents are banned in integral skin applications beginning January 1, 2017. Contact a Honeywell representative for a complete breakdown of replacement foam blowing agents by application.

**HCFC Blowing Agents Banned in Mexico**

With HCFC-141b banned in Mexico for use in all applications as of Dec. 31, 2016, the region is transitioning to HFC blowing agents or adopting 4th generation HFO blowing agents.

**EUROPE**

- **F-Gas Regulation** for certain applications: By 2020, HFCs must have GWP below 250. By 2022, HFCs must have GWP below 150. General phasedown of HFC consumption between 2015 and 2030.
- **MAC Directive**: GWP < 150 for automobiles
- **Countries with HFC taxes in place**: Denmark (2001), Norway (2003), Slovenia (2009), Spain (2014), Countries considering HFC taxes: France, Poland and Sweden

**JAPAN**

METI regulating HFCs with GWP limits in MAC, RAC, Comm Ref, and blowing agents starting 2015 thru 2025. HFC phaseout for spray foam 2020.

**MEXICO**

Credit for voluntary replacements of HFCs in new MAC similar to EPA’s CAFE credits. Phase-out of HFCs in MAC may be effective by 2017 for 2018 models. Bans in other sectors to be considered after EPA final rule. HCFC-141b blowing agent banned in Mexico for all applications as of December 31, 2016.

**SOUTH KOREA**

2016 implemented credit for replacement of HFCs in MACs

**UNIVERSAL AGREEMENT**

- **Historic Accord Reached** to Phase Down HFCs Globally

On October 15, 2016, delegates to The Montreal Protocol agreed in Kigali, Rwanda, to an historic amendment that adds high-GWP HFCs to the Protocol and establishes schedules for their phase down in developed and developing countries. The accord will further accelerate the adoption of HFC substitutes used for aerosols, foam insulation, and air conditioning and refrigeration equipment.

In the EU, F-gas regulations passed in 2014 will affect the current HFC market in two ways:

- Through bans by application, which began to affect some applications in January 1, 2015
- Through the availability of HFCs in the EU

For example, as early as 2018, supply will be cut by 37% compared to the total quota for 2015. In 2021, the cut will be 55% compared to the 2015 baseline. Japanese producers began including the GWP on HFC products in April of 2015, and will phase out HFCs in spray foam starting in 2020.

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Solstice® LBA: An Ideal Replacement for HFCs in Integral Skin Application

By replacing HCFCs or HFCs with Solstice LBA, you can produce foam with the comfort level and density you want with a tough skin and fewer defects, while meeting changing blowing agent regulations calling for a transition to low-GWP blowing agents. For example, the use of HFC blowing agents in integral skin polyurethane foam applications has been banned in the U.S. beginning Jan. 1, 2017, and other countries are expected to follow.

Closed-cell Foam with Solstice® LBA Tops Shopping Center Roof

"NCFI’s system was specified due to its ability to seamlessly and monolithically seal this roof from water. It will also improve the building’s energy efficiency by providing superior insulation value. The white top coat will help protect it from ultraviolet rays."

M itch Clifton
Sales Director, NCFI Polyurethanes

Customers have found success using Solstice® blowing agents in many applications.

AWIP: First to North American Market with Panels Using Solstice® LBA

“Solstice® LBA makes our panels more efficient and will advance our insulated metal panel technology to further meet the growing energy, environmental and economic challenges facing the North American building industry.”

William Lowery
President, All Weather Insulated Panels

honeywell-blowingagents.com

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