



# Solstice® Propellant: Comparison with Common Propellants

## Physical Properties and Regulatory Comparison (U.S. Only)

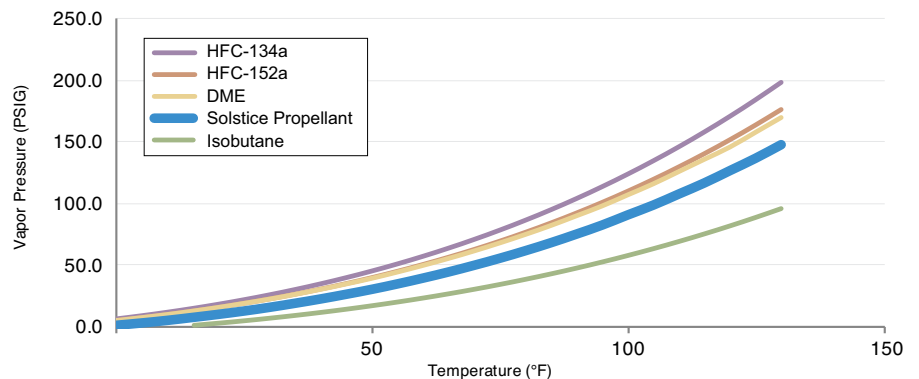
| Requirement  | Solstice®<br>Propellant<br>HFO-1234ze(E) | HFC-134a | HFC-152a | DME      | Propane | i-Butane | n-Butane |
|--|--|----------|----------|----------|---------|----------|----------|
| <b>Global Warming Potential (GWP) vs. CO<sub>2</sub>, 100 year ITH<sup>1</sup></b> | <1                                       | 1300     | 138      | 1        | 3.3     | 3        | 4        |
| <b>Volatile Organic Compound (VOC)<sup>2</sup></b>                                 | No                                       | No       | No       | Yes      | Yes     | Yes      | Yes      |
| <b>Flammability<sup>3</sup></b>  | No                                       | No       | Yes      | Yes      | Yes     | Yes      | Yes      |
| <b>LFL / UFL<sup>4</sup></b><br>(Vol.% in Air @70°F)                               | NONE                                     | NONE     | 3.9/16.9 | 3.4/18.0 | 2.2/9.5 | 1.8/8.4  | 1.9/8.5  |
| <b>Molecular Weight</b>  | 114                                      | 102      | 66       | 46       | 44      | 58       | 58       |
| <b>Boiling Point (°F)</b>  | -2.2                                     | -15      | -13      | -13      | -44     | 11       | 31       |
| <b>Vapor Pressure (PSIG) @70°F</b>   | 49                                       | 71       | 62       | 63       | 108     | 31       | 17       |
| <b>(PSIG) @130°F</b>   | 147                                      | 199      | 176      | 174      | 257     | 97       | 66       |
| <b>KB Value</b>  | 12                                       | 9        | 11       | 60       | 15      | 18       | 20       |
| <b>Specific Gravity @70°F</b>  | 1.17                                     | 1.22     | 0.91     | 0.67     | 0.51    | 0.55     | 0.58     |

<sup>1</sup> ITH; integrated time horizon. Data from Intergovernmental Panel on Climate Change (IPCC) report, 2013 (for Solstice Propellant/HFO-1234ze(E), HFC-134a, HFC-152a) and <http://www.epa.gov/ozone/snap/aerosol/list.html> (for DME, propane, i-Butane and n-Butane).

<sup>2</sup> VOC exempt status—U.S. EPA; California Air Resources Board (CARB)

<sup>3</sup> ASTM E681 and ISO 10156 flammability testing

<sup>4</sup> LFL/UFL; lower flame limit/upper flame limit



# Physical Properties and Regulatory Comparison (Outside U.S.)

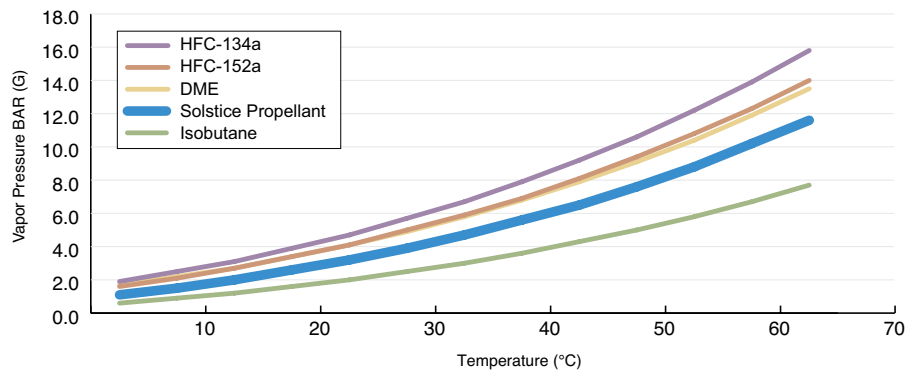
| Requirement  | Solstice®<br>Propellant<br>HFO-1234ze(E) | HFC-134a    | HFC-152a    | DME         | Propane    | i-Butane   | n-Butane   |
|--|--|-------------|-------------|-------------|------------|------------|------------|
| Global Warming Potential (GWP) vs. CO <sub>2</sub> , 100 year ITH <sup>1</sup> | <1                                       | 1300        | 138         | 1           | 3.3        | 3          | 4          |
| Volatile Organic Compound (VOC) <sup>2</sup>                                   | No                                       | No          | No          | Yes         | Yes        | Yes        | Yes        |
| Flammability <sup>3</sup>  | No                                       | No          | Yes         | Yes         | Yes        | Yes        | Yes        |
| LFL / UFL <sup>4</sup><br>(Vol.% in Air @21°C)                                 | NONE                                     | NONE        | 3.9/16.9    | 3.4/18.0    | 2.2/9.5    | 1.8/8.4    | 1.9/8.5    |
| Molecular Weight   | 114                                      | 102         | 66          | 46          | 44         | 58         | 58         |
| Boiling Point (°C)   | -19                                      | -26         | -25         | -25         | -42        | -12        | -0.5       |
| Vapor Pressure<br>barg @21.1°C<br>barg @54.4°C                                 | 3.4<br>10.1                              | 4.9<br>13.7 | 4.3<br>12.1 | 4.3<br>12.0 | 7.5<br>7.7 | 2.1<br>6.7 | 1.2<br>4.5 |
| KB Value   | 12                                       | 9           | 11          | 60          | 15         | 18         | 20         |
| Specific Gravity<br>@21°C  | 1.17                                     | 1.22        | 0.91        | 0.67        | 0.51       | 0.55       | 0.58       |

<sup>1</sup> ITH; integrated time horizon. Data from Intergovernmental Panel on Climate Change (IPCC) report, 2013 (for Solstice Propellant/HFO-1234ze(E), HFC-134a, HFC-152a) and <http://www.epa.gov/ozone/snap/aerosol/list.html> (for DME, propane, i-Butane and n-Butane).

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## Contact Honeywell to Learn More

To learn more about the benefits of Solstice Propellant, call Honeywell at 1-800-631-8138 or visit [www.honeywell-solstice-propellants.com](http://www.honeywell-solstice-propellants.com)

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