

Solstice® Propellant

**REDUCING YOUR CARBON FOOTPRINT**

# Honeywell Solstice<sup>®</sup> Propellant

Aerosols are used in a variety of products from personal and household care to insect sprays and industrial uses, such as precision and electronics cleaners and spray paints. They are efficient and safe in use, tamper-proof and allow for controlled product delivery. With the advent of global warming-based regulations in many regions, HFC (hydrofluorocarbon) propellants, such as 134a and 152a, have come under pressure as potential contributors to global warming. In response to current and possible future restrictions on the use of HFCs, Honeywell introduced Solstice<sup>®</sup> Propellant, which has all the performance benefits of hydrofluorocarbons, but exhibits very favorable environmental properties.

## THE PRIMARY APPLICATIONS FOR SOLSTICE PROPELLANT ARE:

- Degreasers
- Dusters
- Household Care Products
- Insect Freezer Spray
- Novelty Aerosols
- Personal Care Products
- Technical Aerosols
- Tire Inflators
- Topical Anesthetics





Honeywell's Solstice Propellant delivers across the dimensions that are most important to users:

Performance

Cost Effectiveness

Sustainability

Safety

Regulatory Compliance

## Performance and Cost Effectiveness

Propellants can be divided into two broad categories: liquefied gases and compressed gases. Both are used in a variety of aerosol products, although liquefied gases are far more common because of the desirable properties they provide. For example, liquefied gas propellants provide constant pressure, delivery rate and spray characteristics from the beginning to the end of the can. With compressed gas propellants, pressure in the can will drop as the product is used, resulting in changing delivery rates and spray characteristics. Propellants can be further divided into flammables and nonflammables. Depending on the end uses, nonflammable propellants are preferred or required in some products.

Solstice Propellant (HFO-1234ze(E)) offers a high degree of versatility to the formulator. It is nonflammable and has a moderate vapor pressure of 49 PSIG (3.4 bars-gauge) at 70°F (21°C) and 147 PSIG (10 bars-gauge) at 130°F (54°C), per ASTM E-681, ISO 15016, EU-A11, and Global Harmonization Standards (GHS). This is a potential benefit when Solstice Propellant replaces HFC-134a in products like dusters and freeze sprays. Since the vapor pressure of unblended HFC-134a exceeds the limit for 2Q cans, special cans have been required. These will not be needed with Solstice Propellant.

Solstice Propellant mixes with other common propellants such as 134a, 152a, DME, butane, isobutane and propane. It is also miscible and compatible with many commonly used solvents like the lower alcohols, ketones, halogenated solvents and hydrocarbons, providing a variety of formulation options.

Solstice Propellant is thermally and hydrolytically stable and exhibits good compatibility with plastics, elastomers and metals. In particular, Solstice Propellant has been shown to be compatible with aluminum, tinplate aerosol cans and PET-lined aerosol cans. Solstice Propellant has also been tested with aerosol valves and found to be compatible with common gasket materials including grades of butyl rubber, buna and neoprene.

Customers have generally found conversion costs to be minimal as Solstice Propellant requires little or no change to existing filling equipment.





## Sustainability

Honeywell Solstice Propellant is a replacement for liquefied gas propellants currently in use, with the potential to make significant reductions in greenhouse gas (GHG) emissions and ground level ozone creation.

When substituted for HFC-134a in aerosol products, the use of Solstice Propellant can substantially reduce GHG emissions. With a global warming potential (GWP) of less than 1, its widespread worldwide adoption could save more than 11 million metric tons per year of CO<sub>2</sub> equivalent emissions, comparable to eliminating carbon dioxide emissions from more than 2.3 million cars every year.\*

Additionally, with a maximum incremental reactivity (MIR) value of 0.09 g O<sub>3</sub>/g VOC, Solstice Propellant does not contribute to ground-level ozone creation and is excluded from the definition of volatile organic compound (VOC) by the U.S. Environmental Protection Agency (EPA) and the California Air Resource Board (CARB).

Overall, Solstice Propellant provides the best solution from an environmental standpoint with an ultra-low photochemical reactivity and GWP.

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## Safety

Solstice Propellant is a UN class 2.2 nonflammable liquefied gas. The results of an extensive set of toxicity tests support the conclusion that Solstice Propellant exhibits a very low order of toxicity. Accordingly, the American Industrial Hygiene Association (AIHA) has assigned a Workplace Environmental Exposure Limit (WEEL) of 800 ppm (8-hour time-weighted average).



## Regulatory Compliance

Solstice Propellant complies with global regulations. The product is registered in Europe under REACH (Regulation 1907/2006) for tonnages of more than 1,000 tonnes/annum. It was added to the SNAP List of Acceptable Substitutes for Aerosol Applications in June 2010 and was added to the TSCA inventory without restrictions in November 2010. It is also registered in Japan, China, Canada, Australia and South Korea.



## Availability

Solstice Propellant is available globally and currently supplied from a commercial-scale facility in the United States. Solstice Propellant has a suggested retail price of US\$ 6.50/lb\*\* (continental U.S. only).

\*Source: GHG Equivalencies Calculator: <http://www.epa.gov/cleanenergy/energy-resources/calculator.html>

\*\*Honeywell MSRP as of December 2015. Honeywell reserves the right to change MSRP without notice.

### For more information

[www.honeywell-solstice-propellants.com](http://www.honeywell-solstice-propellants.com)

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FP-PF-60 | Rev10 | 12/2015  
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