

Solstice[®] yf Refrigerant Fact Sheet

Solstice [®] yf	<ul style="list-style-type: none">• Developed for automobile air-conditioning• Low global warming potential (<1)• Comprehensively tested and conclusively confirmed safe• Reliable• Cost-efficient
Solstice [®]	Registered trade name of the refrigerant
HFO-1234yf	Describes an organic fluorine compound called hydrofluoro-olefin a specific set of compounds and specific isomer
MAC Directive	Starting in January 2011, all new vehicle types sold in Europe must have an air-conditioning refrigerant with a global warming potential (GWP) below 150. From 2017 on, this will apply to all new vehicles. This is based on the European MAC Directive (2006/40/EC), passed in July 2006.
Development	Honeywell and DuPont, in a joint development agreement, developed the new low global warming potential refrigerant to replace HFC-134a. They are commercializing the product independently. Honeywell is selling the product under the brand name Solstice [®] yf refrigerant.
Environmental Benefit	Solstice [®] yf refrigerant has a GWP of <1. It significantly exceeds the mandate of the MAC Directive (GWP below 150), by 99.3%.
Approval	<p>Solstice[®] yf refrigerant can be used in Europe, Japan, Korea, Canada, the U.S. and other countries.</p> <p>Solstice[®] yf refrigerant is registered under the EU chemical regulation REACH (Registration, Evaluation, Authorization and Restriction of Chemicals).</p> <p>Solstice[®] yf refrigerant is also included in the U.S. EPA's SNAP Program (Significant New Alternatives Policy). With this program, the EPA evaluates new and improved substances that replace ozone-depleting substances.</p>
Time of Implementation	The adoption of Solstice [®] yf is progressing apace. Car manufacturers will receive the product according to their commitments.
Quantity	About 600 grams of refrigerant are contained in modern air-conditioning equipment; refills might be necessary in the automotive lifecycle.
Scientific Studies	<p>Honeywell ensures that all products undergo intense testing both internally and externally, especially during the development phase.</p> <p>SAE International has tested Solstice[®] yf refrigerant for five years in their Cooperative Research Programs. Eighteen international, independent scientific institutions and 15 international car manufacturers and component suppliers have participated in these programmes. These industry participants include: Audi, BMW, Chrysler, Daimler, Fiat, Ford/Volvo, GM/Opel, Honda, Porsche, PSA, Renault, Jaguar/Land</p>

Rover, Toyota and VW, as well as Conti Tech, Delphi, Denso, DuPont, Freudenberg, Goodyear, Maflow, Valeo and Visteon.

SAE has stated that Solstice[®] yf refrigerant is safe for use in automobiles.

After a thorough examination of the SAE's work and of all other studies and tests on the refrigerant, the Joint Research Center of the EU (JRC) in spring 2014 conclusively confirmed that Solstice[®] yf can safely be used in automobile air-conditioning.

Crash Tests

Automotive manufacturers and component suppliers have tested Solstice[®] yf refrigerant in detail during the SAE Cooperative Research Program. They have access to modern testing facilities and broad experience in conducting these tests. Two examples:

1. An automobile OEM performed a crash test with Solstice[®] yf refrigerant at 65 km/h (in accordance with EuroNCAP Protocol). The result was 'no fire'.

2. A separate OEM conducted a crash test with Solstice[®] yf refrigerant in an automobile at 56 km/h (in accordance to ECE 94). The engine had been running for a long time and was particularly hot. Again, there was no fire.

3. Moreover, together with TÜV Rheinland, Opel conducted a dynamic real-life crash test under extreme conditions with its model Mokka 1.4 Turbo (the Opel Mokka received the best possible rating of five stars in the NCAP rating). The car hit a moving deformable barrage – and again, no fire occurred.

Safety

Note: now there are two classes under 1272/2008:

Category Criteria

1. Gases, which at 20 °C and a standard pressure of 101.3 kPa: (a) are ignitable when in a mixture of 13% or less by volume in air; or (b) have a flammable range with air of at least 12 percentage points regardless of the lower flammable limit.

2. Gases other than those of Category 1, which, at 20 °C and a standard pressure of 101.3 kPa, have a flammable range while mixed in air.

Class 1 is 'Extremely flammable' and Class 2 is 'Flammable'.

Tests under real-life conditions have shown that the product does not ignite on surfaces up to 800 °C. The auto ignition temperature is established using a test protocol set at 405 °C.

Additional Resources

Additional Safety information for Solstice[®] yf refrigerant (HFO-1234yf) can be found at www.honeywellmsds.com.

www.1234facts.com has the latest industry information regarding Solstice[®] yf.