



Use less Honeywell blowing agent to achieve equivalent properties to foam made with HCFC-141b.

## **Cost-Effective Replacements for HCFC-141b**

Spray Foam Insulation



## **Replace HCFC-141b in Your Spray Foam Formulation with Confidence**

Honeywell, Blowing Agent Technology Leader for 70+ Years

Honeywell has been at the forefront of blowing agent technology for decades, first offering chlorofluorocarbons like CFC-11, followed by HCFC-141b.

Honeywell's Enovate® 245fa (HFC-245fa), part of the third-generation of hydrofluorocarbons (HFCs), has long been considered a standard in the spray foam insulation industry. For over 15 years, it has delivered proven performance globally in spray foam wall and roof applications. It has a global-warming-potential (GWP) of 858.

In 2014, Honeywell introduced Solstice® Liquid Blowing Agent (HFO-1233zd(E)), based on hydrofluoro-olefin (HFO) technology, which retained all the positive attributes of Enovate 245fa, but boasts a GWP of 1, which is 99.9 percent lower than HFCs and equal to carbon dioxide.

### **Cost-Effective Solutions, Available Today, Offer Equal or Better Performance**

Honeywell tested spray foam formulations with various blowing agents as replacements for HCFC-141b. Both of the Honeywell blowing agent solutions, Enovate 245fa and Solstice LBA, provide the following benefits:

- Nonflammable - no flame limits
- Non-ozone-depleting
- Compatible with most materials of construction
- Thermally stable
- Better low temperature thermal performance
- Liquid at room temperature

Review the following blowing agent comparison information to help determine which solution is best for you.

## Formulation Detail

Parts	HCFC-141b System	HFC-245fa System
Polyol A	33	40
Polyol B	14	18
Polyol C	—	15
Polyol D	18	—
Water	2	3
Flame Retardant	6.5	6.5
Catalyst A	0.5	0.5
Catalyst B	3.5	3.5
Catalyst C	0.14	0.14
Surfactant	1.5	1.5
Glycerine	4	4
HCFC-141b	18	—
HFC-245fa	—	12

## Physical Property Data

	HCFC-141b System	HFC-245fa System
Core Density (kg/m <sup>3</sup> )	32.5	32
Dimensional Stability, (% Volume Change at 28 Days)		
-20°C	2.0	1.8
70°C	1.9	2.0
Initial $\lambda$ (mW/mK) @10°C	20.3	20.9

## HFC-245fa vs HCFC-141b

### Cost-effective in formulations:

- Near “drop-in” replacement
- Superior blowing efficiency—potential to use less blowing agent for comparable formulation cost
- Good miscibility in polyols
- Nonflammable polyol blends

### Cost-effective in the field:

- Reduce blowing agent levels by 30% or more and achieve equivalent lambda
- Use existing equipment
- Wider application window

Use less Enovate 245fa to achieve equivalent properties to foam made with HCFC-141b.

## Solstice LBA vs HFCs

### Next-Generation Solstice Liquid Blowing Agent Available Today

In addition to Enovate 245fa as a replacement for HCFC-141b, Honeywell offers Solstice LBA, a proven, ultra-low GWP replacement for HFCs or HCFCs. Solstice LBA not only enables superior foam performance, it helps your formulation stay ahead of changing environmental regulations (see sidebar).

### Cost-effective in formulations:

- Superior blowing efficiency—potential to use less blowing agent
- Lower molecular weight than HFC-245fa or HFC-365mfc means less blowing agent needed to do the job
- Lower vapor pressure in polyol blends—as much as 60% lower in formulations tested
- Higher miscibility in polyols—as much as 20% higher than HFC-245fa in polyols tested
- Nonflammable polyol blends

### Cost-effective in the field:

- Improved lambda—4-6% better than foams made with HFCs
- Improved blowing efficiency—10-15% yield improvement reported in the field
- Use existing equipment
- Equivalent application window

Use equal or less Solstice LBA to achieve the same or better insulation performance than HFCs.

## Global Environmental Treaty Mandates Product Phaseout

*As defined by the Montreal Protocol, Article V countries are being required to phase out their use of HCFC blowing agents, such as HCFC-141b.*

*In October 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.*

## Honeywell Technical Services Helps You Develop Optimized Solutions

Our technical service experts, located around the world, provide consulting services that can help you optimize your formulation and recommend materials that can further improve your foam performance.

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### Interested in learning more?

To discuss your formulation requirements or to start a trial with a Honeywell blend today, call 1.800.631.8138 or visit: [www.honeywell-blowingagents.com](http://www.honeywell-blowingagents.com)



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